Trading and Capital-Markets Activities Manual

First Printing, February 1998

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Federal Reserve System

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Nature of Changes

Trading Activities

In section 2020.1, ''Counterparty Credit Risk and Presettlement Risk,'' a new subsection on off-market or prefunded derivatives transactions has been added to provide examples of derivatives transactions that are the functional equivalent of extensions of credit to counterparties and to describe the risks associated with them. The discussion of assessment of counterparty credit risk has been revised to specify that banking organizations should understand and confirm with their counterparties the business purpose of derivatives transactions.

A more detailed discussion of contingency funding plans has been added to section 2030.1, ''Liquidity Risk.'' The characteristics of effective contingency funding plans, such as forming a crisis-management team and establishing action plans for different levels of liquidity stress, are described. Specific information on contingency liquidity for bank holding companies is also provided.

Section 2070.1, ''Legal Risk,'' has been reorganized and updated. A new subsection describes how a banking organization can mitigate the risk that may arise if a counterparty claims that a bank-recommended or -structured derivatives transaction was unsuitable for it. Other changes discuss the new-product approval process in banking organizations, including the role of in-house or outside legal counsel in defining and approving new products. The examination objectives and examination procedures, sections 2070.2 and 2070.3, respectively, have also been updated.

Capital-Markets Activities

Section 3040.1, ''Equity Investment and Merchant Banking Activities,'' has been completely revised. The accounting, valuation, and risk management of equity investments in banking organizations are summarized. In addition, the section explains the legal and regulatory compliance requirements for these transactions—including the January 2002 rule establishing minimum regulatory capital requirements for equity investments in nonfinancial companies. Examination objectives and examination procedures, sections 3040.2 and 3040.3, respectively, have been added.

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Nature of Changes

Section 3000.1, ''Investment Securities and End-User Activities,'' has been revised to explain recent interpretations of sections 23A and 23B of the Federal Reserve Act. The internal control questionnaire, section 3000.4, has also been updated.

- A final rule, effective June 11, 2001, provides three exemptions from the quantitative limits and collateral requirements of section 23A. The exemptions apply to certain loans an insured depository institution makes to third parties that use the proceeds to purchase securities or assets through an affiliate of the depository institution.
- A final rule, effective June 11, 2001, exempts from section 23A an insured depository institution's purchase of a security from an affiliated broker-dealer registered with the Securities and Exchange Commission (SEC), provided several conditions are met. Among other conditions, the purchased security must have a ready market, as defined by the SEC, and a publicly available market quotation.
- An interim rule, effective January 1, 2002, confirms that (1) derivative transactions between an insured depository institution and its affiliates and (2) intraday extensions of credit by an insured depository institution to its affiliates are subject to the market-terms requirement of section 23B.

In Section 3020.1, ''Securitization and Secondary-Market Credit Activities,'' the discussion of risk-based provisions affecting asset securitizations has been updated to include a final rule on the capital treatment of recourse obligations, residual interests, and direct-credit substitutes resulting from asset securitizations. The new rule treats recourse obligations and direct-credit substitutes more consistently than the current risk-based capital standards, adds new standards for the treatment of residual interests, and introduces a ratings-based approach to assigning risk weights within a securitization. There is a one-year transition period for applying the new rules to existing transactions. All transactions settled on or after January 1, 2002, are subject to the revised rules.

Revisions to section 3040.1, ''Equity Investment and Merchant Banking Activities,'' incorporate a final rule establishing special minimum regulatory capital requirements for equity investments in nonfinancial companies. The new requirements, effective April 1, 2002, impose a series of marginal capital charges on covered equity investments. The charges increase with the level of a banking organization's overall exposure to equity investments relative to tier 1 capital.

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Supplement 6—September 2001

Nature of Changes

Sections 2120.1, "Accounting," and 3020.1, "Securitization and Secondary-Market Credit Activities," have been corrected to remove references to Statement of Financial Accounting Standards No. 125 (FAS 125), which has been replaced by Statement of Financial Accounting Standards No. 140 (FAS 140). Section 2120.1 was further corrected to replace a reference to Accounting Principles Board (APB) Opinion No.16 with Statement of Financial Accounting Standards No. 141 (FAS 141), "Business Combinations." References to FAS 125 have also been removed from the instrument profiles (sections 4010.1 through 4255.1 and section 4353.1).

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Nature of Changes

Trading Activities

Section 2120.1, ‘‘Accounting,’’ has been revised to incorporate the following recent guidance from the Financial Accounting Standards Board: Statement of Financial Accounting Standards (SFAS) No. 133, ‘‘Accounting for Derivative Instruments and Hedging Activities,’’ and SFAS No. 140, ‘‘Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." (SFAS 140 supersedes SFAS 125, which had the same title). The accounting treatment for securitizations, repurchase agreements, derivative instruments, and foreign-currency instruments has been updated. The discussion on accounting for derivatives includes information on fair-value, cash-flow, and foreign-currency hedges. The examination objectives, examination procedures, internal control questionnaire, and appendix on financial statement disclosures, sections 2120.2, 2120.3, 2120.4, and 2120.5, respectively, have also been updated.

In section 2130.1, ‘‘Regulatory Reporting,’’ references to the obsolete Monthly Consolidated Foreign Currency Report (FFIEC form 035) have been removed, and the guidance on institutions that are required to file the FR Y-20 report has been revised. The examination objectives, examination procedures, internal control questionnaire, and appendix on reports for trading instruments, sections 2130.2, 2130.3, 2130.4, and 2130.5, respectively, have also been updated.

The Gramm-Leach-Bliley Act (GLB Act), enacted in 1999, removed some restrictions that were formerly applicable to section 20 subsidiaries engaged in underwriting, dealing, and other related activities. Under the GLB Act, banking regulators are also required to rely to the greatest extent possible on the functional regulator of securities firms. Section 2140.1, ‘‘Regulatory Compliance,’’ has been revised to incorporate these provisions of the GLB Act.

Capital-Markets Activities

New information on the valuation of retained interests, including SR-99-37 and its related interagency guidance, has been added to section 3020.1, ‘‘Securitization and Secondary-Market Credit Activities.’’ The subsection on internal controls has also been expanded to include the minimum requirements for management information systems reports on securitization activities.

A new section 3040.1, ‘‘Equity Investment and Merchant Banking Activities,’’ has been added. The new section incorporates the supervisory letter on these activities (SR-00-9) that was formerly in section 4360.1. The section also provides new guidance on merchant banking activities of financial holding companies, including investment limitations, cross-marketing limitations, and special rules for private equity funds.

Instrument Profiles

The ‘‘Accounting Treatment’’ subsections in the instrument profiles have been revised to delete references to obsolete accounting standards and add references to SFAS 133 and SFAS 140. Section 4350.1, ‘‘Credit Derivatives,’’ was further revised to expand the risk-based capital weighting guidance. In section 4353.1, ‘‘Collateralized Loan Obligations,’’ more detailed information was provided on the risk-based capital weighting of three types of transactions for synthetic collateralized loan obligations.

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Equity Investments and Merchant Banking

The Federal Reserve's supervisory letter SR-00-9, issued June 22, 2000, has been added as a new instrument profile, section 4360.1. The section provides guidance for managing the risks of equity investments and merchant banking activities, which have become important sources of earnings at some financial institutions. Furthermore, the recently enacted Gramm-Leach-Bliley Act provides additional merchant banking authority to financial holding companies.

The new section outlines sound practices for equity investments and merchant banking, appropriate disclosure practices for institutions engaging in these activities, and additional risk-management issues for institutions engaging in transactions with portfolio companies. A final rule on the conduct of equity investment and merchant banking activities is forthcoming and will be included in a future update to this manual.

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Capital Adequacy

A subsection on the capital treatment of synthetic collateralized loan obligations (CLOs) has been added to section 2110.1, ''Capital Adequacy.'' The use of credit derivatives to synthetically replicate CLOs has raised questions about how to calculate their leverage and risk-based capital ratios. The new material discusses supervisory and examination considerations for three types of synthetic CLO transactions in banking organizations: (1) the entire notional amount of the reference portfolio is hedged, (2) a high-quality senior risk position in the reference portfolio is retained, and (3) a first-loss position is retained.

Accounting

''Accounting,'' section 2120.1, was revised in the ''Netting or Offsetting Assets and Liabilities'' subsection to clarify the conditions necessary for a master netting arrangement to exist and to add information from the Financial Accounting Standards Board's Interpretation 41. A new subsection also provides guidance on accounting for derivative instruments under FASB Statement of Financial Accounting Standard No. 133 (SFAS 133), which is effective for fiscal years beginning after June 15, 2000. SFAS 133 requires banking organizations to recognize all derivatives on their balance sheets as assets or liabilities, and to report them at their fair value.

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Trading and Capital-Markets Activities Manual
Supplement 2—September 1999

Nature of Changes

This supplement reflects new or revised statutory and regulatory provisions and new or revised supervisory instructions or guidance issued by the Division of Banking Supervision and Regulation since the publication of the March 1999 supplement.

Counterparty Credit Risk

Section 2020.1, ''Counterparty Credit Risk and Presettlement Risk,'' has been revised to add a list of conditions examiners should use when evaluating credit-risk management in banking institutions, as provided in SR-99-3 (February 1, 1999). The guidance on collateral arrangements has been expanded to incorporate recent recommendations from the central banks of the Group of Ten countries on over-the-counter derivatives settlement procedures, as well as market-practice recommendations from the 1999 collateral review by the International Swaps and Derivatives Association. The examination objectives, examination procedures, and internal control questionnaire (sections 2020.2, 2020.3, and 2020.4, respectively) have also been updated.

Capital Adequacy

A new subsection on assessing capital adequacy at large, complex banking organizations has been added to section 2110.1, ''Capital Adequacy.'' The new guidance outlines the fundamental elements of a sound internal analysis of capital adequacy, describes the risks that should be addressed in this analysis, and discusses the examiner's review of an institution's capital adequacy analysis. Other revisions were made to expand the guidance on market-risk measure, including the use of internal models and qualitative and quantitative requirements for market-risk management.

Accounting

In section 2120.1, ''Accounting,'' the description of the Statement of Financial Accounting Standard No. 133, ''Accounting for Derivative Instruments and Hedging Activities,'' has been updated. The Financial Accounting Standards Board has delayed the statement's effective date to fiscal years beginning after June 15, 1999.

A reference to an outdated Federal Reserve policy statement on securities activities has been removed. The appendix on financial-statement disclosures, section 2120.5, has also been updated.

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Trading and Capital-Markets Activities Manual
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This supplement reflects new or revised statutory and regulatory provisions and new or revised supervisory instructions or guidance issued by the Division of Banking Supervision and Regulation since the publication of the manual in February 1998.

LIST OF CHANGES

Counterparty Credit Risk

Section 2020.1, Counterparty Credit Risk and Presettlement Risk, has been revised to incorporate the supervisory guidance on counterparty credit risk management provided in SR-99-3 (February 1, 1999). Specific guidance on the calculation of potential future exposure, exposure-monitoring and limit systems, the importance of stress testing and scenario analysis, and the interrelationship between credit and market risk, is included. Additional guidance on credit enhancements, including collateral, close-out provisions, and margining requirements, is provided. The section discusses in detail the need for robust counterparty credit risk management policies and internal controls to ensure that existing practice conforms to stated policies. The unique risks posed by institutional investors and hedge funds are detailed in a separate subsection, which includes a discussion of the January 1999 report of the Basle Committee on Banking Supervision on the risks posed by hedge funds to creditors and the accompanying sound practices standards for interactions with hedge funds. The examination objectives, examination procedures, and internal control questionnaire (sections 2020.2, 2020.3, and 2020.4, respectively) have also been updated.

In section 2021.1, Counterpary Credit Risk and Settlement Risk, a discussion of the Board's June 1998 Policy Statement on Privately Operated Multilateral Settlement Systems provides guidance on the additional settlement risks posed by these systems.

Legal Risk

Section 2070.1, Legal Risk, has been updated to include a discussion on the importance of properly and accurately defining the trigger events that provide for payments between counterparties, in light of experiences during the market disruptions of 1998. A subsection on nondeliverable forwards and the need for explicit documentation of these contracts is also added. The examination objectives and examination procedures (sections 2070.2 and 2070.3, respectively) have been updated.

Capital Adequacy

Section 2110.1, Capital Adequacy, has been updated to reflect regulatory changes to the definition of tier 1 and tier 2 capital and to include a revised discussion of the regulatory treatment of credit derivatives.

Accounting

In section 2120.1, Accounting, a brief description of the Statement of Financial Accounting Standards No. 133 (SFAS 133) for derivatives has been added. SFAS 133 is effective for fiscal years beginning after June 15, 1999, with an effective date of January 1, 2000, for most banks. The description of SFAS 133 will be expanded in subsequent revisions to the manual.

Securities

Section 3000.1, Investment Securities and End-User Activities, has been revised to reflect the Policy Statement on Investment Securities and End-User Derivatives Activities, published by the Federal Financial Institutions Examination Council, and the recission of the high-risk test for mortgage-derivative products.

Interest-Rate Risk

In section 3010.1, Interest-Rate Risk Management, a discussion of an examination scope for noncomplex institutions has been revised to

delete specific criteria previously used to identify institutions in which only baseline examination procedures were necessary. The revised focus is on the overall risk profile of the individual institution in lieu of dependence on strict quantitative criteria.

Collateralized Loan Obligations

A new product profile on collateralized loan obligations (CLOs) has been added as section 4353.1. CLOs are securitizations of portfolios of commercial and industrial loans through a bankruptcy-remote special-purpose vehicle that issues asset-backed securities in one or more classes (or tranches). Alternatively, CLOs may be synthetically created through the use of credit derivatives.

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Preface

USING THIS MANUAL

This manual seeks to provide the examiner with guidance for reviewing capital-markets and trading activities at all types and sizes of financial institutions. The manual will be updated periodically as products and activities evolve.

The manual codifies current procedures used in the review of capital-markets and trading activities. It discusses the risks involved in various activities, risk-management and -measurement techniques, appropriate internal controls, and the examination process from the following perspectives:

- *Global applicability.* The manual is not directed at trading at any one type of institution (commercial bank, branch/agency, other) but is meant to apply to capital-markets and trading activities at all financial institutions to be examined.
- *Portfolio.* The manual attempts to broaden our review of trading operations from a product-by-product approach to a portfolio and functional-activity approach. This method better reflects the multiple uses of financial instruments by institutions, their relationship to other instruments and activities on or off the balance sheet, and attendant correlations.
- *Types of risk.* The manual identifies the range of risks—market, credit, liquidity, operational, legal, and other risks—relevant to the review of capital-markets and trading activities, and discusses their management on a functional and legal-entity basis.

The manual is divided into four basic sections. The first section consists of broad introductory remarks regarding the examination of most capital-markets and trading activities, including important considerations in preparing for the examination and review of capital-markets activities. It also discusses the importance of examiner review of the management organization of the activity to be examined.

The second section presents supervisory guidance regarding trading and dealer operations at banking organizations and specifically details certain aspects of the examination process for these operations. In general, the discussion of each topic has the following four subsections:

- discussion of the general topic
- examination objectives
- examination procedures
- internal control questionnaire

The focus of the examination objectives, examination procedures, and internal control questionnaires is to provide examiners with a practical guide to examining the core areas of any trading operation. Examination objectives describe the goals that should be of primary interest to the examiner and determine the scope of the examination for the specific area of interest. The examination procedures include procedures to be performed during a comprehensive examination. In some instances, not all the procedures may apply to all financial institutions. Thus, examiners have the flexibility, depending on the characteristics of the particular institution under examination, to determine the examination scope and procedures. The materiality and significance of a given area of operations are an examiner's primary considerations when deciding the scope of the examination and the procedures to be performed. Examiner flexibility results in examinations tailored to the operations of the banking institution. After determining the proper objectives and procedures, the examiner will have an organized approach to examining the institution's trading processes. Core topics include the following:

- market risk
- credit risk
- settlement risk
- liquidity risk
- operations and systems risk
- legal risk
- financial performance
- capital adequacy of trading activities
- accounting
- regulatory reporting
- regulatory compliance
- ethics

The third section of this manual offers supervisory guidance regarding various banking activities and functions that are not trading-related but are directly linked with capital-markets and Treasury operations. While targeted primarily at larger institutions, the general principles identified in this section are applicable to activities at institutions of all sizes. This section presents the latest Federal Reserve

supervisory guidance on issues such as interest-rate risk management within the banking book, securitization and secondary-market credit activities, securities and end-user derivative activities, and other topics. In some cases, the guidance consists of Federal Reserve supervision and regulation (SR) letters on specific topics. In others, formal examination-manual treatments are presented that include exam procedures and internal control questionnaires.

The fourth section of this manual presents profiles of specific financial instruments commonly encountered in capital-markets and trading activities. An examiner's understanding of these instruments is crucial to successful implementation of a capital-markets examination. While the write-ups are not intended to provide in-depth and fully comprehensive coverage of each instrument, they do present basic instrument characteristics and examination considerations. In general, each instrument profile contains discussions in the following areas:

- general description
- characteristics and features
- uses
- description of the instrument's market
- pricing conventions
- hedging issues
- discussion of the risks involved
- accounting treatment
- risk-based capital considerations
- bank-eligibility requirements
- references for further information

When assigned to review a particular product, the examiner should first review the appropriate instrument profile to become familiar with the characteristics of and the marketplace for the product. The examination objectives, examination procedures, and internal control questionnaires will often be applicable across any number of instruments and products. Therefore, coordination with examiners who are reviewing other products is essential.

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2100	Financial Performance		
2110	Capital Adequacy	4240	Spanish Government Bonds
2120	Accounting	4245	Swiss Government Notes and Bonds
2130	Regulatory Reporting	4250	United Kingdom Government Bonds
2140	Regulatory Compliance	4255	Brady Bonds and Other Emerging-Markets Bonds
2150	Ethics	4305	Foreign Exchange
		4310	Forwards
3000	CAPITAL-MARKETS ACTIVITIES	4315	Forward Rate Agreements
		4320	Financial Futures
3000	Investment Securities and End-User Activities	4325	Interest-Rate Swaps
		4330	Options
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3020	Securitization and Secondary-Market Credit Activities	4340	Swaptions
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3030	Futures Brokerage Activities and Futures Commission Merchants	4350	Credit Derivatives
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4000	INSTRUMENT PROFILES		SUBJECT INDEX
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The globalization of markets, increased transaction volume and volatility, and the introduction of complex products and trading strategies have led capital-markets and trading activities to take on an increasingly important role at financial institutions over the last decade. These activities include the use of a range of financial products and strategies, from the most liquid fixed-income securities to complex derivative instruments. The risk dimensions of these products and strategies should be fully understood, monitored, and controlled by bank management. Accordingly, adequate risk-management systems and controls at financial institutions are essential to prevent losses and protect capital. The role of regulators in supervising capital-markets and trading activities is to evaluate management's ability to identify, measure, monitor, and control the risks involved in these activities and to ensure that institutions have sufficient capital to support the risks they take. The level of risk an institution may reasonably assume through capital-markets and trading activities should be determined by the board of directors' stated tolerance for risk, the ability of senior management to effectively govern these operations, and the capital position of the institution.

OVERVIEW OF RISK

For capital-markets and trading activities, risk is generally defined as the potential for loss on an instrument, portfolio, or activity. Thus, the risks referred to in this manual will be discussed in terms of the impact of some event on value (value-at-risk) and income (earnings-at-risk) from the instrument, activity, or portfolio being addressed.

Risk management is the process by which managers identify, assess, monitor, and control all risks associated with a financial institution's activities. The increasing complexity of the financial industry and the range of financial instruments have made risk management more difficult to accomplish and to evaluate. In more sophisticated institutions, the role of risk management is to identify the risks associated with particular business activities and to aggregate summary data into generic components, ultimately allowing exposures to be evaluated on a common basis. This methodology enables institutions to manage risks by portfolio and to consider exposures in relationship to the institution's global strategy and risk tolerance.

A financial institution's risk-management process should not only be assessed by business line, but also in the context of the global, consolidated institution. A review of the global organization may reveal risk concentrations not readily identifiable from the limited view of a branch, agency, Edge Act institution, nonbank subsidiary, or head office on a stand-alone basis. The consolidation of risk information also allows the institution to identify, measure, and control its risks, while giving the necessary consideration to the breakdown of exposure by legal entity. Sometimes, if applicable rules and laws allow, identified risks at a branch or subsidiary may be compensated for by offsetting exposures at another related institution. However, this management of risks across separate entities must be done in a way that is consistent with the authorities granted to each entity. Some financial institutions and their subsidiaries may not be permitted to hold, trade, deal, or underwrite certain types of financial instruments, including some of those instruments discussed in the 4000 sections of this manual, unless they have specifically received regulatory approval. Furthermore, conditions and commitments may be attached to regulatory approvals to engage in certain capital-markets activities. Examiners should ensure that financial institutions have the proper regulatory authority for the activities they engage in and that activities are conducted consistent with their specific regulatory approvals.

Ideally, an institution should be able to identify the relevant generic risks and should have measurement systems in place to conceptualize, quantify, and control these risks on an institutional level using a common measurement framework. However, it is recognized that not all institutions have an integrated risk-management system that aggregates all business activities. In addition, risk-management methodologies in the marketplace and an institution's scope of business are continually evolving, making risk management a dynamic process. Nonetheless, an institution's risk-management system should always be able to identify, aggregate, and control all risks posed by capital-markets and trading activities that could have a significant impact on capital or equity.

Examiners need to determine the ability of the institution's risk-management system to measure and control risks. The assessment of risk-management systems and controls should be performed by type of instrument and type of risk. Some of the risks inherent in the trading process are described below:

- *Market (price) risk* is the risk that the value of a financial instrument or a portfolio of financial instruments will change as a result of a change in market conditions (for example, interest-rate movement).
- *Funding-liquidity risk* refers to the ability to meet investment and funding requirements arising from cash-flow mismatches.
- *Market-liquidity risk* refers to the risk of being unable to close out open positions quickly enough and in sufficient quantities at a reasonable price to avoid adverse financial impacts.
- *Counterparty credit risk* is the risk that a counterparty to a transaction will fail to perform according to the terms and conditions of the contract, thus causing the holder of the claim to suffer a loss in cash flow or market value.
- *Clearing/settlement credit risk* is (1) the risk that a counterparty who has received a payment or delivery of assets defaults before delivery of the asset or payment or (2) the risk that technical difficulties interrupt delivery or settlement despite the counterparty's ability or willingness to perform.
- *Operations and systems risk* is the risk of human error or fraud or the risk that systems will fail to adequately record, monitor, and account for transactions or positions.
- *Legal risk* is the risk that a transaction cannot be consummated because of some legal barrier, such as inadequate documentation, a regulatory prohibition on a specific counterparty, and nonenforceability of bilateral and multilateral close-out netting and collateral arrangements in bankruptcy.
- *Reputational risk* is the risk arising from negative public opinion regarding an institution's products or activities.

The examiner must be prepared to identify and evaluate exposures that arise out of any part of a capital-markets operation. To that end, the examiner must become familiar with the institution's overall reporting structure and segregation of duties, range of business activities, global risk-management framework, risk-measurement models, and system of internal controls. Furthermore, the examiner must assess the qualitative and quantitative assumptions implicit in the overall risk-management system and the effectiveness of the institution's approach to controlling risks. In addition, the examiner must determine that the management information system and other forms of communication are adequate for the institution's level of business activity.

Banking supervision is a dynamic process and this is especially evident in the oversight of capital-markets and trading activities. As capital markets, financial instruments, and secondary-market activities continue to expand and develop, they have an increasingly significant impact on the safety and soundness of financial institutions. Consequently, it has become equally necessary for bank supervisors to focus their attention on the capital-markets and trading activities arena. Policies and practices for evaluating the exposures, management tools, and controls employed by banking institutions have had to be constructed and adapted to keep pace with changes in the industry. In this context, the manual encourages the examiner to ask the following basic questions:

- Are the tools employed by management to measure and monitor risk exposure adequate?
- Is the level of risk exposure appropriate given the financial institution's size, sophistication, and financial condition?
- Are the risks in the institution's portfolio of products and activities recognized, understood, measured, and managed?
- Are the activities conducted consistent with the goals and risk tolerance of senior management and the board of directors?

To prepare for the on-site portion of the examination of any capital-markets or trading activity, a preliminary overview of the range of products and activities of the institution should be developed. This overview will help examiners formulate a scope and objective for the upcoming exam that is consistent with the types and levels of risk exposure assumed by the institution.

PREEXAMINATION REVIEW

The review of trading activities is generally

conducted on the basis of a financial institution's organizational structure. These structures may vary widely depending on the size and sophistication of the institution, the markets and geographies in which it competes, and the objectives and strategies of its management and board of directors.

Many banks and bank holding companies have several subsidiaries that conduct business independent of affiliated entities, and some branches and agencies may operate autonomously. The overlap of business lines, sharing of information and personnel, and transaction netting agreements that exist among affiliated legal entities force examiners to go beyond the basic business-unit review and focus on functional exposures within the global institution. It is also important for an examiner to ensure that an institution respects divisions between legal entities, such as firewall and bank/nonbank separations. For example, while a bank holding company must be aware of the level of its consolidated risk, it cannot ignore legal boundaries completely in the management of that risk. Exposure in the bank is not automatically hedged by offsetting positions in the bank holding company and vice versa. In some cases, transactions may be offset by a transaction between these affiliates which may, however, be subject to other regulatory requirements. Bank holding companies should manage and control risk exposures on a consolidated basis, while recognizing legal distinctions among subsidiaries. Examiners should always maintain a view of the ''big picture'' impact of capital-markets and trading activities on consolidated risk exposure.

The examiner team should meet before the examination begins to summarize the institution's status and assign responsibilities for completing preparatory work. Generally, examination assignments may be segregated based on products, activities, or functions. For example, for trading operations, examiners may be given administrative responsibility for the following areas of review:

- interest-rate products including fixed-income securities, swaps, futures, forward-rate agreements (FRAs), options, caps, and floors
- currency-related activities including customer-driven and discretionary foreign-exchange (FX) trading, cross-currency transactions, and currency derivatives (for example, currency options, forwards, futures, and swaps)
- equity-based products and activities including equity options, warrants, and swaps
- commodity-based products and activities including commodity futures, options, and forwards

Other capital-markets activities, such as asset securitization or secondary-market credit activities may be assessed by specific activity, function, or product.

To prepare examiners for their assignments, the following initial procedures should be followed to achieve the required scope and coverage of the institution's activities.

- Determine the extent of work performed during the past year by auditors and regulatory agencies (these would include, but not be limited to, the institution's internal auditors, the various exchanges, the Securities and Exchange Commission, the Commodity Futures Trading Commission, the National Association of Securities Dealers, the National Futures Association, and the Internal Revenue Service).
- Review deficiencies identified by audit reports and reports of examination.
- Obtain a listing of the names, qualifications, functions, and positions of key trading and front- and back-office personnel, and a current organizational chart. This material should be available in prior examination and inspection reports.
- Evaluate the volume of transactions and the dollar value of positions held in each trading product and activity. These data may be found in various regulatory reports.
- Using the audit findings on the effectiveness of controls over capital-markets and trading activities, evaluate the examination scope to assess organizational and reporting changes, identify perceived weaknesses, and highlight patterns of error.

BACKGROUND REVIEW

Specific items which should be reviewed during the preexamination process for capital-markets and trading activities include the following:

- *Regulatory reports.* During the planning stages of an examination, the examiners may estimate activity volumes and diversity of instru-

ments and activities from periodical regulatory reports. This information will help in the development of an examination scope and objective, as well as in the determination of staffing and resource requirements.

- *Prior report of examination.* The findings and conclusions of the prior examination are invaluable to the preparation of the scope and objectives of the current examination. Examination reports provide insight into bank management's policies and practices in measuring and managing risk, the extent of risk exposure in a given product and/or activity, and the overall adequacy of the trading-activity control environment.
- *Audit reports.* Internal and external audits are often focused on the activities of individual business units and may not encompass aggregate exposures and controls. Nevertheless, they are useful in identifying exceptions to internal policies and specific violations such as limit exceptions. Management's responses to audit findings are also useful in identifying corrective actions and the direction of the unit.
- *Correspondence since the last examination.* An additional resource that should be reviewed before an examination is the correspondence file. This will contain important information such as management's response to the prior examination findings, any applications submitted to the Federal Reserve (for additional powers, mergers, and acquisitions), and any supervisory action or agreement that may exist.
- *Outstanding applications.* The examiner-in-charge should inquire about the status of any outstanding applications before the Federal Reserve Board that may suggest expansion in the capital-markets and trading activities of the banking institution.

FIRST-DAY LETTER

In preparation for an on-site examination, examiners will often need to customize the first-day-letter questionnaire to reflect the specific focus of the capital-markets review. The focus will reflect the range of products and activities of the institution as well as management's approach to risk control. The following is a brief list of core requests to be made in the first-day letter:

- a copy of the organization charts (including name and title of managers) for the capital-markets or global-trading operations to be assessed, including functional and legal-entity organization
- a copy of the institution's written risk-management policies and procedures that outline the instruments traded, their associated risks, and the monitoring of the risks
- a copy of established limits for each principal type of risk as well as documentation indicating periodic approval by the board of directors
- general-ledger and subsidiary-ledger accounts identifying the range and level of activity as of the examination date
- management information reports used in the global, functional, or legal-entity oversight of market- and credit-risk management
- detailed information on transactions that are unique or uncommon
- copies of management reports issued in connection with the bank's new financial products that were put in place since the last examination indicating the office at which such activity is conducted, the lines and limits established for each activity, and the perceived risks associated with each activity
- a description of the scope and frequency of internal and external audits of the institution's capital-markets and trading activities and copies of audits, including working papers, conducted of capital-markets operations since the last examination

The first-day letter to an institution that engages in capital-markets or trading activities and the use of derivatives usually will be much more precise and comprehensive than this list, depending on the institution's range of products and activities. Significantly more detail should be requested relative to the objectives of the trading operations, the activities in which the institution engages, the products it uses, and the risk-management methods and reports it relies on. The first-day letter should also include requests for detailed information related to the areas highlighted in the market, credit, liquidity, and operational risk sections of this manual.

Obtaining an overview of the organization, management structure, product universe, and control environment of a financial institution's capital-markets and trading activities is a critical initial step in the examination process. This overview can be developed by applying the examination procedures listed in this manual, which enable the examination team to understand the institution's legal-entity and managerial structures and the scope and location of its activities, and to evaluate policies, procedures, and actual practices. An overview also helps the examiner to identify broad internal control processes and gain insight into how effectively they cover trading activities. Finally, the overview helps identify significant changes in operations and the rationale for those changes.

Evaluating the capital-markets, trading, and marketing activities conducted by the financial institution can be a complicated task that may be compounded by the lack of a clear distinction between bank and nonbank powers granted to an institution. A number of institutions will shift positions among legal entities to facilitate risk management along product or geographic-market lines. Therefore, the overview or organizational structure is central in evaluating whether the financial institution has separated activities as required by law and regulation.

The examiner-in-charge is responsible for evaluating the organizational structure, activities, overall risk-management system, and controls of the global-trading and capital-markets operations at the highest organizational level. In a U.S. financial institution, this would generally be the bank holding company level. Examiners should be aware that organization and structure can differ significantly among financial institutions.

OPERATIONAL AND LEGAL STRUCTURE OF THE FIRM AND ITS CAPITAL-MARKETS ACTIVITIES

The ownership structure includes the geographic locations and legal-entity divisions of an institution's relevant banking and nonbanking operations, including holding companies, significant affiliated entities, and separately capitalized units such as section 20 or limited purpose ''venture'' entities. Other organizational structures include branches, agencies, subsidiaries, joint ventures, or portfolio investment partnerships. Some of these entities may be registered with regulatory agencies such as the Securities and Exchange Commission (SEC), National Association of Securities Dealers (NASD), and Commodity Futures Trading Commission (CFTC) and may have affiliations with, or membership in, stock and commodities exchanges worldwide. These organizations may impose constraints on the activities of an institution, and the examination team should be aware of the scope, conclusions, and timing of any examinations, inspections, and reviews conducted by other regulatory bodies.

Depending on the powers granted to it by the country having jurisdiction, a diversified multinational banking organization may use a variety of functional management structures which cross legal-entity boundaries to invest, trade, underwrite, or deal in trading products. Functional management lines may be introduced to facilitate decision making. An institution may clear its own trading products, provide clearing services for customers, or maintain clearing and settlement relationships with correspondent financial institutions. The examiner should review these operations as well as the reasons and results of significant reorganizations, particularly if the entities have exceptional earnings profiles.

To manage and control activities on a global basis, a financial institution should have programs established to identify where it conducts activities both by business entity and by legal entity. These programs should document how activities are monitored on an ongoing basis and reported to senior management. The examiner should review the adequacy of the management information system from a reporting and automation perspective. The most recent internal and external audit reports covering the banking institution's capital-markets and trading activities should be evaluated to identify any deficiencies related to organizational structure and separation of duties. For additional guidance, examiners should refer to the *Bank Holding Company Examination Manual*, specifically section 2185.0 on nonbank section 20 subsidiaries engaged in dealing and underwriting and the 3000 sections on nonbank activities, including

securities brokerage, foreign-exchange advisory, futures commission merchant, primary dealer, and a wide range of other underwriting and dealing activities.

Risk-Management Organization

Risk management is the process of monitoring, controlling, and communicating to senior management and the board of directors the nature and extent of risk from capital-markets and trading activities. The board of directors has a regulatory mandate to set and periodically approve an institution's limit levels, given its tolerance for risk. Senior management should regularly evaluate the risk-management procedures in place to ensure they are appropriate and sound. Senior management should also foster and participate in active discussions with the board of directors, staff of risk-management functions, and traders regarding procedures for measuring and managing risk. Management must also ensure that capital-markets and trading activities are allocated sufficient resources to manage and control risks.

Personnel responsible for the risk-management function should be separate from trading-floor personnel. In contrast to the measurement and assessment of risk exposures, the day-to-day management of exposures by trading staff may follow a decentralized, product- or portfolio-specific approach. Therefore, an independent system for reporting exposures to both senior-level management and the board of directors is an important element in the overall risk-management process.

A review of the structure of managerial reporting lines is helpful in determining the financial institution's capacity to identify and manage risk. The reporting lines may be structured by legal entity, by functional lines of responsibility, or along business or profit-center lines. The examiner should request the organization chart to identify overlaps in the legal and operational structures and should cite possible violations of section 20 firewall provisions or other regulations which require strict separation of activities. Examiners should be aware of special conditions appearing in authorizations for the board of directors. Potential conflicts of interest of board members should also be evaluated.

Risk management can be performed globally, concentrating on the institution's generic categories of risk, locations, and activities, or by functional department, specific product, or portfolio. Global risk-management reports should clearly describe the elements of risk; provide a quantifiable description of the amount of capital allocated to capital-markets and trading activities; and identify limits on market, credit, and operational risks. *Examiners should be aware that a global approach to risk analysis can fail to identity specific risk levels in specific products, functions, or activities. Conversely, functional decentralized approaches can miss consolidated risks. Risk-analysis methods which incorporate aspects of both approaches are more effective.*

Financial institutions should have highly qualified personnel throughout their capital-markets and trading teams, including those in functions responsible for risk management and internal control. The personnel of independent risk-management functions should have a complete understanding of the risk associated with all on- and off-balance-sheet instruments that are transacted. Accordingly, compensation policies for these individuals should be adequate to attract and retain qualified personnel. As a matter of general policy, compensation policies, especially in the risk-management, control, and senior-management functions, should be structured to avoid potential incentives for excessive risk taking that can occur if, for example, salaries are tied too closely to the profitability of capital-markets and trading activities.

BUSINESS LINES AND SERVICES

Financial institutions identify primary business lines in a variety of ways. In trading operations, the transaction activity of different instruments may be subdivided into financial engineering, sales and distribution, underwriting, market making, proprietary trading and advisory services, and others. The grouping of activities may provide insight into the market strategy or competitive advantage of an institution, its capital and risk-limit allocation, and its concentration of risk. Transaction-activity groupings may help to identify the managerial and operational synergy between business and product lines and between affiliated entities.

Institutions may specialize in trading specific types of instruments and offer services tailored to their customers. The degree of diversity in the

range of business lines and services is a measure of the banking organization's capacity to establish a presence in those markets. Diversity of business lines can be an early indicator of potential imbalances in an institution's resource allocation, such as too broad a range of unsupervised activities or dependence on too narrow a range of activities.

Products and services that an institution has begun offering or discontinued since the previous examination should be identified. Business strategies which discuss any planned or recent changes to the business should be reviewed. A restructuring in business lines and services might be used to camouflage problems such as recognizing illegal profits or incurring large losses or breaches of internal limits, controls, regulations, or banking and securities laws. The examiner should refer all exceptional or unusual findings to the examiner-in-charge. Initiation of new products or new business initiatives should be formally approved by the board of directors after thorough research into all relevant aspects of the product.

Banking regulations provide for limitations and restrictions on permissible activities for banking organizations and their nonbank subsidiaries. A review of specific products and services is an additional check for identifying the banking organization's adherence to applicable legal or regulatory requirements. To ensure the adequacy of internal accounting, clearing, and settlement of transactions, banking institutions should document the methods used to collect and monitor information on all traded instruments.

MANAGEMENT AND COMPENSATION STRUCTURE

Capital-markets and trading management structures may be organized by legal entity, business line, profit center, or a combination thereof. Regulatory conditions as well as safe-and-sound banking practices often require the separation of managerial duties. Overlaps should be reviewed for compliance with regulations, ethical standards, and safety-and-soundness concerns.

Background reviews include the evaluation of management expertise and character. Resumes should be reviewed to determine whether key managers in trading, sales, operations, and compliance have been or are currently registered with any nonbank securities regulators (for example, provisions such as NASD Series 7 or CFTC commodity or exchange requirements such as ''registered principal''). The reviews should indicate whether management or trading and sales personnel have been cited for violations of securities laws, mentioned in criminal referrals to state or federal officials and are currently or have been under statutory supervision or periods of disqualification under NASD, New York Stock Exchange (NYSE), or other self-regulatory organization (SRO) rules.

The review should indicate whether management or trading and sales personnel are allowed to trade for their own accounts. Policies directed at the personal-investment activities of staff, as well as the areas responsible for monitoring and controlling them, should be identified. The compensation structure of key principals, including current and deferred salary, bonus, commission, equity participation, or other remuneration, should be described. Loans between the institution and key management should also be identified. Compensation practices should be reviewed to determine that the independence of those involved in risk-management oversight is not compromised by direct benefit from the profits of the risk-taking function. Finally, the profiles section should comment on the reasons for resignations or reassignments of key managers, traders, and salespeople.

The growing level of sophistication of capital markets requires experienced management with appropriate credentials to understand complex trading instruments and their associated risk-management techniques. The level of experience required to understand quantitative analysis and advanced risk-based sensitivity analysis should be commensurate with the sophistication of the firm's activities.

Any deficiencies in management's capacity to understand and control the instruments or the types of risk associated with them are cause for regulatory concern. However, the determination of deficiencies must be based on a fair and impartial assessment of the products traded and the institution's future business plans.

GENERAL POLICIES AND PROCEDURES

The adequacy of policies and procedures for capital-markets and trading activities should be

evaluated against the complexity and volume of financial transactions. Policies and procedures should be written and include, at a minimum, a mission statement, limits approved by the board of directors, procedures for reviewing limits, a list of traders and their assignments, the organization's structure and responsibilities, permissible activities, an approved list of brokers, counterparties, dealing guidelines, and an explicit dispute-resolution methodology. Furthermore, the institution should have a code of ethics for employees, a policy for personal trading, investment guidelines, a detailed description of transaction processing, and reconciliations and accounting procedures including a chart of accounts.

Policies and procedures should require that capital-markets and trading activities are under senior management review and subject to periodic audit. An internal audit department should be organizationally and functionally separate from trading-management oversight and should report to the board of directors of the institution. In institutions that are more active in trading, other organizational units should provide an independent assessment of the profitability and risk inherent in these activities.

Risk is an inevitable component of intermediation and trading activity. Given the fundamental trade-off between risks and returns, the objective of regulators is to determine when risk exposures either become excessive relative to the financial institution's capital position and financial condition or have not been identified to the extent that the situation represents an unsafe and unsound banking practice.

Determination of whether the institution's risk-management system can measure and control its risks is of particular importance. The primary components of a sound risk-management process are a comprehensive risk-measurement approach; a detailed structure of limits, guidelines, and other parameters used to govern risk taking; and a strong management information system for monitoring and reporting risks. These components are fundamental to both trading and nontrading activities. Moreover, the underlying risks associated with these activities, such as market, credit, liquidity, operations, and legal risks, are not new to banking, although their measurement can be more complex for trading activities than for lending activities. Accordingly, the process of risk management for capital-markets and trading activities should be integrated into the institution's overall risk-management system to the fullest extent possible using a conceptual framework common to the financial institution's other business activities. Such a common framework enables the institution to consolidate risk exposure more effectively, especially since the various individual risks involved in capital-markets and trading activities can be interconnected and may transcend specific markets.

The examiner must apply a multitude of analyses to appropriately assess the risk-management system of an institution. The assessment of risk-management systems and controls may be performed in consideration of the type of risk, the type of instrument, or by function or activity. The examiner must become familiar with the institution's range of business activities, global risk-management framework, risk-measurement models, and system of internal controls. Furthermore, the examiner must assess the qualitative and quantitative assumptions implicit in the risk-management system as well as the effectiveness of the institution's approach to controlling risks. The examiner must determine that the computer system, management information reports, and other forms of communication are adequate and accurate for the level of business activity of the institution.

GLOBAL RISK-MANAGEMENT FRAMEWORK

The primary goal of risk management is to ensure that a financial institution's trading, position-taking, credit extension, and operational activities do not expose it to losses that could threaten the viability of the firm. Global risk management is ultimately the responsibility of senior management and the board of directors; it involves setting the strategic direction of the firm and determining the firm's tolerance for risk. The examiner should verify that the risk management of capital-markets and trading activities is embedded in a strong global (firmwide) risk-management system, and that senior management and the directors are actively involved in overseeing the risk management of capital-markets products.

Role of Senior Management and the Board of Directors

Senior management and the board of directors have a responsibility to fully understand the risks involved in the institution's activities, question line management about the nature and management of those risks, set high standards for prompt and open discussion of internal control problems and losses, and engage management in discussions regarding the events or developments that could expose the firm to substantial loss. The commitment to risk management in any organization should be clearly delineated in practice and codified in written policies and procedures approved by the board of directors. These policies should be consistent with the financial institution's broader business strategies and overall willingness to take risk. Accordingly, the board of directors should be informed regularly of the risk exposure of the institution and should regularly reevaluate the organization's exposure and its risk tolerance regarding these activities. Middle and senior

management, including trading and control staff, should be well versed in the risk-measurement and risk-management methodology of the financial institution.

Senior management is responsible for ensuring that adequate policies and procedures for conducting long-term and day-to-day activities are in place. This responsibility includes ensuring clear delineations of responsibility for managing risk, adequate systems for measuring risk, appropriately structured limits on risk taking, effective internal controls, and a comprehensive risk-reporting process.

The risk-management mandate from senior management and the board of directors should include—

- identifying and assessing risks
- establishing policies, procedures, and risk limits
- monitoring and reporting compliance with limits
- delineating capital allocation and portfolio management
- developing guidelines for new products and including new exposures within the current framework
- applying new measurement methods to existing products

The limit structure should reflect the risk-measurement system in place, as well as the financial institution's tolerance for risk, given its risk profile, activities, and management's objectives. The limit structure should also be consistent with management's experience and the overall financial strength of the institution.

In addition, senior management and the board of directors are responsible for maintaining the institution's activities with adequate financial support and staffing to manage and control the risks of its activities. Highly qualified personnel must staff not only front-office positions such as trading desks, relationship or account officers, and sales, but also all back-office functions responsible for risk management and internal control.

Comprehensiveness of the Risk-Management System

The examiner should verify that the global risk-management system is comprehensive and adequately identifies the major risks to which the institution is exposed. The global risk-management system should cover all areas of the institution, including "special portfolios" such as exotic currency and interest-rate options or specially structured derivatives. At a minimum, the global risk-management system should provide for the separate institution-wide measurement and management of credit, market, liquidity, legal, and operational risk.

The evaluation of the firm's institution-wide risk relative to the firm's capital, earnings capacity, market liquidity, and professional and technological resources is an essential responsibility of senior management. The examiner should also verify that senior management oversees each of the major risk categories (credit, market, liquidity, operational, and legal risk).

Examiners should ascertain whether the financial institution has an effective process to evaluate and review the risks involved in products that are (1) either new to the firm or new to the marketplace and (2) of potential interest to the firm. In general, a bank should not trade a product until senior management and all relevant personnel (including those in risk management, internal control, legal, accounting, and audit) understand the product and are able to integrate the product into the financial institution's risk-measurement and control systems. Examiners should determine whether the financial institution has a formal process for reviewing new products and whether it introduces new products in a manner that adequately limits potential losses.

Financial institutions active in the derivatives markets generate many new products that are variants of existing instruments they offer. In evaluating whether these products should be subject to the new-product-evaluation process, examiners should consider whether the firm has adequately identified and aggregated all significant risks. In general, all significant structural variations in options products should receive some form of new-product review, even when the firm is dealing in similar products.

ORGANIZATIONAL STRUCTURE OF RISK MANAGEMENT

Examiners should evaluate the company's organizational structure and job descriptions to make sure that there is a clear understanding of the

appropriate personnel interaction required to control risk. In particular, measuring and setting parameters for the total amount of various risks facing the institution are distinct functions that should be clearly separated from the day-to-day management of risks associated with the normal flow of business. Normally, these parameters should be managed independently by senior management, with approval from the institution's board of directors.

The trading-risk-management role within an organization includes defining trading-risk-management policies, setting uniform standards of risk assessment and capital allocation, providing senior management with global risk reporting and evaluation, monitoring compliance with limits, and assisting in strategic planning related to risk management.

In some organizations, risk management has a control or policing function; in others, it is a counselor to the trading-operations area. Regardless of how it is implemented, the risk-management function should have reporting lines that are fully independent of the trading groups.

When defining an institution's exposures, risk managers must address all risks, those that are easily quantifiable and those that are not. Many trading risks lend themselves to common financial-estimation methods. Quantifiable risks related to price changes should be applied consistently to derive realistic estimates of market exposure. Consequently, examiners must subjectively and pragmatically evaluate an institution's risk related to capital-markets and trading activities.

The risk measurement and management of an institution will only be as strong as its internal control system. Effective internal control mechanisms for monitoring risk require that risk managers maintain a level of independence from the trading and marketing functions—a requirement not only for the development of the conceptual framework applied but for determining the applicable parameters used in daily evaluations of market risks. This function would be responsible for measuring risk, setting risk parameters, identifying risk vulnerabilities, monitoring risk limits, and evaluating or validating pricing and valuation models. Examiners should ascertain that the financial institution has some form of independent risk management and that management information is comprehensive and reported to senior management on a frequency commensurate with the level of trading activity.

The day-to-day management of risks that occur in the normal course of business can be accomplished through either centralized or decentralized structures. The choice of approach should reflect the organization's risk profile, trading philosophy, and strategy. In a highly decentralized structure, examiners should ascertain that adequate controls are in place to ensure the integrity of the aggregate information provided to senior management and the board of directors.

Trading positions must be accurately transmitted to the risk-measurement systems. The appropriate reconciliations should be performed to ensure data integrity across the full range of products, including new products that may be monitored apart from the main processing networks. Management reports should be reviewed to determine the frequency and magnitude of limit excesses over time. Traders, risk managers, and senior management should be able to define constraints on trading and justify identified excesses. The integrity of the management information system is especially important in this regard (See section 2040.1, ''Operations and Systems Risk (Management Information Systems)''.) Examiners should also review and assess the compensation arrangements of risk-management staff to ensure that there are no incentives which may conflict with maintaining the integrity of the risk-control system.

Measurement of Risks

The increasing globalization and complexity of capital markets and the expanding range of esoteric financial instruments have made trading-risk management more difficult to accomplish and evaluate. Fortunately, a number of commonly used risk-measurement systems have been developed to assist financial institutions in evaluating their unique combinations of risk exposures. These systems all aim to identify the risks associated with particular business activities and group them into generic components, resulting in a single measure for each type of risk. These systems also allow institutions to manage risks on a portfolio basis and to consider exposures in relation to the institution's global strategy and risk profile.

Managing the residual exposure or net position of a portfolio, instead of separate transactions and positions, provides two important benefits: a better understanding of the port-

folio's exposure and more efficient hedging. A market maker's portfolio benefits from economies of scale in market-risk management because large portfolios tend to contain naturally offsetting positions, which may significantly reduce the overall market risk. Hedging the residual risk of the net portfolio position rather than individual transactions greatly reduces transactions costs. A portfolio-focused management approach reduces the complexity of position tracking and management.

All major risks should be measured explicitly and consistently and integrated into the firmwide risk-management system. Systems and procedures should recognize that measurement of some types of risk is an approximation and that some risks, such as the market liquidity of a marketable instrument, can be very difficult to quantify and can vary with economic and market conditions. Nevertheless, at a minimum, the vulnerabilities of the firm to these risks should be explicitly assessed on an ongoing basis in response to changing circumstances.

Sound risk-measurement practices include the careful and continuous identification of possible events or changes in market behavior that could have a detrimental impact on the financial institution. The financial institution's ability to withstand economic and market shocks points to the desirability of developing comprehensive and flexible data-management systems.

Risk Limits

The risk-management system should include a sound system of integrated institution-wide risk limits that should be developed under the direction of and approved by senior management and the board of directors. The established limits structure should apply to all risks arising from an institution's activities. For credit and market risk, in particular, limits on derivatives should be directly integrated with institution-wide limits on those risks as they arise in all other activities of the firm. When risks are not quantifiable, management should demonstrate an awareness of their potential impact.

In addition to credit risk and market risk, limits or firm guidelines should be established to address liquidity and funding risk, operational risk, and legal risk. Careful assessment of operational risk by the financial institution is especially important, since the identification of vulnerabilities in the operational process can often lead to improvements in procedures, data processing systems, and contingency plans that significantly reduce operational risk.

Examiners should ascertain whether management has considered the largest losses which might arise during adverse events, even scenarios which the financial institution may consider fairly remote possibilities. The evaluation of worst-case scenarios does not suggest that the limits themselves must reflect the outcomes of a worst-case scenario or that the financial institution would be imprudent to assume risk positions that involve large losses if remote events were to occur. However, financial institutions should have a sense of how large this type of risk might be and how the institution would manage its positions if such an event occured. Evaluation of such scenarios is crucial to risk management since significant deviations from past experience do occur, such as the breakdown in 1992 and 1993 of the traditionally high correlation of the movements of the dollar and other European currencies of the European monetary system.

An institution's exposures should be monitored against limits by control staff who are fully independent of the trading function. The process for approving limit excesses should require that, before exceeding limits, trading personnel obtain at least oral approval from senior management independent of the trading area. The organization should require written approval of limit excesses and maintenance of such documentation. Limits need not be absolute; however, appropriate dialogue with nontrading senior management should take place before limits are exceeded. Finally, senior management should properly address repeated limit excesses and divergences from approved trading strategies.

Procedures should address the frequency of limit review, method of approval, and authority required to change limits. Relevant management reports and their routing through the organization should be delineated.

Maintenance Issues

Complex instruments require sound analytical tools to assess their risk. These tools are grounded in rigorous financial theory and mathematics. As an institution commits more resources to structured products, complex cash instruments, or derivatives, existing staff will be required to develop an understanding of the

methodologies applied. Institutions should not create an environment in which only trading staff can evaluate market risk; information on new products and their attendant risks should be widely disseminated.

Concurrent with the review of the existing risk-management framework, the resources provided to maintain the integrity of the risk-measurement system should be evaluated. Limits should be reviewed at least annually. Assumptions underlying the established limits should be reviewed in the context of changes in strategy, the risk tolerance of the institution, or market conditions. Automated systems should be upgraded to accommodate increased volumes and added financial complexity, either in applying new valuation methodologies or implementing tools to evaluate new products. Products that are recorded ''off-line,'' that is, not on the mainframe or LAN (linked personal computers), should provide automated data feeds to the risk-measurement systems to reduce the incidence of manual error.

Internal Controls and Audits

A review of internal controls has long been central to the examination of capital-markets and trading activities. The examiner should review the system of internal controls to ensure that they promote effective and efficient operations; reliable financial and regulatory reporting; and compliance with relevant laws and regulations, safe and sound banking practices, and policies of the board of directors and management. Evaluating the ability of internal controls to achieve these objectives involves understanding and documenting adherence to control activities such as approvals, verifications, and reconciliations.

When evaluating internal controls, examiners should consider the frequency, scope, and findings of internal and external audits and the ability of those auditors to review the capital-markets and trading activities. Internal auditors should audit and test the risk-management process and internal controls periodically, with the frequency based on a careful risk assessment. Adequate test work should be conducted to re-create summary risk factors in management reports from exposures in the trading position. This may include validation of risk-measurement algorithms independent of the trading or control functions with special emphasis on new, complex products. Internal auditors should also test compliance with risk limits and evaluate the reliability and timeliness of information reported to the financial institution's senior management and the board of directors. Internal auditors are also expected to evaluate the independence and overall effectiveness of the financial institution's risk-management functions.

The level of confidence that examiners place in the audit work, the nature of the audit findings, and management's response to those findings will influence the scope of the current examination. Even when the audit process and findings are satisfactory, examiners should test critical internal controls, including the revaluation process, the credit-approval process, and adherence to established limits. Significant changes in product lines; modeling; or risk-management methodologies, limits, and internal controls should receive special attention. Substantial changes in earnings from capital-markets and trading activities, in the size of positions, or the value-at-risk associated with these activities should also be investigated during the examination. These findings and evaluations and other factors, as appropriate, should be the basis for decisions to dedicate greater resources to examining the trading functions.

SOUND PRACTICES

Capital-markets and trading operations vary significantly among financial institutions, depending on the size of the trading operation, trading and management expertise, organizational structures, the sophistication of computer systems, the institution's focus and strategy, historical and expected income, past problems and losses, risks, and types and sophistication of the trading products and activities. As a result, the risk-management practices, policies, and procedures expected in one institution may not be necessary in another. With these caveats in mind, a list of sound practices for financial institutions actively engaged in capital-markets and trading operations follows:

- Every organization should have a risk-management function that is independent of its trading staff.
- Every organization should have a risk-management policy that is approved by the board of directors annually. The policy should outline products traded, parameters for risk

activities, the limit structure, over-limit-approval procedures, and frequency of review. In addition, every organization should have a process to periodically review limit policies, pricing assumptions, and model inputs under changing market conditions. In some markets, frequent, high-level review of such factors may be warranted.

- Every organization should have a new-product policy that requires review and approval by all operational areas affected by such transactions (for example, risk management, credit management, trading, accounting, regulatory reporting, back office, audit, compliance, and legal). This policy should be evidenced by an audit trail of approvals before a new product is introduced.
- Every organization should be able to aggregate each major type of risk on a single common basis, including market, credit, and operational risks. Ideally, risks would be evaluated within a value-at-risk framework to determine the overall level of risk to the institution. The risk-measurement system should also permit disaggregation of risk by type and by customer, instrument, or business unit to effectively support the management and control of risks.
- Every organization should have a methodology to stress test the institution's portfolios with respect to key variables or events to create plausible worst-case scenarios for review by senior management. The limit structure of the institution should consider the results of the stress tests.
- Every organization should have an integrated management information system that controls market risks and provides comprehensive reporting. The sophistication of the system should match the level of risk and complexity of trading activity. Every institution should have adequate financial applications in place to quantify and monitor risk positions and to process the variety of instruments currently in use. A minimum of manual intervention should be required to process and monitor transactions.
- Risk management or the control function should be able to produce a risk-management report that highlights positions, limits, and excesses on a basis commensurate with trading activity. This report should be sent to senior management, reviewed, signed, and returned to control staff.
- Counterparty credit exposure on derivative transactions should be measured on a replacement-cost and potential-exposure basis. Every organization should perform a periodic assessment of credit exposure to redefine statistical parameters used to derive potential exposure.
- With regard to credit risk, any organization that employs netting should have a policy related to netting agreements. Appropriate legal inquiry should be conducted to determine enforceability by jurisdiction and counterparty type. Netting should be implemented only when legally enforceable.
- Every organization should have middle and senior management inside and outside the trading room who are familiar with the stated philosophy on market and credit risk. Also, pricing methods employed by the traders should be well understood.
- Every organization should be cognizant of nonquantifiable risks (such as operational risks), have an approach to assessing them, and have guidelines and trading practices to control them.
- Every organization with a high level of trading activity should be able to demonstrate that it can adjust strategies and positions under rapidly changing market conditions and crisis situations on a timely basis.
- For business lines with high levels of activity, risk management should be able to review exposures on an intraday basis.
- Management information systems should provide sufficient reporting for decision making on market and credit risks, as well as operational data including profitability, unsettled items, and payments.
- A periodic compliance review should be conducted to ensure conformity with federal, state, and foreign securities laws and regulatory guidelines.
- Every institution should have a compensation system that does not create incentives which may conflict with maintaining the integrity of the risk-control system.
- Auditors should perform a comprehensive review of risk management annually, emphasizing segregation of duties and validation of data integrity. Additional test work should be performed when numerous new products or models are introduced. Models used by both the front and back offices should be reassessed periodically to ensure sound results.

Market risk is the potential that changes in the market prices of an institution's holdings may have an adverse effect on its financial condition. The four most common market-risk factors are interest rates, foreign-exchange rates, equity prices, and commodity prices. The market risk of both individual financial instruments and portfolios of instruments can be a function of one, several, or all of these basic factors and, in many cases, can be significantly complex. The market risks arising from positions with options, either explicit or embedded in other instruments, can be especially complex and difficult to manage. Institutions should ensure that they adequately measure, monitor, and control the market risks involved in their trading activities.

The measurement of market risk should take due account of hedging and diversification effects and should recognize generally accepted measurement techniques and concepts. Although several types of approaches are available for measuring market risk, institutions have increasingly adopted the ''value-at-risk'' approach for their trading operations. Regardless of the specific approach used, risk measures should be sufficiently accurate and rigorous to adequately reflect all of an institution's meaningful market-risk exposure and should be adequately incorporated into the risk-management process.

Risk monitoring is the foundation of an effective risk-management process. Accordingly, institutions should ensure that they have adequate internal reporting systems that address their market-risk exposures. Regular reports with appropriate detail and frequency should be provided to the various levels of trading operations and senior management, from individual traders and trading desks to business-line management and senior management and, ultimately, the board of directors.

A well-constructed system of limits and policies on acceptable levels of risk exposure is a particularly important element of risk control in trading operations. Financial institutions should establish limits for market risk that relate to their risk measures and are consistent with maximum exposures authorized by their senior management and board of directors. These limits can be allocated to business units, product lines, or other appropriate organizational units and should be clearly understood by all relevant parties. In practice, some limit systems often include additional elements such as stop-loss limits and other trading guidelines that may play an important role in controlling risk at the trader and business-unit level. All limits should be appropriately enforced and adequate internal controls should exist to ensure that any exceptions to limits are detected and adequately addressed by management.

TYPES OF MARKET RISKS

Interest-Rate Risk

Interest-rate risk is the potential that changes in interest rates may adversely affect the value of a financial instrument or portfolio, or the condition of the institution as a whole. Although interest-rate risk arises in all types of financial instruments, it is most pronouced in debt instruments, derivatives that have debt instruments as their underlying reference asset, and other derivatives whose values are linked to market interest rates. In general, the values of longer-term instruments are often more sensitive to interest-rate changes than the values of shorter-term instruments.

Risk in trading activities arises from open or unhedged positions and from imperfect correlations between offsetting positions. With regard to interest-rate risk, open positions arise most often from differences in the maturities or repricing dates of positions and cash flows that are asset-like (i.e., ''longs'') and those that are liability-like (i.e., ''shorts''). The exposure that such ''mismatches'' represent to an institution depends not only on each instrument's or position's sensitivity to interest-rate changes and the amount held, but also on how these sensitivities are correlated within portfolios and, more broadly, across trading desks and business lines. In sum, the overall level of interest-rate risk in an open portfolio is determined by the extent to which the risk characteristics of the instruments in that portfolio interact.

Imperfect correlations in the behavior of offsetting or hedged instruments in response to changes in interest rates—both across the yield curve and within the same maturity or repricing category—can allow for significant interest-rate risk exposure. Offsetting positions with different maturities, although theoretically weighted to

create hedged positions, may be exposed to imperfect correlations in the underlying reference rates. Such ''yield curve'' risk can arise in portfolios in which long and short positions of different maturities are well hedged against a change in the overall level of interest rates, but not against a change in the shape of the yield curve when interest rates of different maturities change by varying amounts.

Imperfect correlation in rates and values of offsetting positions within a maturity or repricing category can also be a source of significant risk. This ''basis'' risk exists when offseting positions have different and less than perfectly correlated coupon or reference rates. For example, three-month interbank deposits, three-month Eurodollars, and three-month Treasury bills all pay three-month interest rates. However, these three-month rates are not perfectly correlated with each other, and spreads between their yields may vary over time. As a result, three-month Treasury bills, for example, funded by three-month Eurodollar deposits, represent an imperfectly offset or hedged position. One variant of basis risk that is central to the management of global trading risk is ''cross-currency interest-rate risk,'' that is, the risk that comparable interest rates in different currency markets may not move in tandem.

Foreign-Exchange Risk

Foreign-exchange risk is the potential that movements in exchange rates may adversely affect the value of an institution's holdings and, thus, its financial condition. Foreign-exchange rates can be subject to large and sudden swings, and understanding and managing the risk associated with exchange-rate volatility can be especially complex. Although it is important to acknowledge exchange rates as a distinct market-risk factor, the valuation of foreign-exchange instruments generally requires knowledge of the behavior of both spot exchange rates and interest rates. Any forward premium or discount in the value of a foreign currency relative to the domestic currency is determined largely by relative interest rates in the two national markets.

As with all market risks, foreign-exchange risk arises from both open or imperfectly offset or hedged positions. Imperfect correlations across currencies and international interest-rate markets pose particular challenges to the effectiveness of foreign-currency hedging strategies.

Equity-Price Risk

Equity-price risk is the potential for adverse changes in the value of an institution's equity-related holdings. Price risks associated with equities are often classified into two categories: general (or undiversifiable) equity risk and specific (or diversifiable) equity risk.

''General equity-price risk'' refers to the sensitivity of an instrument's or portfolio's value to changes in the overall level of equity prices. As such, general risk cannot be reduced by diversifying one's holdings of equity intruments. Many broad equity indexes, for example, primarily involve general market risk.

Specific equity-price risk refers to that portion of an individual equity instrument's price volatility that is determined by the firm-specific characteristics. This risk is distinct from market-wide price fluctuations and can be reduced by diversification across other equity instruments. By assembling a portfolio with a sufficiently large number of different securities, specific risk can be greatly reduced because the unique fluctuations in the price of any single equity will tend to be canceled out by fluctuations in the opposite direction of prices of other securities, leaving only general-equity risk.

Commodity-Price Risk

Commodity-price risk is the potential for adverse changes in the value of an institution's commodity-related holdings. Price risks associated with commodities differ considerably from interest-rate and foreign-exchange-rate risk and require even more careful monitoring and management. Most commodities are traded in markets in which the concentration of supply can magnify price volatility. Moreover, fluctuations in market liquidity often accompany high price volatility. Therefore, commodity prices generally have higher volatilities and larger price discontinuities than most commonly traded financial assets. An evaluation of commodity-price risk should be performed on a market-by-market basis and include not only an analysis of historical price behavior, but also an assessment of the structure of supply and demand in the

marketplace to evaluate the potential for unusually large price movements.

OPTIONS

Exposure to any and all of the various types of market risk can be significantly magnified by the presence of explicit or embedded options in instruments and portfolios. Moreover, assessing the true risk profile of options can be complex. Under certain conditions, the significant leverage involved in many options can translate small changes in the underlying reference instrument into large changes in the value of the option.

Moreover, an option's value is, in part, highly dependent on the likelihood or probability that it may become profitable to exercise in the future. In turn, this probability can be affected by several factors including the time to expiration of the option and the volatility of the underlying reference instrument. Accordingly, factors other than changes in the underlying reference instrument can lead to changes in the value of the option. For example, as the price variability of the reference instrument increases, the probability that the option becomes profitable increases. Therefore, a change in the market's assessment of volatility can affect the value of an option even without any change in the current price of the underlying asset.

The presence of option characteristics is a major complicating factor in managing the market risks of trading activities. Institutions should ensure that they fully understand, measure, and control the various sources of optionality influencing their market-risk exposures. Measurement issues arising from the presence of options are addressed more fully in the instrument profile on options (section 4330.1).

MARKET-RISK MEASUREMENT

There are a number of methods for measuring the various market risks encountered in trading operations. All require adequate information on current positions, market conditions, and instrument characteristics. Regardless of the methods used, the scope and sophistication of an institution's measurement systems should be commensurate with the scale, complexity, and nature of its trading activities and positions held.

Adequate controls should be imposed on all elements of the process for market-risk measurement and monitoring, including the gathering and transmission of data on positions, market factors and market conditions, key assumptions and parameters, the calculation of the risk measures, and the reporting of risk exposures through appropriate chains of authority and responsibility. Moreover, all of these elements should be subject to internal validation and independent review.

In most institutions, computer models are used to measure market risk. Even within a single organization, a large number of models may be used, often serving different purposes. For example, individual traders or desks may use ''quick and dirty'' models that allow speedy evaluation of opportunities and risks, while more sophisticated and precise models are needed for daily portfolio revaluation and for systematically evaluating the overall risk of the institution and its performance against risk limits. Models used in the risk-measurement and front- and back-office control functions should be independently validated by risk-management staff or by internal or outside auditors.

Examiners should ensure that institutions have internal controls to check the adequacy of the valuation parameters, algorithms, and assumptions used in market-risk models. Specific considerations with regard to the oversight of models used in trading operations and the adequacy of reporting systems are discussed in sections 2100 and 2110, ''Financial Performance'' and ''Capital Adequacy of Trading Activities,'' respectively.

Basic Measures of Market Risk

Nominal Measures

Nominal or notional measurements are the most basic methodologies used in market-risk management. They represent risk positions based on the nominal amount of transactions and holdings. Typical nominal measurement methods may summarize net risk positions or gross risk positions. Nominal measurements may also be used in conjunction with other risk-measurement methodologies. For example, an institution may use nominal measurements to control market risks arising from foreign-exchange trading while using duration measurements to control interest-rate risks.

For certain institutions with limited, noncomplex risk profiles, nominal measures and controls based on them may be sufficient to adequately control risk. In addition, the ease of computation in a nominal measurement system may provide more timely results. However, nominal measures have several limitations. Often, the nominal size of an exposure is an inaccurate measure of risk since it does not reflect price sensitivity or price volatility. This is especially the case with derivative instruments. Also, for sophisticated institutions, nominal measures often do not allow an accurate aggregation of risks across instruments and trading desks.

Factor-Sensitivity Measures

Basic factor-sensitivity measures offer a somewhat higher level of measurement sophistication than nominal measures. As the name implies, these measures gauge the sensitivity of the value of an instrument or portfolio to changes in a primary risk factor. For example, the price value of a basis point change in yield and the concept of duration are often used as factor-sensitivity measures in assessing the interest-rate risk of fixed-income instruments and portfolios. Beta, or the measure of the systematic risk of equities, is often considered a first-order sensitivity measure of the change in an equity-related instrument or portfolio to changes in broad equity indexes.

Duration provides a useful illustration of a factor-sensitivity measure. Duration measures the sensitivity of the present value or price of a financial instrument with respect to a change in interest rates. By calculating the weighted average duration of the instruments held in a portfolio, the price sensitivity of different instruments can be aggregated using a single basis that converts nominal positions into an overall price sensitivity for that portfolio. These portfolio durations can then be used as the primary measure of interest-rate risk exposure.

Alternatively, institutions can express the basic price sensitivities of their holdings in terms of one representative instrument. Continuing the example using duration, an institution may convert its positions into the duration equivalents of one reference instrument such as a four-year U.S. Treasury, three-month Eurodollar, or some other common financial instrument. For example, all interest-rate risk exposures might be converted into a dollar amount of a ''two-year'' U.S. Treasury security. The institution can then aggregate the instruments and evaluate the risk as if the instruments were a single position in the common base.

While basic factor-sensitivity measures can provide useful insights, they do have certain limitations—especially in measuring the exposure of complex instruments and portfolios. For example, they do not assess an instrument's convexity or volatility and can be difficult to understand outside of the context of market events. Examiners should ensure that factor-sensitivity measures are used appropriately and, where necessary, supported with more sophisticated measures of market-risk exposure.

Basic Measures of Optionality

At its most basic level, the value of an option can generally be viewed as a function of the price of the underlying instrument or reference rate relative to the exercise price of the option, the volatility of the underlying instrument or reference rate, the option contract's time to expiration, and the level of market interest rates. Institutions may use simple measures of each of these elements to identify and manage the market risks of their option positions, including the following:

- ''Delta'' measures the degree to which the option's value will be affected by a (small) change in the price of the underlying instrument.
- ''Gamma'' measures the degree to which the option's delta will change as the instrument's price changes; a higher gamma typically implies that the option has greater value to its holder.
- ''Vega'' measures the sensitivity of the option value to changes in the market's expectations for the volatility of the underlying instrument; a higher vega typically increases the value of the option to its holder.
- ''Theta'' measures how much an option's value changes as the option moves closer to its expiration date; a higher theta is typically associated with a higher option value to its holder.
- ''Rho'' measures how an option's value changes in response to a change in short-term interest rates; a higher rho typically is associated with a lower option value to its holder.

Measurement issues arising from the presence of options are addressed more fully in the instrument profile on options (section 4330.1).

Scenario Simulations

Another level of risk-exposure measurement is the direct estimation of the potential change in the value of instruments and portfolios under specified scenarios of changes in risk factors. On a simple basis, changes in risk factors can be applied to factor-sensitivity measures such as duration or the present value of a basis point to derive a change in value under the selected scenario. These scenarios can be arbitrarily determined or statistically inferred either from analyzing historical data on changes in the appropriate risk factor or from running multiple forecasts using a modeled or assumed stochastic process that describes how a risk factor may behave under certain circumstances. In statistical inference, a scenario is selected based on the probability that it will occur over a selected time horizon. A simple statistical measure used to infer such probabilities is the standard deviation.

Standard deviation is a summary measure of the dispersion or variability of a random variable such as the change in price of a financial instrument. The size of the standard deviation, combined with some knowledge of the type of probability distribution governing the behavior of a random variable, allows an analyst to quantify risk by inferring the probability that a certain scenario may occur. For a random variable with a normal distribution, 68 percent of the observed outcomes will fall within plus or minus one (±1) standard deviation of the average change, 90 percent within 1.65 standard deviations, 95 percent within 1.96 standard deviations, and 99 percent within 2.58 standard deviations. Assuming that changes in risk factors are normally distributed, calculated standard deviations of these changes can be used to specify a scenario that has a statistically inferred probability of occurrence (for example, a scenario that would be as severe as 95 percent or 99 percent of all possible outcomes). An alternative to such statistical inference is to use directly observed historical scenarios and assume that their future probability of occurrence is the same as their historical frequency of occurrence.

However, some technicians contend that short-term movements in the prices of many financial instruments are not normally distributed, in particular, that the probability of extreme movements is considerably higher than would be predicted by an application of the normal distribution. Accordingly, more sophisticated institutions use more complex volatility-measurement techniques to define appropriate scenarios.

A particularly important consideration in conducting scenario simulations is the interactions and relationships between positions. These interrelationships are often identified explicitly with the use of correlation coefficients. A correlation coefficient is a quantitative measure of the extent to which changes in one variable are related to another. The magnitude of the coefficient measues the likelihood that the two variables will move together in a linear relationship. Two variables (that is, instrument prices) whose movements correspond closely would have a correlation coefficient close to 1. In the case of inversely related variables, the correlation coefficient would be close to −1.

Conceptually, using correlation coefficients allows an institution to incorporate multiple risk factors into a single risk analysis. This is important for instruments whose value is linked to more than one risk factor, such as foreign-exchange derivatives, and for measuring the risk of a trading portfolio. The use of correlations allows the institution to hedge positions—to partially offset long positions in a particular currency/maturity bucket with short positions in a different currency/maturity bucket—and to diversify price risk for the portfolio as a whole in a unitary conceptual framework. The degree to which individual instruments and positions are correlated determines the degree of risk offset or diversification. By fully incorporating correlation, an institution may be able to express all positions, across all risk factors, as a single risk figure.

Value-at-Risk

Value-at-risk (VAR) is the most common measurement technique used by trading institutions to summarize their market-risk exposures. VAR is defined as the estimated maximum loss on an instrument or portfolio that can be expected over a given time interval at a specified level of probability. Two basic approaches are generally used to forecast changes in risk factors for a

desired probability or confidence interval. One involves direct specification of how market factors will act using a defined stochastic process and Monte Carlo techniques to simulate multiple possible outcomes. Statistical inference from these multiple outcomes provides expected values at some confidence interval. An alternative approach involves the use of historical changes in risk factors and parameters observed over some defined sample period. Under this alternative approach, forecasts can be derived using either variance-covariance or historical-simulation methodologies. Variance-covariance estimation uses standard deviations and correlations of risk factors to statistically infer the probability of possible scenarios, while the historical-simulation method uses actual distributions of historical changes in risk factors to estimate VAR at the desired confidence interval.

Some organizations allocate capital to various divisions based on an internal transfer-pricing process using measures of value-at-risk. Rates of return from each business unit are measured against this capital to assess the unit's efficiency as well as to determine future strategies and commitments to various business lines. In addition, as explained in the section on capital adequacy, the internal value-at-risk models are used for risk-based capital purposes.

Assumptions about market liquidity are likely to have a critical effect on the severity of conditions used to estimate risk. Some institutions may estimate exposure under the assumption that dynamic hedging or other rapid portfolio adjustments will keep risk within a given range even when significant changes in market prices occur. Dynamic hedging depends on the existence of sufficient market liquidity to execute the desired transactions at reasonable costs as underlying prices change. If a market-liquidity disruption were to occur, the difficulty of executing transactions would cause the actual market risk to be higher than anticipated.

To recognize the importance of market-liquidity assumptions, measures such as value-at-risk should be estimated over a number of different time horizons. The use of a short time horizon, such as a day, may be useful for day-to-day risk management. However, prudent managers will also estimate risk over longer horizons, since the use of a short horizon relies on an assumption that market liquidity will always be sufficient to allow positions to be closed out at minimal losses. In a crisis, the firm's access to markets may be so impaired that closing out or hedging positions may be impossible except at extremely unfavorable prices, in which case positions may be held for longer than envisioned. This unexpected lengthening of the holding period will cause a portfolio's risk profile to be much greater than expected because the likelihood of a large price change increases with time (holding period), and the risk profile of some instruments, such as options, changes substantially as their remaining time to maturity decreases.

Stress Testing

The underlying statistical methods used in daily risk measurements summarize exposures that reflect the most probable market conditions. Market participants should periodically perform simulations to determine how their portfolios will perform under exceptional conditions. The framework of this stress testing should be detailed in the risk-management policy statement, and senior management should be regularly apprised of the findings. Assumptions should be critically questioned and input parameters altered to reflect changing market conditions.

The examiner should review available simulations to determine the base case, as well as review comparable scenarios to determine whether the resulting ''worst case'' is sufficiently conservative. Similar analyses should be conducted to derive worst-case credit exposures. Nonquantifiable risks, such as operational and legal risks, constraints on market or product liquidity, and the probability of discontinuities in various trading markets, are important considerations in the review process. Concerns include unanticipated political and economic events which may result in market disruptions or distortions. This overall evaluation should include an assessment of the institution's ability to alter hedge strategies or liquidate positions. Additional attention should be committed to evaluating the frequency of stress tests.

MARKET-RISK LIMITS

Market-risk limits are one of the most fundamental controls over the risks inherent in an institution's trading activities. Banks should establish limits for market risk that relate to their

risk measures and are consistent with maximum exposures authorized by their senior management and board of directors. These limits should be allocated to business units and individual traders and be clearly understood by all relevant parties. Internal controls should ensure that exceptions to limits are detected and adequately addressed by management. In practice, some limit systems include additional elements, such as stop-loss limits and trading guidelines, that may play an important role in controlling risk at the trader and business-unit level. Examiners should include these elements in their review of the limit system. Other institutions may have several levels of limits informally allocated by product or by staff. For example, policy guidelines may give head traders substantial discretion in allocating limits among staff. Some institutions that permit traders to take positions in multiple instruments may apply limits broadly across the organization, with sublevels of advisory limits when gross exposures exceed a given percentage, such as 75 percent, of overall levels.

When analyzing an institution's limits, examiners should evaluate the size of limits against the institution's financial strength. The risks resulting from full utilization of an institution's limits should not compromise its safety and soundness. Examiners should also evaluate the percentage of limit use over time. Excessively large limits may circumvent normal reporting lines; an increase in activity or position may not be properly highlighted to senior management. Conversely, overly restrictive limits which are frequently exceeded may undermine the discipline of the limit structure in place. Finally, examiners should evaluate profitability along with position taking. Institutions should be able to explain abnormal daily profits or losses given the size of their positions.

The following is a summary of limits frequently used by financial institutions:

- *Limits on net and gross positions.* Limits may be placed on gross positions, net positions, or both. Limits on gross positions restrict the size of a long or short position in a given instrument. Limits on net positions, on the other hand, attempt to recognize the natural offset of long and short positions. Institutions generally should employ both types of limits in their risk management.
- *Maximum allowable loss ("stop-loss").* Limits may be established to avoid the accumulation of excessive losses in a position. Typically, if these limits are reached, a senior management response is required to hedge or liquidate a position. These limits are usually more restrictive than overall position limits. Typical stop-loss limits are retrospective and cover cumulative losses for a day, week, or month.
- *Value-at-risk limits.* Management may place limits on the extent to which the value of a portfolio is affected by changes in underlying risk factors. Limits can be specified as the maximum loss for a specified scenario (for example, a 100 basis point change in rates) or for scenarios defined at some specified confidence level derived from internal VAR measures (for example, 99 percent of possible occurrences over a one-day time horizon). Generally, measures of sensitivity are based on historical volatilities of risk.
- *Maturity gap limits.* These limits enable an institution to control the risk of adverse changes in rates for the periods designated in the institution's planning time horizon. Limits might range from stated absolute amounts for each time frame to weighted limits that emphasize increasing rate-movement exposure applicable to the relative distance into the future in which the gap appears. In addition, these limits should specify the maximum maturity of the specific instrument or combination of instruments. Typically, institutions employ maturity gap limits to control risks arising from nonparallel shifts in yield curves and forward curves.
- *Limits on options positions.* An institution should place unique limits on options positions to adequately control trading risks. Options limits should include limits which address exposures to small changes in the price of the underlying instrument (delta), rate of change in the price of the underlying instrument (gamma), changes in the volatility of the price of the underlying instrument (vega), changes in the option's time to expiration (theta), and changes in interest rates (rho).
- *Limits for volatile or illiquid markets.* Management may choose to limit trading in especially volatile markets, in which losses could accumulate quickly, or in illiquid markets, in which management may be forced to take a loss to close a position it cannot offset.

1. To evaluate the organizational structure of the market-risk-management function.
2. To evaluate the adequacy of internal market-risk-management policies and procedures for capital-markets and trading activities and to determine that actual operating practices reflect such policies.
3. To identify the market risks of the institution.
4. To determine if the institution's market-risk-measurement system has been correctly implemented and adequately measures the institution's market risks.
5. To determine how the institution measures nonstandard products such as exotic options, structured financings, and certain mortgage-backed securities.
6. To determine if senior management and the board of directors of the financial institution understand the potential market exposures of the capital-markets and trading activities of the institution.
7. To ensure that business-level management has formulated contingency plans for illiquid market conditions.
8. To review management information systems for comprehensive coverage of market risks.
9. To assess the effectiveness of the global risk-management system and determine if it can evaluate market, liquidity, credit, operational, and legal risks and that management at the highest level is aware of the institution's global exposure.
10. To recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient.

These procedures list processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge that determines which procedures are warranted in examining any particular activity.

1. Review the market-risk-management organization.
   a. Check that the institution has a market-risk-management function with separate reporting lines from traders and marketers.
   b. Determine if market-risk-control personnel have sufficient credibility in the financial institution to question traders' and marketers' decisions.
   c. Determine if market-risk management is involved in new-product discussions.
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments. Obtain copies of all risk-management reports prepared by the institution.
   a Define the use and purpose of the institution's capital-markets products.
   b. Define the institution's range, scope, and size of risk exposures. Determine the products in which the institution makes markets. Determine the hedging instruments used to hedge these products.
   c. Evaluate market-risk-control personnel's demonstrated knowledge of the products traded by the financial institution and their understanding of current and potential exposures.
3. Obtain and evaluate the adequacy of risk-management policies and procedures for capital-markets and trading activities.
   a. Review market-risk policies, procedures, and limits. Determine whether the risk-measurement model and methodology adequately address all identified market risks and are appropriate for the institution's activities.
   b. Review contingency market-risk plans for adequacy.
   c. Check that limits are in place for market exposures before transacting a deal. If the financial institution relies on one-off approvals, check that the approval process is well documented.
   d. Review accounting and revaluation policies and procedures. Determine that revaluation procedures are appropriate.
4. Determine the credit rating and market acceptance of the financial institution as a counterparty in the markets.
5. Obtain all management information analyzing market risk.
   a. Determine the comprehensiveness, accuracy, and integrity of analysis.
   b. Review valuation and simulation methods in place.
   c. Review stress tests, analyzing changes in market conditions.
   d. Determine whether the management information reports accurately reflect risks and that reports are provided to the appropriate level of management.
6. Determine if any recent market disruptions have affected the institution's trading activities. If so, determine the institution's market response.
7. Establish that the financial institution is following its internal policies and procedures. Determine whether the established limits adequately control the range of market risks. Determine whether management is aware of limit excesses and takes appropriate action when necessary.
8. Determine whether the institution has established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency.
9. Determine whether management considered the full range of exposures when establishing capital-at-risk exposures.
   a. Determine if the financial institution established capital-at-risk limits which address both normal and distressed market conditions.

   b. Determine if senior management and the board of directors are advised of market-risk exposures in times of market disruption and under normal market conditions.
10. Determine that business managers have developed contingency plans which outline actions to be taken in times of market disruption to minimize losses as well as the potential damage to the institution's market-making reputation.
11. Based on information provided, determine the institution's exposure from dynamic hedging strategies during times of market disruption.
12. Recommend corrective action when policies, procedures, practices, internal controls, and management information systems are found to be deficient.

1. Review the market-risk-management organization.
   a. Does the institution have a market-risk-management function with separate reporting lines from traders and marketers?
   b. Do market-risk-control personnel have sufficient credibility in the financial institution to question traders' and marketers' decisions?
   c. Is market-risk management involved in new-product discussions in the financial institution?
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments and obtain copies of all risk-management reports prepared.
   a. Do summaries identify all the institution's capital-markets products?
   b. Define the role that the institution takes for the range of capital-markets products. Determine the hedging instruments used to hedge these products. Is the institution an end-user, dealer, market maker? In what products?
   c. Do market-risk-control personnel demonstrate knowledge of the products traded by the financial institution? Do they understand the current and potential exposures to the institution?
3. Does the institution have comprehensive, written risk-management policies and procedures for capital-markets and trading activities?
   a. Have limits been approved by the board of directors?
   b. Have policies, procedures, and limits been reviewed and reapproved within the last year?
   c. Are market-risk policies, procedures, and limits clearly defined?
   d. Are the limits appropriate for the institution and the level of capital-markets and trading activity?
   e. Do the limits adequately distinguish between trades used to manage the institution's asset-liability mismatch position and discretionary trading activity?
   f. Are there contingency market-risk plans?
   g. Are there appropriate accounting and revaluation policies and procedures?
   h. Do the policies authorize the use of appropriate hedging instruments?
   i. Do the policies address the use of dynamic hedging strategies?
   j. Do the policies establish market-risk limits which consider bid/ask spreads for the full range of products in normal markets?
   k. Do the policies provide an explanation of the board of directors' and senior management's philosophy regarding illiquid markets?
   l. Do the policies establish market-risk limits which consider bid/ask spreads in distressed markets? How do the policies reflect liquidity concerns?
   m. Are limits in place for market exposures before transacting a deal? If the financial institution relies on one-off approvals, is the approval process well documented?
4. If the financial institution has recently experienced a ratings downgrade, ascertain the impact of the credit-rating downgrade. What has been the market response to the financial institution as a counterparty in the markets? Have instances in which the institution provides collateral to its counterparties significantly increased?
5. Obtain all management information analyzing market risk.
   a. Is management information comprehensive and accurate, and is the analysis sound?
   b. Are the simulation assumptions for a normal market scenario reasonable?
   c. Are stress tests analyzing changes in market condition appropriate? Are the market assumptions reasonable?
   d. Do management information reports accurately reflect risks? Are reports provided to the appropriate level of management?
6. If there have been any recent market disruptions affecting the institution's trading activities, what has been the institution's market response?
7. Is the financial institution following its internal policies and procedures? Do the established limits adequately control the range of market risks? Are the limits appropriate for the institution's level of activity? Is management aware of limit excesses?

Does management take appropriate action when necessary?

8. Has the institution established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency? Are risk-management, revaluations, and close-out valuation reserves subject to audit?
9. Has management considered possible market disruptions when establishing capital-at-risk exposures?
   a. Has the financial institution established capital-at-risk limits which address both normal and distressed market conditions? Are these limits aggregated on a global basis?
   b. Are senior management and the board of directors advised of market-risk exposures in illiquid markets?
10. Have business managers developed contingency plans which outline actions to be taken to minimize losses as well as to minimize the potential damage to the institution's market-making reputation when market disruptions occur? Are management's activities in times of market disruptions prudent?
    a. Do opportunities for liquidation or unwinding of transactions exist?
    b. Is the depth (volume, size, number of market makers) of the market such that undue risk is not being taken?
    c. If executed on an exchange, is the open interest in the contract sufficient to ensure that management would be capable of hedging or closing out open positions in one-way directional markets?
    d. Can management execute transactions in large enough size to hedge and/or close out market-risk exposures without resulting in significant price adjustments?
11. Has management determined the institution's exposure to dynamic hedging strategies during times of market disruption?
12. Does the institution have a methodology for addressing difficult-to-value products or positions?

Broadly defined, credit risk is the risk of economic loss from the failure of an obligor to perform according to the terms and conditions of a contract or agreement. Credit risk exists in all activities that depend on the performance of issuers, borrowers, or counterparties, and virtually all capital-markets and trading transactions involve credit exposure. Over-the-counter (OTC) derivative transactions such as foreign exchange, swaps, and options can involve particularly large and dynamic credit exposures. Accordingly, institutions should ensure that they identify, measure, monitor, and control all of the various types of credit risks encountered in their trading of both derivative and nonderivative products.

Credit risk should be managed through a formal and independent process guided by appropriate policies and procedures. Measurement systems should provide appropriate and realistic estimates of the credit-risk exposure and should use generally accepted measurement methodologies and techniques. The development of customer credit limits and the monitoring of exposures against those limits is a critical control function and should form the backbone of an institution's credit-risk-management process. The most common forms of credit risks encountered in trading activities are issuer credit risk and counterparty credit risk. Issuer risk is the risk of default or credit deterioration of an issuer of instruments that are held as long positions in trading portfolios. While the short time horizon of trading activities limits much of the issuer credit risk for relatively high-quality and liquid instruments, other less-liquid instruments such as loans, emerging-market debt, and below-investment-quality debt instruments, may be the source of significant issuer credit risk.

Counterparty risks, the most significant credit risks faced in trading operations, consist of both ''presettlement'' risk and ''settlement'' risk. Presettlement risk is the risk of loss due to a counterparty's failure to perform on a contract or agreement during the life of a transaction. For most cash instruments, the duration of this risk exposure is limited to the hours or days from the time a transaction is agreed upon until settlement. However, in the case of many derivative products, this exposure can often exist for a period of several years. Given this potentially longer-term exposure and the complexity associated with some derivative instruments, banks should ensure that they fully assess the presettlement credit risks involved with such instruments. This section discusses the nature of the credit risks involved in trading activities and reviews basic credit-risk-management issues.

Settlement risk is the risk of loss when an institution meets its obligation under a contract (through either an advance of funds or securities) before the counterparty meets its obligation. Failures to perform at settlement can arise from counterparty default, operational problems, market liquidity constraints, and other factors. Settlement risk exists from the time an outgoing payment instruction cannot be recalled until the incoming payment is received with finality. This risk exists with any traded product and is greatest when delivery is made in different time zones. Issues and examination procedures regarding settlement risk are discussed at length in section 2021.1.

CREDIT-RISK-MANAGEMENT ORGANIZATION

An institution's process and program for managing credit risks should be commensurate with the range and scope of its activities. Institutions with relatively small trading operations in noncomplex instruments may not need the same level of automated systems and policies, or the same level of highly skilled staff, as firms that make markets in a variety of cash and derivative products.

Credit-risk management should begin at the highest levels of the organization, with credit-risk policies approved by the board of directors, the formation of a credit-risk policy committee of senior management, a credit-approval process, and credit-risk management staff who measure and monitor credit exposures throughout the organization. Although the organizational approaches used to manage credit risk may vary, the credit-risk management of trading activities should be integrated into the overall credit-risk management of the institution to the fullest extent practicable. With regard to policies, most complex banking organizations appear to have extensive written policies covering their assessment of counterparty creditworthiness for both the initial due-diligence process (that is,

before conducting business with a customer) and ongoing monitoring. However, examiners should focus particular attention on how such policies are structured and implemented.

Typically, credit-risk management in trading operations consists of (1) developing and approving credit-exposure measurement standards, (2) setting counterparty credit limits, (3) monitoring credit-limit usage and reviewing credits and concentrations of credit risk, and (4) implementing minimum documentation standards. In general, staff responsible for approving exposures should be segregated from those responsible for monitoring risk limits and measuring exposures. Traders and marketers should not be permitted to assume risks without adequate institutional credit-risk controls.

Institutions with very large trading operations often have a credit function in the trading area; staff in this area develop a high level of expertise in trading-product credit analysis and meet the demand for rapid credit approval in a trading environment. To carry out these responsibilities without compromising internal controls, the credit-risk-management function must be independent of these marketing and trading personnel who are directly involved in the execution of the transactions. While the credit staff in the trading area may possess great expertise in trading-product credit analysis, the persons responsible for the institution's global credit function should have a solid understanding of the measurement of credit-risk exposures in trading products and the techniques available to manage those exposures. The examiner's review of credit-risk management in trading activities should evaluate the quality and timeliness of information going to the global credit function and the way that information is integrated into global exposure reports.

Examiners should evaluate whether banking institutions—

- devote sufficient resources and adequate attention to the management of the risks involved in growing, highly profitable, or potentially high-risk activities and product lines;
- have internal audit and independent risk-management functions that adequately focus on growth, profitability, and risk criteria in targeting their reviews;
- achieve an appropriate balance among all elements of credit-risk management, including both qualitative and quantitative assessments of counterparty creditworthiness; measurement and evaluation of both on- and off-balance-sheet exposures, including potential future exposure; adequate stress testing; reliance on collateral and other credit enhancements; and the monitoring of exposures against meaningful limits;
- employ policies that are sufficiently calibrated to the risk profiles of particular types of counterparties and instruments to ensure adequate credit-risk assessment, exposure measurement, limit setting, and use of credit enhancements;
- ensure that actual business practices conform with stated policies and their intent; and
- are moving in a timely fashion to enhance their measurement of counterparty-credit-risk exposures, including refining potential future exposure measures and establishing stress-testing methodologies that better incorporate the interaction of market and credit risks.

To adequately evaluate these conditions, examiners should conduct sufficient and targeted transaction testing. See SR-99-3 (February 1, 1999).

CREDIT-RISK MEASUREMENT

Appropriate measurement of exposures is essential for effective credit-risk management in trading operations. For most cash instruments, presettlement credit exposure is measured as current carrying value. However, in the case of many derivative contracts, especially those traded in OTC markets, presettlement exposure is measured as the current value or replacement cost of the position, plus an estimate of the institution's potential future exposure to changes in the replacement value of that position over the term of the contract. The methods used to measure counterparty credit risk should be commensurate with the volume and level of complexity of the instruments involved. Importantly, measurement systems should use techniques that present a relevant picture of the true nature of the credit exposures involved. Some techniques used to measure presettlement risk can generate very large exposure estimates that, by definition, are unlikely to materialize. Unrealistic measures of credit exposure suggest important flaws in the institution's risk-management process and should receive special examiner attention.

Presettlement Risk

Presettlement credit exposure for cash instruments is measured as the current carrying value, which for trading operations is the market value or fair value of the instrument. Market values can be obtained from direct market quotations and pricing services or, in the case of more complex instruments, may be estimated using generally accepted valuation techniques. For derivative contracts, credit exposure is measured as the current value or replacement cost of the position, plus an estimate of the institution's potential future exposure to changes in that replacement value in response to market price changes. Together, replacement cost and estimated potential future exposure make up the loan-equivalent value of a derivative contract.

For derivative contracts, presettlement exposure to a counterparty exists whenever a contract's replacement cost has positive value to the institution (''in the money'') and negative value to the counterparty (''out of the money''). The current replacement cost of the contract is its mark-to-market value. If a counterparty defaults on a transaction before settlement or expiration of the deal, the other counterparty has an immediate exposure which must be filled. If the contract is in the money for the nondefaulting party, then the nondefaulting counterparty has suffered a credit loss. Thus, all deals with a positive mark-to-market value represent actual credit exposure. The replacement cost of derivative contracts is usually much smaller than the face or notional value of derivative transactions.

Some derivatives involving firm commitments, such as swaps, initially have a zero net present value and, therefore, no replacement cost at inception. At inception, the only potential for credit exposure these contracts have is what can arise from subsequent changes in the market price of the instrument, index, or interest rate underlying them. Once market prices move to create a positive contract value, the contract has the current credit-risk exposure of its replacement cost as well as the potential credit exposure that can arise from subsequent changes in market prices.

Options and derivative contracts which contain options (for example, swaptions and rate-protection agreements) face both current and potential credit exposure. However, a difference with option contracts is that they have a positive value at inception reflected by the premium paid by the purchaser to the writer of the option. The value of the purchased option may be reduced as a result of market movements, but cannot become negative. The seller or writer of an option receives a premium, usually at inception, and must deliver the underlying at exercise. Therefore, the party that buys the option contract will always have credit exposure when the option is in the money, and the party selling the option contract will have none, except for settlement risk while awaiting payment of the premium.

Potential Future Exposure

Potential future exposure is an estimate of the risk that subsequent changes in market prices could increase credit exposure. In measuring potential exposure, institutions attempt to determine how much a contract can move into the money for the institution and out of the money for the counterparty over time. Given the important interrelationships between the market-risk and credit-risk exposures involved in banks' derivative activities that have been emphasized over the past two years of financial-market turbulence, examiners should be alert to situations in which banks may need to enhance their current computations of potential future exposures and loan equivalents used to measure and monitor their derivative counterparty credit exposure.

Estimating potential exposure can be subjective, and firms approach its measurement in several different ways. One technique is to use ''rules of thumb'' or factors, such as percentages of the notional value of the contract, similar to the ''add-on'' factors used in bank risk-based capital. Institutions using such an approach should be able to demonstrate that the rules of thumb or factors provide adequate estimates of potential exposure. For example, differences in the add-ons used for different instruments should reflect differences in the volatility of the underlying instruments and in the tenor (or maturity) across instruments, and should be adjusted periodically to reflect changes in market conditions and the passage of time.

A more sophisticated and complex practice of measuring the potential exposure of derivatives is to statistically estimate the maximum probable value that the derivative contract might reach over a specified time horizon, which sometimes may be the life of the contract. This is often done by estimating the highest value the

contract will achieve within some confidence interval (for example, 95, 97.5, or 99 percent confidence) based on the estimated distribution of the contract's possible values at each point in time over the time horizon, given historical changes in underlying risk factors. The specified percentile or confidence level of the distribution represents the maximum expected value of the contract at each point over the time horizon.

The time horizon used to calculate potential future exposure can vary depending on the bank's risk tolerance, collateral protection, and ability to terminate its credit exposure. Some institutions may use a time horizon equal to the life of the respective instrument. While such a time horizon may be appropriate for unsecured positions, for collateralized exposures, the use of lifetime, worst-case estimates of potential future exposure may be ineffective in measuring the true nature of counterparty risk exposure—especially given the increasing volatility and complexity of financial markets and derivatives instruments. While life-of-contract potential future exposure measures provide an objective and conservative long-term exposure estimate, they bear little relationship to the actual credit exposures banks typically incur in the case of collateralized relationships. In such cases, a bank's actual credit exposure is the potential future exposure from the time a counterparty fails to meet a collateral call until the time the bank liquidates its collateral—a period which is typically much shorter than the contract's life. For some institutions, more realistic measures of collateralized exposures in times of market stress are needed. These measures should take into account the shorter time horizons over which action can be taken to mitigate losses. They should also incorporate estimates of collateral-recovery rates given the impact of potential market events on the liquidity of collateral values.

Institutions with vigorous monitoring systems can employ additional credit-risk-measurement methodologies that will tend to generate more precise and often smaller reported exposure levels. Some institutions already calculate such measures by assessing the worst-case value of positions over a time horizon of one or two weeks—their estimate of a reasonable liquidation period in times of stress. Other institutions are moving to build the capability of estimating portfolio-based potential future exposures by any one of several different time horizons or buckets, owing to the liquidity and breadth of the underlying instrument or risk factor. Some institutions measure the "expected" exposure of a contract in addition to its maximum probable exposure. The expected exposure is the mean of all possible probability-weighted replacement costs estimated over the specified time horizon. This calculation may reflect a good estimate of the present value of the positive exposure that is likely to materialize. As such, expected exposure can be an important measure for use in an institution's internal pricing, limit-setting, and credit-reserving decisions. However, expected exposure is by definition lower than maximum probable exposure and may underestimate potential credit exposure. For this reason, expected exposure estimates are not frequently used as loan-equivalent amounts in assessing capital adequacy from either an internal or regulatory basis.

Statistically generated measures of future exposure use sophisticated risk-measurement models that, in turn, involve the use of important assumptions, parameters, and algorithms. Institutions using such techniques should ensure that appropriate controls are in place regarding the development, use, and periodic review of the models and their associated assumptions and parameters. The variables and models used for both replacement cost and potential exposure should be approved and tested by the credit-risk-management function and should be subject to audit by independent third parties with adequate technical qualifications. The data-flow process should also be subject to audit to ensure data integrity. Equally important are the approval and testing of information systems that report positions. The functions responsible for managing credit risk should validate any modifications to models made to accommodate new products or variations on existing products.

Aggregate Exposures

In measuring aggregate presettlement credit-risk exposures to a single counterparty, institutions may use either a transactions approach or a portfolio approach. Under a transactions approach, the loan-equivalent amounts for each derivative contract with a counterparty are added together. Some institutions may take a purely transactional approach to aggregation and do not incorporate the netting of long and short derivatives contracts, even when legally enforceable bilateral netting agreements are available. In such

cases, simple sum estimates of positive exposures may seriously overestimate true credit exposure, and examiners should monitor and encourage an institution's movement toward more realistic measures of counterparty exposure. When they exist, legally enforceable close-out netting agreements should be factored into these measurements, whatever approach is used to obtain them. Master close-out netting agreements are bilateral contracts intended to reduce presettlement credit risk in the event that a counterparty becomes insolvent before settlement. Upon default, the nondefaulting party nets gains and losses with the defaulting counterparty to a single payment for all covered transactions. All credit-risk-exposure measures should fully reflect the existence of such legally binding netting agreements as well as any other credit enhancements.

Some financial institutions measure potential credit-risk exposures on a portfolio basis, where information systems allow and incorporate netting (both within and across products, business lines, or risk factors) and portfolio correlation effects to construct a more comprehensive counterparty exposures measure. The portfolio approach recognizes the improbability that all transactions with a given counterparty will reach their maximum potential exposure at the same time as is implicitly assumed under the transactions approach. The portfolio approach uses simulation modeling to calculate aggregate exposures through time for each counterparty. As discussed in section 2070.1, "Legal Risk," gains and losses may be offset in measuring potential credit-risk exposure with the portfolio approach. If legally enforceable netting is not in place, then the sum of contracts with positive value under the simulation should be used as a measure of potential exposure. Contracts with negative value should only be considered as an offset for gains when netting is deemed to be legally enforceable. If executed correctly, the portfolio approach may provide a more realistic measurement of potential credit exposure for the portfolio than simply summing the potential worst-case exposures for each instrument in the portfolio. Whatever approach is used, the credit-risk-management function should clearly define the measurement aggregation methodology and apply it consistently across all instruments and types of capital-markets exposures.

In addition, examiners should ensure that an institution has adequate internal controls governing exposure estimation, including robust model-review processes and data integrity checks. Examiners should be aware that some banks may need to develop more meaningful measures of credit-risk exposures under volatile market conditions by developing and implementing timely and plausible stress tests of counterparty credit exposures. Stress testing should evaluate the impact of large market moves on the credit exposure to individual counterparties and on the inherent liquidation effects. Stress testing also should consider liquidity impacts on underlying markets and positions, and their effect on the value of any collateral received. Moreover, stress-testing results should be incorporated in senior management reports and provide sufficient information to trigger risk-reducing actions when necessary. Simply applying higher confidence intervals or longer time horizons to potential future exposure measures may not capture the market and exposure dynamics under turbulent market conditions, particularly as they relate to the interaction between market, credit, and liquidity risk. Examiners should determine whether stress testing has led to risk-reducing actions or a redefinition of the institution's risk appetite under appropriate circumstances.

Global Exposures

While an institution may use various methods to measure the credit exposure of specific types of instruments, credit exposures for both loans and capital-markets products should be consolidated by counterparty to enable senior management to evaluate the overall counterparty credit risk. To obtain an aggregate, institution-wide credit exposure for a customer in the global credit-risk-management system, many institutions use the risk in commercial loans as a base and convert credit-risk exposures in capital-markets instruments, both on- and off-balance-sheet, to the same base using loan-equivalent amounts. Together these two measures can be added to any other credit exposures to get the total credit exposure to a given counterparty.

CREDIT ENHANCEMENTS

As the derivatives market has expanded so has the number of market participants with lower credit ratings. Accordingly, institutions have

increased the use of credit enhancements in the derivatives marketplace. Some of the more common credit enhancements include the following:

- Collateral arrangements in which one or both counterparties agree to pledge collateral, usually consisting of cash or liquid securities, to secure credit exposures arising from derivative transactions.
- Special-purpose vehicles (SPVs) that can be separately capitalized subsidiaries or specially designed collateral programs organized to obtain a triple A counterparty credit rating.
- Mark-to-market cash settlement in which counterparties periodically mark transactions to market and make cash payments equal to their net present value, thus reducing any exposure to a preset threshold.
- Option-to-terminate or ''close out'' contracts which give either counterparty, after an agreed-upon interval, the option to instruct the other party to cash settle and terminate a transaction based on the transaction's net present value as quoted by agreed-upon reference dealers. The existence of the option allows both parties to view the transaction as having a maturity which is effectively reduced to the term of the option.
- Material-change triggers that convey the right to change the terms of or terminate a contract if a prespecified credit event occurs such as a rating downgrade, failure to pay or deliver, an adverse change in the counterparty's financial standing, or a merger event. Credit events may trigger the termination of a contract, the imposition of a collateral requirement, or stricter collateral terms.

Credit enhancements and other nonprice terms should be tailored to the counterparty and closely linked to assessments of counterparty credit quality.

Collateral Arrangements

Collateral arrangements are becoming an increasingly common form of credit enhancement in the derivatives market. There are generally two types of collateral arrangements. In the first type, the counterparty does not post collateral until exposure has exceeded a prespecified amount (threshold). The second type of collateral arrangement requires an initial pledge of liquid assets (initial margin) and often involves calls for additional collateral based on a periodic marking to market of the position. This type of arrangement is intended to reduce the frequency of collateral movements and protect the institution against unanticipated swings in credit exposure. Collateral agreements can require either one or both counterparties to pledge collateral. Increasingly, collateral arrangements are being formed bilaterally, where either counterparty may be asked to post collateral, depending on whose position is out of the money.

The use of collateral raises several important considerations. Similar to other credit enhancements, collateralization mitigates but does not eliminate credit risk. To the extent that collateral is sufficient, credit risk is transferred from the counterparty to the obligor of the collateral instrument. However, institutions should ensure that overreliance on collateralization does not compromise other elements of sound counterparty credit risk management, such as the due-diligence process. In addition, collateralization may reduce credit risk at the expense of increasing other risks, such as legal, operational, and liquidity risk. For instance, heavy reliance on collateral-management systems poses increased operational risk. Collateral agreements must be monitored, the collateral posted must be tracked and marked to market, and the physical safekeeping of the collateral must be ensured. Finally, the use of collateral is potentially more costly than other forms of credit enhancements, in part because it requires a substantial investment in systems and back-office support.

The fundamental aspects of a collateral relationship are usually specified in a security agreement or in the credit annex of a master netting agreement. The calculation of required collateral is usually based on the net market value of the portfolio. The amount of required collateral and appropriate margin levels are largely determined by the volatility of the underlying portfolio, the frequency of collateral calls, and the type of counterparty. In general, the higher the volatility of an underlying portfolio, the greater the amount of collateral and margin required. Frequent collateral calls will result in smaller amounts of margin and collateral posted. Institutions should be aware that if volatility increases beyond what is covered in the predetermined margin level, credit exposure to a counterparty may be greater than originally anticipated. For this reason, institutions generally revalue both the portfolio and the collateral regularly.

The amount of collateral and margining levels also should be based on the type of counterparty involved. Policies should not be overly broad so as to compromise the risk-reducing nature of collateral agreements with certain types of counterparties. Indeed, policies governing collateral arrangements should specifically define those cases in which initial and variation margin is required, and should explicitly identify situations in which lack of transparency, business-line risk profiles, and other counterparty characteristics merit special treatment. When appropriate to the risk profile of the counterparty, policies should specify when margining requirements based on estimates of potential future exposures might be warranted.

Securities that are posted as collateral are generally subject to haircuts, with the most liquid and least volatile carrying the smallest haircuts. Acceptable forms of collateral traditionally include cash and U.S. Treasury and agency securities. However, letters of credit, Eurobonds, mortgage-backed securities, equities, and corporate bonds are increasingly being considered acceptable collateral by some market participants. Institutions that actively accept collateral should ensure that haircuts for instruments accepted as collateral are reviewed at least annually to reflect their volatility and liquidity.

Collateral arrangements sometimes include rehypothecation rights, in which a counterparty repledges collateral to a third party. Institutions with rehypothecation rights may be exposed to the risk that the third party holding the rehypothecated collateral may fail to return the collateral or may return a different type of collateral. Institutions should ensure that they review the legal issues arising from collateral arrangements carefully, especially when rehypothecation rights are involved and when different locales can claim jurisdiction over determining the effectiveness of security interests. Rehypothecation of collateral may have an impact on a counterparty's right to set off the value of the collateral against amounts owed by a defaulting counterparty. In addition, institutions should review the laws of jurisdictions to which they are potentially subject to determine the potential effects of stays and the competing claims of other creditors on the enforcement of security interests.

Institutions with collateralization programs should establish policies and procedures that address position and collateral revaluations, the frequency of margin calls, the resolution of valuation disputes, the party holding the collateral, the window of time allowed for moving collateral, trigger thresholds, closeout rights, and rehypothecation. In addition, these policies and procedures should address the process of overriding credit limits, making margin calls, and waiving margin requirements.

In September 1998, the Committee of Payment and Settlement Systems and the Eurocurrency Standing Committee (now the Committee on the Global Financial System) of the central banks of the Group of Ten countries published a report entitled "OTC Derivatives Settlement Procedures and Counterparty Risk Management" that recommended that derivatives counterparties carefully assess the liquidity, legal, custody, and operational risks of using collateral. The report made the following specific recommendations to counterparties:

- Counterparties should review the backlogs of unsigned master agreements and outstanding confirmations and take appropriate steps to manage the risks effectively.
- Counterparties should assess the potential for reducing backlogs and associated risks through use of existing or new systems for the electronic exchange or matching of confirmations.
- Counterparties should assess the potential for clearinghouses for OTC derivatives to reduce credit risks and other counterparty risks, taking into account the effectiveness of the clearinghouse's risk-management procedures and the effects on contracts that are not cleared.

In March 1999, the International Swaps and Derivatives Association (ISDA) published its 1999 collateral review. The ISDA collateral review was an assessment of the effectiveness of existing collateral-management practices and recommendations for improvements in those practices. Among the market-practice recommendations for counterparties arising from the ISDA collateral review were the following:

- Counterparties should understand the role of collateral as a complement to, not a replacement for, credit analysis tailored to the risk profile presented by the counterparty, type of transaction, size of potential future exposure, term of risk, and other relevant factors.
- Counterparties should assess the secondary risks of collateralization, for example:

  — *Legal risk.* The risk that close-out netting

provisions under a master agreement are not enforceable upon the counterparty's insolvency, thus allowing the bankruptcy representative to ''cherry pick'' and repudiate contracts.
  - — *Operational risk.* The risk that deficiencies in information systems or internal controls could result in losses.
  - — *Credit risk.* Replacement-cost risk when a counterparty defaults prior to settlement, and settlement risk
  - — *Correlation risk.* Default may be highly correlated with the market value of the contract, as was the case with dollar-denominated instruments held by counterparties in emerging-market countries.
  - — *Liquidity risk.* Close-out provisions triggered by a ratings downgrade may create substantial liquidity demands at a time when meeting those demands is particularly costly.
- Counterparties should centralize and automate the collateral function and reconciliation procedures and impose a rigorous control environment.
- Counterparties should coordinate the collateral, payments, and settlement functions in order to maximize information flows regarding counterparties and markets in stress situations.
- Counterparties should consider the use of a wider range of assets as collateral and accept cash when a collateral-delivery failure occurs. (Counterparties often do not wish to accept cash because of the costs of reinvestment.)
- Counterparties should establish clear internal policies and methodologies for setting initial margins based on the volatility of the value of the derivative position.
- When setting haircut levels, counterparties should ensure that appropriate asset price volatility measures are considered over the appropriate timeframe.
- Counterparties should ensure that collateral agreements address the potential for changes in credit quality over the course of the transaction.

Other Credit Enhancements

Adequate polices should also govern the use of material-change triggers and close-out provisions, which should take into account counterparty-specific situations and risk profiles. For example, close-out provisions based on annual events or material-change triggers based on long-term performance may prove ineffective for counterparties whose risk profiles can change rapidly.

In evaluating an institution's management of its collateral arrangements and other credit enhancements, examiners should assess not only the adequacy of policies but should determine whether internal controls are sufficient to ensure that practices comply with these policies. Accordingly, in reviewing targeted areas dealing with counterparty credit risk management, examiners should identify the types of credit enhancements and contractual covenants used by an institution and determine whether the institution has sufficiently assessed their adequacy relative to the risk profile of the counterparty. Finally, examiners should be alert to situations in which collateralized exposures may be mis-estimated, and they should encourage management at these institutions to enhance their exposure-measurement systems and collateral-protection programs accordingly.

COUNTERPARTY ASSESSMENT

As with traditional banking transactions, an independent credit function should conduct an internal credit review before engaging in transactions with a prospective counterparty. Credit guidelines should be employed to ensure that limits are approved for only those counterparties that meet the appropriate credit criteria, incorporating any relevant credit support. The credit-risk-management function should verify that limits are approved by credit specialists with sufficient signing authority.

The quick credit-approval process often required in trading operations may lead financial institutions to conduct only summary financial analysis. Institutions should ensure that the level of financial analysis is adequate and that all transactions have formal credit approval. If the credit officers prefer not to establish a formal line for a new relationship, a transaction-specific written approval should be given based on the potential exposure from the transaction. In making such one-off approvals, credit officers and credit-risk management should keep settlement risks in mind.

Broad policies that were structured in the interests of flexibility to apply to all types of counterparties may prove inadequate for directing bank staff in the proper review of the risks posed by specific types of counterparties. The assessment of counterparties based on simple balance-sheet measures and traditional assessments of financial condition may be adequate for many types of counterparties. However, these assessments may be entirely insufficient for those counterparties whose off-balance-sheet positions are a source of significant leverage and whose risk profiles are narrowly based on concentrated business lines, such as with hedge funds and other institutional investors.

General policies calling for annual counterparty credit reviews are another example of broad policies that may compromise the integrity of the assessment of individual counterparties or types of counterparties—especially in cases when a counterparty's risk profile can change significantly over much shorter time horizons. Moreover, credit-risk assessment policies should properly define the types of analysis to be conducted for particular types of counterparties, based on the nature of their risk profile. In addition to customizing fundamental analyses based on the industry and business-line characteristics of a counterparty, stress testing may be needed when a counterparty's creditworthiness may be adversely affected by short-term fluctuations in financial markets—especially when potential credit exposure to a counterparty increases when credit quality deteriorates.

A key responsibility of examiners has always been to identify areas where bank practices may not conform to stated policies. These efforts are made especially difficult when bank policies lack sufficient granularity, or specificity, to properly focus bank-counterparty risk assessments. Accordingly, examiners should ensure that a bank's counterparty credit-risk assessment policies are sufficiently defined to adequately address the risk profiles of specific types of counterparties and instruments. Policies should specify (1) the types of counterparties that may require special consideration; (2) the types and frequency of information to be obtained from such counterparties; (3) the types and frequency of analyses to be conducted, including the need for and type of any stress-testing analysis; and (4) how such information and analyses appropriately address the risk profile of the particular type of counterparty. This definition in policy is particularly important when limited transparency may hinder market discipline on the risk-taking activities of counterparties—which may have been the case with hedge funds. Banking organizations should also understand their counterparties' business purpose for entering into derivatives transactions with the institution. Understanding the underlying business rationale for the transaction allows the institution to evaluate the credit, legal, and reputational risks that may arise if the counterparty has entered into the transaction to evade taxes, hide losses, or circumvent legal or regulatory restrictions.

Even when credit-risk assessment policies appear to be sufficiently defined, examiners should place increasing emphasis on ensuring that existing practice conforms with both the stated objectives and intent of the organization's established policies. Quite often, in highly competitive and fast-moving transaction environments, examiners found that the analyses specified in policies, such as the review of a counterparty's ability to manage the risks of its business, were not done or were executed in a perfunctory manner.

Necessary internal controls for ensuring that practices conform with stated policies include actively enforced documentation standards and periodic independent reviews by internal auditors or other risk-control units. Examiners should evaluate an institution's documentation standards and determine if internal reviews are adequately conducted for business lines, products, exposures to particular groups of counterparties, and individual customers that exhibit significant growth or above-normal profitability. As always, examiners should evaluate the integrity of these internal controls through their own transaction testing of such situations, using targeted examinations and reviews. Testing should include robust sampling of transactions with an institution's major counterparties in the targeted area, as well as sufficient stratification to ensure that practices involving smaller relationships also adhere to stated policies.

In stratifying samples and selecting counterparties and transactions on which to base targeted testing of practices and internal controls, examiners should incorporate measures of potential future exposure, regardless of whether such exposures are collateralized. As evidenced by banks' experience with hedge-fund relationships in 1998, meaningful counterparty credit risks during periods of stress can go undetected if only unsecured exposures are used in transaction testing.

OTC and Exchange-Traded Instruments

Assessing the financial health of counterparties is a critical element in effectively identifying and managing credit-risk exposures. Before conducting transactions, institutions should conduct due-diligence assessments of their potential credit-risk exposure to all of the parties that might be involved in the transaction. For OTC transactions, this generally involves a single counterparty. For exchange-traded instruments, involved parties may include brokers, clearing firms, and the exchange's clearinghouse. In exchange-traded transactions, the clearinghouse guarantees settlement of all transactions.

An institution's policies should clearly identify criteria for evaluating and approving both OTC counterparties and, for exchange-traded instruments, all entities related to a transaction. For counterparties, brokers, and dealers, the approval process should include a review of their financial statements and an evaluation of the counterparty's ability to honor its commitments. An inquiry into the general reputation of the counterparty, dealer, or broker is also appropriate. At a minimum, institutions should consider the following in establishing relationships with counterparties and the dealers and brokers used to conduct exchange-traded transactions:

- the ability of the counterparty; broker; and clearinghouse and its subsidiaries, affiliates, or members to fulfill commitments as evidenced by capital strength, liquidity, and operating results
- the entity's general reputation for financial stability and fair and honest dealings with customers
- a counterparty's ability to understand and manage the risks inherent in the product or transaction
- information available from state or federal regulators, industry self-regulatory organizations, and exchanges concerning any formal

enforcement actions against the counterparty, dealer, broker, its affiliates, or associated personnel

With regard to exchange-traded transactions, institutions should assure themselves that sufficient safeguards and risk-management practices are in place at the involved entities to limit potential presettlement and settlement risk exposure. Exchange clearinghouses generally use a variety of safeguards to limit the likelihood of defaults by clearing members and ensure that there are adequate resources to meet any losses should a default occur. These safeguards can include (1) financial and operating requirements for clearinghouse membership, (2) margin requirements that collateralize current or potential future exposures and periodic settlements of gains and losses that are structured to limit the buildup of these exposures, (3) procedures that authorize resolution of a clearing member's default through close-out of its proprietary positions and transfer or close-out of its client's positions, and (4) the maintenance of supplemental clearinghouse resources (for example, capital, asset pools, credit lines, guarantees, or the authority to make assessments on nondefaulting members) to cover losses that may exceed the value of a defaulting member's margin collateral and to provide liquidity during the time it takes to realize the value of that margin collateral. Institutions should assure themselves of the adequacy of these safeguards before conducting transactions on exchanges.

Due diligence is especially important when dealing with foreign exchanges; institutions should be cognizant of differences in the regulatory and legal regimes in these markets. Substantial differences exist across countries, exchanges, and clearinghouses in fundamental areas such as mutualization of risk, legal relationships between the clearinghouse and its members, legal relationships between the clearinghouse and customers, procedures in the event of default, and segregation of customer funds. These considerations are particularly important for institutions such as futures commission merchants (FCMs) that conduct trades for customers.[1]

COUNTERPARTY CREDIT RISK LIMITS

Exposure-monitoring and limit systems are critical to the effective management of counterparty credit risk. Examiners should focus special attention on the policies, practices, and internal controls of banking institutions. An effective exposure-monitoring system consists of establishing meaningful limits on the risk exposures an institution is willing to take, independent ongoing monitoring of exposures against such limits, and adequate controls to ensure that reporting and meaningful risk-reducing action takes place when limits are exceeded. Since an effective exposure-monitoring and limit process depends on meaningful exposure-measurement methodologies, examiners should closely evaluate the integrity of these systems at institutions that may have inadequate exposure-measurement systems—especially regarding the estimation of potential future exposures. Overly conservative measures or other types of less-than-meaningful exposure measurements can easily compromise well-structured policies and procedures. Such situations can lead to limits being driven primarily by customer demand and used only to define and monitor customer facilities, instead of using limits as strict levels, defined by credit management, for initiating exposure-reducing actions.

Limits should be set on the amounts and types of transactions authorized for each entity before execution of any trade. Distinct limits for presettlement and settlement risk should be established and periodically reviewed and reconfirmed. Both overall limits and product sublimits may be established. For example, a customer may be assigned a foreign-exchange trading line, while interest-rate or cross-currency swaps are approved against the general line on a transaction-by-transaction basis. In some cases, the approach to assigning sublimits reflects the pace of transactions in the marketplace as well as the amount of credit risk (largely a reflection of tenor). The sum of product-specific sublimits may well exceed the aggregate limit, reflecting management's experience that all sublimits are not used simultaneously. In such cases, however, the organization should have sufficient monitoring of global credit exposures to detect a breach of the global limit.

The frequency with which credit exposures are monitored depends on the size of the trading and derivatives portfolios and on the nature of

1. See section 3030.1, "Futures Brokerage Activities and Futures Commission Merchants," as well as the Federal Reserve's *Bank Holding Company Supervision Manual*.

the trading activities. Active dealers should have counterparty credit exposure monitored daily. Irrespective of how credit exposure is monitored, the replacement cost should be calculated daily and compared to the approved potential exposure figure for validity.

Unusual market movements may lead to rapid accumulation of credit exposure. The creditworthiness of counterparties can also change. Between its regular reviews of credit exposures, the institution should have a mechanism that guarantees timely recognition of either unusual credit-exposure buildups or credit deterioration in a counterparty. For institutions that are dealers in these markets, the monitoring should be very frequent, and regular reviews should be conducted with the same frequency as for other significant credit customers.

Management should have procedures for controlling credit-risk exposures when they become large, a counterparty's credit standing weakens, or the market comes under stress. Management should show clear ability to reduce large positions. Common ways of reducing exposure include halting any new business with a counterparty and allowing current deals to expire, assigning transactions to another counterparty, and restructuring the transaction to limit potential exposure or make it less sensitive to market volatility. Institutions can also use many of the credit enhancement tools mentioned earlier to manage exposures that have become uncomfortably large.

INSTITUTIONAL INVESTORS AND HEDGE FUNDS

Examiners should pay increasing attention to the appropriateness, specificity, and rigor of the policies, procedures, and internal controls that institutions use in assessing, measuring, and limiting the counterparty credit risks arising from their trading and derivative activities with institutional investors in general, and particularly with hedge funds. In the area of counterparty assessment, institutions doing business with institutional investors and hedge funds should have sufficient information on which to assess the counterparty and its inherent risks, including information on total leverage, both on- and off-balance-sheet, and firm strategies. Banks should conduct in-depth due-diligence reviews of the effectiveness of a counterparty's risk-management systems and capabilities and its internal control environment to make effective decisions regarding the level of risk they are willing to assume. Institutions should be cautioned to obtain supporting documentation for the claims of fund managers.

Counterparty credit risk management should emphasize comprehensive stress testing across a variety of scenarios, with particular focus on possible asset or position concentrations. Institutions should also determine the investor's or fund's ability to stress test its portfolio. In limiting counterparty credit risks through the use of collateral and other credit enhancements, it should be recognized that standard arrangements that may be suitable for most counterparties may not be suitable for counterparties that have the potential to quickly change their portfolios, such as hedge funds. For example, 12-month rolling average close-out provisions may be inappropriate for counterparties engaged in active trading, where a prior month's gains can mask serious losses in the current month. Institutions that deal with institutional investors and hedge funds should have the policies, procedures, and internal controls in place to ensure that these exposures are measured, monitored, and controlled by management on an on-going basis.

The Basle Committee on Banking Supervision released a report that analyzed the risks posed by hedge funds to creditors and published sound practices standards for interactions with hedge funds. The sound practices standards identified areas in which bank practices could be enhanced, including—

- establishing clear policies and procedures that define the bank's risk appetite and drive the process for setting credit standards;
- obtaining adequate information on which to base sound judgments of counterparty credit quality;
- performing adequate due diligence, including setting standards for risk management by counterparties that are commensurate with the level of sophistication and complexity of their activities;
- developing meaningful limits for derivatives counterparties and more accurate measures of potential future exposure;
- adequately assessing and measuring unsecured exposures under collateralized derivatives transactions, and setting meaningful credit limits based on such assessments;

- adequately stress-testing counterparty credit risk under a variety of scenarios that take into account liquidity effects, and incorporating results into management decisions about risk taking and limit setting;
- closely linking nonprice terms, including collateral arrangements and termination provisions, to assessments of counterparty credit quality; and
- timely monitoring counterparty transactions and credit exposures, including frequently reassessing banks' large exposures, counterparty leverage, and concentration of counterparty activities and strategies.

UNNAMED COUNTERPARTIES

Institutions that deal in products such as foreign exchange, securities, and derivatives sometimes face situations in which they are unaware of a counterparty's identity. Investment advisers or agents typically conduct trades on behalf of their investment-management clients and do not provide the names of the ultimate counterparty on the grounds of confidentiality. In this situation, the dealing institution will most likely never know the identity of its counterparties.

Because institutions may not be able to assess the creditworthiness of unnamed counterparties in advance, institutions should develop policies and procedures that define the conditions under which such transactions can be conducted. Exposures arising from these transactions should be closely monitored and controlled. Given the potential reputational risks involved, transactions with unnamed counterparties should be restricted to reputable agents and firms. Institutions with significant relationships with investment advisers who trade on behalf of undisclosed counterparties may wish to establish agency agreements with those advisers. These agreements can provide for a series of representations and warranties from the investment adviser on a variety of issues, including compliance with local and national laws and regulations, particularly on money-laundering regulations.

Techniques used to reduce credit exposure to undisclosed counterparties include setting limits on the aggregate amount of business or on the types of instruments or transactions conducted with unnamed counterparties. In addition, institutions often pay particular attention when processing an agent's trades for an unnamed counterparty. An effective and efficient back-office process helps to ensure that the institution is aware of the size of such exposures on a timely basis.

Similarly, institutions often manage the settlement process with unnamed counterparties more closely than they do with traditional trading counterparties. Institutions often set settlement limits with unnamed counterparties so that large sums are not settled on a single day. Institutions sometimes develop procedures that ensure management is made immediately aware of settlement failures by unnamed counterparties.

OFF-MARKET OR PREFUNDED DERIVATIVES TRANSACTIONS

Banking organizations may enter into off-market or prefunded derivatives contracts that are the functional equivalent of extensions of credit to trading counterparties. However, the business or legal structure of some of these transactions may not readily convey their economic function. Institutions should ensure that off-market or prefunded transactions are recognized appropriately as credit extensions and represented accurately and adequately in the institution's internal risk-management processes, regulatory reports, and published financial statements. Moreover, since off-market or prefunded transactions may have the potential to obscure the true nature of a counterparty's assets, liabilities, income, or expenses, these transactions may expose the originating banking organization to increased reputational, legal, or credit risk. Accordingly, banking organizations should have formal policies, procedures, and internal controls for assessing the business purpose and appropriateness of off-market or prefunded transactions with customers.[2]

Typical Off-Market or Prefunded Derivatives Transactions

Off-market or prefunded derivatives transactions involve an up-front extension of credit to the counterparty, either in the form of new

2. See the committee letter "Historical-Rate Rollovers: A Dangerous Practice" (December 26, 1991), Foreign Exchange Committee, Federal Reserve Bank of New York (www.newyorkfed.org/fxc/fx26.html).

money or as a rollover of existing debt. Examples of some off-market or prefunded derivatives transactions are described below.

Historical-Rate Rollovers

Often, historical-rate rollovers involve a dealer's extension of a forward foreign-exchange contract, on behalf of the customer, at off-market rates. In a typical rollover, the customer will ask the dealer to apply the historical rate of a maturing contract to the spot end of a new pair of contracts, which in effect extends the maturing contract and defers any gains or losses on it. Historical-rate rollovers virtually always involve the extension of credit from one party to the other. If the customer has a loss on the maturing contract, the rollover would in effect represent a loan by the dealer to the customer. If the customer has a profit, the dealer would in effect be borrowing from the customer. The resulting loan or borrowing amount and associated interest-rate charges are typically built into the forward points the dealer quotes to the customer.

Off-Market Swap Transactions

In off-market swap transactions, the contractual market rates (for example, the interest rate or currency-exchange rate) used in the swap transaction are varied from current market levels. This necessitates payment at the commencement of the transaction, by one counterparty to the other, to compensate for the off-market coupon.

Prepaid Swaps

A prepaid swap is generally a physical-commodity forward contract featuring an up-front buyer payment that is equal to the present value of future commodity deliveries. The commodity deliveries may be priced at the spot prices in effect on each delivery date, making the transaction a loan secured by an obligation to deliver the commodity at future market prices. Alternatively, the contract may call for delivery of specific quantities of the commodity on each delivery date, in effect fixing future delivery prices. A prepaid swap can also be an annuity-like transaction in which the present value of future payments on one side of a swap is paid up front, while (variable) payments on the other side of the swap are paid on a traditional swap schedule. This is the functional equivalent of a variable-rate loan.

Deep-in-the-Money Options

Sales of deep-in-the-money options can generate large up-front premiums for the option seller. Deep-in-the-money options are functionally equivalent to loans to the seller because the option is almost certain to be exercised by the buyer.

Zero-Coupon Swaps

A zero-coupon swap is an interest-rate swap agreement with the fixed-rate side based on a zero-coupon bond. With the agreement of the counterparty, the swap agreement may call for a single fixed payment at maturity by the holder of the zero. The payments on the other side may follow typical swap interim-payment schedules. Because of the payment mismatch, a zero-coupon swap exposes one counterparty to significant credit risk and is the functional equivalent of a loan to the holder of the zero.

Reverse Zero-Coupon Swaps

In a reverse zero-coupon swap, one counterparty makes a zero-coupon payment up front, and the other counterparty pays interest and principal payments over time. Like a zero-coupon swap, this is the functional equivalent of a term loan from the counterparty making the up-front payment.

Specific Risks with Off-Market or Prefunded Derivatives Transactions

Credit Risk

Off-market and prefunded derivative transactions may expose a banking organization to significant credit risk. Therefore, institutions should adopt written credit policies and procedures guiding the use of these transactions. Off-market and prefunded transactions should be treated as credit extensions for purposes of the lending institution's credit-approval, risk-measurement, monitoring, and control systems. Conversely, they should be appropriately recog-

nized as a financing by the borrowing counterparty. Failure to recognize the transaction as a credit extension or borrowing could threaten centralized control over the management of credit risk. Lending institutions should also consider establishing transaction sizes, maturity limits, and collateral guidelines for these types of nontraditional transactions. Procedures for obtaining appropriate sign-off from the finance function to ensure proper accounting for the transaction should also be in place.

Reputational Risk

Banking organizations should establish written policies and procedures for assessing the appropriateness of and for approving off-market or prefunded derivatives transactions with a customer. These policies should consider the sophistication of the customer, the reason for the transaction, whether the customer understands the risks in the transaction, whether the transaction is consistent with the customer's internal policies, and whether it has been approved at appropriate levels in the customer's organization. Transactions generating significant profits or losses, nontraditional transactions, and transactions or patterns of activity that may not be compatible with a customer's business lines or risk profile should be referred to senior management of both the banking organization and the counterparty. Importantly, in marketing off-market or prefunded transactions, institutions should ensure that the transactions are presented and described in a manner consistent with their true economic substance.

Legal Risk

Even if a banking organization properly markets an off-market or prefunded derivatives transaction, the organization may be faced with reputational and legal risk exposure if its counterparty mischaracterizes the transaction in regulatory or public reports. Failure to ensure that management of both counterparties understand and sign off on a transaction increases the risk that the transaction may be mischaracterized. To manage this risk, banking organizations should adopt specific written policies and procedures to ensure that the senior management of the banking organization and the counterparty fully understand and approve of the transaction, including the appropriate representation and accounting of the transaction on the books and records of both counterparties. These policies and procedures may include—

- written documentation from senior management of the counterparty requesting the off-market or prefunded transaction, explaining the reason for the request, and confirming that the request is a request for an extension of credit that is consistent with the firm's internal policies;
- written documentation from senior management in the appropriate credit, finance, and accounting functions of the banking organization, explaining the reason for the transaction and the accounting that will be followed to reflect the transaction on the institution's books; and
- written confirmation to senior management of the counterparty, confirming the particulars of the transaction and explicitly stating the implied loan amount and pricing terms.

BLOCK TRADES WITH INVESTMENT ADVISERS

Frequently, investment advisers or agents will bundle together trades for several clients, particularly in the case of mutual funds and hedge funds.[3] Most of these trades are accompanied by information about how the trade should be allocated among the funds for which it was executed, or they are subject to standing allocation information. Occasionally, investment advisers may fail to give institutions timely allocation information. Institutions should be concerned that such delays do not become habitual. When significant investment-adviser relationships exist, institutions should adopt policies requiring that all transactions be allocated within some minimum period (for example, by the end of the business day). The credit department should be promptly notified of any exceptions to such policies.

Many institutions track the allocation arrangements made by investment advisers. While late

3. The Securities and Exchange Commission, in a number of no-action letters, has permitted this practice as long as the adviser does not favor any one client over another, has a written allocation statement before the bundled order was placed, and receives the client's written approval. See the following SEC letters: SMC Capital, Inc. (September 5, 1995) and Western Capital Management, Inc. (August 11, 1977).

allocations or frequent changes to allocation arrangements are often symptomatic of back-office problems at the investment adviser, they could also indicate that the investment adviser is engaging in unfair allocation.

Sometimes the allocations provided by investment advisers include counterparties that may not have established credit lines with the institution. Institutions should try to minimize such situations and may wish to limit the percentage of any trade that can be allocated to counterparties that do not have an existing credit line with the institution.

MANAGEMENT INFORMATION SYSTEMS

Management information systems (MIS) used to control counterparty credit risk include systems to monitor exposure levels; track customer limits and limit excesses; and, when used, value and track collateral. Important inputs to these systems include transaction data, current market values, and estimated potential credit exposures. The primary purpose of these systems is to provide comprehensive, accurate, and timely credit information to credit-risk-management personnel; front-office personnel; business-line and other senior management; and, ultimately, the board of directors. Institutions should ensure that their credit MIS are adequate for the range and scope of their trading and derivative activities and that there are appropriate controls in place to ensure the integrity of these systems. As part of the normal audit program, internal audit should review credit MIS to ensure their integrity.

A critical element of MIS is their timeliness in reflecting credit exposures. For derivative contracts, institutions should be able to update the current market values and potential credit exposures of their holdings throughout the life of a contract. The frequency of updates for credit-risk-management purposes often depends on the complexity of the product and the volume of trading activity. More sophisticated systems provide intraday exposure numbers that enable the front office to determine, without any additional calculations, whether a proposed deal will cause a credit excess.

Institutions that use collateral to manage credit risk usually maintain collateral-management systems for valuation and monitoring purposes. The sophistication of an institution's collateral-management system should reflect the size of the collateral program, frequency of collateral revaluations and associated credit-exposure calculations, nature of collateral-posting events, and location of the collateral. The most effective collateral-management systems are global and have the ability to identify, post, value, stress-test, and monitor collateral. When collateral-management systems are able to feed data into the front-office's credit-line-availability system, an institution can factor collateral into credit-approval decisions and, consequently, have a more accurate picture of unsecured credit risk.

Institutions often maintain databases that detail the extent to which netting is applicable for a given counterparty. Depending on whether netting is applicable, obligations are presented on a net or gross basis in credit-monitoring reports.

Credit MIS should furnish adequate reports to credit personnel and business-line management. Daily reports should address significant counterparty line usage and exceptions to limits. Less frequent reports on the maturity or tenor of credit exposures, sector and industry concentrations, trends in counterparty exposures, trends in limit excesses, ''watch lists,'' and other pertinent reports are also appropriate. Periodic summary reports on credit exposures should also be presented to senior management and the board.

DOCUMENTATION OF POLICIES AND PROCEDURES

Current and sufficient documentation is critical to the effective operation of a credit-risk-management program and is necessary to ensure that the program is consistent with the stated intentions of senior management and the board. The institution's credit-policy manual is an important tool for both auditors and examiners, as well as an important resource for resolving any disputes between credit-risk management and traders or marketers.

All policies and procedures specific to credit-risk management for trading should be added to the financial institution's overall credit-policy manual. Procedures should include limit-approval procedures, limit-excess and one-off approval procedures, exposure-measurement methodologies, and procedures for accommodating new products and variations on existing products. Policies should also address the meth-

odologies for assessing credit-loss reserves for trading operations. When established, such reserves should take into account both current and potential future exposure. Credit-approval documentation should also be closely tracked by the credit-risk-management function. All limit approvals should be filed by counterparty and made available to traders so that they know the available limit to a counterparty before entering into a deal. Signed over-limit or one-off approvals should also be tracked down and kept in a file for historical records. A log should be maintained for all missing signed approvals, and approvals for new products should be maintained.

1. To evaluate the organizational structure of the credit-risk-management function.
2. To evaluate the adequacy of internal credit-risk-management policies and procedures relating to the institution's capital-markets and trading activities and to determine that sufficient resources and adequate attention are devoted to the management of the risks involved in growing, highly profitable, or potentially high-risk activitivities and product lines.
3. To ensure that actual operating practices reflect such policies.
4. To identify the credit risks of the institution.
5. To determine if the institution's credit-risk-measurement system has been correctly implemented and adequately measures the institution's credit risks.
6. To determine if the institution's credit-risk-management processes achieve an appropriate balance among all elements of credit-risk management, including both qualitative and quantitative assessments of counterparty creditworthiness; measurement and evaluation of both on- and off-balance-sheet exposures, including potential future exposure; adequate stress testing; reliance on collateral and other credit enhancements; and the monitoring of exposures against meaningful limits.
7. To determine how the institution measures difficult-to-value exposures.
8. To determine if senior management and the board of directors of the institution understand the potential credit exposures of the capital-markets and trading activities of the institution.
9. To ensure that business-level management has formulated contingency plans in the event of credit deterioration and associated market disruptions.
10. To evaluate the adequacy of the policies, procedures, and legal and operational support relating to the institution's use of credit enhancements.
11. To determine if the institution has implemented adequate policies and procedures that are sufficiently calibrated to the risk profiles of particular types of counterparties and instruments to ensure adequate credit-risk assessment, exposure measurement, limit setting, and use of credit enhancements.
12. To ensure the comprehensiveness, accuracy, and integrity of management information systems that analyze credit exposures and to ensure that the methodology and automated processing can accommodate netting and other legal offset agreements, if applicable.
13. To determine if the institution's credit-risk-management system has been correctly implemented and adequately measures the institution's exposures.
14. To determine if the institution has an effective *global* risk-management system that can aggregate and evaluate market, liquidity, credit, settlement, operational, and legal risks, and that management at the highest level is aware of the institution's global exposure.
15. To determine if the institution is moving in a timely fashion to enhance its measurement of counterparty-credit-risk exposures, including the refinement of potential future exposure measures and the establishment of stress-testing methodologies that better incorporate the interaction of market and credit risks.
16. To recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient.

These procedures are processes and activities that may be considered in reviewing the credit-risk-management of trading and derivative operations. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal audit comments and previous examination workpapers to assist in designing the scope of the examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Review the credit-risk-management organization.
   a. Check that the institution has a credit-risk-management function with a separate reporting line from traders and marketers.
   b. Determine if credit-risk-control personnel have sufficient authority in the institution to question traders' and marketers' decisions.
   c. Determine if credit-risk management is involved in new-product discussions in the institution.
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments. Obtain copies of all risk-management reports prepared by the institution. Using this information, evaluate credit-risk-control personnel's demonstrated knowledge of the products traded by the institution and their understanding of current and potential exposures.
3. Obtain and evaluate the adequacy of risk-management policies and procedures for capital-markets and trading activities.
   a. Review credit-risk policies, procedures, and limits. Determine whether the risk-measurement model and methodology adequately address all identified credit risks and are appropriate for the institution's activities. Review the methodologies used to measure current exposure and potential exposure.
   b. Review credit-administration procedures.
      - Determine how frequently counterparty credit conditions are analyzed and lines reviewed. This should be done no less frequently than annually.
      - Assess whether management has demonstrated an ability to identify downgrades in creditworthiness between reviews.
      - Determine if credit-risk-management staff demonstrate an ability to work out of positions with counterparties whose credit quality has deteriorated.
      - Check that limits are in place for counterparties before transacting a deal. If the institution relies on one-off approvals, check that the approval process is as formal as that for counterparty limits.
   c. Review contingency credit-risk plans for adequacy.
   d. Review accounting and revaluation policies and procedures. Determine that revaluation procedures are appropriately controlled.
   e. Determine the extent to which management relies on netting agreements. Determine if aggregation of exposure assumes netting, and check that netting agreements are in place and that legal research is performed to justify management's confidence in the enforceability of the netting agreements.
4. Determine the credit rating and market acceptance of the institution as a counterparty in the markets.
5. Obtain all management information analyzing credit risk.
   a. Determine the comprehensiveness, accuracy, and integrity of analysis.
   b. Review valuation and simulation methods in place.
   c. Review stress tests analyzing changes in credit quality, including deterioration of credit due to changing macroeconomic conditions. Review stress-testing methodologies to determine the extent to which they incorporate both credit and market risk.
   d. Review potential future exposure calcu-

lations to determine whether they reflect realistic measures of exposure in both normal and stressed markets.

e. Determine whether the management information reports accurately reflect risks and whether reports are provided to the appropriate levels of management.

6. Determine if any of the institution's counterparties have recently experienced credit downgrades or deteriorations and whether the institution's trading activities have been affected. If so, determine the institution's response.
7. Review documentation that evidences credit-risk management's adherence to its program.
   a. Obtain copies of written approvals for limit excesses or one-off approvals. Determine the timeliness of these approvals.
   b. Select a sample of master agreements to ensure that each counterparty with whom management nets exposure for risk-management purposes has signed a master agreement. Review the master agreement aging report of unsigned master agreements to ensure adequate chasing procedures are in place.
8. Establish that the institution is following its internal policies and procedures. Determine whether the established limits adequately control the range of credit risks. Determine that the limits are appropriate for the institution's level of activity. Determine whether management is aware of limit excesses and takes appropriate action when necessary.
9. Determine whether the internal-audit and independent risk-management functions adequately focus on growth, profitability, and risk criteria in targeting their reviews.
10. Determine whether the institution has established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency.
11. Determine that business managers have developed contingency plans which reflect actions to be taken in times of market disruption (and major credit deteriorations) to minimize losses as well as the potential damage to the institution's market-making reputation. These should include controls over the settlement process.
12. Obtain and evaluate the adequacy of policies and procedures relating to the institution's use of credit enhancements.
    a. Review collateralization policies and procedures.
       - Determine the frequency of margin calls and portfolio and collateral revaluations.
       - Ensure that legal agreements are in place and that the fundamental aspects of collateral relationships are specified in the agreements.
       - Review the policies for determining the types of acceptable collateral, haircuts on the collateral, and margin requirements.
    b. Determine whether the institution has rehypothecation rights. Determine whether appropriate policies and procedures are in place to manage the risks associated with collateral rehypothecation.
    c. Ensure that collateral-management systems and operational internal controls are fully documented and able to support the institution's credit enhancement activity.
13. Determine whether policies and procedures reflect the risk profiles of particular counterparties and instruments. If the institution trades with institutional investors, hedge funds, or unnamed counterparties, determine if the institution has an overall limit on trading with these types of counterparties.
14. Determine whether appropriate policies and procedures are in place if the institution engages in block trades with investment advisors.
    a. Determine if the institution has a policy that all trades not allocated at the time of the trade must be allocated by the end of the trading day. Determine whether exceptions to such a policy are monitored by the credit area.
    b. Determine how the institution deals with investment advisors who are habitually late with allocation information.
    c. Determine whether the institution limits the percentage of a block trade that can be allocated to counterparties without credit lines.
15. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient.

1. Review the credit-risk-management organization.
   a. Does the institution have a credit-risk-management function with a separate reporting line from traders and marketers?
   b. Do credit-risk-control personnel have sufficient credibility in the institution to question traders' and marketers' decisions?
   c. Is credit-risk management involved in new-product discussions in the institution?
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments and obtain copies of all risk-management reports prepared.
   a. Do summaries identify all the institution's capital-markets products?
   b. Define the role that the institution takes for the range of capital-markets products. Determine the instruments used to hedge these products. Is the institution an end-user, dealer, or market maker? If so, in what products?
   c. Do credit-risk-control personnel demonstrate knowledge of the products traded by the institution? Do they understand the current and potential exposures to the institution?
3. Does the institution have comprehensive, written risk-management policies and procedures for capital-markets and trading activities?
   a. Review credit-risk policies and procedures.
      • Do the risk-measurement model and methodology adequately address all identified credit risks? Are the risk-measurement model and methodology appropriate for the institution's activities?
      • Do the policies explain the board of directors' and senior management's philosophy regarding illiquid markets and credit events (downgrades/deteriorations)?
   b. Review credit-administration procedures.
      • Are counterparty credit conditions analyzed and lines reviewed with adequate frequency? (This should be done no less frequently than annually.)
      • Can management identify downgrades in creditworthiness between reviews?
      • Has credit-risk-management staff demonstrated an ability to work out of positions with counterparties whose credit quality has deteriorated?
      • Are limits in place for counterparties before transacting a deal? If the institution relies on one-off approvals, is the approval process as formal as that for counterparty limits?
   c. Have limits been approved by the board of directors?
   d. Have policies, procedures, and limits been reviewed and reapproved within the last year?
   e. Are credit-risk policies, procedures, and limits clearly defined?
   f. Are the credit limits appropriate for the institution and its level of capital?
   g. Are there contingency credit-risk plans?
   h. Are there appropriate accounting and revaluation policies and procedures?
   i. Does management rely on netting agreements?
      • Does aggregation of exposure assume netting?
      • Are netting agreements in place and has legal research been performed to justify management's confidence in the enforceability of the netting agreements?
4. Has there been a credit-rating downgrade for the examined institution? What has been the market response to the financial institution as a counterparty in the markets?
5. Obtain all management information analyzing credit risk.
   a. Is management information comprehensive and accurate and is the analysis sound?
   b. Are the simulation assumptions for a normal market scenario reasonable?
   c. Are stress tests analyzing changes in credit quality appropriate? Are the market assumptions reasonable given credit deterioration of concentrations? Do stress-testing methodologies incorporate both credit and market risk?
   d. Are calculations of potential future exposure realistic in both normal and stressed markets?

   e. Do management information reports accurately reflect risks? Are reports provided to the appropriate levels of management?
6. Have any of the institution's counterparties recently experienced credit downgrades or deteriorations? If so, how have the institution's trading activities been affected and what was the institution's response?
7. Review documentation that evidences credit management's adherence to its program.
   a. Does the institution maintain copies of written approvals for limit excesses or one-off approvals? Are these prepared in a timely manner?
   b. Obtain a sample of master agreements. Are they appropriately signed? Are they signed in a timely manner? Does the institution have an appropriate chasing process to follow up on unsigned master agreements?
8. Is the institution following its internal policies and procedures? Do the established limits adequately control the range of credit risks? Are the limits appropriate for the institution's level of activity? Is management aware of limit excesses? Does management take appropriate action when necessary?
9. Do the internal audit and independent risk-management functions adequately focus on growth, profitability, and risk criteria in targeting their reviews?
10. Has the institution established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency? Are risk-management, revaluations, and closeout valuation reserves subject to audit?
11. If any recent market disruptions affected the institution's trading activities, what has been the institution's market response?
12. Does the institution have comprehensive written policies and procedures relating to its use of credit enhancements?
   a. Does the institution revalue collateral and positions with adequate frequency?
   b. Are the fundamental aspects of collateral relationships reflected in legal agreements?
   c. Does the institution have policies specifying the types of acceptable collateral, haircuts on the collateral, and margin requirements? How often are these policies reviewed by management?
   d. Does the institution have rehypothecation rights?
      - Does the institution have policies and procedures in place to manage the risk that a third party holding rehypothecated collateral may fail to return the collateral or may return a different type of collateral?
      - Does the institution have measures in place to protect its security interest in the rehypothecated collateral?
   e. Do material-change triggers and closeout provisions take into account counterparty-specific situations and risk profiles?
   f. Are the collateral-management system and operational environment able to support the institution's collateral activity?
13. Does the institution trade with institutional investors, hedge funds, or unnamed counterparties?
   a. Does the institution place an overall limit on trading with these types of counterparties?
   b. Are credit officers aware of all cases in which a counterparty's identity is unknown?
14. Does the institution engage in block trades with investment advisors?
   a. Does the institution have a policy that all trades not allocated at the time of the trade must be allocated by the end of the trading day? Are exceptions to the policy monitored closely by the credit area?
   b. How does the institution deal with investment advisors who are habitually late with allocation information?
   c. Does the institution limit the percentage of a block trade that can be allocated to counterparties without credit lines?
15. Do policies and procedures generally reflect the risk profiles of particular counterparties and instruments?

Settlement risk is the risk of loss when an institution meets its payment obligation under a contract (through either an advance of funds or securities) before its counterparty meets a counterpayment or delivery obligation. Failures to perform at settlement can arise from counterparty default, operational problems, market liquidity constraints, and other factors. Settlement risk exists for any traded product and is greatest when delivery is made in different time zones. For banking institutions, foreign-exchange (FX) transactions are, perhaps, the greatest source of settlement-risk exposure. For large, money-center institutions, FX transactions can involve sizable credit exposures amounting to tens of billions of dollars each day. Accordingly, although the following general guidance can be applied to the settlement of all types of traded instruments, it focuses primarily on the settlement risks involved in FX transactions.

Settlement risk has a number of dimensions that extend beyond counterparty credit risk to include liquidity, legal, operational, and systematic risks. Even temporary delays in settlement can expose a receiving institution to liquidity pressures if unsettled funds are needed to meet obligations to other parties. Such liquidity exposure can be severe if the unsettled amounts are large and alternative sources of funds must be raised at short notice in turbulent or unreceptive markets. In an extreme example, the financial failure of a counterparty can result in the loss of the entire amount of funds.

As with other forms of credit risk, settlement risk should be managed through a formal and independent process with adequate senior management oversight and should be guided by appropriate polices, procedures, and exposure limits. Measurement systems should provide appropriate and realistic estimates of the settlement exposures and should use generally accepted measurement methodologies and techniques. The development of customer credit limits and the monitoring of exposures against those limits is a critical control function and should form the backbone of an institution's settlement-risk-management process.

This section discusses settlement risks involved in trading activities, especially as they apply to FX transactions. A primary reference for this material is the 1996 report of the Committee on Payment and Settlement Systems of the central banks of the Group of Ten Countries, ''Settlement in Foreign Exchange Transactions,'' which was prepared under the auspices of the Bank for International Settlements. In addition, the Board issued a policy statement, effective January 4, 1999, that addresses risks relating to private multilateral settlement systems (63 FR 34888, June 26, 1998).

SETTLEMENT-RISK-MANAGEMENT ORGANIZATION

An institution's process and program for managing its settlement risks should be commensurate with the range and scope of its activities. Institutions with relatively small trading operations in noncomplex instruments may not need the same level of automated systems, policies, and staff skills as do firms that are heavily engaged in FX transactions and other trading activities.

The management of settlement risk should begin at the highest levels of the organization, with senior management exercising appropriate oversight of settlement exposures. Although the specific organizational approaches may vary across institutions, managing settlement risk for FX and other trading activities should be integrated into the overall risk management of the institution to the fullest extent practicable. Settling transactions can involve many different functional areas of an institution, including trading, credit, operations, legal, risk assessment, branch management, and correspondent relations. Only senior management can effect the coordination necessary to define, measure, manage, and limit settlement risks across such varied functions. Accordingly, senior management should ensure that they fully understand the settlement risks incurred by the institution and should clearly define lines of authority and responsibility for managing these risks so that priorities, incentives, resources, and procedures across different areas can be structured to reduce exposures and mitigate risks. Staff responsible for all aspects of settlement-risk management should be adequately trained.

Measuring FX Settlement Exposures

Settlements generally involve two primary

events: the transmission of payment orders and the actual advance or receipt of funds. In FX transactions, it is important to distinguish a payment order, which is an instruction to make a payment, from the payment, which involves an exchange of credits and debits on the accounts of a correspondent bank or the accounts of a central bank when an interbank transfer takes place. To avoid paying late delivery fees, banks try to send their orders to their back office, branch, or correspondent bank on the day of trade or the next day. Since spot FX transactions generally call for settlement on the second day after the trade, orders are transmitted one or two days before settlement. On settlement day, payment orders are routed to the receiving institution through its correspondent or through the domestic payment system for actual final payment. Final payment may also be made through book-entry transfer if the two trading banks use a common correspondent.

A bank's settlement exposure runs from the time that its payment order for the currency sold can no longer be recalled or canceled with certainty and lasts until the time that the currency purchased is received with finality. In general, book-entry payments provide somewhat greater flexibility in terms of the ability to cancel a transfer because their processing does not rely on domestic payment systems. However, even the cancellation of book-entry transfers is still subject to restrictions presented by an institution's internal processing cycles and communication networks as well as time zone differences between branch locations. In theory, institutions may retrieve and cancel payment orders up until the moment before the funds are finally paid to a counterparty. However, many institutions have found that operational, economic, and even legal realities may result in payment orders becoming effectively irrevocable one or two business days before settlement day.

Institutions should specifically identify the actual time past which they can no longer stop a payment without the permission of a third party. This time is termed the unilateral cancellation deadline and should be used as a key parameter in assessing settlement-risk exposure. The documentation covering a correspondent's service agreement generally identifies these cutoff times. In the event of a dispute, a correspondent is likely to use the contractually agreed-upon unilateral cancellation deadline as a binding constraint.

The effect of an institution's internal processing patterns on its settlement risk should also be considered. The interval from the unilateral cancellation deadline for sold currency until final receipt of bought currency is generally referred to as the period of irrevocability. The full face value of the trade is at risk and the exposure on this amount can last overnight and up to one or two full days. If weekends and holidays are included, the exposure can exist for several days. The total exposures outstanding during this interval constitutes an institution's minimum FX settlement exposure.

The process of reconciling payments received with expected payments can also be a significant source of settlement-risk exposure. Many institutions may not perform this exercise until the day after settlement. During this interval, there is uncertainty as to whether the institution has received payments from particular counterparties. This period of uncertainty can create increased exposure, if it extends past the unilateral cancellation deadline for payments on the following day. For example, if an institution is subject to a unilateral cancellation deadline of 3:00 a.m. on settlement day and payments from the prior day's settlements are not reconciled until mid-morning on the day following settlement, it may be too late to manage its payments exposure for that following day. In this case, the maximum exposure from the evening of settlement day to morning on the following day can amount to both the receipts expected on settlement day (since their receipt has not been reconciled) and the entire amount of the following day's settlements (since they cannot be recalled.) In effect, an estimation of worst-case or maximum settlement exposures involves adding the exposures outstanding during the period of irrevocability to the exposures outstanding during the period of uncertainty. In a worst-case situation, a bank might find itself in the position of having sent out payments to a counterparty on one day when it had not been paid on the previous day.

Many institutions commonly define and measure their daily settlement exposures as the total receipts coming due that day. In some cases, this technique may either understate or overstate exposures. Simple measures using multiples of daily receipts can also incorrectly estimate risk. For example, using simple ''rules of thumb'' of two or three days of receipts may not sufficiently account for the appropriate timing of the settlement processing across different currencies.

Appropriately measuring FX settlement exposures requires an institution to explicitly identify both the unilateral cancellation deadlines and the reconciliation process times involved in each type of currency transaction. Accordingly, any simple rules used to measure settlement exposures should be devised in such a way as to consider both the unilateral cancellation deadlines and the reconciliation process involved in settlement. Identifying the duration of the settlement process and the related exposures does not require real-time tracking of all payments and can be accomplished through estimations based on standard settlement instructions and an understanding of the key milestones in the settlement process. Institutions should have a clear means of reflecting this risk in their exposure measurements.

Explicit consideration of unilateral cancellation deadlines and the reconciliation process can help an institution identify areas for improvement. If the time from its unilateral cancellation deadline to reconciliation can be reduced to under 24 hours, then an exposure measure of one day's receivables may provide a reasonable approximation of the duration and size of the settlement exposure to a counterparty. However, even then it must be recognized that overnight and weekend exposure may remain and that different currency pairs may require different intervals, which might overlap.

Limits

Institutions should ensure that settlement exposures to counterparties are properly limited. FX settlement exposures should be subject to an adequate credit-control process, including credit evaluation and review and determination of the maximum exposure the institution is willing to take with a particular counterparty bank. The process is most effective when the counterparty's FX settlement exposure limit is subject to the same procedures used to devise limits on exposures of similar duration and size to the same counterparty. For example, in cases where the FX settlement exposure to a counterparty lasts overnight, the limit might be assessed in relation to the trading bank's willingness to lend fed funds on an overnight basis.

Examiners should verify that the firm has set up separate presettlement and settlement lines for counterparties. Settlement exposures may also be broken down into sublimits by product. Sublimits may also be specified by date since settlement risk tends to be highest on the date of settlement.

Effective monitoring of exposures is crucial to the management of settlement risk, and institutions with large settlement exposures should strive to monitor payment flows on a real-time basis. Institutions should look to reduce settlement risk by arranging with their correspondents and counterparties to minimize, as much as practicable, the timing of an exchange of payments. Collateral arrangements and net settlement agreements are also important settlement-risk-management tools.

The timely reconciliation of nostro accounts also helps to mitigate settlement risk. Institutions often assume they have settlement exposure until they can confirm final receipt of funds or securities. Timely reconciliation enables an institution to determine its settlement exposure accurately and make informed judgments about its ability to assume additional settlement risk.

Procedures

From time to time, institutions may misdirect their payments, and funds may fail to arrive in promptly. While such mistakes may be inadvertent and corrected within a reasonable time, institutions should have procedures for quickly identifying fails, obtaining the funds due, and taking steps to avoid recurrences. Some institutions deduct fails from counterparty limits and review a series of fails to determine whether their pattern suggests that the problem is not procedural.

Netting

Banks can reduce the size of their counterparty exposures by entering into legally binding agreements for the netting of settlement payments. (Netting of payment obligations should not be confused with the more common netting of mark-to-market credit exposures of outstanding contracts such as swaps and forward FX.) Common arrangements involving bilateral netting of settlement flows, including FXNet, ValueNet, and Swift Accord, and bilateral agreements following IFEMA or other contracts. Legally binding netting arrangements permit banks to

offset trades against each other so that only the net amount in each currency must be paid or received by each bank to its netting counterparts. Depending on trading patterns, netting can significantly reduce the value of currencies settled. Netting also reduces the number of payments to one per currency either to or from the counterparty.

Netting is most valuable when counterparties have a considerable two-way flow of business. As a consequence, netting may only be attractive to the most active institutions. To take advantage of risk-reducing opportunities, institutions should have a process for identifying attractive netting situations that would provide netting benefits that outweigh the costs involved.

Some banks use the procedure of informal payment netting. Based on trading patterns, back offices of each counterparty will confer by telephone on the day before settlement and agree to settle only the net amount of the trades falling due. Since there may not be a legal opinion underpinning such procedures, institutions should ensure that they develop a good understanding of their ability to manage the legal, credit, and liquidity risks of this practice.

Multilateral Settlement Systems

The use of multilateral settlement systems by institutions raises additional settlement risks insofar as the failure of one system participant to settle its obligations when due can have credit or liquidity effects on participants that have not dealt with the defaulting participant. The Board's recent Policy Statement on Privately Operated Multilateral Settlement Systems provides guidance on the risks of these systems. The policy statement applies to systems with three or more participants that settle U.S. dollar payments with an aggregate gross value of more than $5 billion on any one day. However, the principles set forth in the policy statement can be used to evaluate risks in smaller systems.

The policy statement addresses the credit, liquidity, operational, and legal risks of multilateral settlement systems and provides risk-management measures for consideration. The policy statement is intended to provide a flexible, risk-based approach to multilateral settlement system risk management and should not be interpreted as mandating uniform, rigid requirements for all systems under its purview.

Risk-management measures to mitigate credit risk include monitoring participants' financial condition; setting caps or limits on some or all participants' positions in the system; and requiring collateral, margin, or other security. To mitigate liquidity risk, institutions operating multilateral settlement systems may also consider external liquidity resources and contingency arrangements. Liquidity risk also is mitigated by timely notification of settlement failures to enable participants to borrow funds to cover shortfalls. Operational risks are mitigated by contingency plans, redundant systems, and backup facilities. Legal risks are mitigated by operating rules and participant agreements, especially when transactions are not covered by an established body of law.

Large multilateral settlement systems also must meet the more comprehensive requirements of the Lamfalussy Minimum Standards established by the central banks of the Group of Ten countries. Under the policy statement, in determining whether a system must meet the Lamfalussy Minimum Standards, the Board will consider whether the system settles a high proportion of large-value interbank or other financial market transactions, has very large liquidity exposures that have potentially systemic consequences, or has systemic credit exposures relative to the participants' financial capacity.

Contingency Planning

Contingency planning and stress testing should be an integral part of the settlement-risk-management process. Contingencies should be established to span a broad spectrum of stress events, ranging from internal operational difficulties to individual counterparty defaults to broad market-related events. Adequate contingency planning in the FX settlement-risk area includes ensuring timely access to key information such as payments made, received, or in process; developing procedures for obtaining information and support from correspondent institutions; and well-defined procedures for informing senior management about impending problems.

Internal Audit

Institutions should have in place adequate internal audit coverage of the settlement areas to

ensure that operating procedures are adequate to minimize exposure to settlement risk. The scope of the FX settlement internal audit program should be appropriate to the risks associated with the market environment in which the institution operates. The audit frequency should be adequate for the relevant risk associated with the FX settlement area. Most institutions base audit frequency on a risk-assessment basis, and examiners should consult with the internal audit examiner to determine the adequacy of the risk-assessment methodology used by the institution.

Audit reports should be distributed to appropriate levels of management, who should take appropriate corrective action to address findings pointed out by the internal audit department. Audit reports should make recommendations for minimizing settlement risk in cases where weaknesses are cited. Management should provide written responses to internal audit reports, indicating its intended action to correct deficiencies where noted.

When audit findings identify areas for improvement in the FX settlement area, other areas of the institution on which this may have an impact should be notified. This could include credit-risk management, reconciliations/accounting, systems development, and management information systems. In automated FX settlement processing, the internal audit department should have some level of specialization in information technology auditing, especially if the institution maintains its own computer facility.

Management Information Systems

In larger, more complex institutions, counterparty exposures and positions can run across departments, legal entities, and product lines. Institutions should have clearly defined methods and techniques for aggregating exposures across multiple systems. In general, automated aggregation produces fewer errors and a higher level of accuracy in a more timely manner than manual methods.

The institution should have a contingency plan in place to ensure continuity of its FX settlement operations if its main production site becomes unusable. This plan should be documented and supported by contracts with outside vendors, where appropriate. The plan should be tested periodically.

Institutions face two types of liquidity risk in their capital-markets and trading activities: ''funding-liquidity risk'' refers to the ability to meet investment and funding requirements arising from cash-flow mismatches, and ''market-liquidity risk'' is the risk that an institution cannot easily eliminate or offset a particular position without significantly affecting the previous market price because of inadequate market depth or market disruption. Measuring, monitoring, and addressing both types of liquidity-risk exposures are vital activities of a financial institution. Ultimate responsibility for setting liquidity policies and reviewing liquidity decisions lies in the financial institution's highest level of management, and its decisions should be reviewed periodically by the board of directors.

In developing guidelines for controlling liquidity risks, institutions should consider the possibility that they could lose access to one or more markets because of concerns about its own creditworthiness, the creditworthiness of a major counterparty, or generally stressful market conditions. At such times, the institution may have less flexibility in managing its market-, credit-, and liquidity-risk exposures. Institutions that make markets in over-the-counter derivatives or that dynamically hedge their positions require constant access to financial markets, and that need may increase in times of market stress. The institution's liquidity plan should reflect the institution's ability to turn to alternative markets, such as futures or cash markets, or to provide sufficient collateral or other credit enhancements to continue trading under a broad range of scenarios.

Examiners should ensure that financial institutions that participate in over-the-counter derivative markets adequately consider the potential liquidity risk associated with the early termination of derivative contracts. Many forms of standardized contracts for derivatives transactions allow counterparties to terminate their contracts early if the institution experiences an adverse credit event or its financial condition deteriorates. Under conditions of market stress, customers may also ask for the early termination of some contracts within the context of the dealer's market-making activities. In these situations, an institution that owes money on derivative transactions may be required to settle a contract early and possibly at a time when the institution may face other funding and liquidity pressures. Furthermore, early terminations may expose additional market positions. Management and directors should be aware of these potential liquidity risks and address them in the liquidity plan and management process. Examiners should consider the extent to which such potential obligations could present liquidity risks to the institution.

FUNDING-LIQUIDITY RISK

Funding-liquidity risk refers to the ability to meet investment and funding requirements arising from cash-flow mismatches. Virtually every financial transaction or commitment has implications for an institution's liquidity. Traditionally, funding-liquidity-risk management focused on the balance-sheet activities of financial institutions; however, the major growth in off-balance-sheet activities in recent years has made liquidity management of these exposures increasingly important. Activities such as foreign-exchange, securities, and derivatives trading can have an important impact on a financial institution's liquidity.

The ability of a financial institution to raise funds in the wholesale marketplace can be influenced by systemic factors, which affect the spectrum of market participants, as well as by weaknesses confined to the individual institution, such as a real or perceived decline in its credit quality. The perception that a financial institution's credit quality is declining can have a dramatic impact on its wholesale funding capabilities. Additionally, customers may wish to reduce or eliminate their exposures to the institution by unwinding their in-the-money positions. (In this instance, the customers' in-the-money position refers to contracts with a positive value to the customer; the position would be out-of-the-money to the financial institution.) While not necessarily obligated to unwind positions, the institution may feel compelled to accommodate its counterparties if it perceives that a continued presence as an active market maker is required to avoid damaging its market-making reputation. Similarly, to the extent that the institution has entered into transactions documented with agreements containing margin

or collateralization provisions in favor of the counterparty, or has granted the counterparty the right to terminate the contract under certain conditions, the institution may be legally obligated to provide cash or cash-equivalent collateral to in-the-money counterparties. Correspondingly, the institution's ability to collect margin or collateral from its customers on its in-the-money positions may be affected by the ability of its counterparties to perform.

Management Information Systems

Virtually all financial institutions have a staff dedicated to measuring and managing the institution's liquidity. Generally, the management information systems designed for liquidity measurement should relate to the level of the activities of the financial institution. An institution's investment in information systems designed to gather liquidity information on balance-sheet and off-balance-sheet exposures may be substantial for firms actively involved in the marketplace, especially if these activities are conducted globally. Correspondingly, financial institutions who are primarily end-users of off-balance-sheet products may have less-sophisticated systems. Cash-flow projections should always incorporate all significant cash-flow sources and uses resulting from on- *and* off-balance-sheet activities. For institutions operating in a global environment, these projections should also reflect various foreign-currency funding requirements.

Management information systems should also be able to project cash flows under a variety of scenarios, including (1) a ''business-as-usual'' approach, which establishes the benchmark for the ''normal'' behavior of cash flows of the institution; (2) a liquidity crisis confined to the institution; and (3) a systemic liquidity crisis, in which liquidity is affected at all financial institutions. While the magnitude and direction of net cash positions can be forecast, it will fluctuate with changes in the market and activity in the portfolios.

As in other areas of risk management, liquidity-information systems and the liquidity-management process should be subject to audit. The examiner should ensure that the overall liquidity-risk-management process takes into account the risks in trading activities, especially when those activities are substantial, and the firm is a market maker. Evidence of analysis should be available for examiner review. A more detailed discussion of funding-liquidity risk can be found in the *Commercial Bank Examination Manual*.

Contingency Funding Plans

The complexity of large trading portfolios can make liquidity and cash-flow management difficult. For example, as market prices change, required adjustments to hedge ratios, variation margin calls, and customers' exercise of options may cause a portfolio that is hedged and solvent in a present-value sense to experience, at a point in time, a shortfall of cash inflows over outflows—thus creating a liquidity squeeze. Even if its portfolio is solvent, a financial institution may be unable to borrow to cover the cash-flow asymmetry because the complexity of the portfolio can obscure its true financial condition from potential lenders, making it appear too risky for lenders to quickly approve an urgent request for funds. For a financial institution with insufficient liquid assets, this cash-flow-management problem adds to the dimensions over which a portfolio must be managed.

To address liquidity and cash-flow issues, senior management is responsible for establishing and implementing a sound funding-liquidity contingency plan that provides for centralized and comprehensive policies and procedures; measurement, monitoring, and reporting of exposures; and internal controls. The board of directors is responsible for reviewing this plan regularly and assessing the institution's overall liquidity-risk profile in light of the banking organization's business strategies, liquidity objectives, and risk appetite.

A liquidity contingency plan should be based on a solid understanding of the institution's anticipated sources and uses of funds and on the expected timing of those sources and uses. The composition, size, availability, volatility, and term structure of asset-backed liquidity sources in relation to the institution's liquidity structure and liquidity needs should be gauged. The plan should reflect an understanding of the increased volatility in financial markets and the speed with which access to financial markets can deteriorate.

The plan should identify stable, flexible, and diverse liquidity sources to accommodate significant fluctuations in asset and liability levels as a result of business cycles or unanticipated

stress events. In designing the plan, management should consider the interrelatedness of funding-liquidity risks with credit, market, interest-rate, and operational risks.

A comprehensive approach formalizes communications between business lines and the funding desk, and it explicitly considers funding requirements arising from all sources within the institution, including off-balance-sheet obligations and derivatives transactions. Many forms of standardized derivatives contracts allow counterparties to request collateral or to terminate contracts early if the institution experiences an adverse credit event or its financial condition deteriorates. In addition, under situations of market stress, a customer may ask for early termination of some contracts. In these circumstances, an institution that owes money on derivatives transactions may be required to deliver collateral or settle a contract early—when the institution is also encountering additional funding and liquidity pressures. The liquidity plan should consider the extent to which the bank acts as a dealer in asset markets or provides payment and settlement services for customers and other banks.

Potential stress scenarios should be identified, and funding-liquidity plans should identify liquidity sources that could be accessed under stress conditions. Stress scenarios should also take into account unusual demands on bank liquidity, such as the sudden draw-down of customer lines of credit or the early termination of derivatives contracts.

Separate, but integrated and coordinated, contingency plans should be developed for the parent company, for significant nonbank subsidiaries or special-purpose funding vehicles for which liquidity risk may be substantial, and for overseas operations that need to address liquidity risk in foreign currencies and under foreign banking systems. Banks may be less well known to liability holders in foreign-currency markets. Therefore, in the event of market stress, especially stress related to the bank's domestic operating environment, these liability holders may react strongly to rumors. The bank should have a contingency plan to mobilize domestic liquidity and the necessary foreign-exchange transactions in sufficient time to meet foreign-currency funding requirements.

An effective contingency plan includes a reliable but flexible crisis-management team and administrative structure, realistic action plans, and frequent communication and reporting among responsible staff, management, and the board. The crisis-management team should include top members of management responsible for asset-liability management, as well as highly skilled line management and staff. The team should be designed to maximize the institution's ability to quickly assess an evolving situation, rapidly decide a course of action, implement the actions, monitor changes in the situation, and take corrective action as needed. The responsibilities and authority of each member of the team should be carefully delineated. Particular attention should be given to the team member or members responsible for communicating with the public, the bank's counterparties, major customers, rating agencies, and regulators. The importance of accurate and consistent information flows cannot be underestimated in a stress scenario.

The plan should provide for realistic action plans that define different levels of liquidity stress. For each level, the plan should evaluate funding capacities; specify actions and procedures to be implemented; identify alternative contingency funding, taking into account the possibility that liquidity pressures may have spread to other funding sources; and measure the institution's ability to fund operations over an extended period of liquidity stress. In defining levels of liquidity stress, some institutions develop predefined triggers, while others rely on more judgmental warning signals that may or may not indicate a need to trigger activation of the contingency plan. Either approach can be used in an effective liquidity contingency plan. Triggers or warning signals may include—

- a reluctance of traditional funds providers to continue funding at past levels;
- smaller deal sizes reflecting funding conservatism;
- rating downgrades or "watch listings" for a downgrade;
- stock-price declines;
- a difficulty accessing longer-term money (particularly over quarter-end reporting dates);
- the reluctance of trust managers, money managers, and public entities to place funds with the bank;
- the reluctance of broker-dealers to show the bank's name in the market, forcing management to arrange friendly broker-dealer support;
- market rumors or concerns that customers have expressed to bank staff about the bank's condition;

- rising funding costs in a stable market;
- the redemption of CDs before maturity;
- counterparty resistance to bank off-balance-sheet products;
- counterparties that begin requesting collateral for credit exposures; and
- correspondent banks eliminating or decreasing their credit lines.

Frequent communication and reporting among crisis team members, the board of directors, and other affected managers optimize the effectiveness of a contingency plan by ensuring that business decisions are coordinated to minimize any further disruptions to liquidity. The quality of communications and reporting depends on the quality of the institution's liquidity metrics and management information systems. More frequent and more detailed reporting is advisable as a stress situation intensifies. Reports that generally should be available include—

- a large-funder report,
- an asset and liability runoff report,
- reports on performance in relation to liquidity limits and benchmarks, and
- cash-flow analyses.

The bank should have a good estimate of the flow-of-funds time line and sequence for the liquidation of major classes of balance-sheet assets. These estimates should be realistic under the current market environment and be empirically supportable. The bank should have a realistic analysis of cash inflows, outflows, and funds availability at various time intervals (for example, at 7, 10, 15, 30, 45, 60, and 90 days). Potential sources of contingency funding should be identified, quantified, and ranked by preference. The ability of the bank to draw down back-up lines of credit in a crisis, and the rights of the lender to deny draw-downs, should be fully evaluated.

Institutions that have significant payment-system operations should have a formal, written plan in place for managing the risk of both intraday and end-of-day funding failures, which may result if internal systems fail or if the systems fail at an institution from which payments are expected. Clear, formal communications channels should be established between the operations areas handling the payment systems and the funding area so that the treasury operation is aware of any funding disruption and can respond quickly.

Contingency Liquidity in Bank Holding Companies

Bank holding companies have a more limited range of asset and liability management options than banks do; thus, their liquidity-risk profile is higher. Moreover, management can quickly change a bank holding company's liquidity profile by repurchasing stock, paying dividends, or making investments in subsidiaries. Examiners should establish that the board of directors of the parent company has a clear, strategic direction for both the level of liquidity that should be maintained at the parent level and the provision of liquidity to subsidiary banks in times of stress.

Bank holding company liquidity should be maintained at levels sufficient to fund holding company and nonbank affiliate operations for an extended period of time in a stress environment (that is, when access to normal funding sources is disrupted), without having a negative impact on insured institution subsidiaries. As they are at the bank level, the stability, flexibility, and diversity of primary and contingent sources of funding liquidity should be identified at the holding company level. The impact of bank holding company liquidity, as well as the composition of liquidity sources, on the bank's access to the funding markets should be considered carefully.

Bank holding companies should develop strategies to remedy funding mismatches that may develop under stress conditions. Strategies may include limiting parent company funding of long-term assets and securing reliable, long-term back-up funding sources. Back-up funding contracts should be reviewed to determine the extent to which any ''material adverse change'' clauses would constrain the company's access to funding if the company's financial condition deteriorated. A common stress test is to analyze whether the holding company has adequate liquidity to meet its potential debt obligations over the next 12 months, in addition to operating expenses, assuming the company loses access to the funding market and dividends from subsidiaries.

MARKET-LIQUIDITY RISK

Market-liquidity risk refers to the risk of being unable to close out open positions quickly enough and in sufficient quantities at a reason-

able price. In dealer markets, the size of the bid/ask spread of a particular instrument provides a general indication as to the depth of the market under normal circumstances. However, disruptions in the marketplace, contraction in the number of market makers, and the execution of large block transactions are some factors that may result in the widening of bid/ask spreads.

Disruptions in various financial markets may have serious consequences for a financial institution that makes markets in particular instru-

ments. These disruptions may be specific to a particular instrument, such as those created by a sudden and extreme imbalance in the supply and demand for a particular product. Alternatively, a market disruption may be all-encompassing, such as the stock market crash of October 1987 and the associated liquidity crisis.

The decision of major market makers to enter or exit specific markets may also significantly affect market liquidity, resulting in the widening of bid/ask spreads. The liquidity of certain markets may depend significantly on the active presence of large institutional investors; if these investors pull out of the market or cease to trade actively, liquidity for other market participants can decline substantially.

Market-liquidity risk is also associated with the probability that large transactions in particular instruments, by nature, may have a significant effect on the transaction price. Large transactions can strain liquidity in markets that are not deep. Also relevant is the risk of an unexpected and sudden erosion of liquidity, possibly as a result of a sharp price movement or jump in volatility. This could lead to illiquid markets, in which bid/ask spreads are likely to widen, reflecting declining liquidity and further increasing transaction costs.

Over-the-Counter Instruments

Market liquidity in over-the-counter (OTC) dealer markets depends on the willingness of market participants to accept the credit risk of major market makers. Changes in the credit risk of major market participants can have an important impact on the liquidity of the market. Market liquidity for an instrument may erode if, for example, a decline in the credit quality of certain market makers eliminates them as acceptable counterparties. The impact on market liquidity could be severe in those OTC markets in which a particularly high proportion of activity is concentrated with a few market makers. In addition, if market makers have increased concerns about the credit risk of some of their counterparties, they may reduce their activities by reducing credit limits, shortening maturities, or seeking collateral for security—thus diminishing market liquidity.

In the case of OTC off-balance-sheet instruments, liquid secondary markets often do not exist. While cash instruments can be liquidated and exchange-traded instruments can be closed out, the ability to effectively unwind OTC derivative contracts is limited. Many of these contracts tend to be illiquid, since they can generally only be canceled by an agreement with the counterparty. Should the counterparty refuse to cancel the open contract, the financial institution could also try to arrange an assignment whereby another party is ''assigned'' the contract. Contract assignments, however, can be difficult and cumbersome to arrange. A financial institution's ability to cancel these financial contracts is a critical determinant of the degree of liquidity associated with the instruments. Financial institutions which are market makers, therefore, typically attempt to mitigate or eliminate market-risk exposures by arranging OTC contracts with other counterparties executing hedge transactions on the appropriate exchanges, or, most typically, a combination of the two.

In using these alternative routes, the financial institution must deal with two or more times the number of contracts to cancel its risk exposures. *While market-risk exposures can be mitigated or completely canceled in this manner, the financial institution's credit-risk exposure increases in the process.*

Exchange-Traded Instruments

For exchange-traded instruments, counterparty credit exposures are assumed by the clearinghouse and managed through netting and margin arrangements. The combination of margin requirements and netting arrangements of clearinghouses is designed to limit the spread of credit and liquidity problems if individual firms or customers have difficulty meeting their obligations. However, if there are sharp price changes in the market, the margin payments that clearinghouses require to mitigate credit risk can have adverse effects on liquidity, especially in a falling market. In this instance, market participants may sell assets to meet margin calls, further exacerbating liquidity problems in the marketplace.

Many exchange-traded instruments are liquid only for small lots, and attempts to execute a large block can cause a significant price change. Additionally, not all financial contracts listed on the exchanges are heavily traded. While some contracts have greater trading volume than the underlying cash markets, others trade infre-

quently. Even with actively traded futures or options contracts, the bulk of trading generally occurs in short-dated contracts. Open interest, or the total transaction volume, in an exchange-traded contract, however, provides an indication of the liquidity of the contract in normal market conditions.

''Unbundling'' of Product Risk

Both on- and off-balance-sheet products typically contain more than one element of market-risk exposure; therefore, various hedging instruments may need to be used to hedge the inherent risk in one product. For example, a fixed coupon foreign currency–denominated security has interest-rate and foreign-exchange risks which the financial institution may choose to hedge. The hedging of the risks of this security would likely result in the use of both foreign-exchange and interest-rate contracts. Likewise, the hedging of a currency interest-rate swap, for example, would require the same.

By breaking the market risk of a particular product down into its fundamental elements, or ''unbundling'' the risks, market makers are able to move beyond product liquidity to risk liquidity. Unbundling not only eases the control of risk, it facilitates the assumption of more risk than was previously possible without causing immediate market concern or building up unacceptable levels of risk. For example, the interest-rate risk of a U.S. dollar interest-rate swap can be hedged with other swaps, forward rate agreements (FRAs), Eurodollar futures contracts, Treasury notes, or even bank loans and deposits. The customized swap may appear to be illiquid but, if its component risks are not, then other market makers would, under normal market conditions, be willing and able to provide the necessary liquidity. Positions, however, can become illiquid, particularly in a crisis.

Dynamic Hedging Risks

Certain unbundled market-risk exposures may tend to be managed as individual transactions, while other risks may be managed on a portfolio basis. The more ''perfectly hedged'' the transactions in the portfolio are, the less the need to actively manage residual risk exposures. Conversely, the use of dynamic hedging strategies to cover open price-risk exposures exposes the financial institution to increased risk when hedges cannot be easily adjusted. (Dynamic hedging is not applied to an entire portfolio, but only to the uncovered risk.) The use of dynamic hedging strategies and technical trading by a sufficient number of market participants can introduce feedback mechanisms that cause price movements to be amplified and lead to one-way markets. Some managers may estimate exposure on the basis of the assumption that dynamic hedging or other rapid portfolio adjustments will keep risk within a given range even in the face of large changes in market prices. However, such portfolio adjustments depend on the existence of sufficient market liquidity to execute the desired transactions, at reasonable costs, as underlying prices change. If a liquidity disruption were to occur, difficulty in executing the transactions needed to change the portfolio's exposure will cause the actual risk to be higher than anticipated. Those institutions who have open positions in written options and, thus, are short volatility and gamma will be the most exposed.

The complexity of the derivatives strategies of many market-making institutions can further exacerbate the problems of managing rapidly changing positions. Some financial institutions construct complex arbitrage positions, sometimes spanning several foreign markets and involving legs in markets of very different liquidity properties. For example, a dollar-based institution might hedge a deutschemark convertible bond for both equities and foreign-exchange risk and finance the bond with a dollar-deutschemark bond swap. Such a transaction may lock in many basis points in profit for the institution, but exposes it to considerable liquidity risk, especially if the arbitrage transaction involves a combination of long-term and short-term instruments (for example, if the foreign-exchange hedging were done through three-month forwards, and the bond had a maturity over one year). If key elements of the arbitrage transaction fall away, it may be extremely difficult for the institution to find suitable instruments to close the gap without sustaining a loss.

Multifaceted transactions can also be particularly difficult to unwind. The difficulty of unwinding all legs of the transaction simultaneously can temporarily create large, unhedged exposures for the financial institution. The ability to control the risk profile of many of these transactions lies in the ability to execute trades

more or less simultaneously and continuously in multiple markets, some of which may be subject to significant liquidity risks. Thus, the examiner should determine whether senior management is aware of multifaceted transactions and can monitor exposures to such linked activity, and whether adequate approaches exist to control the associated risks in a dynamic environment.

Market-Liquidity-Risk Limits

Risk measures under stress scenarios should be estimated over a number of different time horizons. While the use of a short time horizon, such as a day, may be useful for day-to-day risk management, prudent managers will also estimate risk over longer horizons because the use of such a short horizon assumes that market liquidity will always be sufficient to allow positions to be closed out at minimal losses. However, in a crisis, market liquidity, or the institution's access to markets, may be so impaired that closing out or hedging positions may be impossible, except at extremely unfavorable prices, in which case positions may be held for longer than envisioned. This unforeseen lengthening of the holding period will cause a portfolio's risk profile to be much greater than envisioned in the original risk measure, as the likelihood of a large price change (volatility) increases with the horizon length. Additionally, the risk profiles of some instruments, such as options, change radically as their remaining time to maturity decreases.

Market makers should consider the bid/ask spreads in normal markets and potential bid/ask spreads in distressed markets and establish risk limits which consider the potential illiquidity of the instruments and products. Stress tests evidencing the ''capital-at-risk'' exposures under both scenarios should be available for examiner review.

Revaluation Issues

Market makers may establish closeout valuation reserves covering open positions to take into consideration a potential lack of liquidity in the marketplace upon liquidation, or closing out of, market-risk exposures. These ''holdback'' reserves are typically booked as a contra account for the unrealized gain account. Since transactions are marked to market, holdback reserves establish some comfort that profits taken into current earnings will not dissipate over time as a result of ongoing hedging costs. Holdback reserves may represent a significant portion of the current mark-to-market exposure of a transaction or portfolio, especially for those transactions involving a large degree of dynamic hedging. The examiner should ensure, however, that the analysis provided can demonstrate a quantitative methodology for the establishment of these reserves and that these reserves, if necessary, are adequate.

Examination objectives relating to funding-liquidity risk are found in the Commercial Bank Examination Manual. *The following examination objectives relate to the examination of market-risk liquidity.*

1. To evaluate the organizational structure of the risk-management function.
2. To evaluate the adequacy of internal policies and procedures relating to the institution's capital-markets and trading activities in illiquid markets and to determine that actual operating practices reflect such policies.
3. To identify the institution's exposure and potential exposure resulting from trading in illiquid markets.
4. To determine the institution's potential exposure if liquid markets suddenly become illiquid.
5. To determine if senior management and the board of directors of the financial institution understand the potential market-liquidity-risk exposures of the trading activities of the institution.
6. To ensure that business-level management has formulated contingency plans in the event of sudden illiquid markets.
7. To ensure the comprehensiveness, accuracy, and integrity of management information systems providing analysis of market-liquidity-risk exposures.
8. To determine if the institution's liquidity-risk-management system has been correctly implemented and adequately measures the institution's exposures.
9. To determine if the open interest in exchange-traded contracts is sufficient to ensure that management would be capable of hedging or closing out open positions in one-way directional markets.
10. To determine if management is aware of limit excesses and takes appropriate action when necessary.
11. To recommend corrective action when policies, procedures, practices, or internal controls are found to be deficient.

These procedures represent a list of processes and activities that can be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

Examination procedures relating to funding-liquidity risk are found in the Commercial Bank Examination Manual. *The following examination procedures relate to the examination of market-liquidity risk.*

1. Review the liquidity-risk-management organization.
   a. Check that the institution has a liquidity-risk-management function with a separate reporting line from traders and marketers.
   b. Determine if liquidity-risk-control personnel have sufficient credibility in the financial institution to question traders' and marketers' decisions.
   c. Determine if liquidity-risk management is involved in new-product discussions in the financial institution.
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments and obtain copies of all risk-management reports prepared by the institution to evaluate liquidity-risk-control personnel's demonstrated knowledge of the products traded by the financial institution and their understanding of current and potential exposures.
3. Obtain and evaluate the adequacy of risk-management policies and procedures for capital-markets and trading activities.
   a. Review market-risk policies, procedures, and limits.
   b. Review contingency market-liquidity-risk plans, if any.
   c. Review accounting and revaluation policies and procedures. Determine that revaluation procedures are appropriate.
4. Determine the credit rating and market acceptance of the financial institution as a counterparty in the markets.
5. Obtain all management information analyzing market-liquidity risk.
   a. Determine the comprehensiveness, accuracy, and integrity of analysis.
   b. Review bid/ask assumptions in a normal market scenario.
   c. Review stress tests that analyze the widening of bid/ask spreads and determine the reasonableness of assumptions.
   d. Determine whether the management information reports accurately reflect risks and that reports are provided to the appropriate level of management.
6. Determine if any recent market disruptions have affected the institution's trading activities. If so, determine the institution's market response.
7. Establish that the financial institution is following its internal policies and procedures. Determine whether the established limits adequately control the range of liquidity risks. Determine that the limits are appropriate for the institution's level of activity. Determine whether management is aware of limit excesses and takes appropriate action when necessary.
8. Determine whether the institution has established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency.
9. Determine whether management considered potential illiquidity of the markets when establishing capital-at-risk exposures.
   a. Determine if the financial institution established capital-at-risk limits which address both normal and distressed market conditions.
   b. Determine if senior management and the board of directors are advised of market-liquidity-risk exposures in illiquid markets as well as of potential risk arising as a result of distressed market conditions.
10. Determine whether business managers have developed contingency plans which reflect

actions to be taken in suddenly illiquid markets to minimize losses as well as the potential damage to the institution's market-making reputation.

11. Based on information provided, determine the institution's exposure to suddenly illiquid markets resulting from dynamic hedging strategies.
12. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient.

The internal control questionnaire relating to funding-liquidity risk is found in the Commercial Bank Examination Manual. *The following internal control questions relate to the examination of market-risk liquidity.*

1. Review the liquidity-risk-management organization.
   a. Does the institution have a liquidity-risk-management function that has a separate reporting line from traders and marketers?
   b. Do liquidity-risk-control personnel have sufficient credibility in the financial institution to question traders' and marketers' decisions?
   c. Is liquidity-risk management involved in new-product discussions in the financial institution?
2. Identify the institution's capital-markets and trading activities and the related balance-sheet and off-balance-sheet instruments and obtain copies of all risk-management reports prepared.
   a. Do summaries identify all the institution's capital-markets products?
   b. Define the role that the institution takes for the range of capital-markets products. Determine the hedging instruments used to hedge these products. Is the institution an end-user, dealer, or market maker? If so, in what products?
   c. Do liquidity-risk-control personnel demonstrate knowledge of the products traded by the financial institution? Do they understand the current and potential exposures to the institution?
3. Does the institution have comprehensive, written risk-management policies and procedures for capital-markets and trading activities?
   a. Do the policies provide an explanation of the board of directors' and senior management's philosophy regarding illiquid markets?
   b. Have limits been approved by the board of directors?
   c. Have policies, procedures, and limits been reviewed and reapproved within the last year?
   d. Are market-liquidity-risk policies, procedures, and limits clearly defined?
   e. Are the limits appropriate for the institution and its level of capital?
   f. Are there contingency market-liquidity-risk plans?
   g. Do the policies address the use of dynamic hedging strategies?
4. Has there been a credit-rating downgrade? What has been the market response to the financial institution as a counterparty in the markets? Are instances in which the institution provides collateral to its counterparties minimal?
5. Obtain all management information analyzing market-liquidity risk.
   a. Is management information comprehensive and accurate and is the analysis sound?
   b. Are the bid/ask assumptions in a normal market scenario reasonable?
   c. Do management information reports accurately reflect risks? Are reports provided to the appropriate level of management?
6. If any recent market disruptions affected the institution's trading activities, what has been the institution's market response?
7. Is the financial institution following its internal policies and procedures? Do the established limits adequately control the range of liquidity risks? Are the limits appropriate for the institution's level of activity?
8. Has the institution established an effective audit trail that summarizes exposures and management approvals with the appropriate frequency?
9. Has management considered potential illiquidity of the markets when establishing capital-at-risk exposures?
   a. Has the financial institution established capital-at-risk limits which address both normal and distressed market conditions? Are these limits aggregated on a global basis?
   b. Are senior management and the board of directors advised of market-liquidity-risk exposures in illiquid markets as well as of potential risk arising as a result of distressed market conditions?
10. Has management determined the institution's exposure to suddenly illiquid markets resulting from dynamic hedging strategies?

Management information systems (MIS) should accumulate, interpret, and communicate information regarding the institution's positions, profits, business activities, and inherent risks. The form and content of management information for trading activities will be a function of the size and complexity of the trading operation and organization, policies and procedures, and management reporting lines. MIS generally take two forms: computing systems with business applications and management reporting. For institutions with trading operations, a computerized system should be in place. For a small number of institutions with limited trading activity, an elaborate computerized system may not be cost effective. Not all management information systems are fully integrated. Examiners should expect to see varying degrees of manual intervention and should determine whether the integrity of the data is preserved through proper controls. The examiner should review and evaluate the sophistication and capability of the financial institution's computer systems and software, which should be capable of supporting, processing, and monitoring the capital-markets and trading activities of the financial institution.

An accurate, informative, and timely management information system is essential to the prudent operation of a trading or derivative activity. Accordingly, the examiner's assessment of the quality of the management information system is an important factor in the overall evaluation of the risk-management process. Examiners should determine the extent to which the risk-management function monitors and reports its measure of trading risks to appropriate levels of senior management and the board of directors. Exposures and profit-and-loss statements should be reported at least daily to managers who supervise but do not conduct trading activities. More frequent reports should be made as market conditions dictate. Reports to other levels of senior management and the board may occur less frequently, but examiners should determine whether the frequency of reporting provides these individuals with adequate information to judge the changing nature of the institution's risk profile.

Examiners should ensure that the management information systems translate the measured risk from a technical and quantitative format to one that can be easily read and understood by senior managers and directors, who may not have specialized and technical knowledge of trading activities and derivative products. Risk exposures arising from various products within the trading function should be reported to senior managers and directors using a common conceptual framework for measuring and limiting risks.

PROFESSIONAL EXPERTISE

The trading institution should have personnel with sufficient expertise to understand the financial instruments and maintain the management information system. Reports should be updated to reflect the changes in the business environment. Institutions that develop their own applications should have adequate staff to alter and test current software. Also, the implementation of automated reporting systems is not a substitute for an adequate reconcilement procedure that would ensure the integrity of data inputs. The system must be independently audited by personnel with sufficient expertise to perform a comprehensive review of management reporting, financial applications, and systems capacity.

COMPUTING SYSTEMS

Worldwide deregulation of financial markets combined with the latest tools in information technologies have brought capital markets together so that geographic financial centers are no longer as important. Access to markets on competitive terms from any location is made possible by instantaneous worldwide transmission of news and market information. To manage their risk-management process in the current financial and technological environment, financial institutions are more readily prepared to incorporate the latest communications systems and database management techniques. In addition, new financial concepts are rapidly becoming standard practice in the industry, made possible by powerful computing tools and communications systems.

Some capital-markets instruments require information technologies that are more complex than those used for more traditional banking products, such as loans, deposits, and standard

foreign-exchange transactions. Indeed, a department developing specialized trading products and their supporting systems is often viewed by senior management as the laboratory for the financial institution. For financial institutions active in capital markets, conducting business in a safe and sound manner depends on the successful integration of management information systems into the daily processes of market- and credit-risk management; transaction processing; settlement; accounting; and financial, regulatory, and management reporting.

Examiners should evaluate the processes of software development, technical specifications, database management, local area networks, and communication systems. Access to the automated systems should be adequately protected. If the organization uses PCs, a written policy to address access, development, maintenance, and other relevant issues should exist. Given the specialized management skills and heightened sophistication in information technologies found in many trading rooms, an evaluation of systems management should be incorporated into the overall assessment of management and internal controls. A full-scope examination of these areas is best performed by specialized electronic data processing examiners. However, a general review of these processes must also be incorporated in the financial examination.

For examination purposes, the scope of the review should be tailored to the functionality of the management information system as opposed to its technical specifications. Functionality refers to how well the system serves the needs of users in all areas of the institution, including senior management, risk management, front office, back office, financial reporting, and internal audit. The organization should have flow charts or narratives that indicate the data flow from input through reporting. The comprehensiveness of this information, however, will depend on the level of reporting necessary for the institution.

An important aspect of evaluating information technology is the degree to which various systems interface. For purposes of this discussion, automated systems refers to the collection of various front-office and control systems. Financial institutions relying on a single database of client and transaction files may have stronger controls on data integrity than those with multiple sources of data. However, rarely does a single automated system handle data entry and all processing and control functions relevant to all over-the-counter and exchange-traded instruments used by an institution. The group of systems used may be a combination of systems purchased from vendors and applications developed in-house by the firm's software programmers. Standard instructions should be set within the automated systems. The organization should identify which instructions may be overridden and under what circumstances.

The organization should give planned enhancement or development projects appropriate priority, given management's stated goals and capital-markets activity. Third-party vendors should be provided with adequate lead time to make changes to existing programs. Sufficient testing should be performed before system upgrades are implemented.

When consolidating data derived from multiple sources, the institution should perform controls and reconciliations that minimize the potential for corrupting consolidated data. If independent databases are used to support subsidiary systems, then reconciliation controls should be evident at each point that multiple data files are brought together. Regardless of the combination of automated systems and manual processes, examiners should ensure that appropriate validation processes are effected to ensure data integrity.

Not all financial institutions have the same automation requirements. For institutions with limited transaction volume, it is not cost effective to perform risk-management reporting in an automated environment, and most analysis can be handled manually. When volumes increase such that timely risk monitoring can no longer be handled manually, then automated applications may be appropriate.

MODEL RISK

A key element of the management information system of trading operations is models and algorithms used to measure and manage risk. The frequency and extent to which financial institutions should reevaluate their models and assumptions depend, in part, on the specific risk exposures created by their trading activities, the pace and nature of market changes, and the pace of innovation with respect to measuring and managing risks. At a minimum, financial institutions with significant capital-markets and trading activities should review the underlying methodologies and assumptions of their models

at least annually, and more often as market conditions dictate, to ensure that they are appropriate and consistent for all products. Such internal evaluations may, in many cases, be supplemented with reviews by external auditors or other qualified outside parties, such as consultants who have expertise with highly technical models and risk-management techniques.

When introducing a pricing model, it is imperative that adequate testing of the algorithm be performed by systems personnel with appropriate sign-off by model users (traders, controllers, and auditors). In practice, pricing models for the most heavily traded financial instruments are well tested. Financial algorithms for complex, exotic products should be well documented as part of the policies and procedures manual and functional specifications. Hazards are more likely to arise for instruments that have nonstandard or option-like features. The use of proprietary models that employ unconventional techniques that are not widely agreed upon by market participants should lead to further questioning by examiners. Even the use of standard models may lead to errors if the financial tools are not appropriate for a given instrument.

NEW PRODUCTS

The development of new products is a key feature of capital-markets and trading operations. The general risks associated with new products should be addressed through the new-product-approval process. In reviewing financial applications, examiners should evaluate whether the current tools quantify and monitor the range of relevant exposures. New applications require special review and additional measures of control. In the absence of a model that provides a reasonable simulation of market price, the risk-management, control, and audit areas should be responsible for developing an appropriate valuation methodology. Nonstandard software applications should proceed through the institution's software development process for testing before implementation. They should not be released for actual business use until validation and sign-off is obtained from appropriate functional departments.

Parameter Selection and Review

Examiners should ensure that financial institutions have a process whereby parameters used in valuation models depend on rigorous statistical methods and are updated to reflect changing market conditions. To the extent possible, the results derived from statistical methods should be validated against available market information.

Models that incorporate assumptions about underlying market conditions or price relationships require ongoing monitoring. Input parameters such as volatility, correlations between market prices, interest rates and currencies, and prepayment speeds of underlying mortgage pools require frequent review. For example, volatility quotes may be compared to those in available published sources, or from implied volatilities derived from a pricing model using current market prices of actively traded exchange-listed options. Mortgage securities prepayment assumptions can be compared to vectors provided by the dealer community to automated services or to factors provided by third-party vendors.

Examiners should evaluate the ability of an institution's model to accommodate changes in assumptions and parameters. Institutions should conduct ''what-if'' analyses and tests of the sensitivity of specific portfolios or their aggregate risk position. Examiners should expect the risk-management and measurement system to be sufficiently flexible to stress test the range of portfolios managed by the institution. Any parameter variations used for stress tests or what-if analyses should be clearly identified. These simulations usually summarize the profit or loss given a change in interest rates, foreign-exchange rates, equity or commodity prices, volatility, or time to maturity or expiry.

MANAGEMENT INFORMATION REPORTING

Management reporting summarizes day-to-day operations, including risk exposure. The financial institution's goal and market profile will be reflected in the reporting format and process at the operational level. These reporting formats should be evaluated for data integrity and clarity. Examiners should determine if reporting is sufficiently comprehensive for sound decision making.

In addition, reports are used to provide management with an overall view of business activity for strategic planning. Overall management

reporting should reflect the organizational structure of the institution and the risk tolerance of senior management. Examiners should expect reports to aggregate data across geographic locations when appropriate and segregate positions by legal entity when appropriate. Examiners may find that periodic reporting is provided to management on market-limit and credit-line utilization. Management uses these to reevaluate the limit structure, relate risks to profitability over a discrete period, evaluate growing businesses, and identify areas of potential profit. Management reporting also should relate risks undertaken to return on capital. In fact, management information systems should allow management to identify and address market, credit, and liquidity risks. See sections 2010.1, 2020.1, and 2030.1 on market, credit, and liquidity risk, respectively.

Management reports will usually be generated by control departments within the institution, independent from front-office influence. When front-office managers have input to reports, the senior managers should be well aware of potential weaknesses in the data provided. Risk reporting should be assessed and performed independently of the front office to ensure objectivity and accuracy and to prevent manipulation or fraud. However, if the back office uses databases and software programs that are independent from those used in the front office, it needs to perform a periodic reconciliation of differences. For financial institutions operating in a less automated environment, report preparation should be evaluated in terms of timeliness and data accuracy. Cross-checking and sign-off by the report preparer and reviewer with appropriate authority should be evident.

Each financial institution will define the acceptable tradeoff between model accuracy and information timeliness. As part of their appraisal of risk management, examiners should review the frequency and accuracy of reporting against the institution's posture in the marketplace, volume of activity, aggregate range of exposures, and capacity to absorb losses.

1. To determine the scope and adequacy of the audit function for management information systems and management reporting.
2. To determine if the policies, practices, procedures, and internal controls regarding management information systems and management reporting are adequate.
3. To ensure that only authorized users are able to gain access to automated systems.
4. To evaluate computer systems, communications networks, and software applications in terms of their ability to support and control the capital-markets and trading activities.
5. To determine that the functions of automated systems and reporting processes are well understood by staff and are fully documented.
6. To determine that software applications pertaining to risk reporting, pricing, and other applications that depend on modeling are fully documented and subject to independent review.
7. To determine that the automated systems and manual processes are designed with sufficient audit trails to evaluate and ensure data integrity.
8. To ensure that reports are fully described in functional specifications and are also included in the policies and procedures of the respective user departments.
9. To determine whether management reporting provides adequate information for strategic planning.
10. To determine that risk-management reporting summarizes the quantifiable and nonquantifiable risks facing the institution.
11. To determine whether financial performance reports are accurate and sufficiently detailed to relate profits to risks assumed.
12. To evaluate summary reports on operations for adequacy.
13. To recommend corrective action when policies, practices, procedures, internal controls, or management information systems are deficient.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Obtain copies of internal and external audit reports for MIS and management reporting. Review findings and management's responses to them and determine whether appropriate corrective action was taken.
2. Obtain a flow chart of reporting and systems flows and review information to identify important risk points. Review policies and procedures for MIS. Review the personal computer policy for the institution, if available.
3. Determine the usage of financial applications on terminals that are not part of the mainframe, minicomputer, or local area network. For instance, traders may use their own written spreadsheet to monitor risk exposure or for reconciliation.
4. Obtain an overview of the system's functional features. Browse the system with the institution's systems administrator. Determine whether passwords are used and access to the automated system is restricted to approved users.
5. Review a list of ongoing or planned management information systems projects. Determine whether the priority of projects is justified given management's strategic goals and recent mix of business activity.
6. From the systems overview, ascertain the range of databases in use. Some system architecture may use independent databases for front office, back office, or credit administration. Determine the types of reconciliations performed, frequency of database reconciliation, and tolerance for variance. The more independent databases are, the more the potential for data error exists.
7. Determine the extent of data-parameter defaults, for example, standard settlement instructions to alleviate manual intervention. Determine the extent of manual intervention for transaction processing, financial analysis, and management reporting.
8. Review the policies and procedures manual for reporting requirements for management.
9. Determine whether the automated and manual process have sufficient audit trails to evaluate and ensure data integrity for the range of functional applications. Determine how control staff validates report content and whether the report content is well understood by the preparer.
10. Determine whether the processing and production of reports is segregated from front-office staff. When the front office has influence, how does management validate summary data and findings?
11. Review the functional applications such as credit administration, trade settlement, accounting, revaluation, and risk monitoring to determine the combination of automation and manual intervention for management reporting. Compare findings with examiners reviewing specific products or business lines.
12. Determine whether the documentation supporting pricing models is adequate. Determine whether ''user instructions'' provide sufficient guidance in model use.
13. Determine whether the range of risk-management reports is adequately documented in terms of inputs (databases, data-feeds external to the organization, economic and market assumptions), computational features, and outputs (report formats, definitions). Evaluate the documentation for thoroughness and comprehensiveness.
14. Determine whether the range of reports (risk management, financial performance and operational controls) provides valid results to evaluate business activity and for strategic planning.

15. Recommend corrective action when policies, practices, procedures, internal controls, or management information systems are deficient.

1. Is the scope of the audit coverage comprehensive? Are audits for management information systems and reporting available? Are findings discussed with management? Has management implemented timely corrective actions for deficiencies?
2. Do policies and procedures address the range of system development and technical maintenance at the institution, including the use of outside vendors and consultants? Does the institution have a comprehensive personal computer policy? If the organization uses PCs, is there a written policy to address access, development, maintenance, and other relevant issues?
3. Do the new product policies and procedures require notification and sign-off by key systems development and management reporting staff?
4. Are there functional specifications for the systems? Are they adequate for the current range of automated systems at the institution? Do they address both automated and manual input and intervention?
5. Does the organization have flow charts or narratives that indicate the data flow from input through reporting? Is this information comprehensive for the level of reporting necessary for the financial institution?
6. Is access to the automated systems adequately protected?
   a. Do access rights, passwords, and logon ID's protect key databases from corruption?
   b. Are ''write or edit'' commands restricted to a limited set of individuals?
   c. Are specific functions assigned to a limited set of individuals? Are access rights reviewed periodically?
   d. Does the system have an audit report for monitoring user access?
   e. Is access logon information stored in records for audit trail support?
7. Is management information provided from mainframe, minicomputers, local area networks (multiuser personal computer networks), or single-user personal computers or a combination of the above?
8. Are third-party vendors provided with adequate lead time to make changes to existing programs? Is sufficient testing performed before system upgrades are implemented?
9. Do planned enhancement or development projects have appropriate priority, given management's stated goals and capital-markets activity?
10. Identify the key databases used for the range of management reports.
    a. Are direct electronic feeds from external services such as Reuters, Telerate, and Bloomberg employed? How are incomplete datafeeds identified? Can market data be overridden by users? How does the institution ensure the data integrity of datafeeds or manually input rates, yields, or prices from market sources?
    b. Are standard instructions set within the automated systems? Can these be overridden? Under what circumstances?
    c. For merging and combining databases, how does the institution ensure accurate output?
    d. What periodic reconciliations are performed to ensure data integrity? Is the reconciliation clerk sufficiently familiar with the information to identify ''contaminated'' data?
11. Does the institution have a model-validation process? Does the organization use consultants for model development and validation? Are these consultants used effectively? Are the yield curve calculations, interpolation methods, discount factors, and other parameters used clearly documented and appropriate to the instruments utilized? Regardless of the source of the model, how does management ensure accurate and consistent results?
12. Does the system design account for the different pricing conventions and accrual methods across the range of products in use at the financial institution? Evaluate the range of system limitations for processing and valuation across the range of products used by the institution. Assess the possible impact on accuracy of management reporting.
13. Is management reporting prepared on a sufficiently independent basis from line management? Is management reporting adequate for the volume and complexity of

capital-markets and trading activities for the types of reports listed below? Are reports complete? Do they have clear formats? Are the data accurate? Are exceptions highlighted? Is appropriate segregation of duties in place for report preparation? Are there reports for the following:

a. Market-risk exposure against limits?
b. Credit-risk exposure against limits?
c. Market-liquidity risk exposure against limits?
d. Funding-liquidity risk exposure against market demand?
e. Transaction volumes and business mix?
f. Profit and loss?
g. Other risk exposures and management information reports?

14. Do reports reflect aggregation of data across geographic locations when appropriate?
15. Do reports segregate positions by legal entity when appropriate?
16. Determine whether the system for measuring and managing risk is sufficiently flexible to stress test the range of portfolios managed by the institution. Does the system provide usable and accurate output? If the institution does not perform automated stress testing, what process is used to minimize quantifiable risks in adverse markets?
17. Are parameter variations used for stress tests or are "what if" analyses clearly identified?
18. Does management reporting relate risks undertaken to return on capital?
19. Do reports provide information on the business units that is adequate for sound strategic planning? Are profitable and unprofitable businesses clearly identified? Does management have adequate information?

The front office is where trading is initiated and the actual trading takes place. It consists of traders, marketing staff, and sometimes other trading-support staff. Front-office personnel execute customer orders, take positions, and manage the institution's market risks. The front office is usually organizationally and functionally separate and distinct from the back-office operation, which is part of the institution's overall operations and control infrastructure.

The back-office function completes the trading transactions executed by the front office. (See section 2060, ''Back-Office Operations.'') It processes contracts, controls various clearing accounts, confirms transactions, and is typically responsible for performing trade revaluations. Additionally, back-office personnel investigate operational problems which may arise as a result of business activities. The back office provides logistical support to the trading room and should be the area where errors are caught and brought to the attention of the traders. While the dealing room and back office must cooperate closely to ensure efficiency and prevent problems, their duties should be segregated to provide an appropriate level of independence and control.

While the overall size, structure, and sophistication of an institution's front office will vary, the general functions and responsibilities described in this section prevail across the majority of financial institutions. The following discussion describes a typical front office, but it is important to consider individual instrument profiles and market-specific characteristics in conjunction with the review of front-office activities.

ROLE AND STRUCTURE OF THE FRONT OFFICE

The trading operation of a financial institution can be categorized by the various roles the front office performs in the marketplace. The front office's responsibilities may include any combination of the following: market maker (dealer), proprietary trader, intermediary, and end-user.

A *market maker* makes two-way markets. When initially contacted, the market maker may not know whether the counterparty wishes to buy or sell a particular product. The market maker quotes two-way prices, reflective of the bid/ask levels in the marketplace. The difference between the bid and the ask is called the spread.

Dealers are not necessarily obliged to make two-way markets. Many market participants are actively involved in facilitating customer transactions even though they are not considered market makers. In some cases, these institutions act similarly to market makers, hedging incremental transactions derived from their customer base. In other cases, the institution may mark transactions up from the bid/ask levels in the marketplace, enter into a transaction with its customer, and fill the order in the marketplace, effectively taking a spread on the transaction. While it may appear as if the dealer is acting as a broker, it should be noted that both the transaction with the customer and the transaction with the marketplace are executed with the financial institution as principal.

A *proprietary trader* takes on risk on the institution's behalf, based on a view of economic and market perceptions and expectations. This type of trader will take a position in the market to profit from price movements and price volatility. Proprietary traders may incur high levels of market risk by managing significant positions which reflect their view of future market conditions. This type of activity requires the highest level of experience and sophistication of all traders in the institution.

Intermediaries communicate *bid* and *ask* levels to potential principals and otherwise arrange transactions. These transactions are entered into on an ''as agent'' basis, and do *not* result in the financial institution acting as a principal to either counterparty involved in the transaction. An intermediary typically charges a fee for its service.

End-users are purchasers or sellers of products for investment or hedging purposes. Sometimes an end-user will be a short-term trader, but its volume will usually be lower than that of a proprietary trader.

An institution may not function in all the above-mentioned roles. Each type of market participant strives to maintain or improve its posture in the market based on its own actual or perceived competitive advantages. The institution may also have a sales force or marketing staff that receives price quotes from the institution's trading staff and represents market opportunities to current and potential clients. Usually,

marketing staff is paid based on volume or on the profit margin for the business developed.

Sound business practices dictate that financial institutions take steps to ascertain the character and financial sophistication of counterparties. These practices include efforts to ensure that the counterparties understand the nature of the transactions into which they are entering. When the counterparties are unsophisticated, either generally or with respect to a particular type of transaction, financial institutions should take additional steps to ensure that they adequately disclose the risks associated with the specific type of transaction. Ultimately, counterparties are responsible for the transactions into which they choose to enter. However, when an institution recommends specific transactions to an unsophisticated counterparty, the institution should ensure that it has adequate information on which to base its recommendation.

Organizational Structure

The organizational structure of the front office is usually a function of the particular roles it performs. In general, the broader the scope of a financial institution's trading activities, the more structured the front-office organization. A market maker of various products can be expected to have numerous trading and sales desks, with each business activity managed independently and overseen by the trading manager. Correspondingly, traders acting exclusively in a proprietary capacity may act relatively independently, reporting only to the trading manager.

TRADE CONSUMMATION

Trading is transacted through a network of communications links among financial institutions and brokers, including telephone lines, telexes, facsimile machines, and other electronic means. The party initiating the transaction contacts one or more dealers, typically over taped telephone lines, to request a ''market,'' that is, a two-sided quote. More than one institution may be contacted to obtain the most favorable rate or execute several trades quickly.

The initiating trader does not normally indicate which side of the market he or she is on. In response, the trader receiving the call considers the current market, the institution's actual and desired positions, and the likely needs of the initiating trader. The trader assesses the current status of the market through information obtained from other financial institutions, brokers, or information services, and uses this information to anticipate the direction of the market. Upon determining the most favorable rate, the initiating trader closes the transaction by signifying a purchase or sale on the quoting trader's terms.

Before closing the transaction, the traders must also ensure that it falls within the institution's counterparty credit lines and authorized trading limits. A trade is usually completed in a matter of seconds and the commitments entered into are considered firm contracts.

Traders at competing institutions may arrange profit-sharing arrangements or provide other forms of kickbacks without attracting the notice of control staff or trading management. To protect against this occurrence, a daily blotter (price/rate sheet) or comparable record or database should be maintained. The blotter or database should be validated against the daily trading range within a narrow tolerance level. Off-market rates should be recorded in a log with appropriate control justification and sign-off.

Time-stamping of trade tickets by the trader or computer system permits comparison between the market rates recorded on the rate sheet and the rates at which trades are transacted. This system not only protects against deliberate transactions at off-market rates, but it is also useful in resolving rate discrepancies in transactions with other financial institutions and customers.

Transaction Flow

Upon execution of the transaction, vital trade information is captured. The form in which details of trade transactions are captured is contingent on the trading systems of the financial institution. When distinct front- and back-office transaction systems are used, trade tickets or initial input forms typically provide the input detail for the back office. These trade tickets are usually handwritten by the trader and hand-delivered to the back office. When straight-through or automated processing systems are used, trade input is typically performed by the front office. Details are input onto a computer screen and verified by the back office before final acceptance. In either case, trade details

should include such basic information as the trade date, time of trade, settlement date, counterparty, instrument, amount, price or rate, and, depending on the instrument, manner and place of settlement.

The trader's own principal record is the trading blotter or position book, which is a chronological record of deals and a running record of the trader's position. The blotter may or may not be automated, depending on the sophistication of the computer systems at the institution.

Transaction Reporting

Traders track market-risk exposures and profit and loss in the ordinary course of business. These calculations, however, should not form the basis for official risk or profit-and-loss reporting. Management information distributed to senior management should be prepared and reviewed independent of the trading function.

TRAINING AND TECHNICAL COMPETENCE

Trading-support functions are technical and require levels of skills and training commensurate with the type of institution and the type and variety of products handled. Back-office personnel should demonstrate a level of competence so that they act as a viable check and balance to the financial institution's front-office staff. Additionally, financial institutions must be able to attract and retain competent personnel, as well as train them effectively. Finally, a sufficient level of staffing is required to ensure the timely and accurate processing, reporting, controlling, and auditing of trading activities.

ETHICS

The potential risk of trading transactions to a financial institution emphasizes the importance of management's ascertaining the character of its potential traders. While there are no guarantees as to how a particular trader may react to seriously adverse market conditions, proper personnel screening, internal controls, and communication of corporate policies should reduce the possibility of trading improprieties.

Additionally, management should establish policies and procedures governing standards for dealing with counterparties. An appropriate level of due diligence should be performed on all counterparties with which the institution deals, even if the transactions do not expose the financial institution to much credit risk (for example, collateralized transactions).

Finally, management should ensure that the marketing practices of its salespersons are ethical. Standards addressing the sales of complex products should be established to ensure that customers are not entering into transactions about which they have no understanding of the potential risks. Management should remain cognizant of the risk to the institution's reputation at all times. Once an institution's reputation is damaged, it can be very difficult to restore. (See section 2150, ''Ethics.'')

UNACCEPTABLE PRACTICES

Certain trading practices are considered unacceptable and require close supervision to control or prevent. In the foreign-exchange market, in which prices will probably change before a dispute or counterparty can be settled, the practice of *brokers' points* has evolved. The use of brokers' points involves one side agreeing to the other's price in a disputed trade, but with the caveat that the discrepancy will be made up in the future. The parties keep an unofficial list of owed or lent monies. The party agreeing to the other's price can then call in the favor at a later date. This practice may be used to hide losses in a trading portfolio until there are sufficient profits to offset them. The practice of brokers' points is considered an unsafe and unsound banking practice, and a financial institution should have a policy forbidding it.

Another unacceptable practice is *adjusted-price trading*. This practice is used to conceal losses in a trading portfolio and involves a collusive agreement with a securities dealer from which the institution previously purchased a security that has now dropped in value. The security is resold to the dealer at the institution's original purchase price, and the institution purchases other securities from the dealer at an inflated price. This practice could also involve ''cross parking,'' whereby the collusive parties are both attempting to conceal trading losses. Adjusted-price trading is further described in the *Municipal Securities Activities Exam Manual.*

Transactions involving *off-market rates* (including foreign-exchange historical-rate rollovers) should be permitted only in limited circumstances with strict management oversight. The use of off-market rates introduces risks above and beyond those normally faced by dealing institutions in day-to-day trading activities. Because off-market rates could be used to shift income from one institution to another or from one reporting period to another, they can serve illegitimate purposes, such as to conceal losses, evade taxes, or defraud a trading institution. All financial institutions should have policies and procedures for dealing with trades conducted at off-market rates.

Customers may give a financial institution the discretionary authority to trade on their behalf. This authority should be documented in a written agreement between the parties that clearly lists the permissible instruments and financial terms, collateral provisions and monitoring, confirmation of trades, reporting to the client, and additional rights of both parties. For institutions that have discretionary authority, examiners should ensure that additional policies and procedures are in place to prevent excessive trading in the client's account (account churning). Close supervision of sales and marketing staff and adequate client reporting and notification are extremely important to ensure that the institution adheres to the signed agreement.

From a management standpoint, inappropriate trading and sales practices can be avoided by establishing proper guidelines and limits, enforcing a reporting system that keeps management informed of all trading activities, and enforcing the segregation of responsibilities. Experience has shown that losses can occur when such guidelines are not respected.

SOUND PRACTICES

Capital-markets and trading operations vary significantly among financial institutions, depending on the size of the trading operation, trading and management expertise, the organizational structure, the sophistication of computer systems, the institution's focus and strategy, historical and expected income, past problems and losses, risks, and the types and sophistication of the trading products and activities. As a result, practices, policies, and procedures expected in one institution may not be necessary in another. Evaluating the adequacy of internal controls requires sound judgment on the part of the examiner. The following is a list of some of the practices examiners should look for.

- Every organization should have comprehensive policies and procedures in place that describe the full range of capital-markets and trading activities performed. These documents, typically organized into manuals, should at a minimum include front- and back-office operations, reconciliation guidelines and frequency, revaluation guidelines, accounting guidelines, descriptions of accounts, broker policies, a code of ethics, and the risk-measurement and management methods, including the limit structure.
- For every institution, existing policies and procedures should ensure the segregation of duties between trading, control, and payment functions.
- The revaluation of positions may be conducted by traders to monitor positions, by controllers to record periodic profit and loss, and by risk managers who seek to estimate risk under various market conditions. The frequency of revaluation should be driven by the level of an institution's trading activity. Trading operations with high levels of activity should perform daily revaluation. Every institution should conduct revaluation for profit and loss at least monthly; the accounting revaluation should apply rates and prices from sources independent of trader input.
- Taping of trader and dealer telephone lines facilitates the resolution of disputes and can be a valuable source of information to auditors, managers, and examiners.
- Trade tickets and blotters (or their electronic equivalents) should be created in a timely and complete manner to allow for easy reconciliation and appropriate position-and-exposure monitoring. The volume and pace of trading may warrant the virtually simultaneous creation of records in some cases.
- Computer hardware and software applications must accommodate the current and projected level of trading activity. Appropriate disaster-recovery plans should be tested regularly.
- Every institution should have a methodology to identify and justify any off-market transactions. Ideally, off-market transactions would be forbidden.
- A clear institutional policy should exist concerning personal trading. If personal trading is

permitted at all, procedures should be established to avoid even the appearance of conflicts of interest.
- Every institution should ensure that management of after-hours and off-premises trading, if permitted at all, is well documented so that transactions are not omitted from the automated blotter or the bank's records.
- Every institution should ensure that staff is both aware of and complies with internal policies governing the trader-broker relationship.
- Every institution that uses brokers should monitor the patterns of broker usage, be alert to possible undue concentrations of business, and review the short list of approved brokers at least annually.
- Every institution that uses brokers should establish a firm policy to minimize name substitutions of brokered transactions. All such transactions should be clearly designated as switches, and relevant credit authorities should be involved.
- Every institution that uses brokers for foreign-exchange transactions should establish a clear statement forbidding lending or borrowing brokers' points as a method to resolve discrepancies.
- Every organization should have explicit compensation policies to resolve disputed trades for all traded products. Under no circumstances should soft-dollar or off-the-books compensation be permitted for dispute resolution.
- Every institution should have ''know-your-customer'' policies, and they should be understood and acknowledged by trading and sales staff.
- The designated compliance officer should perform a review of trading practices annually. In institutions with a high level of activity, interim reviews may be warranted.

1. To review the organization and range of activities of the front office.
2. To determine whether the policies, procedures, and internal systems and controls for the front office are adequate and effective for the range of capital-markets products used by the financial institution.
3. To determine whether the financial institution adequately segregates the duties of personnel engaged in the front office from those involved in the back-office-control function.
4. To ascertain that the front office is complying with policies and established market and counterparty limits.
5. To determine that trade consummation and transaction flow do not expose the financial institution to operational risks.
6. To ensure that management's reporting to front-office managers, traders, and marketing staff is adequate for sound decision making.
7. To evaluate the adequacy of the supervision of trading and marketing personnel.
8. To determine that front-office personnel are technically competent and well trained, and that ethical standards are established and respected.
9. To ascertain the extent, if any, of unacceptable business practices.
10. To determine that traders and salespeople know their customers and engage in activities appropriate for the institution's counterparties.
11. To recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of laws, rulings, or regulations have been noted.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

GENERAL PROCEDURES

1. Obtain the following:
   a. policies and procedures
   b. organization chart
   c. resumes of key trading personnel
   d. systems configuration
   e. management information reports
2. Determine the roles of front office in the marketplace.
3. Ensure that the terms under which brokerage service is to be rendered are clear and that management has the authority to intercede in any disputes that may arise. Additionally, ensure that any exclusive broker relationships in a single market do not result in an overdependence or other vulnerability on the part of the financial institution.

POLICIES AND PROCEDURES

1. Check that procedures clearly indicate under what conditions, if any, market-risk limits may be exceeded and what authorizations must be obtained. (See section 2010, ''Market Risk.'')
2. Check that procedures clearly indicate under what conditions, if any, counterparty risk limits may be exceeded and what approvals must be obtained. If netting agreements exist for any counterparties, determine that transactions are appropriately reflected. (See section 2020, ''Counterparty Credit Risk and Presettlement Risk.'')
3. Ensure that comprehensive policies and procedures covering the introduction of new trading products exist. A full review of the risks involved should be performed by all relevant parties: trading, credit- and market-risk management, audit, accounting, legal, tax, and operations.
4. Determine that policies and procedures adequately address the following:
   a. The financial institution complies with regulatory policy regarding brokers' points.
   b. The financial institution has policies addressing traders' self-dealing in commodities or instruments closely related to those traded within the institution. A written policy requires senior management to grant explicit permission for traders to trade for their personal account, and procedures are established that permit management to monitor these trading activities.
   c. The financial institution does not engage in adjusted-price trading.
   d. The financial institution has adequate policies regarding off-market-rate transactions. All requests for the use of off-market rates are referred to management for policy and credit judgments as well as for guidance on appropriate internal accounting procedures. Specifically, review and assess the financial institution's policies and procedures regarding *historical-rate rollovers*.
   e. Adequate control procedures are in place for trading that is conducted outside of normal business hours—either at the office or at traders' homes. Personnel permitted to engage in such dealing should be clearly identified along with the types of authorized transactions. Additionally, procedures ensure that *off-premises transactions* will not exceed risk limits.
   f. The financial institution has adequate procedures for handling customer stop-loss orders. Documentation related to both the agreed-on arrangements as well as the individual transactions is available for review.

g. The financial institution requires that the appropriate level of due diligence be performed on all counterparties with which the institution enters into transactions, even if the transactions do not expose the financial institution to credit risk (for example, delivery versus payment and collateralized transactions).
h. The marketing practices of the institution's salespersons are ethical. Standards address the sales of complex products to ensure that customers are not entering into transactions about which they have no understanding of the potential risks.

TRAINING AND TECHNICAL COMPETENCE PROCEDURES

1. Evaluate key personnel policies and practices and their effects on the financial institution's capital-markets and trading activities.
   a. Evaluate the experience level of senior personnel.
   b. Determine the extent of internal and external training programs.
   c. Assess the turnover rate of front-office personnel. If the rate has been high, determine the reasons for the turnover and evaluate what effect the turnover has had on the financial institution's trading operations.
   d. Review the financial institution's compensation program for trading activities to determine whether remuneration is based on volume and profitability criteria. If so, determine whether controls are in place to prevent personnel from taking excessive risks to meet the criteria.
   e. Determine the reasons for each trader's termination or resignation.
2. Determine whether the financial institution has a management succession plan.
3. Evaluate the competence of trading and marketing personnel. Determine whether information on the organization, trading strategy, and goals is well disseminated.
4. Determine if management remains informed about pertinent laws, regulations, and accounting rules.

SEGREGATION OF DUTIES PROCEDURES

1. Ensure that all transactions are promptly recorded by the trader after the deal has been completed.
2. Ensure that the financial institution has established satisfactory controls over trade input.
3. Confirm that a separation of duties exists for the revaluation of the portfolio, reconciliation of traders' positions and profits, and the confirmation of trades.

TRANSACTION-CONSUMMATION PROCEDURES

1. Ensure that traders and marketers check that they are within market- and credit-risk limits before the execution of the transaction.

TRANSACTION-FLOW PROCEDURES

1. Ensure that trade tickets or input sheets include all trade details needed to validate transactions.
2. Ensure that transactions are processed in a timely manner. Check that some type of method exists to reconstruct trading history.
3. Ensure that the transaction-discrepancy procedure is adequate and includes independent validation of the back office.

TRANSACTION REPORTING

1. Ensure that management information reports prepared for front-office management provide adequate information for risk monitoring, including financial performance and transaction detail, to ensure sound decision making.

ETHICS PROCEDURES

1. Evaluate the level of due diligence performed on counterparties.
2. Evaluate the code of ethics and staff adherence to it.
3. Evaluate ''know-your-customer'' guidelines and staff adherence.
4. Evaluate the management of trading and marketing staff. Evaluate the seriousness of any ethical lapses.

CORRECTIVE ACTION

1. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of laws, rulings, or regulations have been noted.

POLICIES AND PROCEDURES

1. Do policies and procedures establish market-risk limits, and do the policies and procedures clarify the process for obtaining approvals for excessions?
2. Do policies and procedures establish credit-risk limits, and do the policies and procedures clarify the process for obtaining approvals for excessions?
3. Do policies address the approval process for new products?
4. Is an appropriate level of approval obtained for off-market transactions and for additional credit risk incurred on off-market trades?
5. Does management make sure that senior management is aware of off-market trades and the special risks involved?
6. Does management inquire about a customer's motivation in requesting an off-market-rate trade to ascertain its commercial justification?
7. Do procedures manuals cover all the securities activities that the financial institution conducts, and do they prescribe appropriate internal controls relevant to those functions (such as revaluation procedures, accounting and accrual procedures, settlement procedures, confirmation procedures, accounting and auditing trails, and procedures for establishing the sequential order and time of transactions)?

ROLE OF THE FRONT OFFICE

1. Do policies clarify the responsibilities of traders as to market making, dealing, proprietary, and intermediary roles?
2. Are the financial institution's dealings with brokers prudent?
3. Is the financial institution's customer base diverse? Is the customer base of high credit and ethical quality?

SEGREGATION OF DUTIES

1. Is there adequate segregation of duties between the front and back office?

TRANSACTION CONSUMMATION

1. Do traders ensure that transactions are within market- and credit-risk limits before the execution of the transaction?

TRANSACTION FLOW

1. Do trade tickets or input sheets include all necessary trade details?
2. Does the institution have procedures to ensure the timely processing of all transactions?
3. Does the institution have a method with which to resolve trade discrepancies on transactions, regardless of communication medium used?
4. Do traders include an adequate amount of trade details on blotters, input sheets, and computer screens to enable reconciliation by the front and back office?
5. Do automated systems for input appear adequate for the volumes and range of products transacted by the institution?

TRANSACTION REPORTING

1. Are reports prepared for front-office management to allow the monitoring of market- and credit-risk limits?

TRAINING AND TECHNICAL COMPETENCE

1. Does the financial institution have a management succession plan?
2. Does the financial institution have an appropriate program for cross-training of personnel?
3. Does the financial institution provide for the adequate training of front-office personnel?
4. Are traders technically competent in their existing positions?
5. Does management remain informed about pertinent laws, regulations, and accounting rules?

ETHICS

1. Is an appropriate level of due diligence performed on all counterparties with which

the front office enters into transactions, regardless of collateralization?
2. Is there a code of ethics? Do traders and marketers appear to be familiar with it?
3. Are there ''know-your-customer'' guidelines? Do traders and marketers appear to be familiar with them?
4. Do internal memos detail any ethical lapses? If so, how were they resolved? Does senior management take its guidance role seriously?
5. Are customer relationships monitored by senior management in the front office? How are customer complaints resolved? Are the back office, control staff, and compliance involved in the process? Are overall controls for customer complaints adequate?
6. Were any unacceptable practices noted by internal or external auditors? Has management addressed these actions? From examiner observation, are there any ongoing unacceptable practices? Is management's response to deficiencies adequate?
7. Does the financial institution have discretionary authority over client monies? Are policies and procedures adequate to control excessive trading by sales and marketing staff? Is front-office supervision adequate? Does the back office have additional controls to alert senior control staff and the compliance department of deficiencies? Is discretionary trading activity included in the institution's audit program?

Operational risks managed outside of the dealing room are potentially more costly than those managed inside the dealing room. While the function of dealers in the front office is primarily to transact and manage positions, the processing of transactions, recording of contracts in the accounting system, and reconciliations and procedures required to avoid errors are functions that must take place outside the dealing room. In conducting these functions, the back office provides the necessary checks to prevent unauthorized trading.

Back office, for the purposes of this manual, may represent a single department or multiple units (such as financial control, risk management, accounting, or securities custody), depending on the organizational structure of the financial institution. Some institutions have combined some of the responsibilities usually found in the back office into a middle-office function, which is also independent of dealing activities.

Close cooperation must exist between the dealing room and the back office to prevent costly mistakes. An understanding of each role and function is important. While their priorities are different, both functions work toward the same goal of proper processing, control, and recording of contracts, which is essential to the success of a trading department.

The back office serves several vital functions. It records and confirms trades transacted by the front office and provides the internal control mechanism of segregation of duties. The checks and balances provided by the back-office function help management supervise the trading activities conducted by the front office. A properly functioning back office will help ensure the integrity of the financial institution and minimize operations, settlement, and legal risks.

Segregation of front- and back-office duties minimizes legal violations, such as fraud or embezzlement, or violation of regulations. Operational integrity is maintained through the independent processing of trades, trade confirmations, and settlements. The goal is to avoid potentially costly mistakes such as incorrectly recorded or unrecorded contracts. The back office also is responsible for the reconcilement of positions and broker statements and may monitor broker relationships with the financial institution. The back-office staff provides an independent assessment of price quotes used for the revaluation process that leads to the maintenance of the subsidiary ledgers and the general ledger. Another crucial function of the back office is accepting or releasing securities, commodities, and payments on trades, as well as identifying possible mistakes. Clearly, trading personnel need to be separate from control of receipts, disbursements, and custody functions to minimize the potential for manipulation. Regulatory reports and management accounting may also be the responsibility of the back office.

Management responsibilities performed by the back office vary by institution. The evaluation of transaction exposure against established market, liquidity, or credit limits may be performed by back-office staff or by a separate risk-management function, independent of front-office traders and marketers. Risk-management reporting may also be performed by back-office staff. Legal documentation, while initiated by internal or external counsel, may be followed up (chased) by back-office staff.

The links between front- and back-office operations may range from totally manual to fully computerized systems in which the functions are directly linked. The complexity of linking systems should be related to the volume and complexity of capital-markets and trading activities undertaken. Manual operations are subject to error. However, management should not have a false sense of security with automated systems. Changes in programming codes installed through the maintenance process, new financial structures, and improper use of software may lead to computational and processing errors. Regardless of the operational process in place, the back-office functions should be subject to comprehensive audit.

Operational risk is the risk that deficiencies in information systems or internal controls will result in unexpected loss. Although operational risk is difficult to quantify, it can be evaluated by examining a series of plausible worst-case or what-if scenarios, such as a power loss, doubling of transaction volume, or a mistake found in the pricing software. It can also be assessed through periodic reviews of procedures, data processing systems, contingency plans, and other operating practices. These reviews may help reduce the likelihood of errors and breakdown in controls, improve the control of risk and the effectiveness of the limit system, and prevent

unsound marketing practices and premature adoption of new products or lines of business. Considering the extent that capital-markets activities rely on computerized systems, financial institutions should have plans that take into account potential problems with their normal processing procedures.

Financial institutions should also ensure that trades that are consummated orally are confirmed as soon as possible. Oral transactions conducted via telephone should be recorded and subsequently supported by written or printed documents. Examiners should ensure that the institution monitors the consistency between the terms of transactions as they were orally agreed on and as they were subsequently confirmed.

Examiners should also consider the extent to which financial institutions evaluate and control operating risks through the use of internal audits, stress testing, contingency planning, and other managerial and analytical techniques. Financial institutions should have approved policies that specify documentation requirements for capital-markets activities as well as formal procedures for saving and safeguarding important documents. All policies and procedures should be consistent with legal requirements and internal policies.

INTERNAL CONTROLS

Management is responsible for minimizing the risks inherent in executing financial contracts. Policies and procedures should be established covering organizational structure, segregation of duties, operating and accounting system controls, and comprehensive management reporting. Formal written procedures should be in place for purchases and sales, processing, accounting, clearance, and safekeeping activities relating to financial contracts transactions. In general, these procedures should be designed to ensure that all financial contracts are properly recorded and that senior management is aware of the exposure and gains or losses resulting from these activities. Desirable controls include—

- written documentation indicating the range of permissible products, trading authorities, and permissible counterparties;
- written position limits for each type of contract or risk type established by the board of directors;
- a market-risk-management system to monitor the organization's exposure to market risk, and written procedures for authorizing trades and excesses of those limits;
- a credit-risk-management system to monitor the organization's exposure with customers and broker-dealers;
- separation of duties and supervision to ensure that persons executing transactions are not involved in approving the accounting methodology or entries (Persons executing transactions should not have authority to sign incoming or outgoing confirmations or contracts, reconcile records, clear transactions, or control the disbursement of margin payments.);
- a clearly defined flow of order tickets and confirmations (The flow of order tickets and confirmations should be designed to verify accuracy and enable reconciliations throughout the system and to enable the reconcilement of traders' position reports to those positions maintained by an operating unit.);
- procedures for promptly resolving failures to receive or deliver securities on the date securities are settled;
- procedures for someone other than the person who executed the contract to resolve customer complaints;
- procedures for verifying brokers' reports of margin deposits and contract positions and for reconciling such reports to records; and
- guidelines for the appropriate behavior of dealing and control staff and for the selection and training of competent personnel to follow written policies and guidelines.

TICKET FLOW

Once a transaction has been initiated by the front office, the primary responsibility for processing trades rests with various back-office personnel. Back-office staff process all payments and delivery or receipt of securities, commodities, and written contracts. Additionally, the back office is responsible for verifying the amounts and direction of payments which are made under a range of netting agreements.

After sending the trade tickets to the back office, the traders are removed from the rest of the processing, except to check their daily positions against the records developed separately by the back office and to verify any periodic

reports it prepared. After receipt of the trade ticket from the front office, back-office personnel verify the accuracy of the trade ticket, and any missing information is obtained and recorded. A confirming communication will be sent to the counterparty, who, in turn, will respond with an acceptance communication. The acceptance comunication will either confirm the trade or identify discrepancies for resolution. The trade is then ready to be processed.

Trade processing involves entering the trade agreement on the correct form or into an automated system. When the front office has already performed this function, verification of transaction data should be performed. The copy of the trade agreement to be sent to the counterparty is once more checked against the original ticket, and the trade agreement is transmitted.

Other copies of the trade agreement will be used for all bookkeeping entries and settlement during the life of the agreement. For instance, all contingent liability, general ledger, and subledger entries will be supported by copies of the trade agreement, with the relevant entry highlighted on the copy. Likewise, at maturity of an agreement, payment or receipt orders will be initiated by the relevant trade-agreement copies.

After the trades are recorded on the institution's books, they will be periodically revalued. Over time, trades will mature or be sold, unwound, exercised, or expire as worthless, depending on circumstances and instruments. Subsequently, these transactions will be removed from the books of the institution, and related deferred accounts will pass through the accounting cycle.

Financial institutions active in global markets may permit some traders to transact business after normal business hours. This activity should be well defined in the institution's policies and procedures manual, in which trading instruments should be listed and possible counterparties defined. Supervisory responsibility of after-hours and off-premises trading and the authorities for traders should be delineated.

A policy should be in place for off-market transactions, and the organization should review trading activity to determine if off-market rates are used. Justification for off-market transactions should be registered in a log by the back office. Frequent use of off-market rates may reflect the extension of credit to a counterparty and should be the subject of further examiner inquiry.

Examiners should determine whether systems and processes enable audit and control staff to adequately monitor dealing activity. Time stamping transactions at the time of execution will enable an institution to validate intraday dealing prices and reconstruct trading activity. Moreover, time-stamp sequences of the trade tickets should closely, if not exactly, match the serial order for a particular trader or dealer.

It is appropriate to evaluate whether an institution's automated systems provide adequate support for its dealing and processing functions. Systems that have increased dealing volumes should be examined for downtime, capacity constraints, and error rates for transaction throughput. Further, institutions that deal in complex derivative products should have automated systems commensurate with the analytical and processing tasks required.

TRADE TRANSACTIONS

Confirmations

Whenever trading transactions are agreed upon, a confirmation is sent to the counterparty to the agreement. A confirmation is the record of the terms of a transaction sent out by each party, before the actual settlement of the transaction itself. The confirmation contains the exact details of the transaction and thus serves legal, practical, and antifraud purposes. The confirmation can be generated manually or automatically by an on-line computer trading system.

The back office should initiate, follow up, and control counterparty confirmations. Usually, an incoming confirmation from the counterparty can be compared with a copy of the outgoing confirmation. If an incoming confirmation is not expected or if the transaction is carried out with commercial customers and individuals, it is wise to send confirmations in duplicate and request a return copy signed or authenticated by the other party.

When a financial institution deals in faster-paced markets, such as foreign exchange, or in instruments which have very short settlement periods, trade validation may be performed through taped telephone conversations before the exchange, with corroboration of a written or electronically dispatched confirmation. The use of taped phone conversations can help reduce the number and size of discrepancies and is a

useful complement to (as opposed to a substitute for) the process of sending out and verifying confirmations. At a minimum, institutions should retain the past 90 days of taped phone conversations, but this time frame may need to be expanded depending on the volume and term of instruments traded. It is poor practice to rely solely on telephone verifications because of their ineffectiveness in litigation in some jurisdictions. Additionally, certain jurisdictions only recognize physical confirmations.

An institution dealing in global markets should ensure the adequacy of its confirmations through legal study of the regulations specific to the foreign locales of its counterparties. In all trading markets, the confirmation should provide a final safeguard against dealing errors or fraud.

All confirmations should be sent to the attention of a department at the counterparty institution which is independent of the trading room. Incoming information should be compared in detail with the outgoing confirmation, and any discrepancies should be carefully appraised. If the discrepancy is significant, it should be investigated independently. If the discrepancy is small, a copy of the confirmation may be given to the trader for clarification with the counterparty, since the trader will probably have daily contact with the other party. Most importantly, the department should follow up on all these discrepancies and ensure that new confirmations are obtained for any agreed-on changes in terms.

A strictly controlled confirmation process helps to prevent fraudulent trades. For example, in a fraudulent deal, a trader could enter into a contract, mail out the original of a confirmation, and then destroy all copies. This technique would enable a trader to build up positions without the knowledge of the financial institution's management. If the incoming confirmation is directed to the trader, it could be destroyed as well, and nobody would ever know about the position. The trader, when closing this position, would make up a ticket for the originally destroyed contract and pass it on together with the offsetting contract so that the position is square again. Receipt and verification of the incoming confirmation by an independent department would immediately uncover this type of fraudulent activity. An additional protection is the use of serially numbered manifold forms for confirmations, with an exact accounting of and comprehensive explanation for any forms not used.

Settlement Process

After an outright or contingent purchase or sale has been made, the transaction must be cleared and settled through back-office interaction with the clearing agent. On the date of settlement (value date), payments or instruments are exchanged and general-ledger entries are updated. Depending on the nature of the deal, currency instruments will be received, paid, or both. The process of paying and receiving must be handled carefully because errors can be extremely costly. When all the proper information is recorded, contracts are placed in "dead files."

Settlement is completed when the buyer (or the buyer's agent) has received the securities or products, and the seller has been paid. Brokers may assign these tasks to a separate organization, such as a clearinghouse, but remain responsible to their customers for ensuring that the transactions are handled properly. They are also responsible for maintaining accurate accounting records.

Examiners should review the various methods of settlement for the range of products covered and note any exceptions to commonly accepted practices. Unsettled items should be monitored closely by the institution. The handling of problems is always a delicate matter, especially when the cost is considerable. Anything more than a routine situation should be brought to the attention of the chief dealer and a senior officer in the back office. Further action should be handled by management.

Losses may be incurred if a counterparty fails to make delivery. In some cases, the clearinghouse and broker may be liable for any problems that occur in completing the transaction. Settlement risk should be controlled through the continuous monitoring of movement of the institution's money and securities and by the establishment of counterparty limits by the credit department. A maximum settlement-risk limit should be established for each counterparty.

Foreign Payments

Two control steps are involved when making foreign payments. The first step is internal; each

payment should be carefully checked with the corresponding contract to ensure the accuracy of the amount, date, and delivery instructions. The second is checking with the dealer responsible for the currency involved to ensure that cash-flow figures for the delivery date, excluding nostro balances, agree with the net of all contracts maturing on that day.

If the financial institution uses more than one financial institution abroad for the payment or receipt of a currency, the back office must ensure that the flow of funds does not leave one account in overdraft while another account has excessive balances; this check will avoid unnecessary overdraft charges. The final check of flows of foreign funds is made through the reconciliation of the foreign account. This is always a *retrospective* reconciliation because of the delays in receiving the statement of account. Some extra actions that can help prevent problems abroad or resolve them more quickly are (1) sending details of expected receipts to the counterparty or correspondent with a request to advise if funds are not received, (2) asking the correspondent financial institution to advise immediately if the account is in overdraft or if balances are above a certain level, and (3) establishing a contact person in the correspondent bank to be notified if problems arise.

Delivery versus payment. Many foreign securities and U.S. Treasury securities are settled on a delivery-versus-payment basis, under which counterparties are assured that delivery of a security from the seller to the buyer will be completed if, and only if, the buyer pays the seller.

Reconciliations

The back office should perform timely reconciliations in conformity with the policies and procedures of the institution. The minimum appropriate frequency for reconciliation will be linked to the volume and complexity of the transactions at the financial institution. The individual responsible for performing the reconcilement of accounts should be independent of the person responsible for the input of transaction data.

Reconciliations should determine positions held by the front office, as well as provide an audit trail detailing reclassified accounts for regulatory reporting. Typical reports to be reconciled include trader position sheets to the general ledger, general ledger to regulatory reports, broker statements to the general ledger, and the income statement.

DISCREPANCIES AND DISPUTED TRADES

Any discrepancy in trading transactions must be brought immediately to the attention of the appropriate operations manager. All discrepancies should be entered into a log, which should be reviewed regularly by a senior operations officer. The log should contain the key financial terms of the transaction, indicate the disputed items, and summarize the resolution. The counterparty should receive notice of the final disposition of the trade, and an adequate audit trail of that notice should be on file in the back office. The institution should have clear and documented policies and procedures regarding the resolution of disputed trades with counterparties.

Brokers' Commissions and Fees

Brokers charge a commission or fee for each transaction they perform. The commission should not be included in the price of the transaction, and it should be billed separately by the brokers. Checking the commissions, initiating the payments, and reviewing brokers' statements are other functions of the back office. To ensure the integrity of fees and commissions, brokers' points arrangements and other trader-negotiated solutions to trade disputes should be avoided.

REVALUATION

Revaluation is the process by which financial institutions update or ''mark to market'' the value of their trading-product portfolios. Guidelines for the formal revaluation should be delineated in written policies and procedures. Weak policies and procedures increase the potential for fraud and raise doubt about the integrity of trading profits and a firm's ability to evaluate risk. A common deficiency of revaluation procedures is the improper segregation of duties between traders and control personnel, including a disproportionate dependence on trader

input and the lack of independent verification of pricing parameters. In addition, the use of inconsistent pricing assumptions and methodologies between the trading desk and back office can lead to incorrect financial reporting and evaluations of market risk.

The determination of current market value is both an intraday activity performed by traders to monitor their position as well as a daily activity performed by control staff to determine the impact on earnings. Discrepancies between trader input and independent market rates should be resolved and documented. Procedures should be established for maintaining a discrepancy log containing the reason for the discrepancy and the profit-and-loss impact. Significant discrepancies should be reported to senior management.

Sufficient information regarding the periodic revaluation and resolution of discrepancies should be documented and maintained. In addition, any adjustments to the general ledger due to changes in revaluation estimates should be clearly recorded and reported to management.

The revaluation process is transparent for securities, futures, and other instruments that are traded on organized exchanges. Published prices from exchanges provide an objective check against the price provided by traders, although liquidity considerations make evaluating quoted prices more complex. A secondary comfort level for exchange-traded products is the margin call in which a position is evaluated at the posted end-of-day price. Prices of actively traded over-the-counter (OTC) products available from electronic wire services provide a similar check against trader prices for these products.

However, with less actively traded products, especially exotic OTC-traded derivatives and options, the revaluation process is more complex. The pricing of illiquid instruments has a greater potential for error or abuse because valuation is more subjective. For example, options that are tailored for customer requirements may have no two-way market, yet still must be evaluated at current market value. While various pricing models exist, all depend on critical assumptions and estimates used to calculate the probable price. Errors can arise from incorrect estimates or manipulation of variables and assumptions. One particular vulnerability concerns the observed volatility of options. See section 2010.1, ''Market Risk,'' for a discussion of problems that can arise with measuring volatilities.

The mark-to-market methodology for risk management may be calculated on the same basis as the controller's income-recognition method. Some financial institutions use equivalency formulas that convert gross exposures to standard measures based on the price sensitivity of benchmark securities. In this regard, the revaluation process serves as a starting point for risk assessment of capital-markets products. The assessment of exposures by risk management, however, should never be less conservative than assessment by actual market levels.

ACCOUNTING

The recording of outstanding transactions allows verification of dealer positions, risk control, and recording of profit and loss. Each institution should follow guidelines established by industry practice or the applicable governing bodies, including—

- generally accepted accounting principles (GAAP)
- regulatory accepted principles (RAP)
- Federal Reserve Board policy statements
- Federal Financial Institutions Examination Council statements

For further discussion, see sections 2120.1, ''Accounting,'' and 2130.1, ''Regulatory Reporting.''

MANAGEMENT INFORMATION REPORTS

Management information reports are prepared by the back office and trader-support areas to enable management and trading personnel to assess the trading position, risk positions, profit and loss, operational efficiency, settlement costs, and volume monitoring of the institution. For further discussion, see section 2040.1, ''Management Information Systems.''

DOCUMENTATION AND RECORDKEEPING

Accurate recording of transactions by back-office personnel is crucial to minimizing the risk

of loss from contractual disputes. Poor documentation can lead to unenforceable transactions. Similarly, poor recordkeeping can render audit trails ineffective, and can result in a qualified or adverse opinion by the public accountant, a violation of Federal Reserve Board policy, or loss due to fraud.

An institution should keep confirmations summarizing the specific terms of each trade. Additionally, master agreements should be kept on premises or a copy should be available locally for examiner reference. For further discussion on master agreements, see section 2070.1, ''Legal Risk.''

AUDITS

The scope and frequency of an institution's audit program should be designed to review its internal control procedures and verify that controls are, in fact, being followed. Any weaknesses in internal control procedures should be reported to management, along with recommendations for corrective action.

Audits of capital-markets and trading products provide an indication of the internal control weaknesses of the financial institution. The audit function should have a risk-assessment map of the capital-markets and trading function that identifies important risk points for the institution. For back-office operations, the risk assessment may highlight manual processes, complex automated computations, independent revaluation, key reconciliations, approval processes, and required investigations or staff inquiries. Examiners should review a sample of internal auditors' workpapers and findings to determine their adequacy. The institution's management should review responses to internal audit findings. Appropriate follow-up by auditors should be in evidence to ensure that deficiencies are, in fact, remedied. Assuming that examiners are comfortable with the quality of an internal audit, they should use audit findings from internal and external auditors as a starting point to evaluate the internal controls of the institution.

SOUND PRACTICES FOR BACK-OFFICE OPERATIONS

Capital-markets and trading operations vary significantly among financial institutions, depending on the size of the trading operation, trading and management expertise, organizational structure, sophistication of computer systems, institution's focus and strategy, historical and expected income, past problems and losses, risks, and types and sophistication of the trading products and activities. As a result, practices, policies, and procedures expected in one institution may not be necessary in another. The adequacy of internal controls requires sound judgment on the part of the examiner. The following is a list of sound back-office operations to check for.

- Every organization should have comprehensive policies and procedures in place that describe the full range of capital-markets and trading activities performed. These documents, typically organized into manuals, should at a minimum include front- and back-office operations; reconciliation guidelines and frequency; revaluation guidelines; accounting guidelines; descriptions of accounts; broker policies; a code of ethics; and the risk-measurement and risk-management methods, including the limit structure.
- For every institution, existing policies and procedures should ensure the segregation of duties between trading, control, and payment functions.
- The revaluation of positions may be conducted by traders to monitor positions, by controllers to record periodic profit and loss, and by risk managers who seek to estimate risk under various market conditions. The frequency of revaluation should be driven by the level of an institution's trading activity. Trading operations with high levels of activity should perform daily revaluation. Every institution should conduct revaluation for profit and loss at least monthly; the accounting revaluation should apply rates and prices from sources independent of trader input.
- The organization should have an efficient confirmation-matching process that is fully independent from the dealing function. Documentation should be completed and exchanged as close to completion of a transaction as possible.
- Computer hardware and software applications must have the capacity to accommodate the current and projected level of trading activity. Appropriate disaster-recovery plans should be tested regularly.
- Auditors should review trade integrity and

monitoring on a schedule that conforms with the institution's appropriate operational-risk designation.

- Every institution should have a methodology to identify and justify any off-market transactions.
- A clear institutional policy should exist concerning personal trading. If permitted at all, procedures should be established to avoid even the appearance of conflicts of interest.
- Every institution should ensure that the management of after-hours and off-premises trading, if permitted at all, is well documented so that transactions are not omitted from the automated blotter or the bank's records.
- Every institution should ensure that staff is both aware of and complies with internal policies governing the trader-broker relationship.
- Every institution that uses brokers should monitor the patterns of broker usage, be alert to possible undue concentrations of business, and review the short list of approved brokers at least annually.
- Every institution that uses brokers should establish a firm policy to minimize name substitutions of brokered transactions. All transactions should be clearly designated as switches, and relevant credit authorities should be involved.
- Every institution that uses brokers for foreign-exchange transactions should establish a clear statement forbidding lending or borrowing broker's points as a method to resolve discrepancies.
- Every organization should have explicit compensation policies to resolve disputed trades for all traded products. Under no circumstances should soft-dollar or off-the-books compensation be permitted for dispute resolution.
- Every institution should have "know-your-customer" policies, which should be understood and acknowledged by trading and sales staff.
- In organizations that have customers who trade on margin, procedures for collateral valuation and segregated custody accounts should be established.
- The designated compliance officer should perform a review of trading practices annually. In institutions with a high level of activity, interim reviews may be warranted.

1. To determine whether the policies, procedures, practices, and internal systems and controls for back-office operations are adequate and effective for the range of capital-markets products used by the financial institution.
2. To determine whether trade-processing personnel are operating in conformance with established policies and procedures.
3. To determine whether the financial institution adequately segregates the duties of personnel engaged in the front office from those involved in the back-office control function (operations, revaluation, accounting, risk management, and financial reporting).
4. To evaluate the adequacy of supervision of the trade-processing operation.
5. To evaluate the sophistication and capability of computer systems and software for the operation and control function.
6. To assess the adequacy of confirmation procedures.
7. To assess the adequacy of settlement procedures.
8. To evaluate the adequacy and timeliness of the reconciliation procedures of outstanding trades, positions, and earnings with the front office and the general ledger.
9. To evaluate the process for resolving discrepancies.
10. To evaluate the process for resolving disputed trades with customers and brokers.
11. To determine the reasonableness of brokers' fees and commissions.
12. To evaluate the effectiveness of and controls on the revaluation process.
13. To review the accounting treatment, reporting, and control of deals for adherence to generally accepted accounting principles and the institution's internal chart of accounts and procedures.
14. To review adherence to regulatory reporting instructions.
15. To evaluate the adequacy of management information reporting systems on trading activities.
16. To evaluate the adequacy of documentation and other requirements necessary to accurately record trading activity, such as signed agreements, dealer tickets, and confirmations.
17. To evaluate the adequacy of audits of capital-markets and trading activities.
18. To recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of laws, rulings, or regulations have been noted.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

GENERAL PROCEDURES

1. Obtain copies of all policies and procedures governing back-office operations. Policies and procedures should at a minimum include the following.
   a. the mission statement
   b. organizational structure and responsibilities
   c permissible activities and off-premises dealing rules
   d. limits approved by the board of directors for the full range of activities and risks, including intraday and overnight net open positions, instrument types, contracts, individual traders, settlement, price movement, market liquidity, counterparty, and commodity or product types, if applicable (For more details on limits, see sections 2010.1, 2020.1, and 2030.1, ''Market Risk,'' ''Counterparty Credit and Presettlement Risk,'' and ''Liquidity Risk,'' respectively.)
   e. the limit-monitoring process used by back-office or risk-management staff independent of the front office, and limit-excess-approval procedures
   f. a detailed description of transaction-processing procedures and flow
   g. procedures for confirming trades
   h. procedures for settlement of trades
   i. required reconciliations
   j. an approved list of brokers, counterparties, and an explicit dispute-resolution methodology (that is, brokers' points policy)
   k. the procedure for addressing disputed trades and discrepancies in financial terms
   l. revaluation procedures
   m. accounting procedures, including a chart of accounts and booking policies for internal transactions and transactions with affiliates
   n. guidelines for management information reporting
   o. requirements for documentation and recordkeeping
   p. guidelines for the quality control and storage of taped conversations of dealer transactions
   q. guidelines for brokers' commissions and fees and their appropriate reconciliations
   r. a code of ethics for traders and other personnel with insider information, and ''know-your-customer'' guidelines
   s. personal-trading guidelines and monitoring procedures
   t. a list of authorized signatures
   u. the policy for off-market rates which includes the following:
      - A letter from someone in senior customer management (treasurer or above) should be kept on file explaining (1) that the customer will occasionally request off-market rates, (2) the reasons such requests will be made, and (3) that such requests are consistent with the customer firm's internal policies. This letter should be kept current.
      - The dealer should solicit an explanation from the customer for each request for an off-market-rate deal at the time the request is made.
      - Senior management and appropriate credit officers at the dealer institution should be informed of and approve each transaction and any effective extension of credit.
      - A letter should be sent to senior customer management immediately after each off-market transaction is executed explaining the particulars of the trade

and explicitly stating the implied loan or borrowing amount.

- Normally, existing forward contracts should not be extended for more than three months nor extended more than once; however, any extension of a rollover should itself meet the requirements above.

2. Review the financial institution's policies to determine whether they are adequate and effective. Does top management have clear directives regarding the responsibilities of management personnel in charge of overseeing and controlling risk? See sections 2010.1, 2020.1, 2030.1, and 2070.1, "Market Risk," "Counterparty Credit and Presettlement Risk," "Liquidity Risk," and "Legal Risk," respectively.
3. Conduct interviews with senior and middle management to determine their familiarity with policy directives in day-to-day situations. Develop conclusions as to the adequacy of these policies in defining responsibilities at lower levels of management in addressing the nature of the business and the business risks being undertaken, and in defining specific limitations on all types of transactional risks and operational failures intended to protect the organization from unsustainable losses. Are these policies reviewed periodically to ensure that all risk-bearing businesses of the financial institutions come under directives approved by top management and in light of the financial institution's profit experience? Develop an understanding of the degree of commitment of middle and lower-level management to the institution's policy directives.
   a. Evaluate whether management is informed about pertinent laws, regulations, and accounting conventions. Evaluate whether training of back-office staff is adequate for the institution's volume and business mix.
   b. Evaluate the management-succession plan for back-office and control staff.
   c. Evaluate the impact of staff turnover on back-office operations.
4. Determine the extent to which the financial institution adheres to its established limits, policies, and procedures.
5. Determine the adherence of key personnel to established policies, procedures, and limits.

SEGREGATION OF DUTIES

1. Ensure that the process of executing trades is separate from that of confirming, reconciling, revaluing, or clearing these transactions or controlling the disbursement of funds, securities, or other payments, such as margins, commissions, and fees.
2. Ensure that individuals initiating transactions do not confirm trades, revalue positions, approve or make general-ledger entries, or resolve disputed trades. Additionally, within the back office, segregation must occur between reconciling and confirming positions. Accounting entry and payment receipt and disbursement must also be performed by distinct individuals with separate reporting lines.
3. Determine whether access to trading products, trading records, critical forms, and both the dealing room and processing areas is permitted only in accordance with stated policies and procedures.
4. Determine whether a unit independent of the trading room is responsible for reviewing daily reports to detect excesses of approved trading limits.
5. Review the job descriptions and reporting lines of all trading and supervisory personnel to ensure that they support the segregation of duties outlined in the financial institution's policies. In addition, during the course of the examination, observe the performance of personnel to determine whether certain duties that are supposed to be segregated are truly segregated.

TICKET-FLOW PROCEDURES

1. Confirm that the trading tickets or automated transactions used to record purchases, sales, and trading contracts are well controlled. Sequential ticketing may be appropriate to permit reconstruction of trading history, if required.
2. Verify that trading tickets are verified and time coded by the front-office personnel.
3. If risk management is monitored by the back office, determine that traders are adhering to stated limits. If limit excesses exist, ensure that management approval has been obtained and documented before the occurrence of the limit violation. Determine

whether the institution maintains adequate records of limit violations.

4. Review transactions for any unusual pattern or activity, such as an increase in volume, new trading counterparties, or a pattern of top-price or bottom-price trades relative to the day's trading range or with the same counterparties.
5. Determine whether the institution holds collateral for margin trading. Determine whether adequate procedures are in place to monitor positions against collateral. Ensure that the margin-monitoring process is wholly independent of the front office. Review the adequacy of procedures for verifying reports of margin deposits and contract-position valuations (based on outside pricing sources) submitted by brokers and futures commission merchants. Review procedures for reconciling these reports to the financial institution's records.
6. Review the financial institution's system for ensuring that deals are transacted at market rates.
7. Determine whether the institution can identify off-market rates for the range of instruments transacted. Determine whether appropriate justification for these transactions is on file and acknowledged by senior management.
8. Review the holdover-trade policy and the holdover register's record of trades made but not posted to the ledgers at the end of the day, the identification of such contracts as ''holdover'' items, and their inclusion in trader or trading-office position reports to management.
9. Determine whether all holdover trades are properly recorded and monitored. In addition, review the financial institution's holdover register and evaluate the reasons for any unusually high incidence of held-over deals.
10. Identify transactions undertaken with affiliated counterparties to determine whether such dealings have been transacted at prices comparable to those employed in deals with nonaffiliated counterparties.

CONFIRMATION PROCEDURES

1. Determine whether the confirmation process is controlled by the back-office area. Different types of transactions sometimes have varying legal or regulatory standards for the medium of communication that can be used (such as telex).
2. Review the confirmation process and follow-up procedures. Determine that personnel check all incoming confirmations to internal records and immediately record, investigate, and correct any discrepancies. In addition, determine whether—
   a. outgoing confirmations are sent not later than one business day after the transaction date;
   b. outgoing confirmations contain all relevant contract details, and incoming confirmations are delivered directly to the back office for review;
   c. all discrepancies between an incoming confirmation and the financial institution's own records are recorded in a confirmation-discrepancy register, regardless of disposition, and open items are reviewed regularly and resolved in a timely manner;
   d. discrepancies are directed and reviewed for resolution by an officer independent of the trading function;
   e. all discrepancies requiring corrective action are promptly identified and followed up on; and
   f. any unusual concentrations of discrepancies exist for traders or counterparties.
3. Review confirmation-aging reports to identify trades without confirmations that have been outstanding more than 15 days. (Significantly less than 15 days in some markets may be a cause for concern.)
4. Determine whether the information on confirmations received is verified with the trader's ticket or the contract.
5. Determine whether the institution has an effective confirmation-matching and confirmation-chasing process.

SETTLEMENT PROCEDURES

1. In all instances, particularly those in which the settlement of trades occurs outside an established clearing system, review the financial institution's settlement controls to determine whether they adequately limit settlement risk.
2. Determine whether the financial institution uses standardized settlement instructions.

(Their use can significantly reduce both the incidence and size of differences arising from the mistaken settlement of funds.)
3. Review the nostro accounts to determine if there are old or numerous outstanding items which could indicate settlement errors or poor procedures.
4. Determine if the institution prepares adequate aging schedules and if they are appropriately monitored.
5. Determine whether disbursements and receipts have been recalculated to reflect the net amounts for legally binding netting arrangements.

RECONCILIATION PROCEDURES

1. Obtain copies of reconciliations (for trade, revaluation confirmation, positions) for capital-markets products. Verify that balances reconcile between appropriate subsidiary controls and the general ledger. Review the reconciliation process used by the back office for its adequacy.
   a. Determine the adequacy of the frequency of the reconciliations in light of the trading operation.
   b. Investigate unusual items and any items outstanding for an inordinately long period of time.
   c. Assess the adequacy of the audit trail to ensure that balances and accounts have been properly reconciled.
   d. Determine that reconciliations are maintained for an appropriate period of time before their destruction.
2. Determine that timely reconciliations are prepared in conformity with applicable policies and procedures of the reporting institution and with regulatory accounting principles.
3. Determine that the reconcilement of front-office positions is performed by an individual without initial transaction responsibility. Determine that timely reconciliations are performed given capital-markets and trading activity.

PROCEDURES FOR DISCREPANCIES AND DISPUTED TRADES

1. Assess the process and procedures for the resolution of disputed trades.
2. Confirm that customer complaints are resolved by someone other than the person who executed the contract.
3. Ensure that the institution's policy prohibits the use of brokers' points in the foreign-exchange market and properly controls any brokers' switch transactions that are permitted.
4. Review the trade-investigations log to determine the size and amount of outstanding disputes, the number resolved and not paid, the amount paid out in the most recent period, and the trend of dispute resolutions (the institution's fault versus counterparties' fault).
5. Review the volume of confirmation and settlement discrepancies noted and the corresponding levels of overdraft interest or compensation expenses paid to counterparties to determine—
   a. the adequacy of operations staffing (number and skill level),
   b. the adequacy of current operating policies and procedures, and
   c. the overall standard of internal controls.

BROKERS' COMMISSIONS AND FEES PROCEDURES

1. Evaluate the volume of trading deals transacted through brokers.
2. Review brokerage expenses. Determine that at least monthly brokerage expenses are—
   a. commensurate with the level of trading activity and profits,
   b. spread over a fair number of brokers with no evidence of favoring particular brokers,
   c. reconciled by personnel independent of traders for accuracy and distribution of expenses.
3. Scrutinize transactions for which the broker has not assessed the usual fee.
4. Does the financial institution retain information on and authorizations for all overdraft charges and brokerage bills within the last 12 months and retain all telex tapes or copies and recorded conversation tapes for at least 90 days? (This retention period may need to be considerably longer for some markets.)
5. Review the retention policy for brokers' commission and fee reports.
6. Assess that adequate information is obtained to substantiate compensated contracts, liquidation of contracts, and canceled contracts.

7. Review a sample of brokered transactions and their documentation.

REVALUATION PROCEDURES

1. Determine whether revaluation procedures address the full range of capital-markets and trading instruments at the institution.
2. Determine the frequency of revaluation by product and application (use).
3. Determine the source of market rates and whether the selection process is subject to manipulation or override by traders. Determine if trader override is justified and well documented.
4. Evaluate the methodology of revaluing illiquid or structured products when prices are not readily available. If the institution establishes reserves for these products, review the adequacy of those reserves.
5. Determine whether investment portfolios are adequately monitored on a reasonable frequency.

DOCUMENTATION AND RECORDKEEPING PROCEDURES

1. Determine the adequacy of control on documentation. Review written documentation for the following:
   a. the types of contracts eligible for purchase or sale by the financial institution
   b. individuals eligible to purchase and sell contracts
   c. individuals eligible to sign contracts or confirmations
   d. the names of firms or institutions with whom employees are authorized to conduct business (counterparties)
2. Determine whether the institution has a formal record-retention policy and whether it results in an adequate audit trail for internal and external auditors.

AUDIT PROCEDURES

1. Determine whether the audit program includes a risk assessment of all front- and back-office activities.
2. Determine whether the audits performed are comprehensive and address areas of concern with appropriate frequency.
3. Determine whether audit findings are complete.
4. Determine whether audit findings are relayed to the appropriate level of management and that there is appropriate follow-up and response.
5. Determine whether the audit staff is adequately trained to analyze the range of capital-markets activities at the financial institution.

CORRECTIVE ACTION

1. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of laws, rulings, or regulations have been noted.

POLICIES AND PROCEDURES

The following questions are appropriate for policies and operating procedures for capital-markets and trading activities.

1. Do the policies and procedures have the approval of the board of directors?
2. Do they give sufficiently precise guidance to officers and employees?
3. Do they have clear directives regarding the responsibilities of management personnel in charge of overseeing and controlling risk? (See sections 2010.1, 2020.1, 2030.1, and 2070.1, ''Market Risk,'' ''Counterparty Credit and Presettlement Risk,'' ''Liquidity Risk,'' and ''Legal Risk,'' respectively.
4. Do they appear to be appropriate to management's objectives and the needs of the institution's customers?
5. Do they cover all of the financial institution's back-office operations and adequately describe the objectives of these activities?
6. Are they updated on a timely basis when new products are introduced or when existing products are modified?
7. Do they fully describe all the documentation requirements relating to trading products?
8. Do they establish parameters which prevent conflicts of interest within the financial institution's overall trading operations (that is, do safeguards prevent insider abuses)?
9. Do procedures manuals cover all the securities activities that the financial institution conducts, and do they prescribe appropriate internal controls relevant to those functions (such as revaluation procedures, accounting and accrual procedures, settlement procedures, confirmation procedures, accounting/auditing trails, and procedures for establishing the sequential order and time of transactions)?
10. Do prodedures include a code of ethics? Is there a ''know-your-customer'' guideline at the institution? How does the institution ensure compliance?
11. Are there written procedures to control after-hours trades and trades originating outside the trading room (for example, at the trader's home)? Is there an approved list of all traders authorized to trade off premises?

SEGREGATION OF DUTIES

1. Does the back office have a current organization chart? If so, obtain a copy.
2. Is the organization chart supplemented by position descriptions and summaries of major functions? If so, obtain copies of them.
3. Is there a management-succession plan for back-office and control staff, and is it adequate? Is the experience level of personnel commensurate with the institution's activity? Is the turnover rate high?
4. Compare organizational charts between exams. If the turnover rate has been high, determine the reasons for the turnover and evaluate what effect the turnover has had on the financial institution's trading operations. Determine the reasons for each trader's termination or resignation.
5. Are all employees required to take two consecutive weeks of vacation annually? Is this policy followed?
6. Does the institution perform background checks on employees?
7. Review the financial institution's compensation program for these activities to determine whether remuneration is based on volume and profitability criteria. If so, determine whether controls are in place to prevent personnel from taking excessive risks to meet the criteria.
8. Is there a list of locations where trading activities are carried out, supplemented by a description of the activities at each location and an explanation of each location's responsibilities with regard to risk management and control? If so, obtain copies of the list and arrange for access to the supplemental information.
9. Are dealers and position clerks that report to them excluded from the following functions:
   a. preparing, validating (officially signing), and mailing trading contracts?
   b. recording trading transactions, maintaining position ledgers and maturity files, and preparing daily activity and position reports (except for memorandum records

used to inform dealers of position information)?

c. periodically revaluing positions and determining gains or losses for official accounting records?

d. settling transactions and other paying or receiving functions, such as issuing or receiving, and processing cable or mail transactions, drafts, or bills of exchange?

e. receiving counterparty confirmations and reconciling them to contracts or broker statements, following up on outstanding confirmations, and correcting related errors and similar processing functions?

f. operating and reconciling nostro and other due-to or due-from accounts related to trading activities?

g. preparing, approving, and posting any other accounting entries?

10. Is management informed about pertinent laws, regulations, and accounting conventions? Is training of back-office staff adequate for the institution's volume and business mix?
11. Does management have a strategy for the back office that parallels that for the organization?
12. Is the process of executing trades separate from that of confirming, reconciling, revaluing, or clearing these transactions or from controlling the disbursement of funds, securities, or other payments, such as margins, commissions, or fees?
13. Are front-office functions segregated from those individuals who confirm trades, revalue positions, approve or make general-ledger entries, or resolve disputed trades? Additionally, within the back office, are reconciling and confirming positions segregated? Is accounting entry and payment receipt or disbursement performed by distinct individuals with separate reporting lines?
14. Is access to trading products, trading records, critical forms, and both the dealing room and processing areas permitted only in accordance with stated policies and procedures?
15. Is a unit independent of the trading room responsible for reviewing daily reports to detect excesses of approved trading limits?
16. From observation, are back-office tasks truly segregated from front-office tasks?

TICKET FLOW

1. Are tickets prenumbered? If not, are trading tickets assigned a computer-generated number? Does control over tickets appear reasonable and adequate?
2. Do tickets clearly define the type of product (for example, interest-rate swap, OTC bond option, or gold bullion)?
3. Do tickets contain all other pertinent information to prepare the related contract without recourse to the dealing room?
4. Are trading tickets time and date stamped in the front office? Are dual signatures on the tickets for the trader and back-office personnel?
5. Are there any unusual patterns of activity (for example, an increase in volume, new trading counterparties, a pattern of top-price or bottom-price trades relative to the day's trading range or with the same counterparties)?
6. Are reviews of outstanding contracts performed on a frequency commensurate with trading activity?
7. Are trader positions reviewed and approved by management on a timely basis?
8. Can the institution identify off-market transactions?
9. Does the institution ensure that senior customer management is aware of off-market transactions and the special risks involved? Is appropriate justification for these transactions on file and acknowledged by senior management?
10. Are holdover trades adequately controlled?
11. Are all holdover trades properly recorded and monitored? Can the institution justify the reasons for any unusually high incidence of held-over deals?
12. Does the institution transact trades with affiliated counterparties? Are such dealings transacted at prices comparable to those employed in deals with nonaffiliated counterparties?
13. Does the financial institution have specific policies for margin lending, and are customer requests adequately reviewed and authorized? Does it enforce all margin requirements and sell securities if customers do not meet margin calls?
14. Does the back office monitor collateral against open positions for margin customers? Is the supervision adequate?

15. Are margin requirements on all outstanding contracts for a customer monitored daily? In the case of actively trading customers, are margin requirements checked after cash trades?

CONFIRMATIONS

Review the confirmation process and follow-up procedures.

1. Are all data on incoming and outgoing confirmations compared to file copies of contracts? Verify that confirmations contain the following information:
   a. counterparty
   b. instrument purchased or sold
   c. trade date
   d. value date
   e. maturity or expiry date
   f. financial terms
   g. delivery and payment instructions
   h. definition of any applicable market conventions (for example, the interest-determination methodology)
   i. date of preparation, if different from the transaction date
   j amount traded
   k. reference number
2. Are signatures on confirmations verified?
3. Are outgoing confirmations sent not later than one business day after the transaction date?
4. Do outgoing confirmations contain all relevant contract details? Are incoming confirmations delivered directly to the back office for review?
5. Does the institution adequately monitor discrepancies between an incoming confirmation and the financial institution's own records?
6. Are discrepancies directed to and reviewed for resolution by an officer independent of the trading function?
7. Are all discrepancies requiring corrective action promptly identified and followed up on?
8. Are there any unusual concentrations of discrepancies for traders or counterparties?
9. Has the institution conducted adequate research to determine the standing of legal or regulatory standards for the medium of communication that can be used (for example, telex)?
10. Does the institution have an effective confirmation-matching and confirmation-chasing process?
11. Are there procedures to uncover unusually heavy trading by a single counterparty?

SETTLEMENT PROCESS

1. Do the financial institution's controls adequately limit settlement risk?
2. Are nostro accounts reconciled frequently? Are there old or numerous outstanding items which could indicate settlement errors or poor procedures?
3. How are failed securities trades managed?
   a. Do procedures promptly resolve transactions that are not settled when and as agreed on (''fails'')?
   b. Are stale items valued periodically and, if any potential loss is indicated, is a particular effort made to clear such items or to protect the financial institution from loss by other means?
   c. Are fail accounts periodically reconciled to the general ledger, and are any differences followed up to a conclusion?
4. Is the back office routinely able to reconcile its cash accounts against securities accepted or delivered?
5. Is physical security of trading products adequate?
6. To ensure segregation of duties, are personnel responsible for releasing funds specifically excluded from any confirmation responsibilities?
7. Does the institution prepare adequate aging schedules? Are they monitored?
8. Are netting arrangements correctly reflected in disbursements and receipts?

RECONCILIATIONS

Obtain copies of reconciliations (for trade, revaluation confirmation, and positions) for traded products. Verify that balances reconcile to appropriate subsidiary controls and the general ledger. Review the reconciliation process followed by the back office for adequacy.

1. Are timely reconciliations prepared in conformity with applicable policies and proce-

dures of the reporting institution and regulatory accounting principles?
2. Are unusual items investigated? Are there any outstandings?
3. Is the audit trail adequate to ensure that balances and accounts have been properly reconciled?
4. Are reconciliations held on file for an appropriate period of time?
5. Is the reconcilement of front-office positions performed by an individual without initial transaction responsibility?

DISCREPANCIES AND DISPUTED TRADES

1. Is the resolution of disputed trades and determination of compensation for the early unwinding of contractual obligations of the financial institution controlled by the back office?
2. Are the processes and procedures for the resolution of disputed trades effective?
3. Are customer complaints resolved by someone other than the person who executed the contract?
4. Does the institution's policy prohibit the use of brokers' points in the foreign-exchange market and control any brokers' switch transactions?
5. Is the volume of confirmation and settlement discrepancies excessive?

BROKERS' COMMISSIONS AND FEES PROCEDURES

1. Evaluate the volume of trading deals transacted through brokers. Are commissions and fees—
   a. commensurate with the level of trading activity and profits?
   b. spread over a fair number of brokers? Is there evidence of favoring a particular or group of brokers?
   c. reconciled by personnel independent of traders to determine accuracy and distribution of expenses?
2. Are regular statements received from these brokers?
3. Are incoming brokers' statements sent directly to the accounting or operations department and not to trading personnel?
4. Are brokers' statements reconciled by the back office with the financial institution's records before the payment of commissions?
5. Does the back office routinely report any significant questions or problems in dealing with brokers? Are discrepancies on brokers' statements directed to someone outside the trading function for resolution?
6. Can the institution justify cases in which the broker has not assessed the usual fee?
7. Is an adequate audit trail established for all overdraft charges and brokerage bills within the last 12 months? Does the process require retention of all telex tapes or copies and recorded conversation tapes for at least 90 days? (This retention period may need to be considerably longer for some markets.)

REVALUATION

1. Do the revaluation procedures address the full range of capital-markets and trading instruments at the institution?
2. Is the frequency of revaluation by product and application (use) adequate?
3. Are the source of market rates and the selection process subject to manipulation or override by traders? Is trader override justified and well documented?
4. Are revaluation results discussed with the trading management? Is an approval process in place to ensure agreement of positions and profit and loss by back- and front-office staff?

ACCOUNTING

See section 2120.1, "Accounting."

MANAGEMENT INFORMATION REPORTING

See section 2040.1, "Management Information Systems."

DOCUMENTATION AND RECORDKEEPING

1. Is written documentation complete, approved at the appropriate level (with authorized signatures), and enforceable?

2. Are there procedures in place to ensure compliance with the Financial Recordkeeping and Reporting Act of 1978?

AUDIT

1. Does the audit program include a risk assessment of all the front- and back-office activities?
2. Are the audits performed comprehensive, and do they address areas of concern with appropriate frequency? Is the scope adequate and clearly stated?
3. Do audit findings summarize all important areas of concern noted in the workpapers?
4. Are audit findings relayed to the appropriate level of management? Is appropriate follow-up and response elicited?
5. Is the audit staff adequately trained to analyze the range of capital-markets activities at the financial institution?
6. Is there the opportunity for undue influence to be imposed on audit staff? Is audit staff sufficiently independent of control and front-office functions?

An institution's trading and capital-markets activities can lead to significant legal risks. Failure to correctly document transactions can result in legal disputes with counterparties over the terms of the agreement. Even if adequately documented, agreements may prove to be unenforceable if the counterparty does not have the authority to enter into the transaction or if the terms of the agreement are not in accordance with applicable law. Alternatively, the agreement may be challenged on the grounds that the transaction is not suitable for the counterparty, given its level of financial sophistication, financial condition, or investment objectives, or on the grounds that the risks of the transaction were not accurately and completely disclosed to the investor.

As part of sound risk management, institutions should take steps to guard themselves against legal risk. Active involvement of the institution's legal counsel is an important element in ensuring that the institution has adequately considered and addressed legal risk. An institution's policies and procedures should include appropriate review by in-house or outside counsel as an integral part of the institution's trading and capital-markets activities, including new-product development, credit approval, and documentation of transactions. While some issues, such as the legality of a type of transaction, may be addressed on a jurisdiction-wide basis, other issues, such as the enforceability of multibranch netting agreements covering several jurisdictions, may require review of individual contracts.

An institution should have established procedures to ensure adequate legal review. For example, review by legal counsel may be required as part of the product-development or credit-approval process. Legal review is also necessary for an institution to establish the types of agreements to be used in documenting transactions, including any modifications to standardized agreements that the institution considers appropriate. The institution should also ensure that prior legal opinions are reviewed periodically to determine if they are still valid.

DOCUMENTATION

If the terms of a transaction are not adequately documented, there is a risk that the transaction will prove unenforceable. Many trading activities, such as securities trading, commonly take place without a signed agreement, as each individual transaction generally settles within a very short time after the trade. The trade confirmations generally provide sufficient documentation for these transactions, which settle in accordance with market conventions. Other trading activities involving longer-term, more complex transactions may necessitate more comprehensive and detailed documentation. Such documentation ensures that the institution and its counterparty agree on the terms applicable to the transaction. In addition, documentation satisfies other legal requirements, such as the ''statutes of frauds'' that may apply in many jurisdictions. Statutes of frauds generally require signed, written agreements for certain classes of contracts, such as agreements with a duration of more than one year (including both longer-term transactions such as swaps and master or netting agreements for transactions of any duration). Some states, such as New York, have provided limited exceptions from their statutes of frauds for certain financial contracts when other supporting evidence, such as confirmations or tape recordings, is available.

In the over-the-counter (OTC) derivatives markets, the prevailing practice has been for institutions to enter into master agreements with each counterparty. Master agreements are also becoming common for other types of transactions, such as repurchase agreements. Each master agreement identifies the type of products and specific legal entities or branches of the institution and counterparty that it will cover. Entering into a master agreement may help to clarify that each subsequent transaction with the counterparty will be made subject to uniform terms and conditions. In addition, a master agreement that includes netting provisions may reduce the institution's overall credit exposure to the counterparty.

An institution should specify its documentation requirements for transactions and its procedures for ensuring that documentation is consistent with orally agreed-on terms. Transactions entered into orally, with documents to follow, should be confirmed as soon as possible. Documentation policies should address the terms that will be covered by confirmations for specific types of transactions and what transactions are

covered by a master agreement; policies should specify when additional documentation beyond the confirmation is necessary. When master agreements are used, policies should cover the permissible types of master agreements. Appropriate controls should be in place to ensure that the confirmations and agreements used satisfy the institution's policies. Additional issues related to the enforceability of the netting provisions of master agreements are discussed below in "Enforceability Issues."

Trigger Events

Special attention should be given to the definition of "trigger events," which provide for payment from one counterparty to another or permit a counterparty to close out a transaction or series of transactions. In the ordinary course of events, contractual disputes can be resolved by parties who wish to continue to enter into transactions with one another, but these disputes can become intractable if serious market disruptions occur. Indeed, the 1998 Russian market crisis raised calls for the establishment of an international dispute-resolution tribunal to handle the large volume of disputed transactions when the Russian government announced its debt moratorium and restructuring.

Trigger events need to be clearly and precisely defined. In the Russian crisis, the trigger events in some master agreements did not include a rescheduling of or moratorium on the payment of sovereign debt. Even when sovereign debt is covered by the master agreement, it may be appropriate to specify that not only debt directly issued by the sovereign, but also debt issued through governmental departments and agencies or through other capital-raising vehicles, falls within the scope of the trigger event. Moreover, when a trigger event has occurred, but the contract expires before the expiration of a cure period or before the completion of a debt restructuring, the nondefaulting party can lose the protection of the contract absent clear provisions to the contrary.

The occurrence of trigger events also may give rise to disputes regarding the appropriate settlement rate at which to close out contracts. It may be difficult to argue in favor of substitute settlement rates that were not referenced as a pricing source in the original documentation. However, original pricing sources may not be available or may be artificially maintained at nonmarket rates by a government seeking to preserve its currency.

Contracts also should be clear as to whether cross-default provisions allow or require the close-out of other contracts between the parties. Finally, close-out provisions should be reviewed to determine what conditions need to be met before the contract can be finally closed out. Formalities in some contracts may delay the close-out period significantly, further injuring a nondefaulting counterparty.

Netting

To reduce settlement, credit, and liquidity risks, institutions increasingly use netting agreements or master agreements that include netting provisions. "Netting" is the process of combining the payment or contractual obligations of two or more parties into a single net payment or obligation. Institutions may have bilateral netting agreements covering the daily settlement of payments such as those related to check-clearing or foreign-exchange transactions. Bilateral master agreements with netting provisions may cover OTC derivatives or other types of transactions, such as repurchase agreements.

The Commodity Futures Trading Commission (CFTC) has exempted a broad range of OTC derivatives from the Commodity Exchange Act, eliminating the risk that instruments meeting certain conditions would be found to be illegal off-exchange futures under U.S. law. The exemption nevertheless limits the use of multilateral netting and similar arrangements for reducing credit and settlement risk, and reserves the CFTC's enforcement authority with respect to fraud and market manipulation.[1]

The CFTC's exemption provides significant comfort with respect to the legality of most OTC derivative instruments within the United States. The risk that a transaction will be unenforceable because it is illegal may be higher in other jurisdictions, however. Jurisdictions outside the United States also may have licensing or other requirements that must be met before certain OTC derivatives or other trading activities can be legally conducted.

1. See 17 CFR 35. Instruments covered by the CFTC's exemption are also excluded from the coverage of state bucket-shop and gambling laws.

Master Agreements

Master agreements generally provide for routine transaction and payment netting and for close-out netting in the event of a default. Under the transaction- and payment-netting provisions of such an agreement, all payments for the same date in the same currency for all covered transactions are netted, resulting in one payment in each currency for any date on which payments are made under the agreement. Close-out netting provisions, on the other hand, generally are triggered by certain default events, such as a failure to make payments or insolvency. Such events may give the nondefaulting party the right to require early termination and close-out of the agreement. Under close-out netting, the positive and negative current replacement values for each transaction under the agreement are netted for the nondefaulting counterparty to obtain a single sum, either positive or negative. If the sum of the netting is positive (that is, the transactions under the agreement, taken as a whole, have a positive value to the nondefaulting counterparty), then the defaulting counterparty owes that sum to the nondefaulting counterparty.

The results may differ if the net is negative, that is, the contracts have a positive value to the defaulting counterparty. Some master agreements include so-called walk-away clauses, under which a nondefaulting counterparty is not required to pay the defaulting counterparty for the positive value of the netting to the defaulting counterparty. The current trend, however, has been to require payments of any positive net value to either party, regardless of whether the party defaulted. Revisions to the Basel Capital Accord have reinforced this trend by not recognizing netting agreements that include a walk-away clause, as discussed more fully below.

Enforceability Issues

The effectiveness of netting in reducing risk depends on both the adequacy and enforceability of the legal arrangements in place. The unenforceability of a netting agreement may expose an institution to significant losses if it relies on the netting agreement to manage its credit risk or for capital purposes.

A major concern for market participants has been the enforceability in bankruptcy of the close-out netting provisions of master agreements covering multiple derivative transactions. When a bank has undertaken a number of contracts with a particular counterparty that are subject to a master agreement, the bank runs the risk that, in the event of the counterparty's failure, the receiver for the counterparty will refuse to recognize the validity of the netting provisions. In such an event, the receiver could ''cherry pick,'' that is, repudiate individual contracts under which the counterparty was obligated to pay the bank while demanding payment on those contracts on which the bank was obligated to pay the counterparty. The Financial Institutions Reform, Recovery, and Enforcement Act of 1990 (FIRREA) and amendments to the Bankruptcy Code, as well as the payment system risk-reduction provisions of the Federal Deposit Insurance Corporation Improvement Act (FDICIA), have significantly reduced this risk for financial institutions in the United States.[2] The enforceability of close-out netting remains a significant risk in dealing with non-U.S. counterparties that are chartered or located in jurisdictions where the legal status of netting agreements may be less well settled. Significant issues concerning enforcement and collection under netting agreements also arise when the counterparty is an uninsured branch of a foreign bank chartered in a state, such as New York, that has adopted a ''ring-fencing'' statute providing for the separate liquidation of such branches.

In evaluating the enforceability of a netting contract, an institution needs to consider a number of factors. First, the institution needs to determine the legal entity that is its counterparty. For example, if the bank is engaging in transactions with a U.S. branch of a foreign bank, the relevant legal entity generally would be the foreign bank itself. Some master agreements, however, are designed to permit netting of transactions with multiple legal entities. A further consideration is the geographic coverage of the agreement. In some instances, bank counterparties have structured their netting agreements to cover transactions entered into between multiple branches of the counterparties in a variety of countries, thereby potentially subjecting the agreements to a variety of legal regimes. Finally, the range of transactions to be covered in a single agreement is an important consider-

2. Risks related to netting enforceability have not been completely eliminated in the United States. Validation of netting under FDICIA is limited to netting among entities that may be considered to be ''financial institutions.''

ation. While there is an incentive to cover a broad range of contracts to achieve a greater reduction of credit risk, overinclusion may be counterproductive if contracts that could jeopardize the enforceability of the entire agreement are included. Some institutions deal with this risk by having separate agreements for particular products, such as currency contracts, or separate master agreements covered by an overall "master master agreement."

Regardless of the scope of a master agreement, clarity is an important factor in ensuring the enforceability of netting provisions. The agreement should clearly specify the types of deals to be netted, mechanisms for valuation and netting, locations covered, and the office through which netting will be done.

Reliance on Netting Agreements

While netting agreements have the potential to substantially reduce credit risk to a counterparty, an institution should not rely on a netting agreement for credit-risk-management purposes unless it has adequate assurances that the agreement would be legally enforceable in the event of a legal challenge. Further, netting will be recognized for capital purposes only if the bank has satisfied the requirements set forth in the Basel Capital Accord (the accord). To meet these requirements, the netting contract or agreement with a counterparty must create a single legal obligation, covering all transactions to be netted, such that the bank would have either a claim to receive or an obligation to pay only the net amount of the individual transactions if a counterparty fails to perform because of default, bankruptcy, liquidation, or other similar circumstances.[3] Netting contracts that include a walkaway clause are not recognized for capital purposes under the accord.

To demonstrate that a netting contract meets the requirements of the accord, the bank must obtain written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find the bank's exposure to be the net amount under—

- the law of the jurisdiction in which the counterparty is chartered and, if a foreign branch of a counterparty is involved, then also under the law of the jurisdiction in which the branch is located;
- the law that governs the individual transactions; and
- the law that governs any contract or agreement necessary to effect the netting.[4]

Under the accord, the bank also must have procedures in place to ensure that the legal characteristics of netting arrangements are regularly reviewed in light of possible changes in relevant law. To help determine whether to rely on a netting arrangement, many institutions have procedures for internally assessing or "scoring" legal opinions from relevant jurisdictions. These legal opinions may be prepared by outside or in-house counsel. A generic industry or standardized legal opinion may be used to support reliance on a netting agreement for a particular jurisdiction. The institution should have procedures for review of the terms of individual netting agreements, however, to ensure that the agreement does not raise issues, such as enforceability of the underlying transactions, choice of law, and severability, that are not covered by the general opinion.

Institutions also rely on netting arrangements in managing credit risk to counterparties. Institutions may rely on a netting agreement for internal risk-management purposes only if they have obtained adequate assurances on the legal enforceability of the agreement in the event of a legal challenge. Such assurances generally would be obtained by acquiring legal opinions that meet the requirements of the accord.

Multibranch Agreements

A multibranch master netting agreement covers transactions entered into between multiple branches of an institution or its counterparty that are located in a variety of countries. These agreements may cover branches of the institu-

3. The agreement may cover transactions excluded from the risk-based capital calculations, such as exchange-rate contracts with an original maturity of 14 calendar days or less or instruments traded on exchanges requiring daily margin. The institution may consistently choose either to include or exclude the mark-to-market values of such transactions when determining net exposure.

4. A netting contract generally must be found to be enforceable in all of the relevant jurisdictions in order for an institution to rely on netting under the contract for capital purposes. For those jurisdictions in which the enforceability of netting may be in doubt, however, an institution may be able, in appropriate circumstances, to rely on opinions that the choice of governing law made by the counterparties to the agreement will be respected.

tion or counterparty located in jurisdictions where multibranch netting is not enforceable, creating the risk that including these branches may render the entire netting agreement unenforceable for all transactions. To rely on a netting agreement for transactions in any jurisdiction, an institution must obtain legal opinions that conclude (1) that transactions with branches in user-unfriendly jurisdictions are severable and (2) that the multibranch master agreement would be enforceable, despite the inclusion of these branches.

Currently, the risk-based capital rules do not specify how the net exposure should be calculated when a branch in a netting-unfriendly jurisdiction is included in a multibranch master netting agreement. In the meantime, institutions are using different practices, which are under review with the goal of providing additional guidance. Some institutions include the amount owed by branches of the counterparty in netting-unfriendly jurisdictions when calculating the global net exposure. Others completely sever these amounts from calculations, as if transactions with these branches were not subject to the netting agreement. With respect to transaction with branches in netting-unfriendly jurisdictions, some institutions add on the amounts they owe in such jurisdictions (which are liabilities) to account for the risk of double payment,[5] while other institutions add on the amounts owed to them in such jurisdictions (which are assets). The approach an institution uses should reflect the specifics of the legal opinions it receives concerning the severability of transactions in netting-unfriendly jurisdictions.

Collateral Agreements

Financial institutions are increasingly using collateral agreements in connection with OTC derivatives transactions to limit their exposure to the credit risk of a counterparty. Depending on the counterparties' relative credit strength, requirements for posting collateral may be mutual or imposed on only one of the counterparties. Under most agreements, posting of collateral is not required until the level of exposure has reached a certain threshold.

While collateral may be a useful tool for reducing credit exposure, a financial institution should not rely on collateral to manage its credit risk to a counterparty and for risk-based capital purposes, unless it has adequate assurances that its claim on the collateral will be legally enforceable in the event the counterparty defaults, particularly for collateral provided by a foreign counterparty or held by an intermediary outside of the United States. To rely on collateral arrangements where such cross-border issues arise, a financial institution generally should obtain written and reasoned legal opinions that (1) the collateral arrangement is enforceable in all relevant jurisdictions, including the jurisdiction in which the collateral is located, and (2) the collateral will be available to cover all transactions covered by the netting agreement in the event of the counterparty's default.

Operational Issues

The effectiveness of netting in reducing risks also depends on how the arrangements are implemented. The institution should have procedures to ensure that the operational implementation of a netting agreement is consistent with its provisions.

Netting agreements also may require that some of a financial institution's systems be adapted. For example, the interface between the front-office systems and back-office payment and receipt functions needs to be coordinated to allow trading activity to take place on a gross basis while the ultimate processing of payments and receipts by the back-office is on a net basis. In particular, an internal netting facility needs to—

- segregate deals to be netted,
- compute the net amounts due to each party,
- generate trade confirmations on the trade date for each trade,
- generate netted confirmations shortly after the agreed-on netting cut-off time,
- generate net payment and receipt messages,
- generate appropriate nostro and accounting entries, and
- provide for the cancellation of any gross payment or receipt messages in connection with the netted trades.

5. The risk of double payment is the risk that the institution must make one payment to a counterparty's main receiver under a multibranch master agreement and a second payment to the receiver of the counterparty's branch in the netting-unfriendly jurisdiction for transactions entered into in that jurisdiction.

Nondeliverable Forwards

An area of growing concern for legal practitioners has been the documentation of nondeliverable forward (NDF) foreign-exchange transactions. The NDF market is a small portion of the foreign-exchange market, but is a large part of the market for emerging-country currencies. An NDF contract uses an indexed value to represent the value of a currency that cannot be delivered due to exchange restrictions or the lack of systems to properly account for the receipt of the currency. NDF contracts are settled net in the settlement currency, which is a hard currency such as U.S. dollars or British pounds sterling.

An NDF contract must be explicitly identified as such—foreign-exchange contracts are presumed to be deliverable. The index should be clearly defined, especially for countries in which dual exchange rates exist, that is, the official government rate versus the unofficial ''street'' rate.

NDF contracts often provide for cancellation if certain disruption events specified in the master agreement occur. Disruption events can include sovereign events (the nationalization of key industries or defaults on government obligations), new exchange controls, the inability to obtain valid price quotes with which to determine the indexed value of the contract, or a benchmark-obligation default. Under a benchmark-obligation default, a particular issue is selected and, if that issue defaults during the term of the contract, the contract is cancelled. Cancellation events should be specifically described in order to minimize disputes about whether an event has occurred. In addition, overly broad disruption events could cause the cancellation of a contract that both counterparties wish to execute.

The International Swaps and Derivatives Association (ISDA) has established an NDF project to develop standard documentation for these transactions. The ISDA documentation establishes definitions that are unique to NDF transactions and provides sample confirmations that can be adapted to reflect disruption events.

LEGAL ISSUES

Capacity

If a counterparty does not have the legal authority to enter into a transaction, the institution runs the risk that a legal challenge could result in a court finding that the contract is ultra vires and therefore unenforceable. Significant losses in OTC derivatives markets resulted from a finding that swap agreements with municipal authorities in the United Kingdom were ultra vires. Issues concerning the authority of municipal and other government units to enter into derivatives contracts have been raised in some U.S. jurisdictions, as well. Other types of entities, such as pension plans and insurance companies, may need specific regulatory approval to engage in derivatives transactions.

A contract may be unenforceable in some circumstances if the person entering into the contract on behalf of the counterparty is not authorized to do so. Many entities, including corporations, have placed more extensive restrictions on the authority of the corporation or its employees to enter into certain types of derivatives and securities transactions.

To address issues related to counterparty authority, an institution's procedures should provide for an analysis, under the law of the counterparty's jurisdiction, of the counterparty's power to enter into and the authority of a trading representative of the counterparty to bind the counterparty to particular transactions. It also is common to look at whether boards of directors or trustees are authorized to enter into specific types of transactions. Depending on the procedures of the particular institution, issues relating to counterparty capacity may be addressed in the context of the initial credit-approval process or through a more general review of classes of counterparties.

Suitability

A counterparty on the losing end of a derivatives transaction may claim that a banking organization recommended or structured an unsuitable transaction, given the counterparty's level of financial sophistication, financial condition, or investment objectives, or it may claim that the transaction and its risks were inaccurately or incompletely disclosed. Banking organizations that recommend or structure derivatives transactions for clients, especially transactions containing nonstandard terms, should make reasonable efforts to know their counterparties in order to avoid such claims. Moreover, banking organizations should fully explain to counterparty personnel with the requisite knowledge and expe-

rience to evaluate a transaction what the structure and risks of any derivatives transaction are.

Banking organizations should also understand their counterparties' business purpose for entering into derivatives transactions with the institution. Understanding the underlying business rationale for the transaction allows the institution to evaluate the credit, legal, and reputational risks that may arise if the counterparty has entered into the transaction to evade taxes, hide losses, or circumvent legal or regulatory restrictions.

New-Product Approval

Legal counsel, either in-house or outside, should be involved in the new-product approval process. New-product reviews should include products being offered for the first time in a new jurisdiction or to a new category of counterparties (for example, a product traditionally marketed to institutional customers being made available to retail customers) and existing products that have been significantly modified. The definition of a new product should be consistent with the size, complexity, and sophistication of the institution. Small changes in the payment formulas or other terms of products can greatly alter their risk profiles and justify designation as a new product.

The authority of the bank to enter into the new or modified transaction or market the new product in all relevant jurisdictions should be established, and any limitations on that authority fully reviewed. Legal review is also necessary for an institution to establish the types of agreements to be used in documenting the transaction, including any modifications to standardized documentation. The institution should ensure that prior legal opinions and standard agreements are reviewed periodically and that they reflect changes in law or the manner in which transactions are structured.

1. To determine if the institution's internal policies and procedures adequately identify potential legal risks and ensure appropriate legal review of documentation, counterparties, and products.
2. To determine whether appropriate documentation requirements have been established and that procedures are in place to ensure that transactions are documented promptly.
3. To determine whether adequate assurances of legal enforceability have been obtained for netting agreements or collateral arrangements relied on for risk-based capital purposes or credit-risk management.
4. To determine whether the operational areas of the bank are effectively implementing the provisions of netting agreements.
5. To determine whether the unique risks of nondeliverable forward (NDF) contracts have been considered and reflected in the institution's policies and procedures, if appropriate.
6. To determine whether the institution's internal policies and procedures adequately address the need to review the suitability of transactions for a counterparty.
7. To determine whether the institution's internal policies and procedures adequately address the approval of new products, including a requirement for appropriate reviews by legal counsel.

Examiners should use the following guidelines to assist in their review of the institution's trading activities with respect to legal risk. This should not be considered to be a complete checklist of subjects to be examined.

1. Obtain copies of policies and procedures that outline appropriate legal review for new products.
   a. Does the institution require legal review of new products, including significant revisions or modifications to existing products, as part of the product-review process?
   b. Do the procedures provide for review of existing products offered in new jurisdictions or to new classes of counterparties?
2. Obtain copies of policies and procedures that outline review requirements for new counterparties.
   a. Does the institution require review of new counterparties to ensure that the counterparty has adequate authority to enter into proposed transactions?
   b. Do the institution's procedures include an assessment of the suitability of any transactions recommended to or structured by the institution for the counterparty?
   c. Do the institution's procedures ensure further review of counterparty authority if new types of transactions are entered into?
3. Obtain copies of policies and procedures that establish documentation requirements.
   a. Has the institution established documentation requirements for all types of transactions in the trading area?
   b. When are master agreements required for over-the-counter (OTC) derivative or other transactions with a counterparty?
   c. Does the institution require legal review for new agreement forms, including netting agreements and master agreements with netting provisions?
   d. Who has authority to approve the use of new agreement forms, including new master agreement forms or agreement terms?
   e. How does the institution ensure that documents are executed in a timely manner for new counterparties and new products?
   f. Does the institution have an adequate document-management system to track completed and pending documentation? How does the institution follow up on outstanding documentation?
   g. What controls does the institution have in place pending execution of required documentation, for example, legal-approval requirements? (Documentation has not been executed until it has been signed by appropriate personnel of both parties to the transaction.)
   h. In practice, is required documentation executed in a timely manner?
   i. Who has the authority to approve exceptions to existing documentation requirements?
   j. Do the procedures ensure that documentation is reviewed for consistency with the institution's policies?
   k. Who reviews documentation?
   l. Does the institution specify the terms to be covered by confirmations for different types of transactions, including transactions that are subject to master agreements?
   m. If the institution engages in nondeliverable forward (NDF) transactions, does the documentation address the index to be used and clearly specify that the contract is for a nondeliverable currency? Are disruption events, if any, specifically described?
4. Obtain copies of policies and procedures concerning the review of the enforceability of netting agreements and master agreements with netting provisions.
   a. Does the institution have procedures to ensure that legal opinions have been obtained addressing the enforceability of a netting agreement under the laws of all relevant jurisdictions before relying on the netting agreement for capital purposes or in managing credit exposure to the counterparty?
   b. Do the procedures include guidelines for determining the relevant jurisdictions for which opinions should be obtained? Opinions should cover the enforceability of netting under (1) the law of the jurisdiction in which the counterparty is chartered, (2) the law of any jurisdiction in which a branch of the counterparty that is a party to the agreement is located, (3) the

law that governs any individual transaction under the netting agreement, and (4) the law that governs the netting agreement itself.

c. When generic or industry opinions are relied on, do the procedures of the institution ensure that individual agreements are reviewed for additional issues that might be raised?
d. Does the institution have procedures for evaluating or ''scoring'' the legal opinions it receives concerning the enforceability of netting agreements?
e. Who reviews the above opinions? How do they communicate their views on the enforceability of netting under an agreement?
f. Who determines when master netting agreements will be relied on for risk-based capital and credit-risk-management purposes?
g. Who determines whether certain transactions should be excluded from the netting, such as transactions in connection with a branch in a netting-unfriendly jurisdiction?
h. When the institution nets transactions for capital purposes, are any transactions that are not directly covered by a close-out netting provision of a master agreement included? If so, does the institution obtain legal opinions supporting the inclusion of such transactions? For example, if the institution includes in netting calculations foreign-exchange transactions between branches of the institution or counterparty not covered by a master agreement, ask counsel if the institution has an agreement and legal opinion that support this practice.
i. Does the institution have procedures to ensure that the legal opinions on which it relies are periodically reviewed?
j. Does the institution have procedures in place to ensure that existing master agreements are regularly monitored to determine whether they meet the requirements for recognition under the institution's netting policies?

5. Obtain copies of policies and procedures concerning the review of the enforceability of collateral arrangements.
   a. Does the institution have guidelines that establish when and from what jurisdictions legal opinions concerning the enforceability of collateral arrangements must be obtained before the institution relies on such arrangements for risk-based capital or credit-risk-management purposes?
   b. Who reviews the above opinions?
   c. Who determines when a collateral arrangement may be relied on by the institution for credit-risk-management or risk-based capital purposes?
   d. Do the procedures ensure that legal opinions relied on by the institution are reviewed periodically?
6. Obtain samples of master agreements, confirmations for transactions under such agreements, and related legal opinions.
   a. Does the institution maintain in its files the master agreements, legal opinions, and related documentation and translations relied on for netting purposes?
   b. Have the master agreements and confirmations been executed by authorized personnel?
   c. Have master agreements been executed by counterparty personnel that the institution has determined are authorized to execute such agreements?
   d. Does the institution maintain records evidencing that master agreements and related legal opinions have been reviewed in accordance with the institution's policies and procedures?
7. Obtain copies of the institution's policies and procedures concerning the implementation of netting agreements.
   a. Do the procedures ensure that the terms of netting agreements are accurately and effectively acted on by the trading, credit, and operations or payments-processing areas of the institution?
   b. Does the institution have adequate controls over the operational implementation of its master netting agreements?
   c. Who determines whether specific transactions are to be netted for risk-based capital and credit-risk-management purposes?
   d. When is legal approval for the netting of particular transactions under a netting agreement required?
   e. How are the relevant details of netting agreements communicated to the trading, credit, and payments areas?
   f. How does each area incorporate relevant netting information into its systems?
   g. What mechanism does the institution have

to link netting information with credit-exposure information and to monitor netting information in relation to credit-exposure information?

h. Do periodic settlement amounts reflect payments or deliveries netted in accordance with details of netting agreements?
i. How does the institution calculate its credit exposure to each counterparty under the relevant master netting agreements?
j. If the master agreement includes transactions excluded from risk-based capital calculations, what method does the institution use to calculate net exposure under the agreement for capital purposes, and is that method used consistently?
k. If a master agreement includes transactions that do not qualify for netting, such as transactions in a netting-unfriendly jurisdiction, how does the institution determine what method to use to calculate net exposure under the agreement for capital purposes?

The evaluation of financial performance, or profitability analysis, is a powerful and necessary tool for managing a financial institution and is particularly important in the control and operation of trading activities. Profitability analysis identifies the amount and variability of earnings, evaluates earnings in relation to the nature and size of risks taken, and enables senior management to judge whether the financial performance of business units justifies the risks taken. Moreover, profitability analysis is often used to determine individual or team compensation for marketing, trading, and other business-line staff engaged in trading activities. The following four elements are necessary to effectively assess and manage the financial performance of trading operations:

- valuing or marking positions to market prices
- assigning appropriate reserves for activities and risks
- reporting results through appropriate chains of command
- attributing income to various sources and products

Valuation of the trading portfolio is critical to effective performance measurement since the accuracy and integrity of performance reports are based primarily on the market price or fair value of an institution's holdings and the process used to determine those prices. The valuation process is often complex, as the pricing of certain financial instruments can require the use of highly sophisticated pricing models and other estimators of fair value. The chief financial officer (CFO) and other senior officers of the bank must receive comprehensive and accurate information on capital-markets and trading activities to accurately measure financial performance, assess risks, and make informed business decisions. Internal profitability reports should indicate to the CFO and other senior management the sources of capital-markets and trading income, and assign profits and losses to the appropriate business units or products (for example, foreign exchange, corporate bond trading or interest-rate swaps). To prepare these reports, an institution should specify its methodologies for attributing both earnings and risks to their appropriate sources such as interest income, bid/offer spreads, customer mark-up, time decay, or other appropriate factors. Similar methodologies for allocating reserves should also be established where appropriate.

Proper segregation of duties and clear reporting lines help ensure the integrity of profitability and performance reports. Accordingly, the measurement and analysis of financial performance and the preparation of management reports are usually the responsibility of a financial-control or other nontrading function. This responsibility includes revaluing or marking to market the trading portfolio and identifying the various sources of revenue. Some banks have begun to place operations and some other control staff in the business line, with separate reporting to the business head. Examiners should satisfy themselves that duties are adequately segregated and that the operations staff is sufficiently independent from trading and risk-taking functions.

VALUATION

The valuation process involves the initial and ongoing pricing or ''marking to market'' of positions using either observable market prices or, for less liquid instruments, fair-value pricing conventions and models. An institution's written policies and procedures should detail the range of acceptable practices for the initial pricing, daily mark-to-market, and periodic independent revaluation of trading positions. At a minimum, the bank's policies should specifically define the responsibilities of the participants involved in the trading function (for example, trading operations, financial-control, and risk-management staff) to ensure reliable and consistent financial reporting. Pricing methodologies should be clearly defined and documented to ensure that they are consistently applied across financial products and business lines. Proper controls should be in place to ensure that pricing feeds are accurate, timely, and not subject to unauthorized revisions. Additionally, the firm should have comprehensive policies and procedures specifically for creating, validating, revising, and reviewing the pricing models used in the valuation process. Inadequate policies and procedures raise doubts about the institution's trading profits and its ability to manage the risks of its trading activities.

Initial Pricing

The initial pricing of positions or transactions is generally the responsibility of the trader who originates the deal, although a marketer will often be involved in the process. For those instruments that trade in fairly liquid markets, the price is usually based on the quoted bid/offer price plus an origination ''value-added'' spread that may include, for example, a credit premium or estimated hedge cost, depending on the characteristics of the product. The prices of less liquid instruments are generally priced at theoretical market prices, usually determined by pricing models. Regardless of the type of transaction, an independent control function should review all new-deal pricing for reasonableness and ensure that pricing mechanics are consistent with those of existing transactions and approved methodologies. Significant differences, as defined in written policies, should be investigated by the control function.

Daily Mark-to-Market Process

Trading accounts should be revalued, or ''marked to market,'' at least daily to reflect fair value and determine the profit or loss on the portfolio for financial-reporting and risk-management purposes. Trading positions are usually marked to market as of the close of business using independent market quotes. Most institutions are able to determine independent market prices daily for most positions, including many exotic and illiquid products. Many complex instruments can be valued using the independent market prices of various elementary components or risk factors. Automatic pricing feeds should be used to update positions whenever feasible. When automatic pricing feeds are not feasible, a separate control function (for example, the middle- or back-office function) should be responsible for inputting appropriate pricing data or parameters into the appropriate accounting and measurement systems, even though traders may have some responsibility for determining those prices and parameters.

Daily revaluation may not be feasible for some illiquid instruments, particularly those that are extremely difficult to model or not widely traded. Institutions may revalue these types of transactions less often, possibly weekly or monthly. In these cases, written policies should specify which types of transactions, if any, are exempt from daily revaluation and how often these transactions must be marked to market.

Independent Price Testing and Revaluation

In addition to the mark-to-market process performed daily, banks should perform an independent review and revaluation of the trading portfolio periodically to verify that trading positions reflect fair value, check the reasonableness of pricing inputs, and assess profitability. The review must be performed by a control function that is independent from the trading function. Usually this independent revaluation process is performed monthly; however, it may be prudent to independently revalue certain illiquid and harder-to-price transactions, and transactions that are not marked to market daily, more frequently.

The scope of the testing process will differ across institutions depending on the size and sophistication of the trading activities conducted. In many institutions, revaluation of an entire portfolio of relatively simple, generic instruments may be too time consuming to be efficient, and price validation may be conducted on a sampling basis. In contrast, more complex transactions may be revalued in their entirety. Alternatively, an institution may choose to revalue holdings based on materiality (for example, all transactions over a dollar threshold). An institution's policies should clearly define the scope of its periodic valuation-testing process, and reasonable justification should be provided for excluding certain transactions from the testing process.

If the value of the portfolios as determined by the periodic (for example, monthly) independent revaluation is significantly different from the book value of these portfolios, further investigation is warranted. The materiality threshold for investigation should be specifically defined in written policies (such as ''all discrepancies above $x thousand must be investigated to determine the source of the difference''). When the reason for the discrepancy is discovered, the institution should determine whether the financial reports need to be adjusted. Based on the magnitude and pattern of the pricing inconsis-

tencies, changes to the pricing process or pricing models may be required.

Results of the month-end valuation process should be formally documented in sufficient detail to provide a complete audit trail. In addition, a summary of the results of the independent revaluation should be communicated to appropriate management and control functions. Reports should be generated to inform management of the results of the periodic price-testing process and include, at a minimum, the scope of the testing process, any material discrepancies between the independent valuations and the reported valuations, and any actions taken in response to them.

Liquid Instruments and Transactions

For transactions that trade on organized exchanges or in liquid over-the-counter (OTC) markets, market prices are relatively easy to determine. Trading positions are simply updated to reflect observable market prices obtained from either the exchange on which the instrument is listed or, in the case of OTC transactions, from automated pricing services or as quotes from brokers or dealers that trade the product. When observable market prices are available for a transaction, two pricing methodologies are primarily used—bid/offer or midmarket. Bid/offer pricing involves assigning the lower of bid or offer prices to a long position and the higher of bid or offer prices to short positions. Midmarket pricing involves assigning the price that is midway between bid and offer prices. Most institutions use midmarket pricing schemes, although some firms may still use bid/offer pricing for some products or types of trading. Midmarket pricing is the method recommended by the accounting and reporting subcommittee of the Group of Thirty's Global Derivatives Study Group, and is the method market practitioners currently consider the most sound.

Some institutions may use bid/offer pricing for some transactions and midmarket pricing for others. For example, bid/offer pricing may be used for proprietary and arbitrage transactions in which the difference between bid and offer prices and the midmarket price is assumed not to be earned. Midmarket pricing may be used for transactions in which the firm is a market maker, and the bid/offer to midmarket spread is earned. Also, some organizations may value positions on the conservative side of midmarket by taking a discount or adding a premium to the midmarket price to act as a ''holdback reserve.'' Firms that use a conservative midmarket valuation system may mark all positions in this manner or may only value some less liquid positions this way. Bank policies should clearly specify which valuation methodologies are appropriate for different types of transactions.

The bid/offer price should be considered a limit on instrument values, net of any reserves. Net instrument values recorded on the books at market value should not be below or above the market's bid/offer price, as these are the values at which a position can be closed. Some institutions have automated programs that use prices obtained from traders to check whether the fair values recorded on the firm's financial statements fall within the bid/offer price. While these programs can help ensure appropriate pricing regardless of the specific method used, a firm should still have a sound, independent daily revaluation that does not rely solely on traders marking their positions to market.

Whether bid/offer or midmarket pricing is used, it is important that banks use consistent time-of-day cut-offs when valuing transactions. For example, instruments and their related hedges should be priced as of the same time even if the hedging item trades on an exchange with a different closing time than the exchange on which the hedged item trades. Also, all instruments in the same trading portfolio should be valued at the same time even if they are traded at different locations. Price quotes should be current as of the time of pricing and should be consistent with other trades that were transacted close to the same time.

For liquid exchange-traded or OTC products, the monthly revaluation process may simply entail a comparison of book values with exchange or broker-dealer quotations. In these cases, it should be known whether the party providing the valuation is a counterparty to the transaction that generated the holding or is being paid for providing the valuation as an independent pricing service. Firms should be aware that broker-dealer quotes may not necessarily be the same values used by that dealer for its internal purposes and may not be representative of other ''market'' or model-based valuations. Therefore, institutions should satisfy themselves that the external valuations provided are appropriate.

Illiquid Instruments and Transactions

Illiquid, nontraditional, and user-specific or customized transactions pose particular pricing challenges because independent third-party prices are generally unavailable. For illiquid products that are traded on organized exchanges, but where trades occur infrequently and available quotes are often not current, mark-to-market valuations based on the illiquid market quotes may be adjusted by a holdback reserve that is created to reflect the product's reduced liquidity (see ''Holdback Reserves'' below). For illiquid OTC transactions, broker quotes may be available, albeit infrequently. When broker quotes are available, the bank may use several quotes to determine a final representative valuation. For example, they may compute a simple average of quotes or eliminate extreme prices and average the remaining quotes. In such cases, internal policies should clearly identify the methodology to be used.

When the middle or back office is responsible for inputting broker quotes directly, the traders should also be responsible for reporting their positions to the middle- or back-office function as an added control. Any differences in pricing should be reconciled. When brokers are responsible for inputting data directly, it is crucial that these data are verified for accuracy and appropriateness by the middle or back office.

For many illiquid or customized transactions, such as highly structured or leveraged instruments and more complex, nonstandard notes or securities, reliable independent market quotes are usually not available, even infrequently. In such instances, other valuation techniques must be used to determine a theoretical, end-of-day market value. These techniques may involve assuming a constant spread over a reference rate or comparing the transaction in question with similar transactions that have readily available prices (for example, comparable or similar transactions done with different counterparties). More likely, though, pricing models will be used to price these types of customized transactions. Even when exchange prices exist for a financial instrument, market anomalies in the pricing may exist, making consistent pricing across the instrument difficult. For example, timing differences may exist between close of the cash market and futures markets causing a divergence in pricing. In these cases, it may be appropriate to use theoretical pricing, and again, pricing models may be used for this purpose.

When conducting the monthly revaluation, the validity of portfolio prices can be tested by reviewing them for historical consistency or by comparing actual close-out prices or the performance of hedge positions to model predictions. In some instances, controllers may run parallel pricing models as a check on the valuations derived by trader models. This method is usually only used for the more exotic, harder-to-price products.

Pricing Models

Pricing models can either be purchased from vendors or developed internally and they can be mainframe or PC-based. Internally developed models are either built from scratch or developed using existing customized models that traders modify and manipulate to incorporate the specific characteristics of a transaction.

The use of pricing models introduces the potential for model risk into the valuation process. Model risk is the risk that faulty pricing models will result in inaccurate valuations of holdings, which results in trading losses to the institution. Model risk can result from inadequate development or application of a model, the assumptions used in running a model, or the specific mathematical algorithms on which a model is based. Accordingly, effective policies and procedures related to model development, model validation and model control are necessary to limit model risk. At a minimum, policies for controlling model risk should address the institution's process for developing, implementing, and revising pricing models. The responsibilities of staff involved in the model-development and model-validation process should be clearly defined.

In some institutions, only one department or group may be authorized to develop pricing models. In others, model development may be initiated in any of several areas related to trading. Regardless of the bank function responsible for model development and control, institutions should ensure that modeling techniques and assumptions are consistent with widely acceptable financial theories and market practices. When modeling activities are conducted in separate business units or are decentralized, business-unit polices governing model develop-

ment and use should be consistent with overall corporate polices on model-risk management. As part of these policies, institutions should ensure that models are properly documented. Documentation should be created and maintained for all models used, and a model-inventory database should be maintained on a corporate-wide or business-line basis.

Before models are authorized for use, they should be validated by individuals who are not directly involved in the development process or do not have methodological input to the model. Ideally, models should be validated by an independent financial-control or risk-management function. Independent model validation is a key control in the model-development process and should be specifically addressed in a firm's policies. Management should be satisfied that the underlying methodologies for all models are conceptually sound, mathematically and statistically correct, and appropriate for the model's purpose. Pricing methodologies should be consistent across business lines. In addition, the technical expertise of the model validators should be sufficient to ensure that the basic approach of the model is appropriate.

All model revisions should be performed in a controlled environment, with changes either made or verified by a control function. When traders are able to make changes to models outside of a controlled environment, an inappropriate change may result in inaccurate valuation. Under no circumstances should traders be able to determine valuations of trading positions by making changes to a model unless those changes are subject to the same review process as a new type of transaction. Accordingly, written policies should specify when changes to models are acceptable and how those revisions should be accomplished. Controls should be in place to prevent inappropriate changes to models by traders or other unauthorized personnel. For example, models can be coded or date marked so that it is obvious when changes are made to those models. Rigorous controls on spreadsheet-based models should ensure their integrity and prevent unauthorized revisions. The control function should maintain copies of all models used by the traders in case those used on the trading floor are corrupted.

Models should be reviewed or reassessed at some specified frequency, with the most important or complex models reviewed at least once a year. In addition, models should be reviewed whenever major changes are made to them. The review process should be performed by a group independent from the traders, such as a control or risk-analysis function. As appropriate, model reviews should consider changes in the types of transactions handled by the model, as well as changes in generally accepted modeling conventions and techniques. Model reviews should incorporate an investigation of actual verses expected performance and fully incorporate assessment of any hedging activity. Significant deviation in expected versus actual performance and unexplainable volatility in the profits and losses of trading activities may indicate that market-defined hedging and pricing relationships are not being adequately captured in a model. The model-review process should be clearly defined and documented, and these policies should be communicated to the appropriate parties throughout the organization.

In addition to the periodic scheduled reviews, models should always be reviewed when new products are introduced or changes in valuations are proposed. Model review may also be prompted by a trader who feels that a model should be updated to reflect the significant development or maturing of a market. In some cases, models may start out as a PC-based spreadsheet model and are subsequently transformed to a mainframe model. Whenever this occurs, the model should be reviewed and any resulting changes in valuation should be monitored. Banks should continually monitor and compare their actual cash flows versus model projections, and significant discrepancies should prompt a model review.

Pricing-Model Inputs

Pricing models require various types of inputs, including hard data, readily observable parameters such as spot or futures prices, and both quantitatively and qualitatively derived assumptions. All inputs should be subject to controls that ensure that they are reasonable and consistent across business lines, products, and geographic locations. Assumptions and inputs regarding expected future volatilities and correlations, and the specification of model-risk factors such as yield curves, should be subject to specific control and oversight. Important considerations in each of these areas are as follows:

- *Volatilities.* Both historically determined and implied volatilities should be derived using

generally accepted and appropriately documented techniques. Implied volatilities should be reviewed for reasonableness and derived from closely related instruments.

- *Correlations.* Correlations should be well documented and estimated as consistently as practicable across products and business lines. If an institution relies on broker quotes, it should have an established methodology for determining the input to be used from multiple quotes (such as the average or median).
- *Risk factors.* Pricing models generally decompose instruments into elementary components, such as specific interest rates, currencies, commodities, and equity types. Interest rates and yield curves are particularly important pricing-model-risk factors. Institutions should ensure that the risk factors in general, and the yield curves in particular, used in pricing instruments are sufficiently robust (have sufficient estimation points). Moreover, the same types of yield curves (spot, forward, yield-to-maturity) should be used to price similar products.

During the periodic revaluation process, many institutions may perform a formal verification of model-pricing inputs, including volatilities, correlation matrices, and yield curves.

HOLDBACK RESERVES

Mark-to-market gains and losses on trading and derivatives portfolios are recognized in the unit's profits and losses and incorporated into the value of trading assets and liabilities. Often a bank will ''hold back,'' or defer, the recognition of a certain portion of first-day profits on a transaction for some period of time. Holdback reserves are usually taken to reflect uncertainty about the pricing of a transaction or the risks entailed in actively managing the position. These reserves represent deferred gains that may or may not be realized, and they are usually not released into income until the close or maturity of the contract.

Holdback reserves can also be taken to better match trading revenues with expenses. Certain costs associated with derivatives transactions, such as credit, operational, and administrative costs, may be incurred over the entire lives of the instruments involved. In an effort to match revenue with expenses, an institution may defer a certain portion of initial profit or loss generated by a transaction and then release the reserve into income over time. By deferring a portion of the profits or losses, holdback reserves may avoid earnings overstatement and more accurately match revenues and expenses.

Reserving methodologies and the types of reserves created vary among institutions. Even within firms, the reserving concept may not be consistent across business lines, or the concept may not be applied consistently. At a minimum, policies regarding holdback reserves should define (1) the universe of risks and costs that are to be considered when creating holdback reserves, (2) the methodologies to be used to calculate them, and (3) acceptable practices for recognizing the reserves into the profits and losses of the institution.

General policies for holdback reserves should be developed by a group independent from the business units, such as the financial-control area. This group may also be responsible for developing and implementing the policy. Alternatively, individual business lines may be given responsibility for developing an implementation policy. If implementation policies are developed by individual business lines, they should be periodically reviewed and approved by an independent operating group. Most importantly, the traders or business units should not be able to determine the level of holdback reserves and, hence, be able to determine the fair value of trading positions. In general, reserving policies should be formula-based or have well-specified procedures to limit subjectivity in the determination of fair value. Reserve policies should be reviewed periodically and revised as necessary.

Reserve Adequacy

An insufficient level of holdback reserves may cause current earnings to be overstated. However, excess holdback reserves may cause current earnings to be understated and subject to manipulation. Accordingly, institutions should develop policies detailing acceptable practices for the creation, maintenance, and release of holdback reserves. The level of holdback reserves should be periodically reviewed for appropriateness and reasonableness by an independent control function and, if deemed necessary, the level should be adjusted to reflect changing market conditions. Often, the reasonableness of reserves will be checked in conjunction with the month-end revaluation process.

Creating Reserves

All holdback reserves should be recognized in the internal reports and financial statements of the institution, whether they are represented as ''pricing adjustments'' or as a specified holdback of a transaction's profit or loss. Any type of holdback reserve that is not recorded in the financial records should be avoided. Reserves may be taken either on a transaction-by-transaction basis or on an overall portfolio basis. Written policies should clearly specify the types of holdback reserves that are appropriate for different portfolios and transactions.

While holdback reserves may be created for a variety of risks and costs, the following are the most common types:

- *Administrative-cost reserves.* These reserves are intended to cover the estimated future costs of maintaining portfolio positions to maturity. Administrative-cost reserves are typically determined as a set amount per transaction based on historical trends.
- *Credit-cost reserves.* These reserves provide for the potential change in value associated with general credit deterioration in the portfolio and with counterparty defaults. They are typically calculated by formulas based on the counterparty credit rating, maturity of the transaction, collateral, netting arrangements, and other credit factors.
- *Servicing-cost reserves.* These reserves provide for anticipated operational costs related to servicing the existing trading positions.
- *Market-risk reserves.* These reserves are created to reflect a potential loss on the open risk position given adverse market movements and an inability to hedge (or the high cost of hedging) the position. This includes dynamic hedging costs for options.
- *Liquidity-risk reserves.* These reserves are usually a subjective estimate of potential liquidity losses (given an assumed change in value of a position) due to the bank's inability to obtain bid/offer in the market. They are intended to cover the expected cost of liquidating a particular transaction or portfolio or of arranging hedges that would eliminate any residual market risk from that transaction or portfolio.
- *Model-risk reserves.* These reserves are created for the expected profit and loss impact of unforeseen inaccuracies in existing models. For new models, reserves are usually based on an assessment of the level of model sophistication.

Recording Reserves

Holdback reserves may be separately recorded in the general-ledger accounts of each business entity, or they may be tracked on a corporate-wide basis. These reserves are usually recorded on the general-ledger account as a contra trading asset (representing a reduction in unrealized gains), but some banks record them as a liability. Alternatively, reserves for some risks may be recorded as a contra asset and reserves for other risks recorded as a liability. Holdback reserves can be netted against ''trading assets,'' included in ''other liabilities,'' or disclosed separately in the published financial statements. Institutions should ensure that they have clear policies indicating the method to be used in portraying reserves in reports and financial statements.

Releasing Reserves

An institution's policies should clearly indicate the appropriate procedure for releasing reserves as profits or losses. Holdback reserves created as a means of matching revenues and expenses are usually amortized into income over the lives of the individual derivative contracts. Reserves that are created to reflect the risk that recognized gains may not be realized due to mispricing or unexpected hedging costs are usually released in their entirety at the close or maturity of the contract, or as the portfolio changes in structure. If reserves are amortized over time, a straight-line amortization schedule may be followed, with reserves being released in equal amounts over the life of the transaction or the life of the risk. Alternatively, individual amortization schedules may be determined for each transaction.

INCOME ATTRIBUTION

Profits and losses (P&L's) from trading accounts can arise from several factors. Firms attempt to determine the underlying reasons for value changes in their trading portfolios by attributing the profits and losses on each transaction to various sources. For example, profits and losses

can be attributed to the ''capture'' of the bid/offer spread—the primary aim of market making. Another example is the attribution of profit to ''origination,'' the difference between the fair value of the created instrument and the contracted transaction price. Profit and loss can also result from proprietary position-taking. Proper attribution of trading revenues is crucial to understanding the risk profile of trading activities. The ability of an institution to accurately determine the sources of daily P&L on different types of financial instruments is considered a key control to ensure that trading-portfolio valuations are reasonable. The discipline of measuring and attributing P&L performance also ensures that risks are accurately measured and monitored.

The income-attribution process should be carried out by a group independent from the traders; in most larger institutions, attribution is the responsibility of the risk-management or middle-office function. The designated group is responsible for conducting analysis of the institution's transactions and identifying the various sources of trading P&L for each product or business line. These analyses may cover only certain types of transactions, but increasingly they are being applied to all products. The income-attribution process should be standardized and consistently applied across all business units. The goal of income-attribution analyses is to attribute, or ''explain,'' as much of the daily trading P&L as possible. A significant level of ''unexplained'' P&L or an unusual pattern of attribution may indicate that the valuation process is flawed, implying that the bank's reported income may be either under- or overstated. It may also point to unexplained risks that are not adequately identified and estimated.

Explained Profits and Losses

Profits and losses that can be attributed to a risk source are considered ''explained P&L.'' Institutions with significant trading activities should ensure they have appropriate methodologies and policies to attribute as much revenue as practicable. For example, some institutions may define first-day profit as the difference between the midmarket or bid/offer price and the price at which the transaction was executed. This first-day profit may then be allocated among sources such as the sales desk, origination desk, and proprietary trading desk, as well as to holdback reserves. Any balance in the first-day profit may then be assigned to the business or product line that acquired the position. As the position is managed over time, subsequent P&L attributions are made based on the effectiveness of a trading desk's management of the position. In turn, the trading desk may further attribute P&L to risk sources and other factors such as spread movements, tax sensitivity, time decay, or basis carry. Many trading desks go on to break out their daily P&L with reference to the actual risks being managed—for example delta, gamma, theta, rho, and vega. Institutions should ensure that they provide an independent review for the reasonableness of all revenue splits.

Unexplained Profits and Losses

Unexplained profits and losses is defined as the difference between actual P&L and explained P&L. If the level of unexplained P&L is considered significant, the control function should investigate the reason for the discrepancy. It may be necessary to make changes to the pricing process as a result of the investigation. For example, models may be modified or the choice of pricing inputs, such as volatilities and correlations, may be challenged. The level of unexplained P&L considered significant will vary among institutions, with some firms specifically defining a threshold for investigation (for example, ''unexplained P&L above $x thousand dollars will be investigated''). Some institutions permit risk-control units to decide what is significant on a case-by-case basis. Alternatively, management ''triggers,'' such as contract limits, may identify particular movements in P&L that should be reviewed.

REPORTS TO MANAGEMENT AND DISCLOSURES TO CUSTOMERS

Reports to Management

An independent control function should prepare daily P&L breakout reports and official month-end P&L breakout reports that are distributed to senior management. Daily reports that identify the profits and losses of new deals should be provided to appropriate management and staff,

including trading-desk managers. These reports should include P&L explanations by source and risks for each trading book. New-deal reports may also be generated periodically to provide information on all new deals transacted during the period. This information may include the customer names, maturities, notional amounts, portfolio values, holdback reserves, and new-deal profits and losses. At a minimum, senior management should receive the formal month-end P&L explanation reports.

Providing Valuations to Customers

Trading institutions are often asked to provide valuations of transacted products to their customers. Quotes may be provided on a daily, weekly, monthly, or less frequent basis at the customer's request. Even when valuations are not requested by the client, sales personnel may follow the clients' positions and notify them of changes in the valuation of their positions due to market movements. Some firms will provide quotes for all of the positions in their customers' portfolios—not just the transactions executed with the firm. Firms may also formally offer to give valuations to certain customers for certain lower-risk products.

Generally, price quotes are taken from the same systems or models used to generate end-of-day mark-to-market values for the firm's own reports and financial records, usually at midmarket. Holdback reserves are generally not included in the valuation given to customers. In all cases, price quotes should be accompanied by information that describes how the value was derived. If internally validated models are used to determine a transaction value, this fact should be made clear and the underlying valuation assumptions provided.

In making any price quotes, institutions should include a disclaimer stating the true nature of any quote—such as ''indication only'' or ''transaction price.'' Disclosures should state the characteristics of any valuation provided (for example, midmarket, indicative, or firm price). In markets that have specific conventions for determining valuations, firms should usually supply valuations using those conventions unless otherwise agreed to by the customer.

Although traders and marketers should receive and review all valuations distributed to customers, customer valuations should be provided primarily by a back- or middle-office function to maintain segregation from the front office. Internal auditors may review valuations provided to clients to ensure consistency with the values derived from the independent pricing models and consistency with internal mark-to-market processes.

1. To review the institution's internal reporting of revenues and expenses to ensure that these reports are prepared in a manner that accurately measures capital-markets and trading results and are generally consistent with industry norms.
2. To review management information reports for content, clarity, and consistency. To ensure that reports contain adequate and accurate financial data for sound decision making, particularly by the chief financial officer and other senior management.
3. To assess whether the institution adequately attributes income to its proper sources and risks. To assess whether the allocation methodology is sufficient.
4. To review the level of profits, risk positions, and specific types of transactions that result in revenues or losses (by month or quarter) since the prior examination to ascertain—
   a. reasonableness,
   b. consistency,
   c. consistency with management's stated strategy and budget assumptions,
   d. the trend in earnings,
   e. the volatility of earnings, and
   f. the risk-reward profile of specific products and business units.
5. To review management's monitoring of capital-markets and trading volumes.
6. To assess whether the institution's market-risk-measuring system adequately captures and reports to senior management the major risks of the capital-markets and trading activities.
7. To determine the extent that capital-markets and trading activities contribute to the overall profitability and risk profile of the institution.
8. To recommend corrective action when policies, procedures, practices, or internal reports or controls are found to be deficient.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Obtain all profitability reports which are relevant to each business line or group. For each line or group, identify the different subcategories of income that are used in internal profit reports.
2. Assess the institution's methodology for attributing income to its sources. Check whether the allocation methodology makes sufficient deductions or holdbacks from the business line to account for the efforts of sales, origination, and proprietary trading, and whether it properly adjusts for hedging costs, credit risks, liquidity risks, and other risks incurred. An adequate methodology should cover each of these factors, but an institution need not make separate reserve categories for each risk incurred. However, such institutions should be making efforts to allocate income more precisely among these different income sources and risks.
3. Review management information reports for content, clarity, and consistency. Determine if reports contain adequate financial data for sound decision making.
4. Review internal trading-income reports to ensure that they accurately reflect the earnings results of the business line or group. Check whether internal profitability reports reflect all significant income and expenses contributing to a business line or group's internally reported income.
5. Check whether internal reporting practices are in line with industry norms and identify the rationale for any significant differences.
6. Check whether amortization and depreciation costs and other overhead costs are appropriately allocated among the appropriate business areas.
7. Determine whether reserves for credit risk and other risks are sufficient to cover any reasonably expectable losses and costs.
8. Review the institution's progress in implementing or updating the methodology for attributing income to the appropriate sources.
9. Analyze the quality of earnings. Review the level of profits and specific types of transactions that result in revenues or losses (by month or quarter) since the prior examination to determine—
   a. reasonableness,
   b. consistency,
   c. consistency with management's stated strategy and budgeted levels,
   d. the trend in earnings,
   e. the volatility of earnings, and
   f. the risk/reward profile of specific products or business units.
10. Review the volume of transactions and positions taken by the institution for reasonableness, and check that the institution has a system for effectively monitoring its capital-markets and trading volumes.
11. Determine whether the market-risk-measuring system provides the chief financial officer and other senior management with a clear vision of the financial institution's market portfolio and risk profile.
12. Determine the extent that trading activities contribute to the overall profitability of the institution. Determine how the trend has changed since the prior examination.
13. Recommend corrective action when methodologies, procedures, practices, or internal reports or controls are found to be deficient.

1. How does the institution define trading income? Does it cover interest, overhead, and other expenses related to the business line in that line's income reports? Do internal income reports accurately reflect the results of the business line? Is the breakdown of business-line income into components sufficient to identify the main sources of profitability and expenses? What variations are there from the general market practice for internal reporting of business-line income?
2. What is the methodology for allocating income to its sources? Do the allocations make sufficient deductions or holdbacks to account for the efforts of sales, origination, and proprietary trading? Do they properly adjust for hedging costs, credit risks, liquidity risks, and other risks incurred?
3. What steps is the institution taking to enhance its income-allocation system?
4. How frequently are earnings reported to middle and senior management? Are the reports comprehensive enough for the level of activity? Can they be used for planning and trend analysis? How often and under what circumstances are these reports sent to the chief financial officer, the president, and members of the board of directors?
5. Evaluate the sources of earnings. Are earnings highly volatile? What economic events or market conditions led to this volatility?
   a. Are there any large, nonrecurring income/expense items? If so, why?
   b. Is profitability of the business unit dependent on income generated from one particular product? Is profitability of the business unit overly dependent on income generated from one particular customer or related group of customers? How diverse is the generation of product and customer profitability?
   c. Is the institution taking an undue amount of credit risk or market risk to generate its profits? Is the institution ''intermediating'' in transactions for a credit ''spread''? What is the credit quality of the customers in which the institution is taking credit risk in the trading unit?
6. How does the institution monitor and control its business-line and overall volume of capital-markets and trading activities?
7. Does the market-risk-measuring system adequately capture and report to the chief financial officer and senior management the major risks from the capital-markets and trading activities?
8. Does the market-risk-measuring system provide the chief financial officer and other senior management with a clear vision of the financial institution's market portfolio and risk profile? How does management compare the profitability of business lines with the underlying market risks?
9. What is the contribution of trading activities to the overall profitability of the institution? How has the trend changed since the prior examination?
10. Evaluate the earnings of new-product or new-business initiatives. What is the earnings performance and risk profile for these areas? What are management's goals and plans for these areas?

As with all risk-bearing activities, the risk exposures a banking organization assumes in its trading, derivative, and capital-markets activities should be fully supported by an adequate capital position. Accordingly, banking organizations should ensure that their capital positions are sufficiently strong to support all trading and capital-markets risks on a fully consolidated basis and that adequate capital is maintained in all affiliated entities engaged in these activities. Institutions with significant trading activities should have reasonable methods to measure the risks of their activities and allocate capital against the economic substance of those risks. To that extent, regulatory capital requirements should be viewed as minimum requirements, and those institutions exposed to a high or inordinate degree of risk or forms of risk that may not be fully addressed in regulatory requirements are expected to operate above minimum regulatory standards consistent with the economic substance of the risks entailed.

As the baseline for capital-adequacy assessment, bank supervisors first consider an organization's risk-based capital ratio; that is, the ratio of qualifying capital to assets and off-balance-sheet items that have been ''risk weighted'' according to perceived credit risk. Supervisors also focus on the tier 1 leverage ratio to help assess capital adequacy. For banking organizations with significant trading activities, the risk-based capital ratio also takes into account an institution's exposure to market risk.[1]

RISK-BASED CAPITAL MEASURE

The principal objectives of the risk-based capital measure[2] are to (1) make regulatory capital requirements generally sensitive to differences in risk profiles among banking organizations; (2) factor off-balance-sheet exposures into the assessment of capital adequacy; (3) minimize disincentives to holding liquid, low-risk assets; and (4) achieve greater consistency in the evaluation of the capital adequacy of major banks throughout the world. The risk-based capital measure focuses primarily on the credit risk associated with the nature of banking organizations' on- and off-balance-sheet exposures and on the type and quality of their capital. It provides a definition of capital and a framework for calculating risk-weighted assets by assigning assets and off-balance-sheet items to broad categories of credit risk. A banking organization's risk-based capital ratio is calculated by dividing its qualifying capital by its risk-weighted assets. The risk-based capital measure sets forth minimum supervisory capital standards that apply to all banking organizations on a consolidated basis.

The risk-based capital ratio focuses principally on broad categories of credit risk. For most banking organizations, the ratio does not incorporate other risk factors that may affect the organization's financial condition. These factors may include overall interest-rate exposure; liquidity, funding, and market risks; the quality and level of earnings; investment or loan portfolio concentrations; the effectiveness of loan and investment policies; the quality of assets; and management's ability to monitor and control financial and operating risks. An overall assessment of capital adequacy must take into account these other factors and may differ significantly from conclusions that might be drawn solely from the level of an organization's risk-based capital ratio.

Definition of Capital

For risk-based capital purposes, a banking organization's capital consists of two major components: core capital elements (tier 1 capital) and supplementary capital elements (tier 2 capital). Core capital elements include common equity including capital stock, surplus, and undivided profits; qualifying noncumulative perpetual preferred stock (or, for bank holding companies, cumulative perpetual preferred stock, the aggre-

1. The market-risk capital rules are mandatory for certain banking organizations with significant exposure to market risk beginning no later than January 1, 1998. See ''Market-Risk Measure,'' below.

2. The risk-based capital measure is based on a framework developed jointly by supervisory authorities from the G-10 countries. The Federal Reserve implemented the risk-based measure in January 1989. This section provides a brief overview of the current risk-based capital measure. More detailed discussions can be found in the Federal Reserve's *Commercial Bank Examination Manual*. Specific guidelines for calculating the risk-based capital ratio are found in Regulation H (12 CFR 208, appendixes A and E) for state member banks and in Regulation Y (12 CFR 225, appendixes A and E) for bank holding companies.

gate of which may not exceed 25 percent of tier 1 capital); and minority interest in the equity accounts of consolidated subsidiaries. Tier 1 capital is generally defined as the sum of core capital elements less goodwill, unrealized holding losses in the available-for-sale equity portfolio, and other intangible assets that do not qualify within capital, as well as any other investments in subsidiaries that the Federal Reserve determines should be deducted from tier 1 capital. Tier 1 capital represents the highest form of capital, namely permanent equity. Tier 2 capital consists of a limited amount of the allowance for loan and lease losses, perpetual preferred stock that does not qualify as tier 1 capital, mandatory convertible securities and other hybrid capital instruments, long-term preferred stock with an original term of 20 years or more, and limited amounts of term subordinated debt, intermediate-term preferred stock, and unrealized holding gains on qualifying equity securities. See section 3020.1, ''Assessment of Capital Adequacy,'' in the *Commercial Bank Examination Manual* for a complete definition of capital elements.

Capital investments in unconsolidated banking and finance subsidiaries and reciprocal holdings of other banking organizations' capital instruments are deducted from an organization's capital. The sum of tier 1 and tier 2 capital less any deductions makes up total capital, which is the numerator of the risk-based capital ratio.

In assessing an institution's capital adequacy, supervisors and examiners should consider the capacity of the institution's paid-in equity and other capital instruments to absorb economic losses. In this regard, it has been the Federal Reserve's long-standing view that common equity (that is, common stock and surplus and retained earnings) should be the dominant component of a banking organization's capital structure and that organizations should avoid undue reliance on non-common-equity capital elements.[3] Common equity allows an organization to absorb losses on an ongoing basis and is permanently available for this purpose. Further, this element of capital best allows organizations to conserve resources when they are under stress because it provides full discretion in the amount and timing of dividends and other distributions. Consequently, common equity is the basis on which most market judgments of capital adequacy are made.

Consideration of the capacity of an institution's capital structure to absorb losses should also take into account how that structure could be affected by changes in the institution's performance. For example, an institution experiencing a net operating loss—perhaps because of realization of unexpected losses—will face not only a reduction in its retained earnings, but also possible constraints on its access to capital markets. These constraints could be exacerbated should conversion options be exercised to the detriment of the institution. A decrease in common equity, the key element of tier 1 capital, may have further unfavorable implications for an organization's regulatory capital position. The eligible amounts of most types of tier 1 preferred stock and tier 2 or tier 3 capital elements may be reduced, because current capital regulations limit the amount of these elements that can be included in regulatory capital to a maximum percentage of tier 1 capital. Such adverse magnification effects could be further accentuated should adverse events take place at critical junctures for raising or maintaining capital, for example, as limited-life capital instruments are approaching maturity or as new capital instruments are being issued.

Risk-Weighted Assets

Each asset and off-balance-sheet item is assigned to one of four broad risk categories based on the obligor or, if relevant, the guarantor or type of collateral. The risk categories are zero, 20, 50, and 100 percent. The standard risk category, which includes the majority of items, is 100 percent. The appropriate dollar value of the amount in each category is multiplied by the risk weight associated with that category. The weighted values are added together and the resulting sum is the organization's risk-weighted assets, the denominator of the risk-based capital ratio.[4]

Off-balance-sheet items are incorporated into the risk-based capital ratio by first being converted into a ''credit-equivalent'' amount. To accomplish this, the face amount of the item is multiplied by a credit conversion factor (zero, 20, 50, or 100 percent). The credit-equivalent

3. The Basel Committee on Banking Supervision affirmed this view in a release issued in October 1998, which stated that common shareholders' funds are the key element of capital.

4. See the *Commercial Bank Examination Manual* for a complete discussion of risk-weighted assets.

amount is then assigned to a risk category in the same manner as on-balance-sheet items. For over-the-counter derivative transactions, the credit-equivalent amount is determined by multiplying the notional principal amount of the underlying contract by a credit-conversion factor and adding the resulting product (which is an estimate of potential future exposure) to the positive mark-to-market value of the contract (which is the current exposure). A contract with a negative mark-to-market value is treated as having a current exposure of zero. (See ''Credit-Equivalent Computations for Derivative Contracts'' below.)

The primary determinant of the appropriate risk category for a particular off-balance-sheet item is the obligor. Collateral or guarantees may be used to a limited extent to assign an item to a lower risk category than would be available to the obligor. The forms of collateral generally recognized for risk-based capital purposes are cash on deposit in the lending institution; securities issued or guaranteed by central governments of the Organization for Economic Cooperation and Development (OECD) countries,[5] U.S. government agencies, or U.S. government–sponsored agencies; and securities issued by multilateral lending institutions or regional development banks in which the U.S. government is a shareholder or contributing member. The only guarantees recognized are those provided by central or state and local governments of the OECD countries, U.S. government agencies, U.S. government–sponsored agencies, multilateral lending institutions or regional development banks in which the United States is a shareholder or contributing member, U.S. depository institutions, and foreign banks.

Banking organizations are expected to meet a minimum ratio of capital to risk-weighted assets of 8 percent, with at least 4 percent taking the form of tier 1 capital. Organizations that do not meet the minimum ratios, or that are considered to lack sufficient capital to support their activities, are expected to develop and implement capital plans acceptable to the Federal Reserve for achieving adequate levels of capital.

TIER 1 LEVERAGE RATIO

The principal objective of the tier 1 leverage measure is to place a constraint on the maximum degree to which a banking organization can leverage its equity capital base.[6] A banking organization's tier 1 leverage ratio is calculated by dividing its tier 1 capital by its average total consolidated assets. Generally, average total consolidated assets are defined as the quarterly average total assets reported on the organization's most recent regulatory reports of financial condition, less goodwill, certain other intangible assets, investments in subsidiaries or associated companies, and certain excess deferred-tax assets that are dependent on future taxable income.

The Federal Reserve has adopted a minimum tier 1 leverage ratio of 3 percent for the most highly rated banks. A state member bank operating at or near this level is expected to have well-diversified risk, including no undue interest-rate-risk exposure; excellent asset quality; high liquidity; good earnings; and in general be considered a strong banking organization rated a composite 1 under the CAMELS rating system for banks. Other state member banks are expected to have a minimum tier 1 leverage ratio of 4 percent. Bank holding companies rated a composite 1 under the BOPEC rating system and those that have implemented the Board's risk-based capital measure for market risk must maintain a minimum tier 1 leverage ratio of 3 percent. Other bank holding companies are expected to have a minimum tier 1 leverage ratio of 4 percent. In all cases, banking organizations should hold capital commensurate with the level and nature of all risks to which they are exposed.

5. OECD countries are defined to include all full members of the Organization for Economic Cooperation and Development regardless of entry date, as well as countries that have concluded special lending arrangements with the International Monetary Fund (IMF) associated with the IMF's General Arrangements to Borrow, but excludes any country that has rescheduled its external sovereign debt within the previous five years. As of May 1999, the OECD countries were Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Saudi Arabia has concluded special lending arrangements with the IMF associated with the IMF's General Arrangements to Borrow.

6. The tier 1 leverage measure, intended to be a supplement to the risk-based capital measure, was adopted by the Federal Reserve in 1990. Guidelines for calculating the tier 1 leverage ratio are found in Regulation H (12 CFR 208, appendix B) for state member banks and in Regulation Y (12 CFR 225, appendix D) for bank holding companies.

CREDIT-EQUIVALENT COMPUTATIONS FOR DERIVATIVE CONTRACTS

Applicable Derivative Contracts

Credit-equivalent amounts are computed for each of the following off-balance-sheet contracts:

- interest-rate contracts
  - — single-currency interest-rate swaps
  - — basis swaps
  - — forward rate agreements
  - — interest-rate options purchased (including caps, collars, and floors purchased)
  - — any other instrument linked to interest rates that gives rise to similar credit risks (including when-issued securities and forward forward deposits accepted)
- exchange-rate contracts
  - — cross-currency interest-rate swaps
  - — forward foreign-exchange-rate contracts
  - — currency options purchased
  - — any other instrument linked to exchange rates that gives rise to similar credit risks
- equity derivative contracts
  - — equity-linked swaps
  - — equity-linked options purchased
  - — forward equity-linked contracts
  - — any other instrument linked to equities that gives rise to similar credit risks
- commodity (including precious metal) derivative contracts
  - — commodity-linked swaps
  - — commodity-linked options purchased
  - — forward commodity-linked contracts
  - — any other instrument linked to commodities that gives rise to similar credit risks
- credit derivatives
  - — credit-default swaps
  - — total-rate-of-return swaps
  - — other types of credit derivatives

Exceptions

Exchange-rate contracts with an original maturity of 14 or fewer calendar days and derivative contracts traded on exchanges that require daily receipt and payment of cash variation margin may be excluded from the risk-based ratio calculation. Gold contracts are accorded the same treatment as exchange-rate contracts except that gold contracts with an original maturity of 14 or fewer calendar days are included in the risk-based ratio calculation. Over-the-counter options purchased are included and treated in the same way as other derivative contracts.

Calculation of Credit-Equivalent Amounts

The credit-equivalent amount of a derivative contract (excluding credit derivatives) that is not subject to a qualifying bilateral netting contract is equal to the sum of—

- the current exposure (sometimes referred to as the replacement cost) of the contract and
- an estimate of the potential future credit exposure of the contract.

The current exposure is determined by the mark-to-market value of the contract. If the mark-to-market value is positive, then the current exposure is equal to that mark-to-market value. If the mark-to-market value is zero or negative, then the current exposure is zero. Mark-to-market values are measured in dollars, regardless of the currency or currencies specified in the contract, and should reflect changes in the relevant rates, as well as in counterparty credit quality.

The potential future credit exposure of a contract, including a contract with a negative mark-to-market value, is estimated by multiplying the notional principal amount of the contract by a credit-conversion factor. Banking organizations should use, subject to examiner review, the effective rather than the apparent or stated notional amount in this calculation. The conversion factors (in percent) are in table 1. The Board has noted that these conversion factors, which are based on observed volatilities of the particular types of instruments, are subject to review and modification in light of changing volatilities or market conditions.

Table 1—Conversion-Factor Matrix

Remaining maturity	*Interest rate*	*Foreign-exchange rate and gold*	*Equity*	*Precious metals*	*Other commodity*
One year or less	0.0	1.0	6.0	7.0	10.0
Over one to five years	0.5	5.0	8.0	7.0	12.0
Over five years	1.5	7.5	10.0	8.0	15.0

For a contract that is structured such that on specified dates any outstanding exposure is settled and the terms are reset so that the market value of the contract is zero, the remaining maturity is equal to the time until the next reset date. For an interest-rate contract with a remaining maturity of more than one year that meets these criteria, the minimum conversion factor is 0.5 percent.

For a contract with multiple exchanges of principal, the conversion factor is multiplied by the number of remaining payments in the contract. A derivative contract not included in the definitions of interest-rate, exchange-rate, equity, or commodity contracts is subject to the same conversion factors as a commodity, excluding precious metals.

No potential future credit exposure is calculated for a single-currency interest-rate swap in which payments are made based on two floating-rate indexes, so-called floating/floating or basis swaps. The credit exposure on these contracts is evaluated solely on the basis of their mark-to-market values.

Examples of the calculation of credit-equivalent amounts for selected instruments are in table 2.

Table 2—Calculating Credit-Equivalent Amounts for Derivative Contracts

Type of Contract	*Notional principal amount*	*Conversion factor*	*Potential exposure (dollars)*	*Mark-to-market*	*Current exposure (dollars)*	*Credit-equivalent amount*
(1) 120-day forward foreign exchange	5,000,000	.01	50,000	100,000	100,000	150,000
(2) 4-year forward foreign exchange	6,000,000	.05	300,000	–120,000	0	300,000
(3) 3-year single-currency fixed- and floating-interest-rate swap	10,000,000	.005	50,000	200,000	200,000	250,000
(4) 6-month oil swap	10,000,000	.10	1,000,000	–250,000	0	1,000,000
(5) 7-year cross-currency floating and floating-interest-rate swap	20,000,000	.075	1,500,000	–1,500,000	0	1,500,000
TOTAL			2,900,000	+	300,000	3,200,000

Avoidance of Double Counting

In certain cases, credit exposures arising from derivative contracts may be reflected, in part, on the balance sheet. To avoid double counting these exposures in the assessment of capital adequacy and, perhaps, assigning inappropriate risk weights, examiners may need to exclude counterparty credit exposures arising from the derivative instruments covered by the guidelines from balance-sheet assets when calculating a banking organization's risk-based capital ratios. This exclusion will eliminate the possibility that an organization could be required to hold capital against both an off-balance-sheet and on-balance-sheet amount for the same item. This treatment is not accorded to margin accounts and accrued receivables related to interest-rate and exchange-rate contracts.

The aggregate on-balance-sheet amount excluded from the risk-based capital calculation is equal to the lower of—

- each contract's positive on-balance-sheet amount or
- its positive market value included in the off-balance-sheet risk-based capital calculation.

For example, a forward contract that is marked to market will have the same market value on the balance sheet as is used in calculating the credit-equivalent amount for off-balance-sheet exposures under the guidelines. Therefore, the on-balance-sheet amount is not included in the risk-based capital calculation. When either the contract's on-balance-sheet amount or its market value is negative or zero, no deduction from on-balance-sheet items is necessary for that contract.

If the positive on-balance-sheet asset amount exceeds the contract's market value, the excess (up to the amount of the on-balance-sheet asset) should be included in the appropriate risk-weight category. For example, a purchased option will often have an on-balance-sheet amount equal to the fee paid until the option expires. If that amount exceeds market value, the excess of carrying value over market value would be included in the appropriate risk-weight category for purposes of the on-balance-sheet portion of the calculation.

Netting of Swaps and Similar Contracts

Netting refers to the offsetting of positive and negative mark-to-market values in the determination of a current exposure to be used in the calculation of a credit-equivalent amount. Any legally enforceable form of bilateral netting (that is, netting with a single counterparty) of derivative contracts is recognized for purposes of calculating the credit-equivalent amount provided that—

- the netting is accomplished under a written netting contract that creates a single legal obligation, covering all included individual contracts, with the effect that the organization would have a claim to receive, or an obligation to receive or pay, only the net amount of the sum of the positive and negative mark-to-market values on included individual contracts if a counterparty, or a counterparty to whom the contract has been validly assigned, fails to perform due to default, insolvency, liquidation, or similar circumstances;
- the banking organization obtains written and reasoned legal opinions that in the event of a legal challenge—including one resulting from default, insolvency, liquidation, or similar circumstances—the relevant court and administrative authorities would find the banking organization's exposure to be such a net amount under—
  - — the law of the jurisdiction in which the counterparty is chartered or the equivalent location in the case of noncorporate entities, and if a branch of the counterparty is involved, then also under the law of the jurisdiction in which the branch is located;
  - — the law that governs the individual contracts covered by the netting contract; and
  - — the law that governs the netting contract;
- the banking organization establishes and maintains procedures to ensure that the legal characteristics of netting contracts are kept under review in light of possible changes in relevant law; and
- the banking organization maintains documentation in its files that is adequate to support the netting of rate contracts, including a copy of the bilateral netting contract and necessary legal opinions.

A contract containing a walkaway clause is not eligible for netting for purposes of calculating the credit-equivalent amount.

By netting individual contracts for the purpose of calculating credit-equivalent amounts of derivative contracts, a banking organization represents that it has met the requirements of the risk-based measure of the capital adequacy guidelines for bank holding companies and that all the appropriate documents are in the organization's files and available for inspection by the Federal Reserve. The Federal Reserve may determine that a banking organization's files are inadequate or that a netting contract, or any of its underlying individual contracts, may not be legally enforceable. If such a determination is made, the netting contract may be disqualified from recognition for risk-based capital purposes, or underlying individual contracts may be treated as though they are not subject to the netting contract.

The credit-equivalent amount of contracts that are subject to a qualifying bilateral netting contract is calculated by adding—

- the current exposure of the netting contract (net current exposure) and
- the sum of the estimates of the potential future credit exposures on all individual contracts subject to the netting contract (gross potential future exposure) adjusted to reflect the effects of the netting contract.

The net current exposure of the netting contract is determined by summing all positive and negative mark-to-market values of the individual contracts included in the netting contract. If the net sum of the mark-to-market values is positive, then the current exposure of the netting contract is equal to that sum. If the net sum of the mark-to-market values is zero or negative, then the current exposure of the netting contract is zero. The Federal Reserve may determine that a netting contract qualifies for risk-based capital netting treatment even though certain individual contracts may not qualify. In these instances, the nonqualifying contracts should be treated as individual contracts that are not subject to the netting contract.

Gross potential future exposure or A_{gross} is calculated by summing the estimates of potential future exposure for each individual contract subject to the qualifying bilateral netting contract. The effects of the bilateral netting contract on the gross potential future exposure are recognized through the application of a formula that results in an adjusted add-on amount (A_{net}). The formula, which employs the ratio of net current exposure to gross current exposure (NGR), is expressed as:

$$A_{net} = (0.4 \times A_{gross}) + 0.6(NGR \times A_{gross})$$

The NGR may be calculated in accordance with either the counterparty-by-counterparty approach or the aggregate approach. Under the counterparty-by-counterparty approach, the NGR is the ratio of the net current exposure for a netting contract to the gross current exposure of the netting contract. The gross current exposure is the sum of the current exposures of all individual contracts subject to the netting contract. Net negative mark-to-market values for individual netting contracts with the same counterparty may not be used to offset net positive mark-to-market values for other netting contracts with the same counterparty.

Under the aggregate approach, the NGR is the ratio of the sum of all the net current exposures for qualifying bilateral netting contracts to the sum of all the gross current exposures for those netting contracts (each gross current exposure is calculated in the same manner as in the counterparty-by-counterparty approach). Net negative mark-to-market values for individual counterparties may not be used to offset net positive current exposures for other counterparties.

A banking organization must consistently use either the counterparty-by-counterparty approach or the aggregate approach to calculate the NGR. Regardless of the approach used, the NGR should be applied individually to each qualifying bilateral netting contract to determine the adjusted add-on for that netting contract.

In the event a netting contract covers contracts that are normally excluded from the risk-based ratio calculation—for example, exchange-rate contracts with an original maturity of 14 or fewer calendar days or instruments traded on exchanges that require daily payment of cash variation margin—an institution may elect to either include or exclude all mark-to-market values of such contracts when determining net current exposure, provided the method chosen is applied consistently.

Examiners are to review the netting of off-balance-sheet derivative contractual arrangements used by banking organizations when calculating or verifying risk-based capital ratios

to ensure that the positions of such contracts are reported gross unless the net positions of those contracts reflect netting arrangements that comply with the netting requirements listed previously.

CAPITAL TREATMENT OF CREDIT DERIVATIVES

Credit derivatives are off-balance-sheet arrangements that allow one party (the beneficiary) to transfer credit risk of a reference asset—which the beneficiary may or may not own—to another party (the guarantor). Many banks increasingly use these instruments to manage their overall credit-risk exposure. In general, credit derivatives have three distinguishing features:

1. the transfer of the credit risk associated with a reference asset through contingent payments based on events of default and, usually, the prices of instruments before, at, and shortly after default (reference assets are most often traded sovereign and corporate debt instruments or syndicated bank loans)
2. the periodic exchange of payments or the payment of a premium rather than the payment of fees customary with other off-balance-sheet credit products, such as letters of credit
3. the use of an International Swap Derivatives Association (ISDA) master agreement and the legal format of a derivatives contract

For risk-based capital purposes, total-rate-of-return swaps and credit-default swaps generally should be treated as off-balance-sheet direct credit substitutes.[7] The notional amount of a contract should be converted at 100 percent to determine the credit-equivalent amount to be included in the risk-weighted assets of a guarantor.[8] A bank that provides a guarantee through a credit derivative transaction should assign its credit exposure to the risk category appropriate to the obligor of the reference asset or any collateral. On the other hand, a bank that owns the underlying asset upon which effective credit protection has been acquired through a credit derivative may, under certain circumstances, assign the unamortized portion of the underlying asset to the risk category appropriate to the guarantor (for example, the 20 percent risk category if the guarantor is an OECD bank).[9]

Whether the credit derivative is considered an eligible guarantee for purposes of risk-based capital depends on the degree of credit protection actually provided, which may be limited depending on the terms of the arrangement. For example, a relatively restrictive definition of a default event or a materiality threshold that requires a comparably high percentage of loss to occur before the guarantor is obliged to pay could effectively limit the amount of credit risk actually transferred in the transaction. If the terms of the credit derivative arrangement significantly limit the degree of risk transference, then the beneficiary bank cannot reduce the risk weight of the ''protected'' asset to that of the guarantor. On the other hand, even if the transfer of credit risk is limited, a banking organization providing limited credit protection through a credit derivative should hold appropriate capital against the underlying exposure while the organization is exposed to the credit risk of the reference asset.

Banking organizations providing a guarantee through a credit derivative may mitigate the credit risk associated with the transaction by entering into an offsetting credit derivative with another counterparty, a so-called ''back-to-back'' position. Organizations that have entered into such a position may treat the first credit derivative as guaranteed by the offsetting transaction for risk-based capital purposes. Accordingly, the notional amount of the first credit derivative may be assigned to the risk category appropriate to the counterparty providing credit protection through the offsetting credit derivative arrangement (for example, to the 20 percent risk category if the counterparty is an OECD bank).

In some instances, the reference asset in the credit derivative transaction may not be identical to the underlying asset for which the

7. Unlike total-rate-of-return swaps and credit-default swaps, credit-linked notes are on-balance-sheet assets or liabilities. A guarantor bank should assign the on-balance-sheet amount of the credit-linked note to the risk category appropriate to either the issuer or the reference asset, whichever is higher. For a beneficiary bank, cash consideration received in the sale of the note may be considered as collateral for risk-based capital purposes.

8. A guarantor bank that has made cash payments representing depreciation on reference assets may deduct such payments from the notional amount when computing credit-equivalent amounts for capital purposes.

9. In addition to holding capital against credit risk, a bank that is subject to the market-risk rule (see ''Market-Risk Measure,'' below) must hold capital against market risk for credit derivatives held in its trading account.

beneficiary has acquired credit protection. For example, a credit derivative used to offset the credit exposure of a loan to a corporate customer may use a publicly traded corporate bond of the customer as the reference asset, whose credit quality serves as a proxy for the on-balance-sheet loan. In such a case, the underlying asset will still generally be considered guaranteed for capital purposes as long as both the underlying asset and the reference asset are obligations of the same legal entity and have the same level of seniority in bankruptcy. In addition, banking organizations offsetting credit exposure in this manner would be obligated to demonstrate to examiners that there is a high degree of correlation between the two instruments; the reference instrument is a reasonable and sufficiently liquid proxy for the underlying asset so that the instruments can be reasonably expected to behave similarly in the event of default; and, at a minimum, the reference asset and underlying asset are subject to mutual cross-default provisions. A banking organization that uses a credit derivative which is based on a reference asset that differs from the protected underlying asset must document the credit derivative being used to offset credit risk and must link it directly to the asset or assets whose credit risk the transaction is designed to offset. The documentation and the effectiveness of the credit derivative transaction are subject to examiner review. Banking organizations providing credit protection through such arrangements must hold capital against the risk exposures that are assumed.

Some credit derivative transactions provide credit protection for a group or basket of reference assets and call for the guarantor to absorb losses on only the first asset in the group that defaults. Once the first asset in the group defaults, the credit protection for the remaining assets covered by the credit derivative ceases. If examiners determine that the credit risk for the basket of assets has effectively been transferred to the guarantor and the beneficiary banking organization owns all of the reference assets included in the basket, then the beneficiary may assign the asset with the smallest dollar amount in the group—if less than or equal to the notional amount of the credit derivative—to the risk category appropriate to the guarantor. Conversely, a banking organization extending credit protection through a credit derivative on a basket of assets must assign the contract's notional amount of credit exposure to the highest risk category appropriate to the assets in the basket. In addition to holding capital against credit risk, a bank that is subject to the market-risk rule (see below) must hold capital against market risk for credit derivatives held in its trading account. (For a description of market-risk capital requirements, see SR-97-18).

CAPITAL TREATMENT OF SYNTHETIC COLLATERALIZED LOAN OBLIGATIONS

Credit derivatives can be used to synthetically replicate collateralized loan obligations (CLOs). Banking organizations can use CLOs and their synthetic variants to manage their balance sheets and, in some instances, transfer credit risk to the capital markets. These transactions allow economic capital to be allocated more efficiently, resulting in, among other things, improved shareholders' returns. A CLO is an asset-backed security that is usually supported by a variety of assets, including whole commercial loans, revolving credit facilities, letters of credit, banker's acceptances, or other asset-backed securities. In a typical CLO transaction, the sponsoring banking organization transfers the loans and other assets to a bankruptcy-remote special-purpose vehicle (SPV), which then issues asset-backed securities consisting of one or more classes of debt. The CLO enables the sponsoring institution to reduce its leverage and risk-based capital requirements, improve its liquidity, and manage credit concentrations.

The first synthetic CLO issued in 1997 used credit-linked notes (CLNs).[10] Rather than transferring assets to the SPV, the sponsoring bank issued CLNs to the SPV, individually referencing the payment obligation of a particular company or ''reference obligor.'' In that particular transaction, the notional amount of the CLNs issued equaled the dollar amount of the reference assets the sponsor was hedging on its balance sheet. Since that time, other structures have evolved that also use credit-default swaps to transfer credit risk and create different levels of risk exposure, but that hedge only a portion of the notional amount of the overall reference

10. CLNs are obligations whose principal repayment is conditioned upon the performance of a referenced asset or portfolio. The assets' performance may be based on a variety of measures, such as movements in price or credit spread, or the occurrence of default.

portfolio. In most traditional CLO structures, assets are actually transferred into the SPV. In synthetic securitizations, the underlying exposures that make up the reference portfolio remain in the institution's banking book. The credit risk is transferred into the SPV through credit-default swaps or CLNs. In this way, the institution is able to avoid sensitive client-relationship issues arising from loan-transfer notification requirements, loan-assignment provisions, and loan-participation restrictions. Client confidentiality also can be maintained.

Under the risk-based capital guidelines, corporate credits are typically assigned to the 100 percent risk category and are assessed 8 percent capital. In the case of high-quality investment-grade corporate exposures, the 8 percent capital requirement may exceed the economic capital that a bank sets aside to cover the credit risk of the transaction. Clearly, one of the motivations behind CLOs and other securitizations is to more closely align the sponsoring institution's regulatory capital requirements with the economic capital required by the market. The introduction of synthetic CLOs has raised questions about their treatment for purposes of calculating the leverage and risk-based capital ratios of the Federal Reserve and other banking agencies.[11] In this regard, supervisors and examiners should consider the capital treatment of synthetic CLOs from the perspective of both investors and sponsoring banking organizations for three types of transactions: (1) the sponsoring banking organization, through a synthetic CLO, hedges the entire notional amount of a reference asset portfolio; (2) the sponsoring banking organization hedges a portion of the reference portfolio and retains a high-quality, senior risk position that absorbs only those credit losses in excess of the junior-loss positions; and (3) the sponsoring banking organization retains a subordinated position that absorbs first losses in a reference portfolio. Each of these transactions is explained more fully below.

Entire Notional Amount of the Reference Portfolio Hedged

In a synthetic securitization that hedges the entire notional amount of the reference portfolio, an SPV acquires the credit risk on a reference portfolio by purchasing CLNs issued by the sponsoring banking organization. The SPV funds the purchase of the CLNs by issuing a series of notes in several tranches to third-party investors. The investor notes are in effect collateralized by the CLNs. Each CLN represents one obligor and the bank's credit-risk exposure to that obligor, which may take the form of, for example, bonds, commitments, loans, and counterparty exposures. Since the noteholders are exposed to the full amount of credit risk associated with the individual reference obligors, all of the credit risk of the reference portfolio is shifted from the sponsoring bank to the capital markets. The dollar amount of notes issued to investors equals the notional amount of the reference portfolio. If there is a default of any obligor linked to a CLN in the SPV, the institution will call the individual note and redeem it based on the repayment terms specified in the note agreement. The term of each CLN is set such that the credit exposure to which it is linked matures before the maturity of the CLN. This ensures that the CLN will be in place for the full term of the exposure to which it is linked.

An investor in the notes issued by the SPV is exposed to the risk of default of the underlying reference assets, as well as to the risk that the sponsoring institution will not repay principal at the maturity of the notes. Because of the linkage between the credit quality of the sponsoring institution and the issued notes, a downgrade of the sponsor's credit rating most likely will result in the notes also being downgraded. Thus, a banking organization investing in this type of synthetic CLO should assign the notes to the higher of the risk categories appropriate to the underlying reference assets or the issuing entity.

For purposes of risk-based capital, the sponsoring banking organizations may treat the cash proceeds from the sale of CLNs that provide protection against underlying reference assets as cash collateralizing these assets.[12] This treatment would permit the reference assets, if carried on the sponsoring institution's books, to be

11. For more information, see SR-99-32, "Capital Treatment for Synthetic Collateralized Obligations."

12. The CLNs should not contain terms that would significantly limit the credit protection provided against the underlying reference assets, for example, a materiality threshold that requires a relatively high percentage of loss to occur before CLN payments are adversely affected, or a structuring of CLN post-default payments that does not adequately pass through credit-related losses on the reference assets to investors in the CLNs.

assigned to the zero percent risk category to the extent that their notional amount is fully collateralized by cash. This treatment may be applied even if the cash collateral is transferred directly into the general operating funds of the institution and is not deposited in a segregated account. The synthetic CLO would not confer any benefits to the sponsoring banking organization for purposes of calculating its tier 1 leverage ratio because the reference assets remain on the organization's balance sheet.

High-Quality, Senior Risk Position in the Reference Portfolio Retained

In some synthetic CLOs, the sponsoring banking organization uses a combination of credit-default swaps and CLNs to essentially transfer the credit risk of a designated portfolio of its credit exposures to the capital markets. This type of transaction allows the sponsoring institution to allocate economic capital more efficiently and to significantly reduce its regulatory capital requirements. In this structure, the sponsoring banking organization purchases default protection from an SPV for a specifically identified portfolio of banking-book credit exposures, which may include letters of credit and loan commitments. The credit risk on the identified reference portfolio (which continues to remain in the sponsor's banking book) is transferred to the SPV through the use of credit-default swaps. In exchange for the credit protection, the sponsoring institution pays the SPV an annual fee. The default swaps on each of the obligors in the reference portfolio are structured to pay the average default losses on all senior unsecured obligations of defaulted borrowers. To support its guarantee, the SPV sells CLNs to investors and uses the cash proceeds to purchase Treasury notes from the U.S. government. The SPV then pledges the Treasuries to the sponsoring banking organization to cover any default losses.[13] The CLNs are often issued in multiple tranches of differing seniority and in an aggregate amount that is significantly less than the notional amount of the reference portfolio. The amount of notes issued typically is set at a level sufficient to cover some multiple of expected losses, but well below the notional amount of the reference portfolio being hedged.

There may be several levels of loss in this type of synthetic securitization. The first-loss position may be a small cash reserve, sufficient to cover expected losses, that accumulates over a period of years and is funded from the excess of the SPV's income (that is, the yield on the Treasury securities plus the credit-default-swap fee) over the interest paid to investors on the notes. The investors in the SPV assume a second-loss position through their investment in the SPV's senior and junior notes, which tend to be rated AAA and BB, respectively. Finally, the sponsoring banking organization retains a high-quality, senior risk position that would absorb any credit losses in the reference portfolio that exceed the first- and second-loss positions. Typically, no default payments are made until the maturity of the overall transaction, regardless of when a reference obligor defaults. While operationally important to the sponsoring banking organization, this feature has the effect of ignoring the time value of money. Thus, when the reference obligor defaults under the terms of the credit derivative and the reference asset falls significantly in value, the sponsoring banking organization should, in accordance with generally accepted accounting principles, make appropriate adjustments in its regulatory reports to reflect the estimated loss relating to the time value of money.

For risk-based capital purposes, banking organizations investing in the notes must assign them to the risk weight appropriate to the underlying reference assets.[14] A banking organization sponsoring such a transaction must include in its risk-weighted assets its retained senior exposures in the reference portfolio, to the extent these are held in its banking book. The portion of the reference portfolio that is collateralized by the pledged Treasury securities may be assigned a zero percent risk weight. The remainder of the portfolio should be risk weighted according to the obligor of the exposures, unless certain stringent minimum conditions are met. When the sponsoring institution has virtually eliminated its credit-risk exposure to the reference portfolio through the issuance of CLNs, and when the other stringent minimum

13. The names of corporate obligors included in the reference portfolio may be disclosed to investors in the CLNs.

14. Under this type of transaction, if a structure exposes investing banking organizations to the creditworthiness of a substantive issuer (for example, the sponsoring institution), then the investing institutions should assign the notes to the higher of the risk categories appropriate to the underlying reference assets or the sponsoring institution.

requirements are met, the institution may assign the uncollateralized portion of its retained senior position in the reference portfolio to the 20 percent risk weight. To the extent that the reference portfolio includes loans and other balance-sheet assets in the banking book, a banking organization that sponsors this type of synthetic securitization would not realize any benefits with respect to the determination of its leverage ratio.

The stringent minimum requirements, which are discussed more fully in the annex to SR-99-32, include (1) the probability of loss on the retained senior position is extremely low due to the high credit quality of the reference portfolio and the amount of prior credit protection; (2) market discipline is injected into the process through the sale of CLNs into the market, the most senior of which must be rated AAA by a nationally recognized credit rating agency; and (3) the sponsoring institution performs rigorous and robust stress testing and demonstrates that the level of credit enhancement is sufficient to protect itself from losses under scenarios appropriate to the specific transaction. The Federal Reserve may impose other requirements as deemed necessary to ensure that the sponsoring institution has virtually eliminated all of its credit exposure. Furthermore, supervisors and examiners retain the discretion to increase the risk-based capital requirement assessed against the retained senior exposure in these structures, if the underlying asset pool deteriorates significantly.

Based on a qualitative review, Federal Reserve staff will determine on a case-by-case basis whether the senior retained portion of a sponsoring banking organization's synthetic securitization qualifies for the 20 percent risk weight. The sponsoring institution must be able to demonstrate that virtually all of the credit risk of the reference portfolio has been transferred from the banking book to the capital markets. As is the case with organizations engaging in more traditional securitization activities, examiners must carefully evaluate whether the institution is fully capable of assessing the credit risk it retains in its banking book and whether it is adequately capitalized given its residual risk exposure. Supervisors will require the sponsoring organization to maintain higher levels of capital if it is not deemed to be adequately capitalized given the retained residual risks. In addition, an institution sponsoring synthetic securitizations must adequately disclose to the marketplace the effect of the transaction on its risk profile and capital adequacy. A failure on the part of the sponsoring banking organization to require the investors in the CLNs to absorb the credit losses that they contractually agreed to assume may be considered an unsafe and unsound banking practice. In addition, this failure generally would constitute ''implicit recourse'' or support to the transaction that would result in the sponsoring banking organization losing the preferential capital treatment on its retained senior position.

If an organization sponsoring a synthetic securitization does not meet the stringent minimum criteria outlined in SR-99-32, it still may reduce the risk-based capital requirement on the senior risk position retained in the banking book by transferring the remaining credit risk to a third-party OECD bank through the use of a credit derivative. Provided the credit derivative transaction qualifies as a guarantee under the risk-based capital guidelines, the risk weight on the senior position may be reduced from 100 percent to 20 percent. Institutions may not enter into nonsubstantive transactions that transfer banking-book items into the trading account to obtain lower regulatory capital requirements.[15]

Retention of a First-Loss Position

In certain synthetic transactions, the sponsoring banking organization may retain the credit risk associated with a first-loss position and, through the use of credit-default swaps, pass the second- and senior-loss positions to a third-party entity, most often an OECD bank. The third-party entity, acting as an intermediary, enters into offsetting credit-default swaps with an SPV, thus transferring its credit risk associated with the second-loss position to the SPV.[16] As described in the second transaction type described above, the SPV then issues CLNs to the capital markets for a portion of the reference portfolio and purchases Treasury collateral to cover some

15. For instance, a lower risk weight would not be applied to a nonsubstantive transaction in which the sponsoring institution enters into a credit derivative to pass the credit risk of the senior retained portion held in its banking book to an OECD bank, and then enters into a second credit derivative transaction with the same OECD bank in which it reassumes into its trading account the credit risk initially transferred.

16. Because the credit risk of the senior position is not transferred to the capital markets but, instead, remains with the intermediary bank, the sponsoring banking organization should ensure that its counterparty is of high credit quality, for example, at least investment grade.

multiple of expected losses on the underlying exposures.

Two alternative approaches could be used to determine how the sponsoring banking organization should treat the overall transaction for risk-based capital purposes. The first approach employs an analogy to the low-level capital rule for assets sold with recourse. Under this rule, a transfer of assets with recourse that is contractually limited to an amount less than the effective risk-based capital requirements for the transferred assets is assessed a total capital charge equal to the maximum amount of loss possible under the recourse obligation. If this rule was applied to a sponsoring banking organization retaining a one percent first-loss position on a synthetically securitized portfolio that would otherwise be assessed 8 percent capital, the organization would be required to hold dollar-for-dollar capital against the one percent first-loss risk position. The sponsoring institution would not be assessed a capital charge against the second and senior risk positions.[17]

The second approach employs a literal reading of the capital guidelines to determine the sponsoring banking organization's risk-based capital charge. In this instance, the one percent first-loss position retained by the sponsoring institution would be treated as a guarantee, that is, a direct credit substitute, which would be assessed an 8 percent capital charge against its face value of one percent. The second-loss position, which is collateralized by Treasury securities, would be viewed as fully collateralized and subject to a zero percent capital charge. The senior-loss position guaranteed by the intermediary bank would be assigned to the 20 percent risk category appropriate to claims guaranteed by OECD banks.[18] It is possible that this approach may result in a higher risk-based capital requirement than the dollar-for-dollar capital charge imposed by the first approach—depending on whether the reference portfolio consists primarily of loans to private obligors, or undrawn long-term commitments. These commitments generally have an effective risk-based capital requirement that is one-half the requirement for loans, since they are converted to an on-balance-sheet credit-equivalent amount using the 50 percent conversion factor. If the reference pool consists primarily of drawn loans to commercial obligors, then the capital requirement on the senior-loss position would be significantly higher than if the reference portfolio contained only undrawn long-term commitments. As a result, the capital charge for the overall transaction could be greater than the dollar-for-dollar capital requirement set forth in the first approach.

Sponsoring institutions are required to hold capital against a retained first-loss position in a synthetic securitization. The capital should equal the higher of the two capital charges resulting from the sponsoring institution's application of the first and second approaches outlined above. Further, although the sponsoring banking organization retains only the credit-risk associated with the first-loss position, it still should continue to monitor all the underlying credit exposures of the reference portfolio to detect any changes in the credit-risk profile of the counterparties. This is important to ensure that the institution has adequate capital to protect against unexpected losses. Examiners should determine whether the sponsoring bank has the capability to assess and manage the retained risk in its credit portfolio after the synthetic securitization is completed. For risk-based capital purposes, banking organizations investing in the notes must assign them to the risk weight appropriate to the underlying reference assets.[19]

ASSESSING CAPITAL ADEQUACY AT LARGE, COMPLEX BANKING ORGANIZATIONS

Supervisors should place increasing emphasis on banking organizations' internal processes for

17. A banking organization that sponsors this type of synthetic securitization would not realize any benefits in the determination of its leverage ratio since the reference assets themselves remain on the sponsoring institution's balance sheet.

18. If the intermediary is a banking organization, then it could place both sets of credit-default swaps in its trading account and, if subject to the Federal Reserve's market-risk capital rules, use its general market-risk model and, if approved, specific-risk model to calculate the appropriate risk-based capital requirement. If the specific-risk model has not been approved, then the sponsoring banking organization would be subject to the standardized specific-risk capital charge.

19. Under this type of transaction, if a structure exposes investing banking organizations to the creditworthiness of a substantive issuer (for example, the sponsoring institution), then the investing institutions should assign the notes to the higher of the risk categories appropriate to the underlying reference assets or the sponsoring institution.

assessing risks and for ensuring that capital, liquidity, and other financial resources are adequate in relation to the organization's overall risk profiles. This emphasis is necessary in part because of the greater scope and complexity of business activities, particularly those related to ongoing financial innovation, at many banking organizations. In this setting, one of the most challenging issues bankers and supervisors face is how to integrate the assessment of an institution's capital adequacy with a comprehensive view of the risks it faces. Simple ratios—including risk-based capital ratios—and traditional ''rules of thumb'' no longer suffice in assessing the overall capital adequacy of many banking organizations, especially large institutions and others with complex risk profiles, such as those that are significantly engaged in securitizations or other complex transfers of risk.

Consequently, supervisors and examiners should evaluate internal capital-management processes to judge whether they meaningfully tie the identification, monitoring, and evaluation of risk to the determination of an institution's capital needs. The fundamental elements of a sound internal analysis of capital adequacy include measuring all material risks, relating capital to the level of risk, stating explicit capital adequacy goals with respect to risk, and assessing conformity to an institution's stated objectives. It is particularly important that large institutions and others with complex risk profiles be able to assess their current capital adequacy and future capital needs systematically and comprehensively, in light of their risk profiles and business plans. For more information, see SR-99-18, ''Assessing Capital Adequacy in Relation to Risk at Large Banking Organizations and Others with Complex Risk Profiles.''

The practices described in this subsection extend beyond those currently followed by most large banking organizations to evaluate their capital adequacy. Therefore, supervisors and examiners should not expect these institutions to immediately have in place a comprehensive internal process for assessing capital adequacy. Rather, examiners should look for efforts to initiate such a process and thereafter make steady and meaningful progress toward a comprehensive assessment of capital adequacy. Examiners should evaluate an institution's progress at each examination or inspection, considering progress relative to both the institution's former practice and its peers, and record the results of this evaluation in the examination or inspection report.

For those banking organizations actively involved in complex securitizations, other secondary-market credit activities, or other complex transfers of risk, examiners should expect a sound internal process for capital adequacy analysis to be in place immediately as a matter of safe and sound banking. Secondary-market credit activities generally include loan syndications, loan sales and participations, credit derivatives, and asset securitizations, as well as the provision of credit enhancements and liquidity facilities to such transactions. These activities are described further in SR-97-21, ''Risk Management and Capital Adequacy of Exposures Arising from Secondary-Market Credit Activities.''

Examiners should evaluate whether an organization is making adequate progress in assessing its capital needs on the basis of the risks arising from its business activities, rather than focusing its internal processes primarily on compliance with regulatory standards or comparisons with the capital ratios of peer institutions. In addition to evaluating an organization's current practices, supervisors and examiners should take account of plans and schedules to enhance existing capital-assessment processes and related risk-measurement systems, with appropriate sensitivity to transition timetables and implementation costs. Evaluation of adherence to schedules should be part of the examination and inspection process. Regardless of planned enhancements, supervisors should expect current internal processes for capital adequacy assessment to be appropriate to the nature, size, and complexity of an organization's activities, and to its process for determining the allowance for credit losses.

The results of the evaluation of internal processes for assessing capital adequacy should currently be reflected in the institution's ratings for management. Examination and inspection reports should contain a brief description of the internal processes involved in internal analysis of the adequacy of capital in relation to risk, an assessment of whether these processes are adequate for the complexity of the institution and its risk profile, and an evaluation of the institution's efforts to develop and enhance these processes. Significant deficiencies and inadequate progress in developing and maintaining capital-assessment procedures should be noted in examination and inspection reports. As noted above, examiners

should expect those institutions already engaged in complex activities involving the transfer of risk, such as securitization and related activities, to have sound internal processes for analyzing capital adequacy in place immediately as a fundamental component of safe and sound operation. As these processes develop and become fully implemented, supervisors and examiners should also increasingly rely on internal assessments of capital adequacy as an integral part of an institution's capital adequacy rating. If these internal assessments suggest that capital levels appear to be insufficient to support the risks taken by the institution, examiners should note this finding in examination and inspection reports, discuss plans for correcting this insufficiency with the institution's directors and management, and initiate supervisory actions, as appropriate.

Fundamental Elements of a Sound Internal Analysis of Capital Adequacy

Because risk-measurement and -management issues are evolving rapidly, it is currently neither possible nor desirable for supervisors to prescribe in detail the precise contents and structure of a sound and effective internal capital-assessment process for large and complex institutions. Indeed, the attributes of sound practice will evolve over time as methodologies and capabilities change, and will depend significantly on the individual circumstances of each institution. Nevertheless, a sound process for assessing capital adequacy should include four fundamental elements:

1. *Identifying and measuring all material risks.* A disciplined risk-measurement program promotes consistency and thoroughness in assessing current and prospective risk profiles, while recognizing that risks often cannot be precisely measured. The detail and sophistication of risk measurement should be appropriate to the characteristics of an institution's activities and to the size and nature of the risks that each activity presents. At a minimum, risk-measurement systems should be sufficiently comprehensive and rigorous to capture the nature and magnitude of risks faced by the institution, while differentiating risk exposures consistently among risk categories and levels. Controls should be in place to ensure objectivity and consistency and that all material risks, both on- and off-balance-sheet, are adequately addressed.

   Banking organizations should conduct detailed analyses to support the accuracy or appropriateness of the risk-measurement techniques used. Similarly, inputs used in risk measurement should be of good quality. Those risks not easily quantified should be evaluated through more subjective, qualitative techniques or through stress testing. Changes in an institution's risk profile should be incorporated into risk measures on a timely basis, whether the changes are due to new products, increased volumes or changes in concentrations, the quality of the bank's portfolio, or the overall economic environment. Thus, measurement should not be oriented to the current treatment of these transactions under risk-based capital regulations. When measuring risks, institutions should perform comprehensive and rigorous stress tests to identify possible events or changes in markets that could have serious adverse effects in the future. Institutions should also give adequate consideration to contingent exposures arising from loan commitments, securitization programs, and other transactions or activities that may create these exposures for the bank.
2. *Relating capital to the level of risk.* The amount of capital held should reflect not only the measured amount of risk, but also an adequate ''cushion'' above that amount to take account of potential uncertainties in risk measurement. A banking organization's capital should reflect the perceived level of precision in the risk measures used, the potential volatility of exposures, and the relative importance to the institution of the activities producing the risk. Capital levels should also reflect that historical correlations among exposures can rapidly change. Institutions should be able to demonstrate that their approach to relating capital to risk is conceptually sound and that outputs and results are reasonable. An institution could use sensitivity analysis of key inputs and peer analysis in assessing its approach. One credible method for assessing capital adequacy is for an institution to consider itself adequately capitalized if it meets a reasonable and objectively determined standard of financial health, tempered by sound judgment—for example, a target public-agency debt rating or even a

statistically measured maximum probability of becoming insolvent over a given time horizon. In effect, this latter method is the foundation of the Basel Accord's treatment of capital requirements for market foreign-exchange risk.

3. *Stating explicit capital adequacy goals with respect to risk.* Institutions need to establish explicit goals for capitalization as a standard for evaluating their capital adequacy with respect to risk. These target capital levels might reflect the desired level of risk coverage or, alternatively, a desired credit rating for the institution that reflects a desired degree of creditworthiness and, thus, access to funding sources. These goals should be reviewed and approved by the board of directors. Because risk profiles and goals may differ across institutions, the chosen target levels of capital may differ significantly as well. Moreover, institutions should evaluate whether their long-run capital targets might differ from short-run goals, based on current and planned changes in risk profiles and the recognition that accommodating new capital needs can require significant lead time.

   In addition, capital goals and the monitoring of performance against those goals should be integrated with the methodology used to identify the adequacy of the allowance for credit losses (the allowance). Although both the allowance and capital represent the ability to absorb losses, insufficiently clear distinction of their respective roles in absorbing losses can distort analysis of their adequacy. For example, an institution's internal standard of capital adequacy for credit risk could reflect the desire that capital absorb ''unexpected losses,'' that is, some level of potential losses in excess of that level already estimated as being inherent in the current portfolio and reflected in the allowance.[20] In this setting, an institution that does not maintain its allowance at the high end of the range of estimated credit losses would require more capital than would otherwise be necessary to maintain its overall desired capacity to absorb potential losses. Failure to recognize this relationship could lead an institution to overestimate the strength of its capital position.
4. *Assessing conformity to the institution's stated objectives.* Both the target level and composition of capital, along with the process for setting and monitoring such targets, should be reviewed and approved periodically by the institution's board of directors.

Risks Addressed in a Sound Internal Analysis of Capital Adequacy

Sound internal risk-measurement and capital-assessment processes should address the full range of risks faced by an institution. The four risks listed below do not represent an exhaustive list of potential issues that should be addressed. The capital regulations of the Federal Reserve and other U.S. banking agencies refer to many specific factors and other risks that institutions should consider in assessing capital adequacy.

- *Credit risk.* Internal credit-risk-rating systems are vital to measuring and managing credit risk at large banking organizations. Accordingly, a large institution's internal ratings system should be adequate to support the identification and measurement of risk for its lending activities and adequately integrated into the institution's overall analysis of capital adequacy. Well-structured credit-risk-rating systems should reflect implicit, if not explicit, judgments of loss probabilities or expected loss, and should be supported where possible by quantitative analyses. Definitions of risk ratings should be sufficiently detailed and descriptive, applied consistently, and regularly reviewed for consistency throughout the institution. SR-98-25, ''Sound Credit-Risk Management and the Use of Internal Credit-Risk Ratings at Large Banking Organizations,'' discusses the need for banks to have sufficiently detailed, consistent, and accurate risk ratings for all loans, not only for criticized or problem credits. It describes an emerging sound practice of incorporating such ratings information into internal capital frameworks, recognizing that riskier assets require higher capital levels.

  Banking organizations should also take full account of credit risk arising from securitiza-

20. In March 1999, the banking agencies and the Securities and Exchange Commission issued a joint interagency letter to financial institutions stressing that depository institutions should have prudent and conservative allowances that fall within an acceptable range of estimated losses. The Federal Reserve has issued additional guidance on credit-loss allowances to supervisors and bankers in SR-99-13, ''Recent Developments Regarding Loan-Loss Allowances.''

tion and other secondary-market credit activities, including credit derivatives. Maintaining detailed and comprehensive credit-risk measures is most necessary at institutions that conduct asset securitization programs, due to the potential of these activities to greatly change—and reduce the transparency of—the risk profile of credit portfolios. SR-97-21, ''Risk Management and Capital Adequacy of Exposures Arising from Secondary-Market Credit Activities,'' states that such changes have the effect of distorting portfolios that were previously ''balanced'' in terms of credit risk. As used here, the term ''balanced'' refers to the overall weighted mix of risks assumed in a loan portfolio by the current regulatory risk-based capital standard. This standard, for example, effectively treats the commercial loan portfolios of all banks as having ''typical'' levels of risk. The current capital standard treats most loans alike; consequently, banks have an incentive to reduce their regulatory capital requirements by securitizing or otherwise selling lower-risk assets, while increasing the average level of remaining credit risk through devices like first-loss positions and contingent exposures. It is important, therefore, that these institutions have the ability to assess their remaining risks and hold levels of capital and allowances for credit losses. These institutions are at the frontier of financial innovation, and they should also be at the frontier of risk measurement and internal capital allocation.

- *Market risk.* The current regulatory capital standard for market risk (see ''Market-Risk Measure,'' below) is based largely on a bank's own measure of value-at-risk (VAR). This approach was intended to produce a more accurate measure of risk and one that is also compatible with the management practices of banks. The market-risk standard also emphasizes the importance of stress testing as a critical complement to a mechanical VAR-based calculation in evaluating the adequacy of capital to support the trading function.
- *Interest-rate risk.* Interest-rate risk within the banking book (that is, in nontrading activities) should also be closely monitored. The banking agencies have emphasized that banks should carefully assess the risk to the economic value of their capital from adverse changes in interest rates. The ''Joint Policy Statement on Interest-Rate Risk,'' SR-96-13, provides guidance in this matter that includes the importance of assessing interest-rate risk to the economic value of a banking organization's capital and, in particular, sound practice in selecting appropriate interest-rate scenarios to be applied for capital adequacy purposes.
- *Operational and other risks.* Many banking organizations see operational risk—often viewed as any risk not categorized as credit or market risk—as second in significance only to credit risk. This view has become more widely held in the wake of recent, highly visible breakdowns in internal controls and corporate governance by internationally active institutions. Although operational risk does not easily lend itself to quantitative measurement, it can have substantial costs to banking organizations through error, fraud, or other performance problems. The great dependence of banking organizations on information technology systems highlights only one aspect of the growing need to identify and control this operational risk.

Examiner Review of Internal Analysis of Capital Adequacy

Supervisors and examiners should review internal processes for capital assessment at large and complex banking organizations, as well as the adequacy of their capital and their compliance with regulatory standards, as part of the regular supervisory process. In general, this review should assess the degree to which an institution has in place, or is making progress toward implementing, a sound internal process to assess capital adequacy as described above. Examiners should briefly describe in the examination or inspection report the approach and internal processes used by an institution to assess its capital adequacy with respect to the risks it takes. Examiners should then document their evaluation of the adequacy and appropriateness of these processes for the size and complexity of the institution, along with their assessment of the quality and timing of the institution's plans to develop and enhance its processes for evaluating capital adequacy with respect to risk. In all cases, the findings of this review should be considered in determining the institution's supervisory rating for management. Over time, this review should also become an integral element of assessing and assigning a supervisory rating for capital adequacy as the institution

develops appropriate processes for establishing capital targets and analyzing its capital adequacy as described above. If an institution's internal assessments suggest that capital levels appear to be insufficient to support its risk positions, examiners should note this finding in examination and inspection reports, discuss plans for correcting this insufficiency with the institution's directors and management, and, as appropriate, initiate follow-up supervisory actions.

Supervisors and examiners should assess the degree to which internal targets and processes incorporate the full range of material risks faced by a banking organization. Examiners should also assess the adequacy of risk measures used in assessing internal capital adequacy for this purpose, and the extent to which these risk measures are also used operationally in setting limits, evaluating business-line performance, and evaluating and controlling risk more generally. Measurement systems that are in place but are not integral to an institution's risk management should be viewed with some skepticism. Supervisors and examiners should review whether an institution treats similar risks across products and/or business lines consistently, and whether changes in the institution's risk profile are fully reflected in a timely manner. Finally, supervisors and examiners should consider the results of sensitivity analyses and stress tests conducted by the institution, and how these results relate to capital plans.

In addition to being in compliance with regulatory capital ratios, banking organizations should be able to demonstrate through internal analysis that their capital levels and composition are adequate to support the risks they face, and that these levels are properly monitored and reviewed by directors. Supervisors and examiners should review this analysis, including the target levels of capital chosen, to determine whether it is sufficiently comprehensive and relevant to the current operating environment. Supervisors and examiners should also consider the extent to which an institution has provided for unexpected events in setting its capital levels. In this connection, the analysis should cover a sufficiently wide range of external conditions and scenarios, and the sophistication of techniques and stress tests used should be commensurate with the institution's activities. Consideration of such conditions and scenarios should take appropriate account of the possibility that adverse events may have disproportionate effects on overall capital levels, such as the effect of tier 1 limitations, adverse capital-market responses, and other such magnification effects. Finally, supervisors should consider the quality of the institution's management information reporting and systems, the manner in which business risks and activities are aggregated, and management's record in responding to emerging or changing risks.

In performing this review, supervisors and examiners should be careful to distinguish between (1) a comprehensive process that seeks to identify an institution's capital requirements on the basis of measured economic risk, and (2) one that focuses only narrowly on the calculation and use of allocated capital (also known as ''economic value added'' or EVA) for individual products or business lines for internal profitability analysis. The latter approach, which measures the amount by which operations or projects return more or less than their cost of capital, can be important to an organization in targeting activities for future growth or cutbacks. However, it requires that the organization first determine by some method the amount of capital necessary for each activity or business line. Moreover, an EVA approach often is unable to meaningfully aggregate the allocated capital across business lines and risk types as a tool for evaluating the institution's overall capital adequacy. Supervisors and examiners should therefore focus on the first process above and should not be confused with related efforts of management to measure relative returns of the firm or of individual business lines, given an amount of capital already invested or allocated.

MARKET-RISK MEASURE

In August 1996, the Federal Reserve amended its risk-based capital framework to incorporate a measure for market risk. (See 12 CFR 208, appendix E, for state member banks and 12 CFR 225, appendix E, for bank holding companies.) As described more fully below, certain institutions with significant exposure to market risk must measure that risk using their internal value-at-risk (VAR) measurement model and, subject to parameters contained in the market-risk rules, hold sufficient levels of capital to cover the exposure. The market-risk amendment is a supplement to the credit risk-based capital rules: An institution applying the market-risk rules remains subject to the requirements of the

credit-risk rules, but must adjust its risk-based capital ratio to reflect market risk.[21]

Covered Banking Organizations

The market-risk rules apply to any insured state member bank or bank holding company whose trading activity (on a worldwide consolidated basis) equals (1) 10 percent or more of its total assets or (2) $1 billion or more. For purposes of these criteria, a banking organization's trading activity is defined as the sum of its trading assets and trading liabilities as reported in its most recent Consolidated Report of Condition and Income (call report) for a bank or in its most recent Y-9C report for a bank holding company. Total assets means quarter-end total assets as most recently reported by the institution. When addressing this capital requirement, bank holding companies should include any section 20 subsidiary as well as any other subsidiaries consolidated in their FR Y-9 reports.

In addition, on a case-by-case basis, the Federal Reserve may require an institution that does not meet the applicability criteria to comply with the market-risk rules if it deems it necessary for safety-and-soundness reasons, or may exclude an institution that meets the applicability criteria if its recent or current exposure is not reflected by the level of its ongoing trading activity. Institutions most likely to be exempted from this capital requirement are small banks whose reported trading activities exceed the 10 percent criterion but whose management of trading risks does not raise supervisory concerns. Such banks may be those whose trading activities focus on maintaining a market in local municipal securities, but who are not otherwise actively engaged in trading or position-taking activities. However, before making any exceptions to the criteria, Reserve Banks should consult with Board staff. An institution that does not meet the applicability criteria may, subject to supervisory approval, comply voluntarily with the market-risk rules. An institution applying the market-risk rules must have its internal-model and risk-management procedures evaluated by the Federal Reserve to ensure compliance with the rules.

21. An institution adjusts its risk-based capital ratio by removing certain assets from its credit-risk weight categories and, instead, including those assets (and others) in the measure for market risk.

Covered Positions

For supervisory purposes, a covered banking organization must hold capital to support its exposure to *general market risk* arising from fluctuations in interest rates, equity prices, foreign-exchange rates, and commodity prices, including risk associated with all derivative positions. In addition, capital must support its exposure to *specific risk* arising from changes in the market value of debt and equity positions in the trading account due to factors other than broad market movements, including the credit risk of an instrument's issuer. An institution's covered positions include all of its trading-account positions as well as all foreign-exchange and commodity positions, whether or not they are in the trading account.

For market-risk capital purposes, an institution's trading account is defined in the instructions to the banking agencies' call report. In general, the trading account includes on- and off-balance-sheet positions in financial instruments acquired with the intent to resell in order to profit from short-term price or rate movements (or other price or rate variations). All positions in the trading account must be marked to market and reflected in an institution's earnings statement. Debt positions in the trading account include instruments such as fixed or floating-rate debt securities, nonconvertible preferred stock, certain convertible bonds, or derivative contracts of debt instruments. Equity positions in the trading account include instruments such as common stock, certain convertible bonds, commitments to buy or sell equities, or derivative contracts of equity instruments. An institution may include in its measure for general market risk certain nontrading account instruments that it deliberately uses to hedge trading activities. Those instruments are not subject to a specific-risk capital charge, but instead continue to be included in risk-weighted assets under the credit-risk framework.

The market-risk capital charge applies to all of an institution's foreign-exchange and commodities positions. An institution's foreign-exchange positions include, for each currency, items such as its net spot position (including ordinary assets and liabilities denominated in a foreign currency), forward positions, guarantees that are certain to be called and likely to be unrecoverable, and any other items that react primarily to changes in exchange rates. An institution may, subject to examiner approval,

exclude from the market-risk measure any structural positions in foreign currencies. For this purpose, structural positions include transactions designed to hedge an institution's capital ratios against the effect of adverse exchange-rate movements on (1) subordinated debt, equity, or minority interests in consolidated subsidiaries and capital assigned to foreign branches that are denominated in foreign currencies, and (2) any positions related to unconsolidated subsidiaries and other items that are deducted from an institution's capital when calculating its capital base. An institution's commodity positions include all positions, including derivatives, that react primarily to changes in commodity prices.

Adjustment to the Risk-Based Capital Calculation

An institution applying the market-risk rules must measure its market risk and, on a daily basis, hold capital to maintain an overall minimum 8.0 percent ratio of total qualifying capital to risk-weighted assets adjusted for market risk.

An institution's risk-based capital ratio denominator is its adjusted credit-risk-weighted assets plus its market-risk-equivalent assets. Adjusted risk-weighted assets are risk-weighted assets, as determined under the credit-risk-based capital standards, less the risk-weighted amounts of all covered positions other than foreign-exchange positions outside the trading account and over-the-counter (OTC) derivatives. (In other words, an institution should not risk weight (or could risk weight at zero percent) any nonderivative debt, equity, or foreign-exchange positions in its trading account and any nonderivative commodity positions whether in or out of the trading account. These positions are no longer subject to a credit-risk capital charge.) An institution's market-risk-equivalent assets is its measure for market risk (determined as discussed in the following sections) multiplied by 12.5 (the reciprocal of the minimum 8.0 percent capital ratio).

An institution's measure for market risk is a VAR-based capital charge plus an add-on capital charge for specific risk. The VAR-based capital charge is the larger of either (1) the average VAR measure for the last 60 business days, calculated under the regulatory criteria and increased by a multiplication factor ranging from three to four, or (2) the previous day's VAR calculated under the regulatory criteria, but without the multiplication factor. An institution's multiplication factor is three unless its backtesting[22] results or supervisory judgment indicate that a higher factor or other action is appropriate.

An institution's risk-based capital ratio numerator consists of a combination of core (tier 1) capital; supplemental (tier 2) capital; and a third tier of capital (tier 3), which may only be used to meet market-risk capital requirements. To qualify as capital, instruments must be unsecured and may not contain or be covered by any covenants, terms, or restrictions that are inconsistent with safe and sound banking practices. Tier 3 capital is subordinated debt with an original maturity of at least two years. It must be fully paid up and subject to a lock-in clause that prevents the issuer from repaying the debt even at maturity if the issuer's capital ratio is, or with repayment would become, less than the minimum 8.0 percent risk-based capital ratio.

An institution must satisfy the overall conditions that at least 50 percent of its total qualifying capital must be tier 1 capital and term subordinated debt (excluding mandatory convertible debt), and intermediate term preferred stock (and related surplus) may not exceed 50 percent of tier 1 capital. In addition, an institution's tier 3 capital must not exceed 250 percent of its tier 1 capital allocated for market risk (that is, tier 3 capital is limited to 71.4 percent of the institution's measure for market risk).[23]

Internal Models

An institution applying the market-risk rules must use its internal model to measure its daily VAR in accordance with the rule's requirements. However, institutions can and will use different assumptions and modeling techniques when determining their VAR measures for internal

22. Beginning one year after an institution begins to apply the market-risk rules, it must begin "backtesting" its VAR measures generated for internal risk-management purposes against actual trading results to assist in evaluating the accuracy of its internal model.

23. The market-risk rules (12 CFR 208 appendix E, section 3(b)(2)) discuss "allocating" capital to cover credit risk and market risk. The allocation terminology is only relevant for the limit on tier 3 capital. Otherwise, as long as the 50 percent tier 1 and tier 2/tier 3 condition is satisfied, there is no requirement that an institution must allocate or identify its capital for credit or market risk.

risk-management purposes. These differences often reflect distinct business strategies and approaches to risk management. For example, an institution may calculate VAR using an internal model based on variance-covariance matrices, historical simulations, Monte Carlo simulations, or other statistical approaches. In all cases, however, the model must cover the institution's material risks.[24] Where shortcomings exist, the use of the model for the calculation of general market risk may be allowed, subject to certain conditions designed to correct deficiencies in the model within a given timeframe.

The market-risk rules do not specify modeling parameters for an institution's internal risk-management purposes. However, the rules do include minimum qualitative requirements for internal risk-management processes, as well as certain quantitative requirements for the parameters and assumptions for internal models used to measure market-risk exposure for regulatory capital purposes. Examiners should verify that an institution's risk-measurement model and risk-management system conform to the minimum qualitative and quantitative requirements discussed below.

Qualitative Requirements

The qualitative requirements reiterate several basic components of sound risk management discussed in earlier sections of this manual. For example, an institution must have a risk-control unit that reports directly to senior management and is independent from business-trading functions. The risk-control unit is expected to conduct regular backtests to evaluate the model's accuracy and conduct stress tests to identify the impact of adverse market events on the institution's portfolio. An in-depth understanding of the risk-control unit's role and responsibilities is completed through discussions with the institution's market-risk and senior management teams and through the review of documented policies and procedures. In addition, examiners should review the institution's organizational structure and risk-management committees and minutes. The review of committee minutes provides insights into the level of discussion of market-risk issues by senior management and, in some cases, by outside directors of the institution.

An institution must have an internal model that is fully integrated into its daily management, must have policies and procedures for conducting appropriate stress tests and backtests and for responding to the results of those tests, and must conduct independent reviews of its risk-management and -measurement systems at least annually. An institution should develop and use those stress tests appropriate to its particular situation. Thus, the market-risk rules do not include specific stress-test methodologies.

An institution's stress tests should be rigorous and comprehensive enough to cover a range of factors that could create extraordinary losses in a trading portfolio, or that could make the control of risk in a portfolio difficult. The review of stress testing is important, given that VAR-based models are designed to measure market risk in relatively stable markets (for example, at a 99 percent confidence interval, as prescribed in the market-risk amendment to the capital rules). However, sound risk-management practices require analyses of wider market conditions. Examiners should review the institution's policies and procedures for conducting stress tests and assess the timeliness and frequency of stress tests, the comprehensive capture of traded positions and parameters (for example, changes in risk factors), and the dissemination and use of testing results. Examiners should pay particular attention to whether stress tests result in an effective management tool for controlling exposure and their ''plausibility'' in relation to the institution's risk profile. Stress testing continues to be more of an art than a science, and the role of the examiner is to ensure that institutions have the appropriate capabilities, processes, and management oversight to conduct meaningful stress testing.

Stress tests should be both qualitative and quantitative, incorporate both market risk and liquidity aspects of market disturbances, and reflect the impact of an event on positions with either linear or nonlinear price characteristics. Examiners should assess whether banks are in a position to conduct three types of broad stress tests—those incorporating (1) historical events, using market data from the respective time periods; (2) hypothetical events, using ''market data'' constructed by the institution to model

24. For institutions using an externally developed or outsourced risk-measurement model, the model may be used for risk-based capital purposes provided it complies with the requirements of the market-risk rules, management fully understands the model, the model is integrated into the institution's daily risk management, and the institution's overall risk-management process is sound.

extreme market events that would pose a significant financial risk to the institution; and (3) institution-specific analysis, based on the institution's portfolios, that identifies key vulnerabilities. When stress tests reveal a particular vulnerability, the institution should take effective steps to appropriately manage those risks.

An institution's independent review of its risk-management process should include the activities of business-trading units and the risk-control unit. Examiners should verify that an institution's review includes assessing whether its risk-management system is fully integrated into the daily management process and whether the system is adequately documented. Examiner assessments of the integration of risk models into the daily market-risk-management process is a fundamental component of the review for compliance with the market-risk capital rule. As a starting point, examiners should review the risk reports that are generated by the institution's internal model to assess the ''stratification,'' or level of detail of information provided to different levels of management, from head traders to senior managers and directors. The review should evaluate the organizational structure of the risk-control unit and analyze the approval process for risk-pricing models and valuation systems. The institution's review should consider the scope of market risks captured by the risk-measurement model; accuracy and completeness of position data; verification of the consistency, timeliness, and reliability of data sources used to run the internal model; accuracy and appropriateness of volatility and correlation assumptions; and validity of valuation and risk-transformation calculations. Examiners should assess the degree to which the institution's methodology serves as the basis for trading limits allocated to the various trading-business units. Examiners should review this limit structure to assess its coverage of risk sensitivities within the trading portfolio. In addition, examiners should assess the limit-development and -monitoring mechanisms to ensure that positions versus limits and excessions are appropriately documented and approved.

In addition to formal reviews, examiners and specialist teams may hold regular discussions with institutions regarding their market-risk exposures and the methodologies they employ to measure and control these risks. These discussions enable supervisors to remain abreast of the institution's changes in methodology (for example, its treatment of nonlinear risks or its approach to stress testing) and its ongoing compliance with the market-risk capital rule. These discussions are particularly important during turbulent markets where exposures and capital may be affected by dramatic swings in market volatility.

In order to monitor compliance with the market-risk amendment and to further their understanding of market-risk exposures, supervisors should make quarterly requests to institutions subject to the market-risk amendment for the following information:

- total trading gain or loss for the quarter (net interest income from trading activities plus realized and unrealized trading gain or loss)
- average risk-based capital charge for market risk during the quarter
- market-risk capital charge for specific risk during the quarter
- market-risk capital charge for general risk during the quarter
- average one-day VAR for the quarter
- maximum one-day VAR for the quarter
- largest one-day loss during the quarter and the VAR for the preceding day
- the number of times the loss exceeded the one-day VAR during the quarter, and for each occurrence, the amount of the loss and the prior day's VAR
- the cause of backtesting exceptions, either by portfolio or major risk factor (for example, volatility in the S&P 500)
- the market-risk multiplier currently in use

If significant deficiencies are uncovered, examiners may require the institution's audit group to enhance the scope and independence of its market-risk review processes. If the audit or independent review function lacks expertise in this area, examiners may require that the institution outsource this review to a qualified independent consultant. Follow-up discussions are held with the institution once appropriate review scopes are developed and upon the completion of such reviews.

Quantitative Requirements

To ensure that an institution with significant market risk holds prudential levels of capital and

that regulatory capital charges for market risk are consistent across institutions with similar exposures, an institution's VAR measures must meet the following quantitative requirements:

- The VAR methodology must be commensurate with the nature and size of the institution's trading activities and risk profile. Because the capital rules do not prescribe a particular VAR methodology, the institution can use generally accepted techniques, such as variance-covariance, historical simulation, and Monte Carlo simulations.
- VAR measures must be computed each business day based on a 99 percent (one-tailed) confidence level of estimated maximum loss.
- VAR measures must be based on a price shock equivalent to a 10-day movement in rates and prices. The Federal Reserve believes that shorter periods do not adequately reflect the price movements that are likely during periods of market volatility and that they would significantly understate the risks embedded in options positions, which display nonlinear price characteristics. The Board recognizes, however, that it may be overly burdensome for institutions to apply precise 10-day price or rate movements to options positions at this time and, accordingly, will permit institutions to estimate one-day price movements using the ''square root of time'' approach.[25] As banks enhance their modeling techniques, examiners should consider whether they are making substantive progress in developing adequate and more robust methods for identifying nonlinear price risks. Such progress is particularly important at institutions with sizable options positions.
- VAR measures must be based on a minimum historical observation period of one year for estimating future price and rate changes. If historical market movements are not weighted evenly over the observation period, the weighted average for the observation period must be at least six months, which is equivalent to the average for the minimum one-year observation period.
- An institution must update its model data at least once every three months and more frequently if market conditions warrant.
- VAR measures may incorporate empirical correlations (calculated from historical data on rates and prices) both within and across broad risk categories, subject to examiner confirmation that the model's system for measuring such correlation is sound. If an institution's model does not incorporate empirical correlations across risk categories, then the institution must calculate the VAR measures by summing the separate VAR measures for the broad risk categories (that is, interest rates, equity prices, foreign-exchange rates, and commodity prices).

During the examination process, examiners should review an institution's risk-management process and internal model to ensure that it processes all relevant data and that modeling and risk-management practices conform to the parameters and requirements of the market-risk rule. When reviewing an internal model for risk-based capital purposes, examiners may consider reports and opinions about the accuracy of an institution's model that have been generated by external auditors or qualified consultants.

If a banking institution does not fully comply with a particular standard, examiners should review the banking institution's plan for meeting the requirement of the market-risk amendment. These reviews should be tailored to the institution's risk profile (for example, its level of options activity) and methodologies.

In reviewing the model's ability to capture optionality, examiners' reviews should identify the subportfolios in which optionality risk is present and review the flow of deal data to the risk model and the capture of higher-order risks (for example, gamma and vega) within VAR. Where options risks are not fully captured, the institutions should identify and quantify these risks and identify corrective-action plans to incorporate the risks. Examiners should review the calculation of volatilities (implied or historical), sources of this data (liquid or illiquid markets), and measurement of implied price volatility along varying strike prices. The understanding of the institution's determination of volatility smiles and skewness is a basic tenet in assessing a VAR model's reasonableness if optionality risk is material. Volatility smiles reflect the phenomenon that out-of-the-market and in-the-market options both have higher volatilities than at-the-market options. Volatility skew refers to the differential patterns of implied

25. For example, under certain statistical assumptions, an institution can estimate the 10-day price volatility of an instrument by multiplying the volatility calculated on one-day changes by the square root of 10 (approximately 3.16).

volatilities between out-of-the-market calls and out-of-the-market puts.

The examiners should review the institution's methodology for aggregating VAR estimates across the entire portfolio. The institution should have well-documented policies and procedures governing its aggregation process, including the use of correlation assumptions. The inspection of correlation assumptions is accomplished through a review of the institution's documented testing of correlation assumptions and select-transaction testing when individual portfolios are analyzed to gauge the effects of correlation assumptions. Although the summation of portfolio VARs is permitted under the capital rules, the aggregation of VAR measures generally overstates risk and may represent an ineffective risk-management tool. Examiners should encourage institutions to develop more rigorous and appropriate correlation estimates to arrive at a more meaningful portfolio VAR.

The aggregation processes utilized by banking institutions may also be subject to certain ''missing risks,'' resulting in an understatement of risk in the daily VAR. Examiners should understand the aggregation process through discussions with risk-management personnel and reviews of models-related documents. Examiners should identify key control points, such as timely updating and determination of correlation statistics, that may result in the misstatement of portfolio VAR.

Examiners should evaluate the institution's systems infrastructure and its ability to support the effective aggregation of risk across trading portfolios. They should also review the systems architecture to identify products that are captured through automated processes and those that are captured in spreadsheets or maintained in disparate systems. This review is important in order to understand the aggregation processes, including the application of correlations, and its impact on the timeliness and accuracy of risk-management reports.

Market-Risk Factors

For risk-based capital purposes, an institution's internal model must use risk factors that address market risk associated with interest rates, equity prices, exchange rates, and commodity prices, including the market risk associated with options in each of these risk categories. An institution may use the market-risk factors it has determined affect the value of its positions and the risks to which it is exposed. However, examiners should confirm that an institution is using sufficient risk factors to cover the risks inherent in its portfolio. For example, examiners should verify that interest-rate-risk factors correspond to interest rates in each currency in which the institution has interest-rate-sensitive positions. The risk-measurement system should model the yield curve using one of a number of generally accepted approaches, such as by estimating forward rates or zero-coupon yields, and should incorporate risk factors to capture spread risk. The yield curve should be divided into various maturity segments to capture variation in the volatility of rates along the yield curve. For material exposure to interest-rate movements in the major currencies and markets, modeling techniques should capture at least six segments of the yield curve.

The internal model should incorporate risk factors corresponding to individual foreign currencies in which the institution's positions are denominated, each of the equity markets in which the institution has significant positions (at a minimum, a risk factor should capture market-wide movements in equity prices), and each of the commodity markets in which the institution has significant positions. Risk factors should measure the volatilities of rates and prices underlying options positions. An institution with a large or complex options portfolio should measure the volatilities of options positions by different maturities. The sophistication and nature of the modeling techniques should correspond to the level of the institution's exposure.

Backtesting

One year after beginning to apply the market-risk rules, an institution will be required to backtest VAR measures that have been calculated for its internal risk-management purposes. The results of the backtests will be used to evaluate the accuracy of the institution's internal model, and may result in an adjustment to the institution's VAR multiplication factor used for calculating regulatory capital requirements. Specifically, the backtests must compare the institution's daily VAR measures calculated for internal purposes, calibrated to a one-day movement in rates and prices and a 99 percent

(one-tailed) confidence level, against the institution's actual daily net trading profit or loss for the past year (that is, the preceding 250 business days). In addition to recording daily gains and losses arising from changes in market valuations of the trading portfolio, net trading profits (or losses) may include items such as fees and commissions and earnings from bid/ask spreads. These backtests must be performed each quarter. Examiners should review the institution's backtesting results at both the portfolio and subportfolio (for example, business-line) levels. Although not required under the capital rules, subportfolio backtesting provides management and examiners with deeper insight into the causes of exceptions. It also gives examiners a framework within which to discuss with risk managers the adequacy of the institution's modeling assumptions as well as issues of position valuation and profit attribution at the business-line level. Examiners should review the profit-and-loss basis of the backtesting process, including actual trading profits and losses (that is, realized and unrealized profits or losses on end-of-day portfolio positions) and fee income and commissions associated with trading activities.

If the backtest reveals that an institution's daily net trading loss exceeded the corresponding VAR measure five or more times, the institution's multiplication factor should begin to increase—from three to as high as four if 10 or more exceptions are found. However, the decision regarding the specific size of any increase to the institution's multiplier may be tempered by examiner judgment and the circumstances surrounding the exceptions. In particular, special consideration may be granted for exceptions that produce abnormal changes in interest rates or exchange rates as a result of major political events or other highly unusual market events. Examiners may also consider factors such as the magnitude of an exception (that is, the difference between the VAR measure and the actual trading loss), and the institution's response to the exception. Examiners may determine that an institution does not need to increase its multiplication factor if it has taken adequate steps to address any modeling deficiencies or other actions that are sufficient to improve its risk-management process. The Federal Reserve will monitor industry progress in developing backtesting methodologies and may adjust the backtesting requirements in the future. Where the backtest reveals exceptions, examiners should review the institution's documentation of the size and cause of the exception and any corrective action taken to improve the assumptions or risk factor inputs underlying the VAR model.

Specific Risk

An institution may use its internal model to calculate specific risk if it can demonstrate that the model sufficiently captures the changes in market values for covered debt and equity instruments and related derivatives (for example, credit derivatives) due to factors other than broad market movements. These factors include idiosyncratic price variation and event/default risk. The capital rules also stipulate that the model should explain the historical price variation in the portfolio and capture potential concentrations, including magnitude and changes in composition. Finally, the model should be sufficiently robust to capture greater volatility due to adverse market conditions. If the bank's internal model cannot meet these requirements, the bank must use the standardized approach to measuring specific risk under the capital rules. The capital charge for specific risk may be determined either by applying standardized measurement techniques (the standardized approach) or using an institution's internal model.

Standardized Approach

Under the standardized approach, trading-account debt instruments are categorized as ''government,'' ''qualifying,'' or ''other,'' based on the type of obligor and, in the case of instruments such as corporate debt, on the credit rating and remaining maturity of the instrument. Each category has a specific-risk weighting factor. The specific-risk capital charge for debt positions is calculated by multiplying the current market value of each net long or short position in a category by the appropriate risk-weight factor. An institution must risk weight derivatives (for example, swaps, futures, forwards, or options on certain debt instruments) according to the relevant underlying instrument. For example, in a forward contract, an institution must risk weight the market value of the effective notional amount of the underlying instrument (or index portfolio). Swaps must be included as the notional position in the underlying debt instrument or index portfolio, with a

receiving side treated as a long position and a paying side treated as a short position. Options, whether long or short, are included by risk weighting the market value of the effective notional amount of the underlying instrument or index multiplied by the option's delta. An institution may net long and short positions in identical debt instruments with the same issuer, coupon, currency, and maturity. An institution may also net a matched position in a derivative instrument and the derivative's corresponding underlying instrument.

The government category includes general obligation debt instruments of central governments of OECD countries, as well as local currency obligations of non-OECD central governments to the extent the institution has liabilities booked in that currency. The risk-weight factor for the government category is zero percent. The qualifying category includes debt instruments of U.S. government–sponsored agencies, general obligation debt instruments issued by states and other political subdivisions of OECD countries, multilateral development banks, and debt instruments issued by U.S. depository institutions or OECD banks that do not qualify as capital of the issuing institution. Qualifying instruments also may be corporate debt and revenue instruments issued by states and political subdivisions of OECD countries that are (1) rated as investment grade by at least two nationally recognized credit-rating firms; (2) rated as investment grade by one nationally recognized credit-rating firm and not less than investment grade by any other credit-rating agency; or (3) if unrated and the issuer has securities listed on a recognized stock exchange, deemed to be of comparable investment quality by the reporting institution, subject to review by the Federal Reserve. The risk-weighting factors for qualifying instruments vary according to the remaining maturity of the instrument as set in table 3. Other debt instruments not included in the government or qualifying categories receive a risk weight of 8.0 percent.

Table 3—Specific-Risk Weighting Factors

Remaining Maturity	*Risk-Weight Factor*
6 months or less	0.25%
over 6 months to 24 months	1.00%
over 24 months	1.60%

The specific-risk charge for equity positions is based on an institution's gross equity position for each national market. Gross equity position is defined as the sum of all long and short equity positions, including positions arising from derivatives such as equity swaps, forwards, futures, and options. The current market value of each gross equity position is weighted by a designated factor, with the relevant underlying instrument used to determine risk weights of equity derivatives. For example, swaps are included as the notional position in the underlying equity instrument or index portfolio, with a receiving side treated as a long position and a paying side treated as a short position. Options, whether long or short, are included by risk weighting the market value of the effective notional amount of the underlying equity instrument or index multiplied by the option's delta. Long and short positions in identical equity issues or indexes may be netted. An institution may also net a matched position in a derivative instrument and its corresponding underlying instrument.

The specific-risk charge is 8.0 percent of the gross equity position, unless the institution's portfolio is both liquid and well diversified, in which case the capital charge is 4.0 percent. A portfolio is liquid and well diversified if (1) it is characterized by a limited sensitivity to price changes of any single equity or closely related group of equity issues; (2) the volatility of the portfolio's value is not dominated by the volatility of equity issues from any single industry or economic sector; (3) it contains a large number of equity positions, with no single position representing a substantial portion of the portfolio's total market value;[26] and (4) it consists mainly of issues traded on organized exchanges or in well-established over-the-counter markets.

26. For practical purposes, examiners may interpret "substantial" as meaning more than 5 percent.

For positions in an index comprising a broad-based, diversified portfolio of equities, the specific-risk charge is 2.0 percent of the net long or short position in the index. In addition, a 2.0 percent specific-risk charge applies to only one side (long or short) in the case of certain futures-related arbitrage strategies (for instance, long and short positions in the same index at different dates or in different market centers, and long and short positions at the same date in different, but similar indexes). Finally, under certain conditions, futures positions on a broad-based index that are matched against positions in the equities composing the index are subject to a specific-risk charge of 2.0 percent against each side of the transaction.

Internal-Models Approach

Institutions using models will be permitted to base their specific-risk capital charge on modeled estimates if they meet all of the qualitative and quantitative requirements for general risk models as well as the additional criteria set out below. Institutions which are unable to meet these additional criteria will be required to base their specific-risk capital charge on the full amount of the standardized specific-risk charge. Conditional permission for the use of specific-risk models is discouraged. Institutions should use the standardized approach for a particular portfolio until they have fully developed a model to accurately measure the specific risk inherent in that portfolio.

The criteria for applying modeled estimates of specific risk require that an institution's model—

- explain the historical price variation in the portfolio;[27]
- demonstrably capture concentration (magnitude and changes in composition);[28]
- be robust to an adverse environment;[29] and
- be validated through backtesting aimed at assessing whether specific risk is being accurately captured.

In addition, the institution must be able to demonstrate that it has methodologies in place which allow it to adequately capture event and default risk for its trading positions. In assessing the model's robustness, examiners review the banking institution's testing of the model, including regression analysis testing (that is, ''goodness-of-fit''), stress-test simulations of ''shocked'' market conditions, and changing credit-cycle conditions. Examiners evaluate the scope of testing (for example, what factors are shocked and to what degree, and what the resultant changes in risk exposures are), the number of tests completed, and the results of these tests. If testing is deemed insufficient or the results are unclear, the banking institution is expected to address these concerns before supervisory recognition of the model.

As previously noted, the review of these models is conducted after supervisory recognition of the banking institution's general market-risk methodology. The examiner reviews are generally conducted on a subportfolio basis (for example, investment-grade corporate debt, credit derivatives, etc.), with a focus on the modeling methodology, validation, and backtesting process. The portfolio-level approach addresses the case in which a banking institution's model adequately captures specific risk within its investment-grade corporate-debt portfolio but not within its high-yield corporate-debt portfolio. In this case, the banking institution would generally be granted internal-models treatment for the investment-grade debt portfolio while continuing to apply the standardized approach for its high-yield debt portfolio.

27. The key ex ante measures of model quality are ''goodness-of-fit'' measures which address the question of how much of the historical variation in price value is explained by the model. One measure of this type which can often be used is an R-squared measure from regression methodology. If this measure is to be used, the institution's model would be expected to be able to explain a high percentage, such as 90 percent, of the historical price variation or to explicitly include estimates of the residual variability not captured in the factors included in this regression. For some types of models, it may not be feasible to calculate a goodness-of-fit measure. In such an instance, a bank is expected to work with its national supervisor to define an acceptable alternative measure which would meet this regulatory objective.

28. The institution would be expected to demonstrate that the model is sensitive to changes in portfolio construction and that higher capital charges are attracted for portfolios that have increasing concentrations.

29. The institution should be able to demonstrate that the model will signal rising risk in an adverse environment. This could be achieved by incorporating in the historical estimation period of the model at least one full credit cycle and ensuring that the model would not have been inaccurate in the downward portion of the cycle. Another approach for demonstrating this is through simulation of historical or plausible worst-case environments.

Examiner assessments of the adequacy of a banking institution's specific-risk modeling address the following major points:

- the type, size, and composition of the modeled portfolio and other relevant information (for example, market data)
- the VAR-based methodology and relevant assumptions applicable to the modeled portfolio and a description of how it captures the key specific-risk areas—idiosyncratic variation and event and default risk
- the backtesting analysis performed by the banking institution that demonstrates the model's ability to capture specific risk within the identified portfolio (This backtesting is specific to the modeled portfolio, not the entire trading portfolio.)
- additional testing (for example, stress testing) performed by the banking institution to demonstrate the model's performance under market-stress events

Institutions which meet the criteria set out above for models but that do not have methodologies in place to adequately capture event and default risk will be required to calculate their specific-risk capital charge based on the internal-model measurements plus an additional prudential surcharge as defined in the following paragraph. The surcharge is designed to treat the modeling of specific risk on the same basis as a general market-risk model that has proven deficient during backtesting. That is, the equivalent of a scaling factor of four would apply to the estimate of specific risk until such time as an institution can demonstrate that the methodologies it uses adequately capture event and default risk. Once an institution is able to demonstrate this, the minimum multiplication factor of three can be applied. However, a higher multiplication factor of four on the modeling of specific risk would remain possible if future backtesting results were to indicate a serious deficiency with the model.

For institutions applying the surcharge, the total of the market-risk capital requirement will equal a minimum of three times the internal model's general- and specific-risk measure plus a surcharge in the amount of either—

- the specific-risk portion of the value-at-risk measure which should be isolated according to supervisory guidelines[30] or
- the value-at-risk measures of subportfolios of debt and equity positions that contain specific risk.[31]

Institutions using the second option are required to identify their subportfolio structure ahead of time and should not change it without supervisory consent.

Institutions which apply modeled estimates of specific risk are required to conduct backtesting aimed at assessing whether specific risk is being accurately captured. The methodology an institution should use for validating its specific-risk estimates is to perform separate backtests on subportfolios using daily data on subportfolios subject to specific risk. The key subportfolios for this purpose are traded-debt and equity positions. However, if an institution itself decomposes its trading portfolio into finer categories (for example, emerging markets or traded corporate debt), it is appropriate to keep these distinctions for subportfolio backtesting pur-

30. Techniques for separating general market risk and specific risk would include the following:

Equities

- The market should be identified with a single factor that is representative of the market as a whole, for example, a widely accepted, broadly based stock index for the country concerned.
- Institutions that use factor models may assign one factor of their model, or a single linear combination of factors, as their general-market-risk factor.

Bonds

- The market should be identified with a reference curve for the currency concerned. For example, the curve might be a government bond yield curve or a swap curve; in any case, the curve should be based on a well-established and liquid underlying market and should be accepted by the market as a reference curve for the currency concerned.

Institutions may select their own technique for identifying the specific-risk component of the value-at-risk measure for purposes of applying the multiplier of four. Techniques would include—

- using the incremental increase in value-at-risk arising from the modeling of specific-risk factors;
- using the difference between the value-at-risk measure and a measure calculated by substituting each individual equity position by a representative index; or
- using an analytic separation between general market risk and specific risk implied by a particular model.

31. This would apply to subportfolios containing positions that would be subject to specific risk under the standardized-based approach.

poses. Institutions are required to commit to a subportfolio structure and stick to it unless it can be demonstrated to the supervisor that it would make sense to change the structure.

Institutions are required to have in place a process to analyze exceptions identified through the backtesting of specific risk. This process is intended to serve as the fundamental way in which institutions correct their models of specific risk if they become inaccurate. Models that incorporate specific risk are presumed unacceptable if the results at the subportfolio level produce 10 or more exceptions. Institutions with unacceptable specific-risk models are expected to take immediate action to correct the problem in the model and ensure that there is a sufficient capital buffer to absorb the risk that the backtest showed had not been adequately captured.

Examiners must confirm with the institution that its model incorporates specific risk for both debt and equity positions. For instance, if the model addressed the specific risk of debt positions but not equity positions, then the institution could use the model-based specific-risk charge (subject to the limitation described earlier) for debt positions, but must use the full standard specific-risk charge for equity positions.

The securities and financial contracts that make up an institution's trading portfolio are generally marked to market, and gains or losses on the positions are recognized in the current period's income. A single class of financial instrument that can meet trading, investment, or hedging objectives may have a different accounting treatment applied to it depending on management's purpose for holding it. Therefore, an examiner reviewing trading activities should be familiar with the different accounting methods to ensure that the particular accounting treatment being used is appropriate for the purpose of holding a financial instrument and the economic substance of the related transaction.

The accounting principles that apply to securities portfolios, including trading accounts and derivative instruments are complex; their authoritative standards and related banking practices have evolved over time. This section summarizes the major aspects of the accounting principles for trading and derivative activities for both financial and regulatory reporting purposes. Accordingly, this section does not set forth new accounting policies or list or explain the detailed line items of financial reports that must be reported for securities portfolios or derivative instruments. Examiners should consult the sources of generally accepted accounting principles (GAAP) and regulatory reporting requirements that are referred to in this section for more detailed guidance.

Examiners should be aware that accounting practices in foreign countries may differ from those followed in the United States. Nevertheless, foreign institutions are required to submit regulatory reports prepared in accordance with regulatory reporting instructions for U.S. banking agencies, which are generally consistent with GAAP. This section will focus on reporting requirements of the United States.

The major topics covered in this section are listed below. The discussion of specific types of balance-sheet instruments (such as securities) and derivative instruments (for example, swaps, futures, forwards, and options) is interwoven with these discussions.

- sources of GAAP accounting standards and regulatory reporting requirements
- the broad framework for accounting for securities portfolios, including the general framework for trading activities
- general framework for derivative instruments, including hedges
- specific accounting principles for derivative instruments, including domestic futures; foreign-currency instruments; forward contracts (domestic), including forward rate agreements; interest-rate swaps; and options

ACCOUNTING STANDARDS

The Federal Reserve has long viewed accounting standards as a necessary step to efficient market discipline and bank supervision. Accounting standards provide the foundation for credible and comparable financial statements and other financial reports. Accurate information, reported in a timely manner, provides a basis for the decisions of market participants. The effectiveness of market discipline, to a very considerable degree, rests on the quality and timeliness of reported financial information.

Financial statements and regulatory financial reports perform a critical role for depository institution supervisors. Supervisory agencies have monitoring systems in place which enable them to follow, off-site, the financial developments at depository institutions. When reported financial information indicates that an institution's financial condition has deteriorated, these systems can signal the need for on-site examinations and any other appropriate actions. In short, the better the quality of reported financial information from institutions, the greater the ability of agencies to monitor and supervise effectively.

Accounting Principles for Financial Reporting

Financial statements provide information needed to evaluate an institution's financial condition and performance. GAAP must be followed for financial-reporting purposes—that is, for annual and quarterly published financial statements. The standards in GAAP for trading activities and derivative instruments are based on pronouncements issued by the Financial Accounting Standards Board (FASB); the American Institute of Certified Public Accountants

(AICPA); and, for publicly traded companies, the Securities and Exchange Commission (SEC). GAAP pronouncements usually take the forms described in table 1.

Table 1—GAAP Pronouncements and Abbreviations

Source	*Major Pronouncements*
FASB	Statements of Financial Accounting Standards (FAS) FASB Interpretations (FIN) Technical Bulletins (TB)
AICPA	Audit and Accounting Guides Industry Audit Guides Statements of Position (SOP) Accounting Interpretations Issues Papers*
SEC	Financial Reporting Releases (FRR) Regulation S-X Guide 3 to Regulation S-X, Article 9 Staff Accounting Bulletins (SAB)
Emerging Issues Task Force (EITF)	Consensus positions by a group of leading accountants from industry and the accounting profession

* These are generally nonauthoritative.

The SEC requires publicly traded banking organizations and other public companies to follow GAAP in preparing their form 10-Ks, annual reports, and other SEC financial reports. These public companies must also follow special reporting requirements mandated by the SEC, such as the guidance listed above, when preparing their financial reports.

Accounting Principles for Regulatory Reporting

Currently, state member banks are subject to two main regulatory requirements to file financial statements with the Federal Reserve. One requirement involves financial statements and other reports that are filed with the Board by state member banks that are subject to the reporting requirements of the SEC.[1] The other requirement involves the regulatory financial statements for state member banks, other federally insured commercial banks, and federally insured savings banks—the Reports of Condition and Income, commonly referred to as call reports. The call reports, the form and content of which are developed by the Federal Financial Institutions Examination Council (FFIEC), are currently required to be filed in a manner generally consistent with GAAP.[2] For purposes of preparing the call reports, the guidance in the instructions (including related glossary items) to the Reports of Condition and Income should be followed. U.S. banking agencies require foreign banking organizations operating in the United States to file regulatory financial reports prepared in accordance with relevant regulatory reporting instructions.

Various Y-series reports submitted to the Federal Reserve by bank holding companies have long been prepared in accordance with GAAP. Section 112 of the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) mandates that state member banks with total consolidated assets of $500 million or more have to submit to the Federal Reserve annual reports containing audited financial statements prepared in accordance with GAAP. Alternatively, the financial-statement requirement can be satisfied by filing consolidated financial statements of the bank holding company. Thus, the summary of GAAP that follows will be relevant for purposes of (1) financial statements of state member banks and bank holding companies, (2) call reports of banks, (3) Y-series reports of bank holding companies, and (4) the

1. Generally, pursuant to section 12(b) or 12(g) of the Securities Exchange Act of 1934, state member banks whose securities are subject to registration are required to file with the Federal Reserve Board annual reports, quarterly financial statements, and other financial reports that conform with SEC reporting requirements.

2. The importance of accounting standards for regulatory reports is recognized by section 121 of the Federal Deposit Insurance Corporation Act of 1991. Section 121 requires that accounting principles applicable to regulatory financial reports filed by federally insured banks and thrifts with their federal banking agency must be consistent with GAAP. However, under section 121, a federal banking agency *may* require institutions to use accounting principles "no less stringent than GAAP" when the agency determines that GAAP does not meet supervisory objectives.

section 112 annual reports of state member banks and bank holding companies.

ACCOUNTING FOR SECURITIES PORTFOLIOS

Treatment Under FASB Statement No. 115

Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," is the authoritative guidance for accounting for equity securities that have readily determinable fair values and for all debt securities.[3] (FAS 140 replaces FAS 125, which had the same title.) Investments subject to FAS 115 are to be classified in three categories and accounted for as follows:

- *Held-to-maturity account.* Debt securities that the institution has the positive intent and ability to hold to maturity are classified as held-to-maturity securities and reported at amortized cost. FAS 140 amended FAS 115 to require that securities that can contractually be prepaid or otherwise settled in such a way that the holder of the security would not recover substantially all of its recorded investment must be recorded as either available-for-sale or trading. Reclassifications of held-to-maturity securities as a result of the initial application of FAS 140 would not call into question an entity's intent to hold other securities to maturity in the future.
- *Trading account.* Debt and equity securities that are bought and held principally for the purpose of selling them in the near term are classified as trading securities and reported at fair value, with unrealized gains and losses included in earnings. Trading generally reflects active and frequent buying and selling, and trading securities are generally used with the objective of generating profits on short-term differences in price.
- *Available-for-sale account.* Debt and equity securities not classified as either held-to-maturity securities or trading securities are classified as available-for-sale securities and reported at fair value, with unrealized gains and losses excluded from earnings and reported as a net amount in a separate component of shareholders' equity.

Under FAS 115, mortgage-backed securities that are held for sale in conjunction with mortgage banking activities should be reported at fair value in the trading account. FAS 115 does not apply to loans, including mortgage loans, that have not been securitized.

Upon the acquisition of a debt or equity security, an institution must place the security into one of the above three categories. At each reporting date, the institution must reassess whether the balance-sheet classification[4] continues to be appropriate.

Proper classification of securities is a key examination issue. As stated above, instruments that are intended to be held principally for the purpose of selling them in the near term should be classified as trading assets. Reporting securities held for trading purposes as available-for-sale or held-to-maturity would result in the improper deferral of unrealized gains and losses from earnings and regulatory capital. Accordingly, examiners should scrutinize institutions that exhibit a pattern or practice of selling securities from the available-for-sale or held-to-maturity accounts after a short-term holding

3. FAS 115 does not apply to investments in equity securities accounted for under the equity method nor to investments in consolidated subsidiaries. This statement does not apply to institutions whose specialized accounting practices include accounting for substantially all investments in debt and equity securities at market value or fair value, with changes in value recognized in earnings (income) or in the change in net assets. Examples of those institutions are brokers and dealers in securities, defined benefit pension plans, and investment companies.

FAS 115 states that the fair value of an equity security is readily determinable if sales prices or bid-and-asked quotations are currently available on a securities exchange registered with the SEC or in the over-the-counter market, provided that those prices or quotations for the over-the-counter market are publicly reported by the National Association of Securities Dealers' automated quotation systems or by the National Quotation Bureau. Restricted stock does not meet that definition.

The fair value of an equity security traded only in a foreign market is readily determinable if that foreign market is of a breadth and scope comparable to one of the U.S. markets referred to above. The fair value of an investment in a mutual fund is readily determinable if the fair value per share (unit) is determined and published and is the basis for current transactions.

4. In this context, "classification" refers to the security's balance-sheet category, not the credit quality of the asset.

period, particularly if significant amounts of losses on securities in these accounts have not been recognized.

FAS 115 recognizes that certain changes in circumstances may cause the institution to change its intent to hold a certain security to maturity without calling into question its intent to hold other debt securities to maturity in the future. Thus, the sale or transfer of a held-to-maturity security due to one of the following changes in circumstances will not be viewed as inconsistent with its original balance-sheet classification:

- evidence of a significant deterioration in the issuer's creditworthiness
- a change in tax law that eliminates or reduces the tax-exempt status of interest on the debt security (but not a change in tax law that revises the marginal tax rates applicable to interest income)
- a major business combination or major disposition (such as the sale of a segment) that necessitates the sale or transfer of held-to-maturity securities to maintain the institution's existing interest-rate risk position or credit-risk policy
- a change in statutory or regulatory requirements significantly modifying either what constitutes a permissible investment or the maximum level of investments in certain kinds of securities, thereby causing an institution to dispose of a held-to-maturity security
- a significant increase by the regulator in the industry's capital requirements that causes the institution to downsize by selling held-to-maturity securities
- a significant increase in the risk weights of debt securities used for regulatory risk-based capital purposes.

Furthermore, FAS 115 recognizes other events that are isolated, nonrecurring, and unusual for the reporting institution and that could not have been reasonably anticipated may cause the institution to sell or transfer a held-to-maturity security without necessarily calling into question its intent to hold other debt securities to maturity. EITF 96-10, as amended by FAS 140, provides that transactions that are not accounted for as sales under FAS 140 would not contradict the entity's intent to hold that security, or any other securities, to maturity. (See paragraph nine of FAS 140 for additional guidance on criteria which would require such transactions to be accounted for as sales.) However, all sales and transfers of held-to-maturity securities must be disclosed in the footnotes to the financial statements.

An institution must not classify a debt security as held-to-maturity if the institution intends to hold the security for only an indefinite period.[5] Consequently, a debt security should not, for example, be classified as held-to-maturity if the banking organization or other company anticipates that the security would be available to be sold in response to—

- changes in market interest rates and related changes in the security's prepayment risk,
- needs for liquidity (for example, due to the withdrawal of deposits, increased demand for loans, surrender of insurance policies, or payment of insurance claims),
- changes in the availability of and the yield on alternative investments,
- changes in funding sources and terms, and
- changes in foreign-currency risk.

According to FAS 115, an institution's asset-liability management may consider the maturity and repricing characteristics of all investments in debt securities, including those held to maturity or available for sale, without tainting or casting doubt on the standard's criterion that there be a "positive intent to hold until maturity." However, to demonstrate its ongoing intent and ability to hold the securities to maturity, management should designate the held-to-maturity securities as not available for sale for purposes of the ongoing adjustments that are a necessary part of its asset-liability management. Further, liquidity can be derived from the held-to-maturity category by the use of repurchase agreements that are classified as financings, but not sales.

5. In summary, under FAS 115, sales of debt securities that meet either of the following two conditions may be considered as "maturities" for purposes of the balance-sheet classification of securities: (1) The sale of a security occurs near enough to its maturity date (or call date if exercise of the call is probable)—for example, within three months—that interest-rate risk has been substantially eliminated as a pricing factor. (2) The sale of a security occurs after the institution has already collected at least 85 percent of the principal outstanding at acquisition from either prepayments or scheduled payments on a debt security payable in equal installments over its term (variable-rate securities do not need to have equal payments).

Transfers of a security between investment categories should be accounted for at fair value. FAS 115 requires that, at the date of transfer, the security's unrealized holding gain or loss must be accounted for as follows:

- For a security transferred from the trading category, the unrealized holding gain or loss at the date of transfer will already have been recognized in earnings and should not be reversed.
- For a security transferred into the trading category, the unrealized holding gain or loss at the date of transfer should be recognized in earnings immediately.
- For a debt security transferred into the available-for-sale category from the held-to-maturity category, the unrealized holding gain or loss at the date of transfer should be recognized in a separate component of shareholders' equity.
- For a debt security transferred into the held-to-maturity category from the available-for-sale category, the unrealized holding gain or loss at the date of transfer should continue to be reported in a separate component of shareholders' equity, but should be amortized over the remaining life of the security as an adjustment of its yield in a manner consistent with the amortization of any premium or discount.

Transfers from the held-to-maturity category should be rare, except for transfers due to the changes in circumstances that were discussed above. According to the standard, transfers into or from the trading category should also be rare.

FAS 115 requires that institutions determine whether a decline in fair value below the amortized cost for individual securities in the available-for-sale or held-to-maturity accounts is ''other than temporary'' (that is, whether this decline results from permanent impairment). For example, if it is probable that the investor will be unable to collect all amounts due according to the contractual terms of a debt security that was not impaired at acquisition, an other-than-temporary impairment should be considered to have occurred. If the decline in fair value is judged to be other than temporary, the cost basis of the individual security should be written down to its fair value, and the write-down should be accounted in earnings as a realized loss. This new cost basis should not be written up if there are any subsequent recoveries in fair value.

Other Sources of Regulatory Reporting Guidance

As mentioned above, FAS 115 has been adopted for regulatory reporting purposes. Call report instructions are another source of guidance, particularly, the glossary entries on—

- coupon stripping, Treasury receipts, and STRIPS;
- fails;
- foreign debt exchange transactions;
- market value of securities;
- nonaccrual status;
- premiums and discounts;
- short positions;
- transfers of financial assets;
- trading accounts;
- trade-date and settlement-date accounting;[6] and
- when-issued securities transactions.

Traditional Model Under GAAP

The traditional model was used to account for investment and equity securities before FAS 115. However, the traditional model still applies to assets that are not within the scope of FAS 115 (for example, equity securities that do not have readily determinable fair values).

Under the traditional accounting model for securities portfolios and certain other assets, debt securities are placed into the following three categories based on the institution's intent and ability to hold them:

- *Investment account.* Investment assets are carried at amortized cost. A bank must have the intent and ability to hold these securities for long-term investment purposes. The market value of the investment account is fully disclosed in the footnotes to the financial statements.
- *Trading account.* Trading assets are marked to market. Unrealized gains and losses are recognized in income. Trading is characterized by a high volume of purchase and sale activity.

6. As described in this glossary entry, for call report purposes, the preferred method for reporting securities transactions is recognition on the trade date.

- *Held-for-sale account.* Assets so classified are carried at the lower of cost or market value (LOCOM). Unrealized losses on these securities are recognized in income. This account is characterized by intermittent sales of securities.

Under GAAP, the traditional model has been generally followed for other assets as well. Thus, loans that are held for trading purposes would be marked to market, and loans that are held for sale would be carried at LOCOM.

SECURITIZATIONS

FAS 140 covers the accounting treatment for the securitization of receivables. The statement addresses (1) when a transaction qualifies as a sale for accounting purposes and (2) the treatment of the various financial components (identifiable assets and liabilities) that are created in the securitization process.

To identify whether a transfer of assets qualifies as a sale for accounting purposes, FAS 140 focuses on control of the assets while taking a "financial components approach." The standard requires that an entity surrender control to "derecognize" the assets, or take the assets off its balance sheet. Under FAS 140, control is considered to be surrendered and, therefore, a transfer is considered a sale if *all* of the following conditions are met:

- The transferred assets have been put beyond the reach of the transferor, even in bankruptcy.
- Either (1) the transferee has the right to pledge or exchange the transferred assets or (2) the transferee is a qualifying special-purpose entity, and the holder of beneficial interests in that entity has the right to pledge or exchange the transferred assets.
- The transferor does not maintain control over the transferred assets through (1) an agreement that entitles and obligates the transferor to repurchase or redeem them before their maturity or (2) an agreement that entitles the transferor to repurchase or redeem transferred assets that are not readily obtainable.

The financial components approach recognizes that complex transactions, such as securitizations, often involve the use of valuation techniques and estimates to determine the value of each component and any gain or loss on the transaction. FAS 140 requires that entities recognize newly created (acquired) assets and liabilities, including derivatives, at fair value. It also requires all assets sold and the portion of any assets retained to be valued by allocating the previous carrying value of the assets based on their relative fair value.

Financial assets that can be prepaid contractually or that can otherwise be settled in such a way that the holder would not recover substantially all of its recorded investments should be measured in the same way as investments in debt securities as either available-for-sale or trading under FAS 115. Examples include some interest-only strips, retained interests in securitizations, loans, other receivables, or other financial assets. However, financial instruments covered under the scope of Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivative Instruments and Hedging Activities," should follow that guidance.

ACCOUNTING FOR REPURCHASE AGREEMENTS

In addition to securitizations, FAS 140 determines the accounting for repurchase agreements. A repurchase agreement is either accounted for as a secured borrowing or as a sale and subsequent repurchase. The treatment depends on whether the seller has surrendered control of the securities as described in the "Securitizations" subsection. If control is maintained, the transaction should be accounted for as a secured borrowing. If control is surrendered, the transaction should be accounted for as a sale and subsequent repurchase. Control is generally considered to be maintained if the security being repurchased is identical to the security being sold.

In a dollar-roll transaction, an institution agrees to sell a security and repurchase a similar, but not identical, security. If the security being repurchased is considered to be "substantially the same" as the security sold, the transaction should be reported as a borrowing. Otherwise, the transaction should be reported as a sale and subsequent repurchase. The *AICPA Audit and Accounting Guide for Banks and Savings Institutions* establishes criteria that must be met for a security to be considered "substantially the same," including having the same obligor, maturity, form, and interest rate.

Generally, a bank surrenders control if the repurchase agreement does not require the repurchase of the same or substantially the same security. In such cases, the bank accounts for the transaction as a sale (with gain or loss) and a forward contract to repurchase the securities. When a repurchase agreement is not a sale (for example, requires the repurchase of the same or substantially the same security), the transaction is accounted for as a borrowing. However, repurchase agreements that extend to the security's maturity date, and repurchase agreements in which the seller has not obtained sufficient collateral to cover the replacement cost of the security, should be accounted for as sales.

ACCOUNTING FOR DERIVATIVE INSTRUMENTS

As discussed in the previous subsection, the general accounting framework for securities portfolios divides them into three categories: held-to-maturity (accounted for at amortized cost), available-for-sale (accounted for at fair value, with unrealized changes in fair value recorded in equity), and trading securities (accounted for at fair value, with changes in fair value recorded in earnings).

In contrast, derivative instruments can be classified in one of the following categories: (1) no hedge designation, (2) fair-value hedge, (3) cash-flow hedge, and (4) foreign-currency hedge. The general accounting framework for derivative instruments under GAAP is set forth below:

- If the derivative does not have a hedge designation, the gains or losses based on changes in fair value of the derivative instrument are included in current income.
- If the derivative is determined to be a hedge of exposure to changes in the fair value of a recognized asset or liability or an unrecognized firm commitment (fair-value hedge), the gains or losses based on changes in fair value are included in current net income with the offsetting gain or loss on the hedged item attributable to the risk being hedged.
- If the derivative is determined to be a hedge of exposure to variable cash flows of a forecasted transaction (cash-flow hedge), the gains or losses based on changes in fair value are included in other comprehensive income outside of net income.
- If the derivative represents a hedge of the foreign-currency exposure of a net investment in foreign operation, an unrecognized firm commitment, an available-for-sale security, or a foreign currency–denominated forecasted transaction (foreign-currency hedge), the gains or losses based on changes in fair value are included in comprehensive income, outside of net income, as part of the cumulative translation adjustment.

This general framework is set forth in FAS 133. This statement, issued in June 1998 and amended by FAS 137 and FAS 138, became effective for fiscal years beginning after June 15, 2000. Thus, banks operating on a calendar year adopted the guidance on January 1, 2001.

FAS 133 comprehensively changes accounting and disclosure standards for derivatives. FAS 133 amends Statement of Financial Accounting Standards No. 52 (FAS 52), ''Foreign Currency Translation,'' to permit special accounting for foreign-currency hedges and makes the following standards obsolete:

- FAS 80 Accounting for Futures Contracts
- FAS 105 Disclosure of Information About Financial Instruments with Off Balance Sheet Risk and Financial Instruments with Concentrations of Credit Risk
- FAS 107 Disclosures About Fair Value of Financial Instruments
- FAS 119 Disclosure About Derivative Financial Instruments and Fair Value of Financial Instruments

FAS 133 requires entities to recognize all derivatives on the balance sheet as either assets or liabilities and to report them at their fair value. The accounting recognition of changes in the fair value of a derivative (gains or losses) depends on the intended use of the derivative and the resulting designation. For qualifying hedges, an entity is required to establish at the inception of the hedge the method it will use for assessing the effectiveness of the hedging derivative and the measurement approach for determining the ineffective aspect of the hedge. The methods applied should be consistent with the entity's approach to managing risk. FAS 133 also precludes designating a nonderivative financial instrument as a hedge of an asset, a liability, an unrecognized firm commitment, or a fore-

casted transaction, except if any of these are denominated in a foreign currency.

Proper classification of derivative instruments is a key examination issue. Inappropriately classifying a derivative instrument as a hedge would result in the improper treatment of gains and losses in earnings and regulatory capital. Institutions should retain adequate documentation to support their hedge activity. Examiners should scrutinize any institutions that do not comply with these new GAAP requirements.

Definitions

A *derivative instrument* is a financial instrument or other contract with all three of the following characteristics;

- It has one or more *underlyings*, and one or more *notional amounts* or *payment provisions* or both.
- It requires no initial net investment or an initial net investment that is smaller than what would be required for other types of contracts expected to have a similar response to changes in market factors.
- Its terms require or permit net settlement, it can be readily settled net by means outside the contract, or it provides for delivery of an asset that puts the recipient in a position not substantially different from net settlement.

An *underlying* is a specified interest rate, security price, commodity price, foreign-exchange rate, index of prices or rates, or other variable. An underlying may be a price or rate of an asset or liability but is not the asset or liability itself.

A *notional amount* is a number of currency units, shares, bushels, pounds, or other units specified in the contract.

A *payment provision* specifies a fixed or determinable settlement to be made if the underlying behaves in a specified manner.

A *hedge* is an identifiable asset, liability, firm commitment, or anticipated transaction.

Offset is the liquidating of a purchase of futures through the sale of an equal number of contracts of the same delivery month on the same underlying instrument on the same exchange, or the covering of a short sale of futures through the purchase of an equal number of contracts of the same delivery month on the same underlying instrument on the same exchange.

Special Types of Derivatives

Credit derivatives are financial instruments that permit one party (the beneficiary) to transfer the credit risk of a reference asset, which it typically owns, to another party (the guarantor) without

actually selling the assets. Credit derivatives that provide for payments to be made only to reimburse the guaranteed party for a loss incurred because the debtor fails to pay when payment is due (financial guarantees), which is an identifiable event, are not considered derivatives under FAS 133 for accounting purposes. Those credit derivatives not accounted for under FAS 133 would not be recorded in the financial statements as assets or liabilities at fair value, but, if material, would typically be disclosed in the financial statements. Credit derivatives not considered financial guarantees, as defined above, are reported as derivatives as determined by FAS 133.

Equity derivatives are derivatives that are linked to various indexes and individual securities in the equity markets. FAS 133 covers the accounting treatment for equity derivatives that are not indexed to an institution's own stock. Equity derivatives indexed to the institution's own stock are determined in accordance with APB No. 18, "The Equity Method of Accounting for Investments in Common Stock," and Statement of Financial Accounting Standards No. 123 (FAS 123), "Accounting for Stock-Based Compensation."

Hedging Activities

Accounting for Fair-Value Hedges

A fair-value hedge is a derivative instrument that hedges exposure to changes in the fair value of an asset or a liability, or an identified portion thereof, that is attributable to a particular risk. To qualify for fair-value-hedge accounting, the hedge must meet all of the following criteria:

- Formal documentation must be made at the inception of the hedging relationship of the institution's risk-management objective and strategy for undertaking the hedge. This includes documenting the hedged instrument, the hedged item, the nature of the risk, and how the hedge's effectiveness in offsetting the exposure to changes in the fair value will be assessed.
- Assessment is required whenever financial statements or earnings are reported, and at least every three months, to ensure the hedge relationship is highly effective in achieving offsetting changes in fair value to the hedged risk.

An asset or liability is eligible for designation as a hedged item in a fair-value hedge if all of the following criteria are met:

- The hedged item is specifically identified as an asset, a liability, or a firm commitment. The hedged item can be a single asset, liability, or firm commitment or a portfolio of similar assets, liabilities, or firm commitments.
- The hedged item is not one of the following:
  - — an asset or liability that is already reported at fair value;
  - — an investment accounted for by the equity method;
  - — a minority interest in one or more consolidated subsidiaries;
  - — an equity investment in a consolidated subsidiary;
  - — a firm commitment either to enter into a business combination or to acquire or dispose of a subsidiary, a minority interest, or an equity-method investee; or
  - — an equity instrument issued by the institution and classified as stockholders' equity in the statement of financial position.
- If the hedged item is all or a portion of a debt security classified as held-to-maturity, the designated risk being hedged is the risk of changes in its fair value attributable to changes in the obligor's creditworthiness. If the hedged item is an option component of a held-to-maturity security that permits its repayment, the designated risk being hedged is the risk of changes in the entire fair value of that option component.
- If the hedged item is a nonfinancial asset or liability or is not a recognized loan-servicing right or a nonfinancial firm commitment with financial components, the designated risk being hedged is the risk of changes in the fair value of the entire hedged asset or liability.
- If the hedged item is a financial asset or liability, a recognized loan-servicing right, or a nonfinancial firm commitment with financial components, the designated risk being hedged is—
  - — the risk of changes in the overall fair value of the entire hedged item,
  - — the risk of changes in its fair value attributable to changes in market interest rates,
  - — the risk of changes in its fair value attributable to changes in the related foreign-currency exchange rates, or
  - — the risk of changes in its fair value attrib-

utable to changes in the obligor's creditworthiness.

An institution is subject to applicable GAAP requirements for assessment of impairment for assets, or recognition of an increased obligation for liabilities. An institution shall also discontinue the accounting treatment for a financial instrument as a fair-value hedge if any of the following conditions occurs:

- Any criterion of the fair-value hedge or hedged item is no longer met.
- The derivative expires or is sold, terminated, or exercised.
- The institution removes the designation of the fair-value hedge.

Accounting for Cash-Flow Hedges

A cash-flow hedge is a derivative hedging the exposure to variability in expected cash flows attributed to a particular risk. That exposure may be associated with an existing asset or liability (that is, variable-rate debt) or a forecasted transaction (that is, a forecasted purchase or sale). Designated hedging instruments and hedged items or transactions qualify for cash-flow-hedge accounting if all of the following criteria are met:

- Formal documentation is required at inception of the hedging relationship, and the institution's risk-management objective and strategy for undertaking the hedge must be done as noted in "Accounting for Fair-Value Hedges."
- The hedge effectiveness must be assessed as described in "Accounting for Fair-Value Hedges."
- If an instrument is used to hedge the variable interest rates associated with a financial asset or liability, the hedging instrument must be clearly linked to the financial asset or liability and highly effective in achieving offset.

A forecasted transaction is eligible for designation as a hedged item in a cash-flow hedge if all of the following additional criteria are met:

- The forecasted transaction is specifically identified as a single transaction or a group of individual transactions.
- The occurrence of the forecasted transaction is probable.
- The forecasted transaction is with a party that is external to the reporting institution.
- The forecasted transaction is not the acquisition of an asset or incurrence of a liability that will subsequently be remeasured with changes in fair value attributed to the hedged risk currently reported in earnings.
- If the variable cash flows of the forecasted transaction relate to a debt security that is classified as held-to-maturity, the risk being hedged is the risk of changes in the cash flows attributable to default or the risk of changes in the obligor's creditworthiness.
- The forecasted transaction does not involve a business combination subject to the provisions of Statement of Financial Accounting Standards No. 141 (FAS 141), "Business Combinations," and is not a transaction involving—
  - — a parent company's interest in consolidated subsidiaries,
  - — a minority interest in a consolidated subsidiary,
  - — an equity-method investment, or
  - — an institution's own equity instruments.
- If the hedged transaction is the forecasted purchase or sale of a financial asset or liability or the variable cash inflow or outflow of an existing financial asset or liability, the designated risk being hedged is—
  - — the risk of changes in the cash flows of the entire asset or liability,
  - — the risk of changes in its cash flows attributable to changes in market interest rates,
  - — the risk of changes in the cash flows of the equivalent functional currency attributable to changes in the related foreign-currency exchange rates, or
  - — the risk of changes in cash flows attributable to default or the risk of change in the obligor's creditworthiness.

As required for fair-value-hedge accounting, an institution shall discontinue the accounting for cash-flow hedges if—

- — any criterion for a cash-flow hedge or the hedged forecasted transaction is no longer met;
- — the derivative expires or is sold, terminated, or exercised; or
- — the institution removes the designation of the cash-flow hedge.

If cash-flow-hedge accounting is discontin-

ued, the accumulated amount in other comprehensive income remains and is reclassified into earnings when the hedged forecasted transaction affects earnings. Existing GAAP for impairment of an asset or recognition of an increased liability applies.

Accounting for Foreign-Currency Hedges

Consistent with the functional-currency concept of FAS 52 (discussed below), FAS 133 indicates that an institution may designate the following types of hedges as hedges of foreign-currency exposure:

- a fair value of an unrecognized firm commitment or an available-for-sale security
- a cash-flow hedge of a forecasted foreign-currency-denominated transaction or a forecasted intercompany foreign-currency-denominated transaction
- a hedge of a net investment in a foreign operation

Foreign-currency fair-value hedges and cash-flow hedges are generally subject to the fair-value-hedge and cash-flow-hedge accounting requirements discussed in those respective subsections.

ACCOUNTING FOR FOREIGN-CURRENCY INSTRUMENTS

The primary source of authoritative guidance for accounting for foreign-currency translations and foreign-currency transactions is FAS 52. The standard encompasses futures contracts, forward agreements, and currency swaps as they relate to foreign-currency hedging. FAS 52 draws a distinction between foreign-exchange ''translation'' and ''transactions.'' Translation, generally, focuses on the combining of foreign and domestic entities so they can be presented and reported in the consolidated financial statements in one currency. Foreign-currency transactions, in contrast, are transactions (such as purchases or sales) by an operation in currencies other than its ''functional currency.'' For U.S. depository institutions, the functional currency will generally be the dollar for its U.S. operations and the local currency of wherever its foreign operations transact business.

Foreign-Currency Translations

Translation is the conversion of the financial statements of a foreign operation (a branch, division, or subsidiary) denominated in the operation's functional currency to U.S. dollars, generally for inclusion in consolidated financial statements. The balance sheets of foreign operations are translated at the exchange rate in effect on the statement date, while income-statement amounts are generally translated at an appropriate weighted amount. Meeting this criterion will be particularly difficult when an anticipated transaction is not expected to take place in the near future.

Detailed guidance for determining the functional currency is set forth in appendix 1 of FAS 52: ''An entity's functional currency is the currency of the primary economic environment in which the entity operates; normally, that is the currency of the environment in which an entity primarily generates and expends cash. The functional currency of an entity is, in principle, a matter of fact. In some cases, the facts will clearly identify the functional currency; in other cases, they will not.''

FAS 52 indicates the salient economic indicators and other possible factors that should be considered both individually and collectively when determining the functional currency: cash flow, price and market sales indicators, expense indicators, financing indicators, intercompany transactions and arrangements, and other factors.

Foreign-Currency Transactions

Gains or losses on foreign-currency transactions, in contrast to translation, are recognized in income as they occur, unless they arise from a qualifying hedge. FAS 52 provides guidance about the types of foreign-currency transactions for which gain or loss is not currently recognized in earnings. Gains and losses on the following foreign-currency transactions should not be included in determining net income but should be reported in the same manner as translation adjustments:

- foreign-currency transactions that are designated and effective as economic hedges of a net investment in a foreign entity, commencing as of the designation date
- intercompany foreign-currency transactions that are long-term investments (that is, settle-

ment is not planned or anticipated in the foreseeable future), when the entities to the transaction are consolidated, combined, or accounted for by the equity method in the reporting institution's financial statements.

NETTING OR OFFSETTING ASSETS AND LIABILITIES

FASB Interpretation 39 (FIN 39), "Offsetting of Amounts Related to Certain Contracts," provides guidance on the netting of assets and liabilities arising from (1) traditional activities, such as loans and deposits, and (2) derivative instruments. The assets and liabilities from derivatives are primarily the fair values, or estimated market values, for swaps and other contracts, and the receivables and payables on these instruments. FIN 39 clarifies the definition of a "right of setoff" that GAAP has long indicated must exist before netting of assets and liabilities can occur in the balance sheet. One of the main purposes of FIN 39 was to clarify that FASB's earlier guidance on the netting of assets and liabilities (Technical Bulletin 88-2) applies to amounts recognized for OBS derivative instruments as well.

Balance-sheet items arise from off-balance-sheet interest-rate and foreign-currency instruments in primarily two ways. First, those banking organizations and other companies that engage in various trading activities involving OBS derivative instruments (for example, interest-rate and currency swaps, forwards, and options) are required by GAAP to mark to market these positions by recording their fair values (estimated market values) on the balance sheet and recording any changes in these fair values (unrealized gains and losses) in earnings. Second, interest-rate and currency swaps have receivables and payables that accrue over time, reflecting expected cash inflows and outflows that must periodically be exchanged under these contracts, and these receivables and payables must be recorded on the balance sheet as assets and liabilities, respectively.[7]

Under FIN 39, offsetting, or the netting of assets and liabilities, is not permitted unless all of the following four criteria are met:

- Two parties must owe each other determinable amounts.
- The reporting entity must have a right to set off its obligation with the amount due to it.
- The reporting entity must actually intend to set off these amounts.
- The right of setoff must be enforceable at law.

When all four criteria are met, a bank or other company may offset the related asset and liability and report the net amount in its GAAP financial statements. On the other hand, if any one of these criteria is not met, the fair value of contracts in a loss position with a given counterparty will not be offset against the fair value of contracts in a gain position with that counterparty, and organizations will be required to record gross unrealized gains on such contracts as assets and to report gross unrealized losses as liabilities. However, FIN 39 relaxes the third criterion (the parties' intent requirement) to permit the netting of fair values of OBS derivative contracts executed with the same counterparty under a legally enforceable master netting agreement.[8] A master netting arrangement exists if the reporting institution has multiple contracts, whether for the same type of conditional or exchange contract or for different types of contracts, with a single counterparty that are subject to a contractual agreement that provides for the net settlement of all contracts through a single payment in a single currency in the event of default or termination of any one contract.

FIN 39 defines "right of setoff" and specifies conditions that must be met to permit offsetting for accounting purposes. FASB's Interpretation

7. In contrast, the notional amounts of off-balance-sheet derivative instruments, or the principal amounts of the underlying asset or assets to which the values of the contracts are indexed, are not recorded on the balance sheet. Note, however, that if the OBS instrument is carried at market value, that value will include any receivable or payable components. Thus, for those OBS instruments that are subject to a master netting agreement, the accrual components in fair value are also netted.

8. The risk-based capital guidelines provide generally that a credit-equivalent amount is calculated for each individual interest-rate and exchange-rate contract. The credit-equivalent amount is determined by summing the positive mark-to-market values of each contract with an estimate of the potential future credit exposure. The credit-equivalent amount is then assigned to the appropriate risk-weight category.

Netting of swaps and similar contracts is recognized for risk-based capital purposes only when accomplished through "netting by novation." This is defined as a written bilateral contract between two counterparties under which any obligation to each other is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single net amount for the previous gross obligations.

41 (FIN 41), ''Offsetting of Amounts Relating to Certain Repurchase and Reverse Repurchase Agreements,'' was issued in December 1994. This interpretation modifies FIN 39 to permit offsetting in the balance sheet of payables and receivables that represent repurchase agreements and reverse repurchase agreements under certain circumstances in which net settlement is not feasible. (See FIN 41 for further information.)

1. To determine whether the organization's written accounting policies relating to trading and hedging with derivatives instruments have been approved by senior management for conformance with generally accepted accounting practices, and that such policies conform with regulatory reporting principles.
2. To determine whether capital-markets and trading activities appear in regulatory reports, as reported by accounting personnel, to conform with written accounting policies.
3. To determine whether securities held in available-for-sale or held-to-maturity accounts meet the criteria of FAS 115 and are, therefore, properly excluded from the trading account.
4. To determine whether market values of traded assets are accurately reflected in regulatory reports.
5. To determine whether, for financial and regulatory reporting purposes, financial instruments are netted for only those counterparties whose contracts conform with specific criteria permitting such setoff.
6. To determine whether management's assertions that financial instruments are hedges meet the necessary criteria for exclusion from classification as trading instruments.
7. To ascertain whether the organization has adequate support that a purported hedge reduces risk in conformance with FAS 133.
8. To determine whether the amount and recognition of deferred losses arising from hedging activities are properly recorded and being amortized appropriately.
9. To recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of law, rulings, or regulations have been noted.

These procedures list a number of processes and activities to be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Obtain a copy of the organization's accounting policies and review them for conformance with the relevant sections (that is, those sections regarding trading and hedging transactions) of authoritative pronouncements by FASB and AICPA (for Y-series reports) and with the call report instructions.
2. Using a sample of securities purchase and sales transactions, check the following:
   a. Securities subledgers accurately state the cost, and the market values of the securities agree to outside quotations.
   b. Securities are properly classified among trading, available-for-sale, and held-to-maturity classifications.
   c. Transactions that transfer securities from the trading account to either held-to-maturity or available-for-sale are authorized and conform with authoritative accounting guidance (such transfers should be rare, according to FAS 115).
3. Obtain a sample of financial instruments held in the trading account and compare the reported market value against outside quotations or compare valuation assumptions against market data.
4. Review the organization's controls over reporting certain financial instruments on a net basis. Using a sample of transactions, review the contractual terms to determine that the transactions qualify for netting for financial reporting and regulatory reporting purposes, according to the criteria specified by FIN 39, FIN 41, or regulatory reporting requirements.
5. Review the organization's methods for identifying and quantifying risk for purposes of hedging. Review the adequacy of documented risk reduction (FAS 52 and FAS 133) and the enterprise or business-unit risk reduction (FAS 80) that are necessary conditions to applying hedge accounting treatment.
6. Obtain schedules of the gains or losses resulting from hedging activities and review whether the determination was appropriate and reasonable.
7. Determine if accounting reversals are well documented.
8. Determine if accounting profits and losses prepared by control staff are reviewed by the appropriate level of management and that the senior staff in the front office (head trader, treasurer) has agreed with accounting numbers. Determine if the frequency of review by senior managers is adequate for the institution's volume and level of earnings.
9. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient, or when violations of law, rulings, or regulations have been noted.

1. Does the organization have a well-staffed accounting unit that is responsible for following procedures and instructions for recording transactions; marking to market when appropriate; filing regulatory and stockholder reports; and dealing with regulatory, tax, and accounting issues?
2. Do the organization's accounting policies conform to the relevant sections (that is, those sections regarding trading and hedging transactions) of authoritative pronouncements by FASB and AICPA, and do they conform to the call report instructions? If the organization is a foreign institution, does the organization have appropriate policies and procedures to convert foreign accounting principles to U.S. reporting guidance? Is there an adequate audit trail to reconcile the financial statements to regulatory reports?
3. For revaluation—
   a. do securities subledgers accurately state the cost, and do market values of the securities agree to outside quotations, and
   b. are securities properly classified among trading, available-for-sale, and held-to-maturity classifications?

   Evaluate the transfer of securities from the trading account to either held-to-maturity or available-for-sale for authorization in conformance with authoritative accounting guidance. Are such transfers rare? (According to FAS 115, such transfers should be rare.)
4. Do the revaluation rates used for a sample of financial instruments held in the trading account appear within range when compared with supporting documentation of market rates?
5. Do the contractual terms of a sample of transactions qualify for netting for financial reporting and regulatory reporting purposes, according to the criteria specified by FIN 39, FIN 41, or regulatory reporting requirements?
6. Does the financial institution have procedures to document risk reduction (FAS 52 and FAS 133), and does it have enterprise or business-unit risk-reduction (FAS 133) conditions to apply hedge accounting treatment? Do the procedures apply to the full range of applicable products used for investment? Is record retention adequate for this process?
7. Are the methods for assessing gains or losses resulting from hedging activities appropriate and reasonable?
8. Are accounting reversals justified by supervisory personnel and are they well documented?
9. Are profits and losses prepared by control staff reviewed by the appropriate level of management and senior staff (head trader, treasurer) for agreement? Is the frequency of review by senior managers adequate for the institution's volume and level of earnings?

SECURITIES PORTFOLIO DISCLOSURES UNDER FAS 115

For securities classified as available-for-sale and separately for securities classified as held-to-maturity, all reporting institutions should disclose the aggregate fair value, gross unrealized holding gains, gross unrealized holding losses, and amortized cost basis by major security type as of each date for which a statement of financial position is presented. Financial institutions should include the following major security types in their disclosure, though additional types may be included as appropriate:

- equity securities
- debt securities issued by the U.S. Treasury and other U.S. government corporations and agencies
- debt securities issued by states of the United States and political subdivisions of the states
- debt securities issued by foreign governments
- corporate debt securities
- mortgage-backed securities
- other debt securities

For investments in debt securities classified as available-for-sale and separately for securities classified as held-to-maturity, all reporting institutions should disclose information about the contractual maturities of those securities as of the date of the most recent statement of financial position presented. Maturity information may be combined in appropriate groupings. In complying with this requirement, financial institutions should disclose the fair value and the amortized cost of debt securities based on at least four maturity groupings: (1) within one year, (2) after one year through five years, (3) after five years through 10 years, and (4) after 10 years. Securities not due at a single maturity date, such as mortgage-backed securities, may be disclosed separately rather than allocated over several maturity groupings; if allocated, the basis for allocation also should be disclosed. For each period for which the results of operations are presented, an institution should disclose—

- the proceeds from sales of available-for-sale securities and the gross realized gains and gross realized losses on those sales,
- the basis on which cost was determined in computing realized gain or loss (that is, specific identification, average cost, or other method used),
- the gross gains and gross losses included in earnings from transfers of securities from the available-for-sale category into the trading category,
- the change in net unrealized holding gain or loss on available-for-sale securities that has been included in the separate component of shareholders' equity during the period, and
- the change in net unrealized holding gain or loss on trading securities that has been included in earnings during the period.

For any sales of or transfers from securities classified as held-to-maturity, the amortized cost amount of the sold or transferred security, the related realized or unrealized gain or loss, and the circumstances leading to the decision to sell or transfer the security should be disclosed in the notes to the financial statements for each period for which the results of operations are presented. Such sales or transfers should be rare, except for sales and transfers due to the changes in circumstances as previously discussed.

ACCOUNTING DISCLOSURES FOR DERIVATIVES AND HEDGING ACTIVITIES

Under FAS 133, institutions that hold or issue derivative instruments, or nonderivative instruments qualifying as hedge instruments, should disclose their objectives for holding or issuing the instruments and their strategies for achieving the objectives. Institutions should distinguish whether the derivative instrument is to be used as a fair-value, cash-flow, or foreign-currency hedge. The description should include the risk-management policy for each of the types of hedges. Institutions not using derivative instruments as hedging instruments should indicate the purpose of the derivative activity.

Fair-Value Hedges

For foreign-currency-transaction gains or losses that qualify as fair-value hedges, report—

- the net gain or loss recognized in earnings during the reporting period, which represents the amount of hedge ineffectiveness and the component of gain or loss, if any, excluded from the assessment of hedge effectiveness, and a description of where the net gain or loss is reported in the income statement; and
- the amount of net gain or loss recognized in earnings when a hedged firm commitment no longer qualifies as a fair-value hedge.

Cash-Flow Hedges

For cash-flow gains or losses that qualify as cash-flow hedges, report—

- the net gain or loss recognized in earnings during the reporting period, which represents the amount of ineffectiveness and the component of the derivative's gain or loss, if any, excluded from the assessment of hedge effectiveness, and a description of where the net gain or loss is reported in the income statement;
- a description of the transactions or other events that will result in the reclassification into earnings of gains and losses that are reported in accumulated other comprehensive income (OCI), and the estimated net amount of the existing gains or losses at the reporting date that is expected to be reclassified into earnings within the next 12 months;
- the maximum length of time over which the entity is hedging its exposure to the variability in further cash flows for forecasted transactions, excluding those forecasted transactions related to the payment of variable interest on existing financial instruments; and
- the amount of gains and losses reclassified into earnings as a result of the discontinuance of cash-flow hedges because it is probable that the original forecasted transactions will not occur by the end of the originally specified time period or within an additional time period as outlined in FAS 133.

Foreign-Currency Hedges

For derivatives, as well as nonderivatives, that may give rise to foreign-currency-transaction gains or losses under FAS 52, and that have been designated as and qualify for foreign-currency hedges, the net amount of gains or losses included in the cumulative translation adjustment during the reporting period should be disclosed.

Reporting Changes in Other Comprehensive Income

Institutions should show as a separate classification within OCI the net gain or loss on derivative instruments designated and qualifying as cash-flow hedges. Additionally, pursuant to FAS 130, ''Reporting Comprehensive Income,'' institutions should disclose the beginning and ending accumulated derivative gain or loss, the related net change associated with current-period hedging transactions, and the net amount of any reclassification into earnings.

SEC Disclosure Requirements for Derivatives

In the first quarter of 1997, the SEC issued rules requiring the following expanded disclosures for derivative and other financial instruments for public companies:

- in the footnotes of the financial statements, improved descriptions of accounting policies for derivatives
- outside of the footnotes to the financial statements, disclosure of quantitative and qualitative information about derivatives and other financial instruments
  - — For the quantitative disclosures about market-risk-sensitive instruments, registrants must follow one of three methodologies and distinguish between instruments used for trading purposes and instruments used for purposes other than trading. The three disclosure methodology alternatives are (1) tabular presentation of fair values and contract terms, (2) sensitivity analysis, or (3) value-at-risk disclosures. Registrants must disclose separate quantitative information for each type of market risk to which the entity is exposed (for example, interest-rate or foreign-exchange rate).
  - — The qualitative disclosures about market risk must include the registrant's primary market-risk exposures at the end of the reporting period, how those exposures are

managed, and changes in primary risk exposures or how those risks are managed as compared with the previous reporting period.

- disclosures about derivative financial instruments with any financial instruments, firm commitments, commodity positions, and anticipated transactions that are being hedged by such items (these are included to avoid misleading disclosures).

The internal-control function is critical in the assessment of an institution's regulatory reporting. The examiner must gain a thorough understanding of (1) the information flows from the execution of a transaction to its inclusion in the appropriate regulatory report, (2) the design and performance of critical internal-control procedures, and (3) the adherence to regulatory reporting standards.

Examiners, report processors, and economists who analyze regulatory reports or otherwise use the data contained in them depend on the data's accuracy. False reporting is punishable by civil monetary penalties as prescribed in the Financial Institutions Recovery, Reform, and Enhancement Act of 1989 (FIRREA).

OVERVIEW OF REPORTS

Several types of regulatory reports contain trading data: the Report of Condition (FFIEC 031–034), the Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks (FFIEC 002), and financial statements of the securities subsidiaries.

The Federal Reserve Board (FRB) and Federal Financial Institutions Examination Council (FFIEC) require financial institutions to summarize their gross positions outstanding in traded products on the Report of Condition and Income as well as on the Report of Assets and Liabilities (collectively, the call reports). These regulatory reports vary according to the size and type of institution. For example, the reports required by the FFIEC include the 002 for U.S. branches and agencies of foreign banks and a series of reports for domestic banks, while the FRB requires the Y-series to cover bank holding companies.

Section 20 subsidiaries show their securities revenue and capitalization in detail on the Financial and Operational Combined Uniform Single (FOCUS) report as required by the Securities and Exchange Commission (SEC). This report is filed with the appropriate self-regulatory organization (SRO), and the SEC furnishes microdata to the Board for bank-affiliated securities dealers. The Y-20, another FRB report, summarizes the FOCUS data and segregates revenues from eligible and ineligible securities. The Y-20 report is only filed by securities subsidiaries that are still operating pursuant to section 4(c)(8) of the Bank Holding Company Act, and are therefore subject to the Board's revenue test designed to prevent violation of the former Glass-Steagall Act. Other bank holding company subsidiaries that trade eligible securities also file the FOCUS report with the SEC and the appropriate SRO. The appendix to this section describes frequently used regulatory reports.

SOUND PRACTICES

- Every organization should have procedures to prepare regulatory reports. When conversion from foreign accounting principles to generally accepted accounting principles (GAAP) is required, a mapping should document an audit trail. This documentation is particularly important as the degree to which reconciliation is automated declines.
- Every institution should maintain clear and concise records with special emphasis on documenting adjustments.
- Every organization should have a procedure to ensure that current reporting instructions are maintained and understood by control staff.
- To ensure correct classification of new products, every organization should have a procedure whereby staff who are preparing regulatory reports are consulted if new products are introduced.
- Every organization should have a procedure, such as contacting the appropriate statistics units within the Federal Reserve System, to resolve questions when they arise.

The examiner's principal objective when reviewing the regulatory reporting function is to verify the accuracy and consistency of reporting requirements. The examiner's review of regulatory reporting, as it applies to trading activities of the institution, should be coordinated with overall trading-examination objectives. To assess the accuracy of regulatory reports, examiners should review appropriate supporting documents, such as workpapers, general ledgers, subsidiary ledgers, and other information used to prepare the regulatory reports.

The reports must meet the following objectives:

1. To confirm that the trading data are as of the report date and that they match the records of the traders and include all material post-closing adjustments to the general ledger.
2. To check that the data conform to the requirements of the report instructions. (''Accounting requirements'' refers to how a transaction should be valued. It also prescribes when transactions should be reported (for example, the rules regarding trade-date accounting). The reports required by the Board are generally consistent with generally accepted accounting principles (GAAP).
3. To assess the effectiveness of the system of internal controls over the regulatory reporting function. To identify, document, and test internal-control procedures that are critical to the accurate, reliable, and complete reporting of trading transactions in regulatory reports.
4. To determine the effectiveness of the internal controls over financial reporting, which can have an impact on the extent of examination procedures that need to be applied to verify the accuracy of regulatory reports. (For example, if an examiner has determined that an organization has very effective internal controls over financial reporting, then the extent of detailed testing procedures applied to verifying the accuracy of regulatory reports will be less extensive than the procedures applied to an institution that has ineffective controls or a system of controls with potential weaknesses.)
5. To review the Financial and Operational Combined Uniform Single (FOCUS) report to evaluate capital adequacy. (For section 20 subsidiaries, the examiner reviews the FR Y-20 report to ensure that revenue from ineligible securities does not exceed 10 percent of total revenue.)

These procedures list processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Early in the examination, the examiner should review trading data for arithmetic mistakes, general accounting errors, and any misunderstanding of the regulatory reporting instructions. Common conceptual errors include incorrect recognition of income on traded products, incorrect valuation of trading-account securities, omission of securities not yet settled, and reporting of currency swaps as interest-rate swaps.
2. The examiner should ensure that previously noted exceptions (either in the prior Report of Examination or by auditors) have been properly addressed.
3. The examiner should review the workpapers of the person responsible for preparing regulatory reports in order to check the descriptions of each transaction included in the line items. These details must match the instructions for the corresponding lines.
4. The examiner should reconcile the regulatory reports to the institution's official records, especially the general ledger, and to reports of the area in charge of trading. The reconciliation process begins with a review of the regulatory report through a spot check of the regulatory report against the preparer's sources. The examiner may be able to avoid line-by-line reconciliation if accuracy runs high in the spot check or if the examiner verifies that the institution has an approved, independently verified reconciliation process.
5. The examiner should ensure that post-closing adjustments and all accounting and timing differences, if any, between the regulatory reporting requirements and generally accepted accounting principles (GAAP) have been effected.

Call report data are the basis for the balance sheet, off-balance-sheet items or activities, income statement, and risk-based capital schedules of the Report of Examination. Corrections to the data made during the reconcilement of the regulatory reports must be reflected in Report of Examination schedules. In the rare instance when the dates of the regulatory reports and the examination do not coincide, data as of the examination date must be compiled in accordance with call report instructions.

1. Before reports are submitted to the regulatory authorities, are all regulatory reports reviewed for accuracy by a person who is independent of the preparation process?
2. Does internal audit at the institution review the process of regulatory reporting, including the accuracy of the trading data on regulatory reports?
3. Are internal controls in place that provide reasonable assurances of the accuracy, reliability, and completeness of reported trading information?
4. Are the internal controls documented and tested by internal audit? If not, examination personnel should document and test critical internal controls in this area to the extent appropriate to satisfy examination objectives.
5. Does supporting documentation include sources of information and reconciliation to the general or subsidiary ledgers, and are reconciling items handled appropriately?
6. Are procedures in place to capture exotic instruments or other transactions that require special handling? Off-balance-sheet items that are handled outside of normal processes or automated systems may be omitted if procedures and adequate communication exist between the reporting and trading functions.
7. Do reporting personnel have an adequate understanding of trading instruments, trading transactions, and reporting requirements to ensure accurate and reliable regulatory reporting?
8. Does the preparer or reviewer maintain the most current instructions for the reports he or she is responsible for?
9. Does the accounting department have procedures to ensure that the preparer or reviewer investigates questions from the FRB report analysts? (Report analysts ask the accounting department over the telephone to explain arithmetic discrepancies and large variances from prior periods.)
10. What knowledge does the signatory have regarding the report he or she is signing and the controls in place to ensure accuracy?

REPORTS LISTED BY TYPE OF INSTITUTION

Listed below, according to the type of respondent, are the regulatory reports that include data on traded products. Some of the reports show detail by product type, while others only have data aggregated for selected products. Before undertaking a review of any trading instruments, examiners should become familiar with the data available to them in the reports filed by the entity under examination.

Bank Holding Company Reports

1. FR Y-9C

Consolidated financial statements for top-tier bank holding companies with total consolidated assets of $150 million or more and lower-tier bank holding companies that have total consolidated assets of $1 billion or more. In addition, FR Y-9C reports are filed by all multibank bank holding companies with debt outstanding to the general public or that are engaged in certain nonbank activities, regardless of size.

Frequency: quarterly

Each of the instruments listed below is captured on this report. See the report instructions/glossary for the treatment of each instrument. See schedule HC-R for risk-based capital components.

Schedule HC-B

Securities
- U.S. Treasuries
- Municipal
- Mortgage-backed
- Asset-backed
- Foreign governments
- Corporations
- LDC debt
- Equities

Schedule HC-L

Futures and forwards
Forward rate agreements
Interest-rate swaps
Foreign exchange
Currency swaps
Options (interest-rate, currency)
Commodities
Index-linked activities
Hybrids

2. FR Y-9SP Parent-company-only financial statements for one-bank holding companies with total consolidated assets of less than $150 million.

   Frequency: semiannually

   Typically, examiners will encounter only securities (for example, U.S. Treasuries, obligations of states and municipalities, and mortgage-backed securities) when reviewing this report. No off-balance-sheet items are captured on this report.

3. FR Y-9LP Parent-company-only financial statements for each bank holding company that files the FR Y-9C. In addition, for tiered bank holding companies, parent-company-only financial statements for each lower-tier bank holding company if the top-tier bank holding company files the FR Y-9C.

   Frequency: quarterly

   Typically, examiners will encounter only securities transactions (for example, U.S. Treasuries, municipal, and mortgage-backed) when reviewing this report. No off-balance-sheet items are captured on this report.

4. FR Y-8 Bank Holding Company Report of Insured Depository Institutions' Section 23A Transactions with Affiliates.

   Frequency: quarterly

   This report collects information on transactions between an insured depository institution and its affiliates that are subject to section 23A of the Federal Reserve Act (FRA). The information is used to enhance the Federal Reserve's ability to monitor bank exposures to affiliates and to ensure compliance with section 23A of the FRA. Section 23A is one of the most important statutes on limiting exposures to individual institutions and protecting the federal safety net. Reporters include all top-tier bank holding companies (BHCs), including financial holding companies (FHCs). In addition, all foreign banking organizations that directly own a U.S. subsidiary bank must file this report. Participation is mandatory.

5. FR Y-20 Financial statements for a bank holding company subsidiary engaged in ineligible securities underwriting and dealing.

   Frequency: quarterly only by firms that continue to function as "section 20 subsidiaries"

   Schedules SUD and SUD-A capture securities transactions (for example, U.S. Treasuries, municipal, foreign, and asset-backed securities) as well as transactions involving equities, futures and forwards, and options.

6. FR Y-11Q Financial statements for each individual nonbank subsidiary of a bank holding company with total consolidated assets of $150 million or more in which the nonbank subsidiary has total assets of 5 percent or more of the top-tier bank holding company's consolidated tier 1 capital, or in which the nonbank subsidiary's total operating revenue equals 5 percent or more of the top-tier bank holding company's consolidated total operating revenue.

   Frequency: quarterly

   Each of the instruments listed below is captured on this report.

   Balance-Sheet Items
   Securities

   Off-Balance-Sheet Items
   Futures and forwards
   Forward rate contracts
   Interest-rate swaps
   Foreign exchange
   Currency swaps
   Option contracts

7. FR Y-11I Financial statements for each individual nonbank subsidiary that is owned or controlled by a bank holding company with total consolidated assets of less than $150 million or with total consolidated assets of $150 million or more if (1) the total assets of the nonbank subsidiary are less than 5 percent of the top-tier bank holding company's consolidated tier 1 capital and (2) the total operating revenue is less than 5 percent of the top-tier bank holding company's consolidated total operating revenue.

   Frequency: annually

   Each of the instruments listed below is captured on this report.

   Balance-Sheet Items
   Securities

   Off-Balance-Sheet Items
   Futures and forwards
   Forward rate contracts
   Interest-rate swaps
   Foreign exchange
   Currency swaps
   Option contracts

8. FFIEC 009 Country Exposure Report filed by U.S. commercial banks and/or bank holding companies that meet the reporting criteria specified in the instructions to this report.

Frequency: quarterly

8a. FFIEC 009a Country Exposure Information Report supplements the FFIEC 009 and is intended to detail significant exposures as defined in the instructions to this report.

Frequency: quarterly

These reports show country distribution of foreign claims held by U.S. banks and bank holding companies. They also include foreign securities in the aggregate assets of the countries shown.

These reports may also be filed by U.S.-chartered insured commercial banks, Edge Act and agreement corporations, and other banking organizations.

9. X-17A-5 FOCUS Report.

Frequency: quarterly

This report collects data on securities and spot commodities owned by broker-dealers. In addition, it reflects the haircuts the broker-dealers are required to take, when applicable, pursuant to SEC rule 15c3-1(f).

Bank Reports

1. FFIEC 031 Consolidated reports of condition and income for a bank with domestic and foreign offices.

Frequency: quarterly

Each of the instruments listed below is captured on this report. See the report instructions for the treatment of each instrument. See schedule RC-R for risk-based capital computation.

Schedules RC-B and RC-D
Securities
- U.S. Treasury
- Municipal
- Mortgage-backed
- Asset-backed
- Foreign government
- Equity
- All others

Schedule RC-L
Futures and forwards
Forward rate agreements
Interest-rate swaps
Foreign exchange
Currency swaps
Options (interest-rate, currency)
Commodities
Index-linked activities
Hybrids
Credit derivatives

The FFIEC 032, 033, and 034 reports of condition and income capture information on the same instruments as the FFIEC 031.

2. FFIEC 030 Report of condition for foreign branch of U.S. bank.

Frequency: annually for all overseas branch offices of insured U.S. commercial banks

quarterly for significant branches with either total assets of at least $2 billion or commitments to purchase foreign currencies and U.S. dollar exchange of at least $5 billion

This is a two-page report that captures information on balance-sheet data as well as selected off-balance-sheet data (options, foreign exchange, interest-rate swaps, and futures and forward contracts).

Reports for U.S. Branches and Agencies of Foreign Banks

1. FFIEC 002 Report of assets and liabilities of U.S. branches and agencies of foreign banks.

Frequency: quarterly

This report captures information pertaining to balance-sheet and off-balance-sheet transactions reported by all branches and agencies.

Schedule RAL
Securities
  U.S. Treasuries
  Government agencies
  All others

Schedules L and M—part 5
Futures and forwards
Forward rate agreements
Interest-rate swaps
Foreign exchange
Currency swaps
Options (interest-rate, currency)

2. FR 2069 Weekly report of assets and liabilities for large U.S. branches and agencies of foreign banks.

Frequency: as of the close of business every Wednesday

Securities are included in this abbreviated report of assets and liabilities, which resembles schedule RAL on FFIEC 002.

3. FFIEC 019 Country exposure for U.S. branches and agencies of foreign banks.

Frequency: quarterly

This report shows country distribution of foreign claims held by branches and agencies. It includes foreign securities in the aggregate assets of the countries shown.

The FFIEC 009 (filed by banks, bank holding companies, and Edge Act and agreement corporations) is similar to this form.

Other Reports

1. FR 2314a Report of condition for foreign subsidiaries of U.S. banking organizations (to be filed by companies with total assets exceeding U.S. $100 million as of the report date).

Frequency: annually

quarterly for significant subsidiaries with either total assets greater than $2 billion or $5 billion in commitments to purchase and sell foreign currencies

1a. FR 2314b Report of condition for foreign subsidiaries of U.S. banking organizations (to be filed by companies with total assets between U.S. $50–100 million as of the report date).

Frequency: annually

1b. FR 2314c Report of Condition for Foreign Subsidiaries of U.S. Banking Organizations (to be filed by companies with total assets less than U.S. $50 million as of the report date).

Frequency: annually

These three schedules are intended to capture financial information on the overseas subsidiaries of U.S. banking organizations (that is, bank holding companies, banks, and Edge Act corporations). The level of detail reported will depend on the asset size of the reporting entity. The FR 2314a and FR 2314b capture information on balance-sheet and off-balance-sheet transactions. The FR 2314c report cannot be used to track individual categories as the other two reports can.

2. FR 2886b Report of condition for Edge Act and agreement corporations.

Frequency: quarterly

This report reflects the consolidation of all Edge and agreement operations, except for those majority-owned Edge or agreement subsidiaries. The latter are accounted for within a single line item, claims on affiliates. Asset instruments (securities and LDC debt) are reflected in the securities and loan lines, respectively, of this report. Off-balance-sheet items are grouped except for foreign-exchange and options contracts.

The trading activities and related instruments discussed in this manual are covered by various securities, commodities, or banking laws and regulations. Trading and other activities relating to securities are regulated under a variety of statutes, including the Securities Act of 1933, Securities Exchange Act of 1934, and Government Securities Act of 1986. In addition to regulation by the Securities and Exchange Commission (SEC) and U.S. Treasury Department, various self-regulatory organizations (SROs) are responsible for oversight of securities broker-dealers. The SROs include the Municipal Securities Rulemaking Board (MSRB), the National Association of Securities Dealers (NASD), and exchanges such as the New York Stock Exchange (NYSE).

Bank activities in the trading of securities are subject to further regulation from the various banking regulators. One of the more important statutory provisions governing securities activities of banks was the Banking Act of 1933 (the Glass-Steagall Act), which provided that member banks could purchase only certain limited types of securities (referred to as ''eligible securities'') and prohibited member banks from affiliating with entities that were engaged principally in the business of underwriting or issuing ineligible securities. Under the provisions of the Gramm-Leach-Bliley Act (GLB Act) enacted in 1999, financial holding companies are permitted to establish broker-dealer subsidiaries engaged in underwriting, dealing, and market making in securities, without the restrictions applicable to section 20 subsidiaries. The GLB Act provisions also permit financial subsidiaries of banks to engage in comparable activities, subject to certain bank capital limitations and deductions. Permissible equity trading activities of foreign and Edge corporation subsidiaries of U.S. banks are governed under the Board's Regulation K.

Activities involving instruments other than securities also may be subject to a variety of regulatory provisions. Commodities futures and options are regulated primarily by the Commodity Futures Trading Commission (CFTC), with the activities of futures commission merchants (FCMs) subject to regulation by the CFTC as well as the rules of the National Futures Association (an SRO) and various exchanges on which trading is conducted. Most over-the-counter derivative instruments (for example, foreign-exchange contracts, forward rate agreements, and interest-rate swaps) are exempt from general CFTC regulation, either by statute in the case of foreign exchange or under CFTC regulatory exemptions in the case of other types of swaps and related transactions. While these instruments are not themselves subject to regulation, the activities of regulated entities in these instruments are subject to oversight by the banking or other regulators.

In addition to laws and regulations issued by the regulatory authorities, industry trade groups such as the International Swaps Dealers Association or the Public Securities Association (PSA) have developed industry guidelines or standards in some areas. Additionally, organizations such as the Financial Accounting Standards Board (FASB) and the American Institute of Certified Public Accountants (AICPA) issue opinions and standards that relate to a financial institution's trading activities and financial disclosure.[1]

Increasingly, securities trading activities of banking organizations are being conducted in separately incorporated, nonbank entities owned, directly or indirectly, by bank holding companies. The Board has permitted some banking organizations to engage in securities underwriting and dealing—most importantly, in corporate debt and equity—that previously was restricted largely to securities firms. The subsidiaries in which these securities activities are conducted are commonly referred to as ''section 20'' subsidiaries, after section 20 of the Glass-Steagall Act. Before the Board's approval of limited underwriting activities relating to corporate debt and equity securities, banking organizations were restricted to underwriting and dealing in bank-eligible securities, such as government securities, general municipal obligations, and money market instruments.

Section 20 companies also are registered broker-dealers, as are many other bank holding company or bank subsidiaries. As such, they fall under the regulatory authority of securities regulators. The GLB Act requires banking regulators to rely to the greatest extent possible on the functional regulator of securities firms. Only under certain specified circumstances may a

1. For example, FASB's Statement No. 80 outlines accounting requirements relating to futures contracts, while Practice Bulletin 4 of the AICPA addresses accounting issues concerning debt-for-equity swaps involving LDC obligations.

banking regulator conduct an examination of a broker-dealer. Thus, bank examiners need to become familiar with the regulatory environment in which securities broker-dealers have traditionally operated. This section will focus on that goal, deferring to existing material in the following manuals: *Commercial Bank Examination Manual*, *Merchant and Investment Bank Examination Manual*, and *Bank Holding Company Supervision Manual*.

PRINCIPLES OF SUPERVISION

The main principles of securities regulation employed by the SEC are the protection of investors (especially the small and unsophisticated) and maintenance of the integrity and liquidity of the capital markets. These are not unlike the goals of banking regulators, who seek to protect small depositors and promote a stable banking system. However, securities and banking regulators differ in how they apply these goals to an institution encountering problems. Securities capital-adequacy rules are liquidity-based and designed to ensure that a troubled broker-dealer can promptly pay off all customers in the event of liquidation. Banking regulators face a different set of constraints when dealing with troubled banks and are less inclined to rely as quickly on the liquidation process.

REGISTRATION

Securities broker-dealers generally must register with the SEC before conducting business. While broker-dealer activities undertaken by a bank itself generally are exempt from registration requirements, bank subsidiaries and bank holding companies or subsidiaries that are broker-dealers must register with the SEC. Registered securities broker-dealers also are registered with the NASD or another SRO, such as an exchange, and are required to have their sales and supervisory personnel pass written examinations.

Broker-dealers that engage in transactions involving municipal or government securities generally are registered with the SEC, but are subject to somewhat different requirements than the general registration requirements. When the bank itself acts as a government securities broker-dealer, the bank is required to notify its appropriate bank regulatory authority that it is acting in that capacity.

CAPITAL REQUIREMENTS

Registered securities broker-dealers are subject to minimum net capital requirements pursuant to SEC Rule 15c3-1 or the U.S. Treasury's rules for government securities dealers (17 CFR 402). Requirements in excess of the minimum are also established by NYSE, NASD, and other SROs. If any of these minimums are breached, the firm is subject to harsh restrictions on its operations. Net capital is generally defined as the broker-dealer's net worth plus subordinated borrowings, minus nonliquid (nonallowable) assets, certain operational deductions, and required deductions (''haircuts'') from the market value of securities inventory and commitments. The level of the haircut depends on the type and duration of the security; the greater the duration and risk (or volatility), the greater the haircut.

CREDIT RESTRICTIONS

Various credit and concentration restrictions are imposed on a securities broker-dealer if the dealer is unduly concentrated in a given issue. Additionally, the Federal Reserve's Regulation T imposes limits on the amount of credit which may be extended by broker-dealers to customers purchasing securities. This restriction varies with the type of security.

REGULATORY REQUIREMENTS

Regulatory Examinations

All securities broker-dealers are required to publish annual financial statements audited by independent accountants. The SEC has the authority to conduct examinations, including examinations for compliance with sales-practice and customer securities custody-protection rules, recordkeeping and internal controls, and regulatory reporting. In most cases, the SEC delegates this examination responsibility to the NYSE or the appropriate SRO. The NASD also conducts all examinations of firms, except banks, that engage strictly in municipal or government securities trading. In the case of banks, bank regulators are responsible for the examination.

Regulatory Reporting

Securities broker-dealers are required to file a monthly Financial and Operational Combined Uniform Single (FOCUS) report with their examining authority. This report contains financial statements and computations for the net capital rule, segregated funds held on behalf of commodity futures customers, and a reserve account designed to protect customer balances.[2] Government securities dealers file a somewhat similar report, the G-405 or ''FOG'' report, unless they are banks. Bank dealers file their normal call reports. If the broker-dealer is a bank-affiliated section 20 company, it will also file a monthly Y-20 report. This report consists of a balance sheet and income statement and is used to ensure compliance with the Federal Reserve's restrictions on the amount of ''ineligible'' revenue a section 20 company may have. Although FOCUS and FOG reports are generally confidential, securities broker-dealers will often make them available to large customers for credit reasons.

U.S. commercial banks and branches and agencies of foreign banks are required to file call reports with the appropriate federal bank regulatory agency. The call report includes schedules that detail various off-balance-sheet instruments and information on the institutions' trading-account securities.

FOREIGN SECURITIES ACTIVITIES

Foreign-owned securities firms in the United States are subject to the same rules as domestically owned firms. In general, offshore activities conducted by U.S. broker-dealers that are located entirely outside of U.S. jurisdiction and do not involve U.S. persons are not subject to U.S. securities regulation. Moreover, for FOCUS and FOG reporting purposes, the securities broker-dealer is not required to consolidate foreign (or domestic) subsidiaries unless the assets and liabilities have been guaranteed by the parent.

2. SEC Rule 15c3-3 restricts the use of customers' funds and fully paid securities for proprietary transactions.

The overall objective is to determine if the institution's trading activities are in compliance with applicable laws, regulations, and supervisory guidelines. Specified senior management, as well as the regulatory reporting area of the bank, must be thoroughly familiar with regulatory requirements. Whenever possible, the bank examiner uses the examination results of the securities regulators and FOCUS/FOG reports to help assess the firm's overall compliance record.

1. To determine if the institution's internal controls and audit program address the regulatory compliance aspect of its various trading activities.
2. To determine if the bank has in place risk-management procedures and controls that provide management with accurate and timely information on all trading positions and their potential impact on the institution's financial and regulatory position.
3. To ascertain whether the institution's personnel involved in trading activities are aware of and knowledgeable about laws, regulations, and supervisory and other standards applicable to these activities.

Senior management of financial institutions should establish ethical standards and codes of conduct governing the activities of their employees to protect the institution's integrity and standing in the market. The orderly operation of financial markets depends greatly on an overall level of trust among all market participants. Traders and marketing and support staff must conduct themselves at all times with unquestionable integrity to protect the institution's reputation with customers and market participants.

CODES OF CONDUCT AND ETHICAL STANDARDS

To ensure that employees understand all ethical and legal implications of trading activities, institutions should have comprehensive rules of conduct and ethical standards for capital-markets and trading activities—especially in areas where the complexity, speed, competitive environment, and volume of activity could create the potential for abuse and misunderstandings. At a minimum, policies and standards should address potential conflicts of interest, confidentiality and the use of insider information, and customer sales practices. Ethical standards and codes of conduct in these areas should conform with applicable laws, industry conventions, and other bank policies. They should also provide proper oversight mechanisms for monitoring staff compliance and dealing with violations and customer complaints. Internal controls, including the role of internal and external audits, should be appropriate to ensure adherence to corporate ethical standards of conduct. Policies and procedures should provide ongoing training for staff, as well as periodic review, revision, and approval of ethical standards and codes of conduct to ensure that they incorporate new products, business initiatives, and market developments.

Conflicts of Interest

Institutions should ensure that capital-markets personnel do not allow self-interest to influence or give the appearance of influencing any activity conducted on behalf of the institution. Safeguards should include specific restrictions on trading for the employee's personal account and on the acceptance of gratuities and entertainment. When developing compensation programs, institutions should recognize and guard against any potential conflicts that may arise between compensation structures and the institution's code of ethics and standards of conduct.

Fee-based activities, securitization, underwriting, and secondary-market trading activities in a number of traditional bank assets may create the potential for conflicts of interests if there is no clear segregation of duties and responsibilities. Conflicts of interest may arise when access to inside information gives an institution an unfair advantage over other market participants. Accordingly, policies should ensure that employees conduct themselves consistent with legal and regulatory restrictions on the use of inside information.

Confidentiality and Insider Information

The maintenance of confidentiality and customer anonymity is critical for the operation of an efficient trading environment. No client information should be divulged outside the institution without the client's authorization unless required by law or by regulatory authorities acting in their official capacities. Managers are responsible for ensuring that their staffs are aware of what constitutes confidential information, and that they know how to deal appropriately with situations that require customer anonymity.

Many institutions have established appropriate policies (so-called ''Chinese walls'') that separate those areas of the institution that routinely have access to confidential or insider information from those areas that are legally restricted from having access to the information. To prevent the misuse of confidential information, employees in sensitive areas should be physically segregated from employees in public areas.

Sales Practices

It is a sound business practice for managers to establish policies and procedures governing stan-

dards for dealing with counterparties. These guidelines and policies preserve the institution's reputation in the marketplace by avoiding situations that create unjustified expectations on the part of a counterparty or client. When determining the responsibilities of sales and marketing staff, management should take into account the sophistication of the counterparty, the nature of the relationship, and the type of transaction being contemplated or executed. In addition, certain regulated entities and markets may have specific legal or regulatory requirements governing sales and marketing practices, which marketers and sales personnel must be aware of.

Financial institutions should take steps to ascertain the character and financial sophistication of their counterparties. An appropriate level of due diligence should be performed on all counterparties with which the institution deals. Financial institutions should also determine that their counterparties have the legal authority to enter into, and will be legally bound by the terms of, the transaction.

When an advisory relationship does not exist between a financial institution and its counterparty, the transaction is assumed to be conducted at ''arms-length'' and the counterparty is generally considered to be wholly responsible for the transactions it chooses to enter. At times, clients may not wish to make independent investment or hedging decisions and instead may wish to rely on a financial institution's recommendations and investment advice. Similarly, clients may give a financial institution the discretionary authority to trade on their behalf. Financial institutions providing investment advice to clients, or using discretionary authority to trade on a client's behalf, should formalize and set forth the boundaries of these relationships with their clients. Formal advisory relationships may entail significantly different legal and business obligations between an institution and its customers than less formal agency relationships. The authority, rights, and responsibilities of both parties should be documented in a written agreement.

Marketing personnel should receive proper guidance and training on how to delineate and maintain appropriate client relationships. This includes guidance to sales and trading personnel regarding the avoidance of the implication of an advisory relationship when none is intended.

While procedures may vary depending on the type and sophistication of a counterparty, for its own protection, a financial institution should take steps to ensure that its counterparties understand the nature and risks inherent in agreed-upon transactions. When a counterparty is unsophisticated, either generally or with respect to a particular type of transaction, the financial institution should take additional steps to adequately disclose the attendant risks of specific types of transactions. Furthermore, a financial institution that recommends specific transactions to an unsophisticated counterparty should ensure that it has adequate information on which to base its recommendation—and that the recommendation is consistent with the needs of the counterparty as known to the financial institution. The institution also should ensure that its recommendations are consistent with any restrictions imposed by a counterparty's management or board of directors on the types or amounts of transactions it may enter into.

Institutions should establish policies governing the content of sales materials provided to their customers. Typically, these policies call for sales materials that accurately describe the terms of the proposed transaction and provide a fair representation of the risks involved. Policies may also identify the types of analysis to be provided to the customer and often specify that analyses include stress tests of the proposed instrument or transaction over a sufficiently broad range of possible outcomes to adequately assess the risk. Some institutions use standardized disclosure statements and analyses to inform customers of the risks involved and suggest that the customer independently obtain advice about the tax, accounting, legal, and other aspects of a proposed transaction.

Institutions should also ensure that procedures and mechanisms to document analyses of transactions and disclosures to clients are adequate and that internal controls ensure ongoing adherence to disclosure and customer-appropriateness policies and procedures. Management should clearly communicate to capital-markets and all other relevant personnel any specific standards that the institution has established for sales materials.

Many customers request periodic valuations of their positions. Institutions that provide periodic valuations of customers' holdings should have internal policies and procedures governing the manner in which such quotations are derived and transmitted to the customer, including the nature and form of disclosure and any disclaimers. Price quotes can be either indicative, meant to give a general level of market prices for a

transaction, or firm, which represent prices at which the institution is willing to execute a transaction. When providing a quote to a counterparty, institutions should be careful that the counterparty does not confuse indicative quotes for firm prices. Firms receiving dealer quotes should be aware that these values may not be the same as those used by the dealer for its internal purposes and may not represent other ''market'' or model-based valuations.

When securities trading activities are conducted in a registered broker-dealer that is a member of the National Association of Securities Dealers (NASD), the broker-dealer will have obligations to its customers under the NASD's ''business conduct rule'' and ''suitability rule.'' The banking agencies have adopted identical rules governing the sales of government securities in financial institutions. The business-conduct rule requires an NASD member to ''observe high standards of commercial honor, and just and equitable principles of trade'' in the conduct of its business. The suitability rule requires that, in recommending a transaction to a customer, an NASD member must have ''reasonable grounds for believing that the recommendation is suitable for the customer upon the basis of facts, if any, disclosed by the customers as to the customer's other securities holdings and as to the customer's financial situation and needs.''

The suitability rule further provides that, for customers who are not institutional customers, an NASD member must make reasonable efforts to obtain information concerning the customer's financial and tax status and investment objectives before executing a transaction recommended to the customer. For institutional customers, an NASD interpretation of its suitability rule requires that a member determine (1) the institutional customer's capability for evaluating investment risk generally and the risk of the particular instruments offered and (2) whether the customer is exercising independent judgment in making investment decisions. The NASD interpretation cites factors relevant to determining these two requirements.

MANAGEMENT OVERSIGHT

Management should monitor any pattern of complaints concerning trading, capital-markets, and sales personnel that originate from outside the institution, such as from customers, other trading institutions, or intermediaries. Patterns of broker usage should be monitored to alert management to unusual concentrations. Broker entertainment of traders should be fully documented, reviewed, and approved by management. In addition, excessive entertainment of brokers by traders should be prohibited.

Management should also be well acquainted with the institution's trading activities and corresponding reports so that, upon regular review, they can determine unusual patterns or concentrations of trading activity or transactions with a customer that are not consistent with the customer's usual activities. Management should clearly and regularly communicate all prohibited practices to capital-markets and all other relevant personnel.

COMPLIANCE MEASURES

Personnel affirmations and disclosures are valuable tools for ensuring compliance with an institution's code of conduct and ethical standards. Procedures for obtaining appropriate affirmations and disclosures where and when required, as well as the development of forms on which these statements are made, are particularly important. At a minimum, employees should be asked to acknowledge annually that they have read and understood the institution's ethics and code of conduct standards. Some companies also require that this annual affirmation contain a covenant that employees will report any noted violations. Several major financial institutions have adopted additional disclosure procedures to enforce the personal financial responsibilities set out in their codes. They require officers to file with the compliance manager an annual statement dealing with family financial matters or, in some cases, a statement of indebtedness. Finally, many institutions require traders to conduct their personal trading through a designated account at the institution. Adequate internal controls including review by internal audit and, when appropriate, external audit are critical for ensuring compliance with an institution's ethical standards.

1. To determine if the institution has adequate codes of conduct and ethical standards specific to its capital-markets and trading activities, that their scope is comprehensive, and that they are periodically updated.
2. To review and ensure the adequacy of the institution's policies, procedures, and internal-control mechanisms used to avoid potential conflicts of interest, prevent breeches in customer confidentiality, and ensure ethical sales practices across the institution's trading activities. To determine if the institution has established appropriate and effective firewall policies where needed.
3. To determine that management has adequate policing mechanisms and internal controls to monitor compliance with the code of ethics and that procedures for reporting and dealing with violations are adequate. To determine if the supervision of staff is adequate for the level of business conducted.
4. To recommend corrective actions when policies, procedures, practices, or internal controls are found to be deficient or when violations of laws, rulings, or regulations have been noted.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of the examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal-audit comments and previous examination workpapers to assist in designing the scope of the examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Obtain copies of the institution's written code of conduct and ethics and any related policies and guidance. Determine if there are codes specific to all relevant trading and marketing activities.
2. Obtain any procedures used to guide staff in developing new accounts or preparing sales presentations and documents.
3. Evaluate the various codes and policies as to their adequacy and scope. Are prohibited practices clearly identified? These may include but are not limited to the following:
   a. altering clients' orders without their permission
   b. using the names of others when submitting bids
   c. compensating clients for losses on trades
   d. submitting false price information to public information services
   e. churning managed client accounts
   f. altering official books and records without legitimate business purposes
   g. trading in instruments prohibited by regulatory authorities
4. Are standards for the content of sales presentations and the offering transaction documents clearly identified? Do these standards address an appropriate range of transactions, customers, and customer relationships?
5. Review the institutions's firewall policies segregating its trading and advisory activities from those areas which have access to material nonpublic or ''insider information.'' Are the areas physically separated? Are employees aware of the requirements of the law restricting the use of such information, specifically section 10(b) of the Securities Exchange Act of 1934 and SEC Rule 10(b)5?
6. Identify the officer within the institution who is designated as compliance manager. Are trading personnel required to confirm in writing their acknowledgment of the various codes and to report violations? Are they required to file annual statements of indebtedness and outside affiliations? Check to see that adherence to these reporting requirements is being monitored by the compliance manager.
7. Determine how compliance with sales-practice policies is monitored by the institution. Are personnel outside the trading area reviewing sales documents and disclosures for compliance with policies? Review and evaluate the findings of internal and external audits conducted in this area.
8. Conduct limited transaction testing of sales documentation to review compliance with financial-institution policies and sound practices.
9. Determine if there is a general policy concerning violations of the code. Is there a specific procedure for reporting violations to senior management and the general auditor? Does it detail grounds for disciplinary action?
10. Recommend corrective action when policies, procedures, practices, or internal controls are found to be deficient or when violations of laws, rulings, or regulations have been noted.

1. Does the institution have a written code of conduct or ethics? Are there specific codes for capital-markets staff?
   a. Is there a statement as to the code's intention to conform with U.S. laws or laws of other countries where the institution has operations?
   b. Does this code cover the whole institution, including subsidiaries? If not, are there codes that apply to those particular areas?
   c. Does the code address specific activities which are unique to this particular institution? Do other areas of the institution with a higher potential for conflicts of interest have more explicit policies?
   d. Do the codes address the following issues:
      - Employee relationships with present or prospective customers and suppliers? Has the institution conducted appropriate inquiry for customer integrity? Does the institution's code properly address the following employee-customer or supplier relationship issues?
        — safeguarding confidential information
        — borrowings
        — favors
        — acceptance of gifts
        — outside activities
        — kickbacks, bribes, and other remunerations
        — integrity of accounting records
        — candor in dealings with auditors, examiners, and legal counsel
        — appropriate background check and assessment of the credit quality and financial sophistication of new customers
        — appropriate sales practices
      - Internal employee relationships between specific areas of the bank?
        — Do policies exist covering the relationship on sharing information between trading and other areas of the bank?
        — Is the confidentiality of account relationships addressed?
      - Personal employee activities outside the corporation? Does the institution—
        — periodically check whether employees maintain sound personal financial conduct and avoid excessive debts or risks?
        — monitor employee business interaction with other staff members, family, or organizations in which an employee has a financial interest?
        — prohibit employee use of confidential information for personal gain? provide for adequate control over trading for personal accounts?
        — require periodic disclosure and approval of outside directorships and business associations?
      - Regarding personal and corporate political activities, is the illegality of corporate political activities (for example, contributions of goods, services, or other support) addressed?
      - The necessity to avoid what might only appear to be a possible conflict of interest?
2. Does management have the necessary mechanism in place to monitor compliance with the code of ethics?
   a. Are officers and staff members required to sign an acknowledgment form that verifies they have indeed seen and read the code of conduct and ethics?
      - Is there a periodic program to make staff aware of and acknowledge the importance of adhering to the code?
      - Are officers required to disclose their borrowing arrangements with other financial institutions to identify a potential conflict of interest?
   b. What departments and which officers are responsible for monitoring compliance with the code of conduct and ethics *and related policies*? What mechanisms do they employ and are they adequate?
   c. How is information in the code relayed to staff?
      - Have there been any breaches of the code? If so, what was the situation and how was it resolved?
      - Do bank personnel avail themselves of the resources outlined in the code when there is a question regarding a potential conflict of interest? If not, why?
      - Are all employees aware of the existence of the code? If not, why?
      - Does the bank's management generally

believe that all potential conflicts of interest have been anticipated and are adequately covered in the code?
- Are internal auditors involved in monitoring the code of ethics?
- Does the organization's culture encourage officers and employees to follow the standards established by the code?

3. Are there resources for an employee to obtain an opinion on the legitimacy of a particular circumstance outlined in the code of conduct and ethics?
   a. Does the code emphasize the need for employees to report questionable activities even when the issues are not their particular responsibility? Are the proper channels of action outlined for these types of cases?
   b. Does the code outline the penalties or repercussions such as the following for breach of the code of conduct and ethics?
      - potential to lose one's job?
      - potential for civil or legal action?
      - eventual damage to the corporation's reputation?
4. Is the code of ethics updated frequently to encompass new activities?

A depository institution's investment and end-user activities involve the use of securities (both available-for-sale and held-to-maturity) and derivative contracts to achieve earnings and risk-management objectives that involve longer time horizons than those typically associated with trading activities.[1] These ''nontrading'' activities involve the full array of cash securities, money market instruments, and derivative contracts. Cash securities include fixed- and floating-rate notes and bonds, structured notes, mortgage pass-through and other asset-backed securities, and mortgage-derivative products. OBS derivative contracts include swaps, futures, and options.

When institutions acquire and manage securities and derivative instruments, they must ensure that these activities are permissible and appropriate within the established limitations and restrictions on banks' holdings. Institutions must also employ sound risk-management practices consistently across these varying product categories, regardless of their legal characteristics or nomenclature. This section provides examiners with guidance on—

- the permissibility and appropriateness of securities holdings by state member banks;
- sound risk-management practices and internal controls used by banking institutions in their investment and end-user activities;
- interaffiliate derivatives transactions;
- securities and derivatives acquired by the bank's international division and overseas branches for its own account, as well as on the bank's foreign equity investments that are held either directly or through Edge Act corporations; and
- unsuitable investment practices.

LIMITATIONS AND RESTRICTIONS ON SECURITIES HOLDINGS

Many states extend the same investment authorities available to national banks to their chartered banks—often with direct reference. In turn, the security investments of national banks are governed by the seventh paragraph of 12 USC 24 (section 5136 of the Revised Statutes) and by the investment-securities regulation of the Office of the Comptroller of the Currency (OCC).

Under 12 USC 24, an ''investment security'' is defined as a debt obligation that is not predominantly speculative. A security is not predominantly speculative if it is rated investment-grade. An ''investment-grade security'' has been rated in one of the four highest rating categories by two or more nationally recognized statistical rating organizations (one rating may suffice if the security has only been rated by one organization). In the case of split ratings—different ratings from different rating organizations—the lower rating applies.

The OCC's investment-securities regulation, which was revised in 2001, identifies five basic types of investment securities (types I, II, III, IV, and V) and establishes limitations on a bank's investment in these types of securities based on the percentage of capital and surplus that such holdings represent. For calculating concentration limits, the term ''capital and surplus'' includes the balance of a bank's allowance for loan and lease losses not included in tier 2 capital. Table 1 summarizes bank-eligible securities and their investment limitations.

Type I securities are those debt instruments that national and state member banks can deal in, underwrite, purchase, and sell for their own accounts without limitation. Type I securities are obligations of the U.S. government or its agencies, general obligations of states and political subdivisions, and mortgage-related securities. As a result of the Gramm-Leach-Bliley Act (GLB Act), municipal revenue bonds that are not general obligation bonds are the equivalent of type I investment securities for well-capitalized state member banks. A bank may purchase type I securities for its own account subject to no limitations, other than the exercise of prudent banking judgment (see 12 USC 24 (seventh) and 15 USC 78c(a)(41)).

Type II securities are those debt instruments that national and state member banks may deal in, underwrite, purchase, and sell for their own accounts subject to a 10 percent limitation of a bank's capital and surplus for any one obligor. Type II investments include obligations issued

1. In general terms, derivatives are financial contracts whose value derives from the value of one or more underlying assets, interest rates, exchange rates, commodities, or financial or commodity indexes.

by the International Bank for Reconstruction and Development; the Inter-American Development Bank; the Asian Development Bank; the Tennessee Valley Authority; the U.S. Postal Service; obligations issued by any state or political subdivision for housing, university, or dormitory purposes; and other issuers specifically identified in 12 USC 24 (seventh).

Type III is a residual securities category consisting of all types of investment securities not specifically designated to another security ''type'' category. Banks cannot deal in or underwrite type III securities, and their holdings of these instruments are limited to 10 percent of the banks' capital and surplus for any one obligor.

Type IV securities include the following asset-backed securities (ABS) that are fully secured by interests in pools of loans made to numerous obligors:

- investment-grade residential mortgage–related securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- residential mortgage–related securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade commercial mortgage securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- commercial mortgage securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade, small-business-loan securities as described in section 3(a)(53)(A) of the Securities Exchange Act of 1934 (15 USC 78c(a)(53)(A))

For all type IV commercial and residential mortgage securities and for type IV small-business-loan securities rated in the top two categories, there is no limitation on the amount a bank can purchase or sell for its own account. Type IV investment-grade, small-business-loan securities that are not rated in the top two rating categories are subject to a limit of 25 percent of a bank's capital and surplus for any one issuer. In addition to being able to purchase and sell type IV securities, subject to the above limitation, a bank may deal in those type IV securities which are fully secured by type I securities.

Type V securities consist of all ABS that are not type IV securities. Specifically, they are defined as marketable, investment-grade-rated securities that are not type IV and are ''fully secured by interests in a pool of loans to numerous obligors and in which a national bank could invest directly.'' They include securities backed by auto loans, credit card loans, home equity loans, and other assets. Also included are residential and commercial mortgage securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)). These securities are not rated in one of the two highest investment-grade-rating categories, but they are still investment-grade. A bank may purchase or sell type V securities for its own account provided the aggregate par value of type V securities issued by any one issuer held by the bank does not exceed 25 percent of the bank's capital and surplus.

As mentioned above, type III securities represent a residual category. The OCC requires a national bank to determine (1) that the type III instrument it plans to purchase is marketable and of sufficiently high investment quality and (2) that the obligor will be able to meet all payments and fulfill all the obligations it has undertaken in connection with the security. For example, junk bonds, which are often issued to finance corporate takeovers, are usually not considered to be of investment quality because they are predominately speculative and have limited marketability.

The purchase of type II and III securities is limited to 10 percent of equity capital and reserves for each obligor when the purchase is based on adequate evidence of the maker's ability to perform. That limitation is reduced to 5 percent of equity capital and reserves for all obligors in the aggregate when the judgment of the obligor's ability to perform is based predominantly on ''reliable estimates.'' The term ''reliable estimates'' refers to projections of income and debt-service requirements or conditional ratings when factual credit information is not available and when the obligor does not have a record of performance. Securities purchased subject to the 5 percent limitation may, in fact, become eligible for the 10 percent limitation once a satisfactory financial record has been established. Additional limitations on specific securities that have been ruled eligible for investment are detailed in 12 CFR 1.3. The par value, not the book value or purchase price, of the

security is the basis for computing the limitations. However, the limitations do not apply to securities acquired through debts previously contracted.

Table 1—Summary of New Investment-Type Categories

Type Category	*Characteristics*	*Limitations*
Type I securities	• U.S. government securities • general obligations of a state or political subdivision • obligations backed by the full faith and credit of the U.S. government • FHLB, FNMA, and FHLMC debt • for well-capitalized banks, municipal revenue bonds that are not general obligation bonds	No limitations on banks' investment, dealing, or underwriting abilities.
Type II securities	• state obligations for housing, university, or dormitory purposes that would not qualify as a type I municipal security • obligations of development banks • debt of Tennessee Valley Authority • debt of U.S. Postal Service	Banks may deal in, underwrite, or invest subject to the limitation that the aggregate par value of the obligation of any one obligor may not exceed 10 percent of a bank's capital and surplus.
Type III securities	• obligations that a national bank is authorized to deal in, underwrite, purchase, or sell under 12 USC 24 (seventh), other than type I securities • an investment security that does not qualify as type I, II, IV, or V • municipal revenue bonds, except those that qualify as a type I municipal security • corporate bonds	The aggregate par value of a bank's purchases and sales of the securities of any one obligor may not exceed 10 percent of a bank's capital and surplus. Banks may not deal in or underwrite these securities.
Type IV securities	• small business–related securities that are rated investment-grade or the equivalent and that are fully secured by a loan pool • residential and commercial mortgage–related securities rated AA, Aa, or higher	For securities rated AA or Aa or higher, no investment limitations. For securities rated A or Baa, the aggregate par value of a bank's purchases and sales of the securities of any one obligor may not exceed 25 percent of a bank's capital and surplus. For mortgage-related securities, no investment limitations. A bank may deal in type IV securities that are fully secured by type I securities, with limitations.

Type Category	*Characteristics*	*Limitations*
Type V securities	• asset-backed securities (credit card, auto, home equity, student loan, manufactured housing) that are investment-grade and marketable • residential and commercial mortgage–related securities rated AA or Aa, but still investment-grade	The aggregate par value of a bank's purchases and sales of the securities of any one obligor may not exceed 25 percent of a bank's capital and surplus.

Sub-investment-quality securities are those in which the investment characteristics are distinctly or predominantly speculative. This group includes securities in grades below the four highest grades and unrated securities of equivalent quality, defaulted securities, and sub-investment-quality stocks. As noted in the following table, securities in grades below the four highest grades and unrated securities of equivalent quality will be valued at market price. The market value will be classified substandard, and the depreciation will be classified doubtful. Depreciation in defaulted securities and sub-investment-quality stocks will generally be classified loss; market value will be classified substandard.

Table 2—Security Classifications

	Classification		
Type of Security	*Substandard*	*Doubtful*	*Loss*
Investment-quality	XXX	XXX	XXX
Sub-investment-quality, except—	Market value	Market depreciation	XXX
Sub-investment-quality, municipal general obligations	Book value	XXX	XXX
Defaulted securities and sub-investment-quality stocks, except—	Market value	XXX	Market depreciation
Defaulted municipal general obligations:			
Interim	XXX	Book value	XXX
Final, i.e., when market is reestablished	Market value	XXX	Market depreciation

An exception to the above is to be made for municipal general obligations, which are backed by the credit and taxing power of the issuer. The entire book value of sub-investment-quality municipal general obligations that are not in default should be classified substandard. In the event of a default of a municipal general obligation, a period of time is usually necessary to permit the market for these defaulted securities to stabilize or for the issuer to put in place budgetary, tax, or other actions that may eliminate the default or otherwise improve the post-default value of the securities. The market for the defaulted securities will be periodically reviewed by the regulatory authorities. Upon a determination that a functioning market has been reestablished, depreciation on defaulted municipal general obligations will be classified

as loss. During this interim, the book value of all defaulted municipal general obligation securities will be classified doubtful.

Banks are required to maintain adequate credit information in their files to demonstrate that they are exercising prudent judgment in their securities and derivative transactions. Unrated securities must be evaluated by the bank to determine if the instrument is a bank-eligible investment. Examiners must ensure that the bank's methodology for evaluating unrated securities is sound. All credit-related information and analyses should be retained for as long as the security remains in the bank's portfolio.

Low-quality securities are sometimes transferred from one depository institution to another to avoid detection and classification during regulatory examinations. This type of transfer may be accomplished through participations, purchases or sales, and asset swaps with other affiliated or nonaffiliated financial institutions. Broadly defined, low-quality securities include depreciated or sub-investment-grade securities of questionable quality. Situations in which an institution appears to be concealing low-quality securities to avoid examination scrutiny and possible classification represent an unsafe and unsound practice. Further, this type of transfer between affiliated banks is a violation of section 23A of the Federal Reserve Act.

Any situations involving the transfer of low-quality or questionable securities should be brought to the attention of Reserve Bank supervisory personnel who, in turn, should notify the local office of the primary federal regulator of the other depository institution involved in the transaction. For example, if an examiner determines that a state member bank or holding company has transferred or intends to transfer low-quality securities to another depository institution, the Reserve Bank should notify the recipient institution's primary federal regulator of the transfer. The same notification requirement holds true if an examiner determines that a state member bank or holding company has acquired or intends to acquire low-quality securities from another depository institution. This procedure applies to transfers involving savings and loan associations and savings banks, as well as commercial banking organizations.

Situations may arise when transfers of securities are undertaken for legitimate reasons. In these cases, the securities should be properly recorded on the books of the acquiring institution at their fair value on the date of transfer. If the transfer was with the parent holding company or a nonbank affiliate, the records of the affiliate should be reviewed as well.

MORTGAGE-DERIVATIVE PRODUCTS

In April 1998, the FFIEC rescinded its Supervisory Policy Statement on Securities Activities, published in February 1992, including the high-risk test for mortgage-derivative products.

EVALUATING RISK MANAGEMENT AND INTERNAL CONTROLS

Examiners are expected to conduct an adequate evaluation of the risk-management process an institution uses to acquire and manage the securities and derivative contracts used in nontrading activities. In conducting this analysis, examiners should evaluate the following four key elements of a sound risk-management process:

- active board and senior management oversight
- adequate risk-management policies and limits
- appropriate risk-measurement and -reporting systems
- comprehensive internal controls

This section identifies basic factors that examiners should consider in evaluating these elements for investment and end-user activities. It reiterates and supplements existing guidance and directives on the use of these instruments for nontrading purposes as provided in various supervisory letters and examination manuals.[2]

2. Existing policies and examiner guidance on various supervisory topics applicable to securities and off-balance-sheet instruments can be found in this manual, the *Commercial Bank Examination Manual*, the *Bank Holding Company Supervision Manual*, and the *Trust Activities Examination Manual*, as well as in various supervision and regulation (SR) letters, including SR-90-16, "Implementation of Examination Guidelines for the Review of Asset Securitization Activities"; SR-91-4, "Inspections of Investment-Adviser Subsidiaries of Bank Holding Companies"; SR-92-1, "Supervisory Policy Statement on Securities Activities"; SR-93-69, "Risk Management and Internal Controls for Trading Activities"; SR-95-17, "Evaluating the Risk Management and Internal Controls of Securities and Derivative Contracts Used in Nontrading

In evaluating an institution's risk-management process, examiners should consider the nature and size of its holdings. Examiner judgment plays a key role in assessing the adequacy of an institution's risk-management process for securities and derivative contracts. Examiners should focus on evaluating an institution's understanding of the risks involved in the instruments it holds. Regardless of any responsibility, legal or otherwise, assumed by a dealer or counterparty for a particular transaction, the acquiring institution is ultimately responsible for understanding and managing the risks of the transactions into which it enters. Failure of an institution to adequately understand, monitor, and evaluate the risks involved in its securities or derivative positions, either through lack of internal expertise or inadequate outside advice, constitutes an unsafe and unsound banking practice.

As with all risk-bearing activities, institutions should fully support the risk exposures of nontrading activities with adequate capital. Banking organizations should ensure that their capital positions are sufficiently strong to support all the risks associated with these activities on a fully consolidated basis and should maintain adequate capital in all affiliated entities engaged in these activities. In evaluating the adequacy of an institution's capital, examiners should consider any unrecognized net depreciation or appreciation in an institution's securities and derivative holdings. Further consideration should also be given to the institution's ability to hold these securities and thereby avoid recognizing losses.

Board of Directors and Senior Management Oversight

Active oversight by the institution's board of directors and relevant senior management is critical to a sound risk-management process. Examiners should ensure that these individuals are aware of their responsibilities and that they adequately perform their appropriate roles in overseeing and managing the risks associated with nontrading activities involving securities and derivative instruments.

Board of Directors

The board of directors has the ultimate responsibility for the level of risk taken by the institution. Accordingly, the board should approve overall business strategies and significant policies that govern risk-taking, including those involving securities and derivative contracts. In particular, the board should approve policies identifying managerial oversight and articulating risk tolerances and exposure limits for securities and derivative activities. The board should also actively monitor the performance and risk profile of the institution and its various securities and derivative portfolios. Directors should periodically review information that is sufficiently detailed and timely to allow them to understand and assess the credit, market, and liquidity risks facing the institution as a whole and its securities and derivative positions in particular. These reviews should be conducted at least quarterly and more frequently when the institution holds significant positions in complex instruments. In addition, the board should periodically reevaluate the institution's business strategies and significant risk-management policies and procedures, placing special emphasis on the institution's financial objectives and risk tolerances. The minutes of board meetings and accompanying reports and presentation materials should clearly demonstrate the board's fulfillment of these basic responsibilities. The section of this guidance on managing specific risks provides guidance on the types of objectives, risk tolerances, limits, and reports that directors should consider.

The board of directors should also conduct and encourage discussions between its members and senior management, as well as between senior management and others in the institution, regarding the institution's risk-management process and risk exposures. Although it is not essential for board members to have detailed technical knowledge of these activities, if they do not, it is their responsibility to ensure that they have adequate access to independent legal and professional advice on the institution's securities and derivative holdings and strategies. The familiarity, technical knowledge, and awareness of directors and senior management should be commensurate with the level and nature of an

Activities''; and SR-98-12, ''FFIEC Policy Statement on Investment Securities and End-User Derivatives Activities.'' Examiners of U.S. branches and agencies of foreign banks should take the principles included in these guidelines into consideration in accordance with the procedures set forth in the *Examination Manual for Branches and Agencies of Foreign Banking Organizations.*

institution's securities and derivative positions. Accordingly, the board should be knowledgeable enough or have access to independent advice to evaluate recommendations presented by management or investment advisers.

Senior Management

Senior management is responsible for ensuring that there are adequate policies and procedures for conducting investment and end-user activities on both a long-range and day-to-day basis. Management should maintain clear lines of authority and responsibility for acquiring instruments and managing risk, setting appropriate limits on risk-taking, establishing adequate systems for measuring risk, setting acceptable standards for valuing positions and measuring performance, establishing effective internal controls, and enacting a comprehensive risk-reporting and risk-management review process. To provide adequate oversight, management should fully understand the institution's risk profile, including that of its securities and derivative activities. Examiners should review the reports to senior management and evaluate whether they provide both good summary information and sufficient detail to enable management to assess the sensitivity of securities and derivative holdings to changes in credit quality, market prices and rates, liquidity conditions, and other important risk factors. As part of its oversight responsibilities, senior management should periodically review the organization's risk-management procedures to ensure that they remain appropriate and sound. Senior management should also encourage and participate in active discussions with members of the board and with risk-management staff regarding risk-measurement, reporting, and management procedures.

Management should ensure that investment and end-user activities are conducted by competent staff whose technical knowledge and experience is consistent with the nature and scope of the institution's activities. There should be sufficient depth in staff resources to manage these activities if key personnel are not available. Management should also ensure that back-office and financial-control resources are sufficient to manage and control risks effectively.

Independence in managing risks. The process of measuring, monitoring, and controlling risks within an institution should be managed as independently as possible from those individuals who have the authority to initiate transactions. Otherwise, conflicts of interest could develop. The nature and extent of this independence should be commensurate with the size and complexity of an institution's securities and derivative activities. Institutions with large and complex balance sheets or with significant holdings of complex instruments would be expected to have risk managers or risk-management functions fully independent of the individuals who have the authority to conduct transactions. Institutions with less complex holdings should ensure they have some mechanism for independently reviewing both the level of risk exposures created by securities and derivative holdings and the adequacy of the process used in managing those exposures. Depending on the size and nature of the institution, this review function may be carried out by either management or a board committee. Regardless of size and sophistication, institutions should ensure that back-office, settlement, and transaction-reconciliation responsibilities are conducted and managed by personnel who are independent of those initiating risk-taking positions.

Policies, Procedures, and Limits

Institutions should maintain written policies and procedures that clearly outline their approach for managing securities and derivative instruments. These policies should be consistent with the organization's broader business strategies, capital adequacy, technical expertise, and general willingness to take risks. They should identify relevant objectives, constraints, and guidelines for both acquiring instruments and managing portfolios. In doing so, policies should establish a logical framework for limiting the various risks involved in an institution's securities and derivative holdings. Policies should clearly delineate lines of responsibility and authority over securities and derivative activities. They should also provide for the systematic review of products new to the firm, specify accounting guidelines, and ensure the independence of the risk-management process. Written policies and procedures governing municipal securities underwriting, dealing, and investment should be maintained by banks engaged in these activities. The types of policies and procedures that are appro-

priate are described in SR-01-13 (May 14, 2001). Examiners should evaluate the adequacy of an institution's risk-management policies and procedures in relation to its size, its sophistication, and the scope of its activities.

Specifying Objectives

Institutions can use securities and derivative instruments for several primary and complementary purposes.[3] Banking organizations should articulate these objectives clearly and identify the types of securities and derivative contracts to be used for achieving them. Objectives also should be identified at the appropriate portfolio and institutional levels. These objectives should guide the acquisition of individual instruments and provide benchmarks for periodically evaluating the performance and effectiveness of an institution's holdings, strategies, and programs. Whenever multiple objectives are involved, management should identify the hierarchy of potentially conflicting objectives.

Identifying Constraints, Guidelines, and Limits

An institution's policies should clearly articulate the organization's risk tolerance by identifying its willingness to take the credit, market, and liquidity risks involved in holding securities and derivative contracts. A statement of authorized instruments and activities is an important vehicle for communicating these risk tolerances. This statement should clearly identify permissible instruments or instrument types and the purposes or objectives for which the institution may use them. The statement also should identify permissible credit-quality, market-risk-sensitivity, and liquidity characteristics of the instruments and portfolios used in nontrading activities. For example, in the case of market risk, policies should address the permissible degree of price sensitivity or effective maturity volatility, taking into account an instrument's or portfolio's option and leverage characteristics. Specifications of permissible risk characteristics should be consistent with the institution's overall credit-, market-, and liquidity-risk limits and constraints and should help delineate a clear set of institutional limits for use in acquiring specific instruments and managing portfolios. Limits can be specified either as guidelines within the overall policies or as management operating procedures. Further guidance on managing specific risks and on the types of constraints and limits an institution might use in managing the credit, market, and liquidity risk of securities and derivative contracts is provided later in this section.

Limits should be set to guide acquisition and ongoing management decisions, control exposures, and initiate discussion within the organization about apparent opportunities and risks. Although procedures for establishing limits and operating within them may vary among institutions, examiners should determine whether the organization enforces its policies and procedures through a clearly identified system of risk limits. The organization's policies should also include specific guidance on the resolution of limit excesses. Positions that exceed established limits should receive the prompt attention of appropriate management and should be resolved according to approved policies.

Limits should implement the overall risk tolerances and constraints articulated in general policy statements. Depending on the nature of an institution's holdings and its general sophistication, limits can be identified for individual business units, portfolios, instrument types, or specific instruments. The level of detail in risk limits should reflect the characteristics of the institution's holdings, including the types of risk to which the institution is exposed. Regardless of their specific form or level of aggregation, limits should be consistent with the institution's overall approach to managing various types of risks. Limits should also be integrated to the fullest extent possible with institution-wide limits on the same risks as they arise in other activities of the firm. Later in this section, specific examiner considerations for evaluating the policies and limits used in managing each of the various types of risks involved in nontrading securities and derivative activities are addressed.

New-Product Review

An institution's policies should also provide for effective review of any products being considered that would be new to the firm. An insti-

3. Such purposes include, but are not limited to, generating earnings, creating funding opportunities, providing liquidity, hedging risk exposures, taking risk positions, modifying and managing risk profiles, managing tax liabilities, and meeting pledging requirements.

tution should not acquire a meaningful position in a new instrument until senior management and all relevant personnel (including those in internal-control, legal, accounting, and auditing functions) understand the product and can integrate it into the institution's risk-measurement and control systems. An institution's policies should define the terms ''new product'' and ''meaningful position'' consistent with its size, complexity, and sophistication. Institutions should not be hesitant to define an instrument as a new product. Small changes in the payment formulas or other terms of relatively simple and standard products can greatly alter their risk profiles and justify designation as a new product. New-product reviews should analyze all of the relevant risks involved in an instrument and assess how well the product or activity achieves specified objectives. New-product reviews also should include a description of the relevant accounting guidelines and identify the procedures for measuring, monitoring, and controlling the risks involved.

Accounting Guidelines

The accounting systems and procedures used for general-purpose financial statements and regulatory reporting purposes are critically important to enhancing the transparency of an institution's risk profile. Accordingly, an institution's policies should provide clear guidelines on accounting for all securities and derivative holdings. Accounting treatment should be consistent with specified objectives and with the institution's regulatory requirements. Furthermore, institutions should ensure that they designate each cash or derivative contract for accounting purposes consistent with appropriate accounting policies and requirements. Accounting for nontrading securities and derivative contracts should reflect the economic substance of the transactions. When instruments are used for hedging purposes, the hedging rationale and performance criteria should be well documented. Management should reassess these designations periodically to ensure that they remain appropriate.

Risk-Measurement and Risk-Reporting Systems

Clear procedures for measuring and monitoring risks are the foundation of a sound risk-management process. Examiners should ensure that an institution sufficiently integrates these functions into its ongoing management process and that relevant personnel recognize their role and understand the instruments held.

Risk Measurement

An institution's system for measuring the credit, market, liquidity, and other risks involved in cash and derivative contracts should be as comprehensive and accurate as practicable. The degree of comprehensiveness should be commensurate with the nature of the institution's holdings and risk exposures. Exposures to each type of risk (that is, credit, market, liquidity) should be aggregated across securities and derivative contracts and integrated with similar exposures arising from lending and other business activities to obtain the institution's overall risk profile.

Examiners should evaluate whether the risk measures and the risk-measurement process are sufficient to accurately reflect the different types of risks facing the institution. Institutions should establish clear risk-measurement standards for both the acquisition and ongoing management of securities and derivative positions. Risk-measurement standards should provide a common framework for limiting and monitoring risks and should be understood by relevant personnel at all levels of the institution—from individual managers to the board of directors.

Acquisition standards. Institutions conducting securities and derivative activities should have the capacity to evaluate the risks of instruments before acquiring them. Before executing any transaction, an institution should evaluate the instrument to ensure that it meets the various objectives, risk tolerances, and guidelines identified by the institution's policies. Evaluations of the credit-, market-, and liquidity-risk exposures should be clearly and adequately documented for each acquisition. Documentation should be appropriate for the nature and type of instrument; relatively simple instruments would probably require less documentation than instruments with significant leverage or option characteristics.

Institutions with significant securities and derivative activities are expected either to conduct in-house preacquisition analyses or use specific third-party analyses that are independent of the seller or counterparty. Analyses provided by the originating dealer or counterparty should be used only when a clearly defined investment advisory relationship exists. Less active institutions with relatively uncomplicated holdings may use risk analyses provided by the dealer only if the analyses are derived using standard industry calculators and market conventions. Such analyses must comprehensively depict the potential risks involved in the acquisition, and they should be accompanied by documentation that sufficiently demonstrates that the acquirer understands fully both the analyses and the nature of the institution's relationship with the provider of the analyses. Notwithstanding information and analyses obtained from outside sources, management is ultimately responsible for understanding the nature and risk profiles of the institution's securities and derivative holdings.

It is a prudent practice for institutions to obtain and compare price quotes and risk analyses from more than one dealer before acquisition. Institutions should ensure that they clearly understand the responsibilities of any outside parties that provide analyses and price quotes. If analyses and price quotes provided by dealers are used, institutions should assume that each party deals at arm's length for its own account unless a written agreement states otherwise. Institutions should exercise caution when dealers limit the institution's ability to show securities or derivative contract proposals to other dealers to receive comparative price quotes or risk analyses. As a general sound practice, unless the dealer or counterparty is also acting under a specific investment advisory relationship, an investor or end-user should not acquire an instrument or enter into a transaction if its fair value or the analyses required to assess its risk cannot be determined through a means that is independent of the originating dealer or counterparty.

Portfolio-management standards. Institutions should periodically review the performance and effectiveness of instruments, portfolios, and institutional programs and strategies. This review should be conducted at least quarterly and should evaluate the extent to which the institution's securities and derivative holdings meet the various objectives, risk tolerances, and guidelines established by its policies.[4] Institutions with large or highly complex holdings should conduct reviews more frequently.

4. For example, the performance of instruments and portfolios used to meet objectives for tax-advantaged earnings should be evaluated to ensure that they meet the necessary credit-rating, market-sensitivity, and liquidity characteristics established for this objective.

For internal measurements of risk, effective measurement of the credit, market, and liquidity risks of many securities and derivative contracts requires mark-to-market valuations. Accordingly, the periodic revaluation of securities and derivative holdings is an integral part of an effective risk-measurement system. Periodic revaluations should be fully documented. When available, actual market prices should be used. For less liquid or complex instruments, institutions with only limited holdings may use properly documented periodic prices and analyses provided by dealers or counterparties. More active institutions should conduct periodic revaluations and portfolio analyses using either in-house capabilities or outside-party analytical systems that are independent of sellers or counterparties. Institutions should recognize that indicative price quotes and model revaluations may differ from the values at which transactions can be executed.

Stress testing. Analyzing the credit, market, and liquidity risk of individual instruments, portfolios, and the entire institution under a variety of unusual and stressful conditions is an important aspect of the risk-measurement process. Management should seek to identify the types of situations or the combinations of credit and market events that could produce substantial losses or liquidity problems. Typically, securities and derivative contracts are managed on the basis of an institution's consolidated exposures, and stress testing should be conducted on the same basis. Stress tests should evaluate changes in market conditions, including alternatives in the underlying assumptions used to value instruments. All major assumptions used in stress tests should be identified.

Stress tests should not be limited to quantitative exercises that compute potential losses or gains, but should include qualitative analyses of the tools available to management to deal with various scenarios. Contingency plans outlining operating procedures and lines of communication, both formal and informal, are important products of such qualitative analyses.

The appropriate extent and sophistication of an institution's stress testing depend heavily on the scope and nature of its securities and derivative holdings and on its ability to limit the effect of adverse events. Institutions holding securities or derivative contracts with complex credit, market, or liquidity risk profiles should have an established regime of stress testing. Examiners should consider the circumstances at each institution when evaluating the adequacy or need for stress-testing procedures.

Risk Reporting

An accurate, informative, and timely management information system is essential. Examiners should evaluate the adequacy of an institution's monitoring and reporting of the risks, returns, and overall performance of security and derivative activities to senior management and the board of directors. Management reports should be frequent enough to provide the responsible individuals with adequate information to judge the changing nature of the institution's risk profile and to evaluate compliance with stated policy objectives and constraints.

Management reports should translate measured risks from technical and quantitative formats to formats that can be easily read and understood by senior managers and directors, who may not have specialized and technical knowledge of all financial instruments used by the institution. Institutions should ensure that they use a common conceptual framework for measuring and limiting risks in reports to senior managers and directors. These reports should include the periodic assessment of the performance of appropriate instruments or portfolios in meeting their stated objective, subject to the relevant constraints and risk tolerances.

Management evaluation and review. Management should regularly review the institution's approach and process for managing risks. This includes regularly assessing the methodologies, models, and assumptions used to measure risks and limit exposures. Proper documentation of the elements used in measuring risks is essential for conducting meaningful reviews. Limits should be compared to actual exposures. Reviews should also consider whether existing measures of exposure and limits are appropriate in view of the institution's holdings, past performance, and current capital position.

The frequency of the reviews should reflect the nature of an institution's holdings and the pace of market innovations in measuring and managing risks. At a minimum, institutions with significant activities in complex cash or derivative contracts should review the underlying methodologies of the models they use at least annually—and more often as market con-

ditions dictate—to ensure that they are appropriate and consistent. Reviews by external auditors or other qualified outside parties, such as consultants with expertise in highly technical models and risk-management techniques, may often supplement these internal evaluations. Institutions depending on outside parties to provide various risk-measurement capabilities should ensure that the outside institution has personnel with the necessary expertise to identify and evaluate the important assumptions incorporated in the risk-measurement methodologies it uses.

Comprehensive Internal Controls and Audit Procedures

Institutions should have adequate internal controls to ensure the integrity of the management process used in investment and end-user activities. Internal controls consist of procedures, approval processes, reconciliations, reviews, and other mechanisms designed to provide a reasonable assurance that the institution's risk-management objectives for these activities are achieved. Appropriate internal controls should address all of the various elements of the risk-management process, including adherence to policies and procedures and the adequacy of risk identification, risk measurement, and reporting.

An important element of a bank's internal controls for investment and end-user activities is comprehensive evaluation and review by management. Management should ensure that the various components of the bank's risk-management process are regularly reviewed and evaluated by individuals who are independent of the function they are assigned to review. Although procedures for establishing limits and for operating within them may vary among banks, periodic management reviews should be conducted to determine whether the organization complies with its investment and end-user risk-management policies and procedures. Any positions that exceed established limits should receive the prompt attention of appropriate management and should be resolved according to the process described in approved policies. Periodic reviews of the risk-management process should also address any significant changes in the nature of instruments acquired, limits, and internal controls that have occurred since the last review.

Examiners should also review the internal controls of all key activities involving securities and derivative contracts. For example, examiners should evaluate and assess adherence to the written policies and procedures for transaction recording and processing. They should analyze the transaction-processing cycle to ensure the integrity and accuracy of the institution's records and management reports. Examiners should review all significant internal controls associated with management of the credit, market, liquidity, operational, and legal risks involved in securities and derivative holdings.

The examiner should review the frequency, scope, and findings of any independent internal and external auditors relative to the institution's securities and derivative activities. When applicable, internal auditors should audit and test the risk-management process and internal controls periodically. Internal auditors are expected to have a strong understanding of the specific products and risks faced by the organization. In addition, they should have sufficient expertise to evaluate the risks and controls of the institution. The depth and frequency of internal audits should increase if weaknesses and significant issues exist or if portfolio structures, modeling methodologies, or the overall risk profile of the institution has changed.

In reviewing risk management of nontrading securities and derivative activities, internal auditors should thoroughly evaluate the effectiveness of the internal controls used for measuring, reporting, and limiting risks. Internal auditors should also evaluate compliance with risk limits and the reliability and timeliness of information reported to the institution's senior management and board of directors, as well as the independence and overall effectiveness of the institution's risk-management process. The level of confidence that examiners place in an institution's audit programs, the nature of the internal and external audit findings, and management's response to those findings will influence the scope of the current examination of securities and derivative activities.

Examiners should pay special attention to significant changes in the nature of instruments acquired, risk-measurement methodologies, limits, and internal controls that have occurred since the last examination. Significant changes in earnings from securities and derivative contracts, in the size of positions, or in the value-at-risk associated with these activities should also receive attention during the examination.

EVALUATING MANAGEMENT OF SPECIFIC RISKS

Specific considerations in evaluating the key elements of sound risk-management systems as they relate to the credit, market, liquidity, operating, and legal risks involved in securities and derivative contracts for nontrading activities are described below.

Credit Risk

Broadly defined, credit risk is the risk that an issuer or counterparty will fail to perform on an obligation to the institution. The policies of an institution should recognize credit risk as a significant risk posed by the institution's securities and derivative activities. Accordingly, policies should identify credit-risk constraints, risk tolerances, and limits at the appropriate instrument, portfolio, and institutional levels. In doing so, institutions should ensure that credit-risk constraints are clearly associated with specified objectives. For example, credit-risk constraints and guidelines should be defined for instruments used to meet pledging requirements, generate tax-advantaged income, hedge positions, generate temporary income, or meet any other specifically defined objective.

As a matter of general policy, an institution should not acquire securities or derivative contracts until it has assessed the creditworthiness of the issuer or counterparty and determined that the risk exposure conforms with its policies. The credit risk arising from these positions should be incorporated into the overall credit-risk profile of the institution to the fullest extent possible. Given the interconnectedness of the various risks facing the institution, organizations should also evaluate the effect of changes in issuer or counterparty credit standing on an instrument's market and liquidity risk. The board of directors and responsible senior management should be informed of the institution's total credit-risk exposures at least quarterly.

Selection of Securities Dealers

In managing their credit risk, institutions also should consider settlement and presettlement credit risk. The selection of dealers, investment bankers, and brokers is particularly important in managing these risks effectively. An institution's policies should identify criteria for selecting these organizations and list all approved firms. The management of a depository institution must have sufficient knowledge about the securities firms and personnel with whom they are doing business. A depository institution should not engage in securities transactions with any securities firm that is unwilling to provide complete and timely disclosure of its financial condition. Management should review the securities firm's financial statements and evaluate the firm's ability to honor its commitments both before entering into transactions with the firm and periodically thereafter. An inquiry into the general reputation of the dealer also is necessary. The board of directors or an appropriate committee of the board should periodically review and approve a list of securities firms with whom management is authorized to do business. The board or an appropriate committee thereof should also periodically review and approve limits on the amounts and types of transactions to be executed with each authorized securities firm. Limits to be considered should include dollar amounts of unsettled trades, safekeeping arrangements, repurchase transactions, securities lending and borrowing, other transactions with credit risk, and total credit risk with an individual dealer.

At a minimum, depository institutions should consider the following when selecting and retaining a securities firm:

- the ability of the securities dealer and its subsidiaries or affiliates to fulfill commitments as evidenced by their capital strength, liquidity, and operating results (this evidence should be gathered from current financial data, annual reports, credit reports, and other sources of financial information)
- the dealer's general reputation or financial stability and its fair and honest dealings with customers (other depository institutions that have been or are currently customers of the dealer should be contacted)
- information available from state or federal securities regulators and securities industry self-regulatory organizations, such as the National Association of Securities Dealers, concerning any formal enforcement actions against the dealer, its affiliates, or associated personnel
- when the institution relies on the advice of a dealer's sales representative, the experience

and expertise of the sales representative with whom business will be conducted

In addition, the board of directors (or an appropriate committee of the board) must ensure that the depository institution's management has established appropriate procedures to obtain and maintain possession or control of securities purchased. In this regard, purchased securities and repurchase-agreement collateral should only be left in safekeeping with selling dealers when (1) the board of directors or an appropriate committee thereof is completely satisfied as to the creditworthiness of the securities dealer and (2) the aggregate market value of securities held in safekeeping is within credit limitations that have been approved by the board of directors (or an appropriate committee of the board) for unsecured transactions (see the October 1985 FFIEC policy statement ''Repurchase Agreements of Depository Institutions with Securities Dealers and Others'').

State lending limits generally do not extend to the safekeeping arrangements described above. Notwithstanding this general principle, a bank's board of directors should establish prudent limits for safekeeping arrangements. These prudential limits generally involve a fiduciary relationship, which presents operational rather than credit risks.

To avoid concentrations of assets or other types of risk, banking organizations should, to the extent possible, try to diversify the firms they use for safekeeping arrangements. Further, while certain transactions with securities dealers and safekeeping custodians may entail only operational risks, other transactions with these parties may involve credit risk that could be subject to statutory lending limits, depending on applicable state laws. If certain transactions are deemed subject to a state's legal lending limit statute because of a particular safekeeping arrangement, the provisions of the state's statutes would, of course, control the extent to which the safekeeping arrangement complies with an individual state's legal lending limit.

Limits

An institution's credit policies should also include guidelines on the quality and quantity of each type of security that may be held. Policies should provide credit-risk diversification and concentration limits, which may define concentrations to a single or related issuer or counterparty, in a geographical area, or in obligations with similar characteristics. Policies should also include procedures such as increased monitoring and stop-loss limits, for addressing deterioration in credit quality.

Sound credit-risk management requires that credit limits be developed by personnel who are independent of the acquisition function. In authorizing issuer and counterparty credit lines, these personnel should use standards that are consistent with those used for other activities conducted within the institution and with the organization's overall policies and consolidated exposures. To assess the creditworthiness of other organizations, institutions should not rely solely on outside sources, such as standardized ratings provided by independent rating agencies, but should perform their own analysis of a counterparty's or issuer's financial strength. In addition, examiners should review the credit-approval process to ensure that the credit risks of specific products are adequately identified and that credit-approval procedures are followed for all transactions.

For most cash instruments, credit exposure is measured as the current carrying value. In the case of many derivative contracts, especially those traded in OTC markets, credit exposure is measured as the replacement cost of the position, plus an estimate of the institution's potential future exposure to changes in the replacement value of that position in response to market price changes. Replacement costs of derivative contracts should be determined using current market prices or generally accepted approaches for estimating the present value of future payments required under each contract, at current market rates.

The measurement of potential future credit-risk exposure for derivative contracts is more subjective than the measurement of current exposure and is primarily a function of the time remaining to maturity; the number of exchanges of principal; and the expected volatility of the price, rate, or index underlying the contract. Potential future exposure can be measured using an institution's own simulations or, more simply, by using add-ons such as those included in the Federal Reserve's risk-based capital guidelines. Regardless of the method an institution uses, examiners should evaluate the reasonableness of the assumptions underlying the institution's risk measure.

For derivative contracts and certain types of cash transactions, master agreements (including netting agreements) and various credit enhancements (such as collateral or third-party guarantees) can reduce settlement, issuer, and counterparty credit risk. In such cases, an institution's credit exposures should reflect these risk-reducing features only to the extent that the agreements and recourse provisions are legally enforceable in all relevant jurisdictions. This legal enforceability should extend to any insolvency proceedings of the counterparty. Institutions should be prepared to demonstrate sufficient due diligence in evaluating the enforceability of these contracts.

In reviewing credit exposures, examiners should consider the extent to which positions exceed credit limits and whether exceptions are resolved according to the institution's adopted policies and procedures. Examiners should also evaluate whether the institution's reports adequately provide all personnel involved in the acquisition and management of financial instruments with relevant, accurate, and timely information about the credit exposures and approved credit lines.

Market Risk

Market risk is the exposure of an institution's financial condition to adverse movements in the market rates or prices of its holdings before such holdings can be liquidated or expeditiously offset. It is measured by assessing the effect of changing rates or prices on the earnings or economic value of an individual instrument, a portfolio, or the entire institution. Although many banking institutions focus on carrying values and reported earnings when assessing market risk at the institutional level, other measures focusing on total returns and changes in economic or fair values better reflect the potential market-risk exposure of institutions, portfolios, and individual instruments. Changes in fair values and total returns directly measure the effect of market movements on the economic value of an institution's capital and provide significant insights into their ultimate effects on the institution's long-term earnings. Institutions should manage and control their market risks using both an earnings and an economic-value approach, and at least on an economic or fair-value basis.

When evaluating capital adequacy, examiners should consider the effect of changes in market rates and prices on the economic value of the institution by evaluating any unrealized losses in an institution's securities or derivative positions. This evaluation should assess the ability of the institution to hold its positions and function as a going concern if recognition of unrealized losses would significantly affect the institution's capital ratios. Examiners also should consider the impact that liquidating positions with unrealized losses may have on the institution's prompt-corrective-action capital category.

Market-risk limits should be established for both the acquisition and ongoing management of an institution's securities and derivative holdings and, as appropriate, should address exposures for individual instruments, instrument types, and portfolios. These limits should be integrated fully with limits established for the entire institution. At the institutional level, the board of directors should approve market-risk exposure limits. Such limits may be expressed as specific percentage changes in the economic value of capital and, when applicable, in the projected earnings of the institution under various market scenarios. Similar and complementary limits on the volatility of prices or fair value should be established at the appropriate instrument, product-type, and portfolio levels, based on the institution's willingness to accept market risk. Limits on the variability of effective maturities may also be desirable for certain types of instruments or portfolios.

The scenarios an institution specifies for assessing the market risk of its securities and derivative products should be sufficiently rigorous to capture all meaningful effects of any options. For example, in assessing interest-rate risk, scenarios such as 100-, 200-, and 300-basis-point parallel shifts in yield curves should be considered as well as appropriate nonparallel shifts in structure to evaluate potential basis, volatility, and yield curve risks.

Accurately measuring an institution's market risk requires timely information about the current carrying and market values of its securities and derivative holdings. Accordingly, institutions should have market-risk measurement systems commensurate with the size and nature of their holdings. Institutions with significant holdings of highly complex instruments should ensure that they have independent means to value their positions. Institutions using internal models to measure risk should have adequate

procedures to validate the models and periodically review all elements of the modeling process, including its assumptions and risk-measurement techniques. Institutions relying on third parties for market-risk-measurement systems and analyses should fully understand the assumptions and techniques used by the third party.

Institutions should evaluate the market-risk exposures of their securities and derivative positions and report this information to their boards of directors regularly, not less frequently than each quarter. These evaluations should assess trends in aggregate market-risk exposure and the performance of portfolios relative to their established objectives and risk constraints. They also should identify compliance with board-approved limits and identify any exceptions to established standards. Examiners should ensure that institutions have mechanisms to detect and adequately address exceptions to limits and guidelines. Examiners should also determine that management reporting on market risk appropriately addresses potential exposures to basis risk, yield curve changes, and other factors pertinent to the institution's holdings. In this connection, examiners should assess an institution's compliance with broader guidance for managing interest-rate risk in a consolidated organization.

Complex and illiquid instruments often involve greater market risk than broadly traded, more liquid securities. Frequently, the higher potential market risk arising from this illiquidity is not captured by standardized financial-modeling techniques. This type of risk is particularly acute for instruments that are highly leveraged or that are designed to benefit from specific, narrowly defined market shifts. If market prices or rates do not move as expected, the demand for these instruments can evaporate. When examiners encounter such instruments, they should review how adequately the institution has assessed its potential market risks. If the risks from these instruments are material, the institution should have a well-documented process for stress testing their value and liquidity assumptions under a variety of market scenarios.

Liquidity Risk

Banks face two types of liquidity risk in their securities and derivative activities: risks related to specific products or markets and risks related to the general funding of their activities. The former, market-liquidity risk, is the risk that an institution cannot easily unwind, or offset, a particular position at or near the previous market price because of inadequate market depth or disruptions in the marketplace. The second, funding-liquidity risk, is the risk that the bank will be unable to meet its payment obligations on settlement dates. Since neither type of liquidity risk is unique to securities and derivative activities, management should evaluate these risks in the broader context of the institution's overall liquidity.

When specifying permissible securities and derivative instruments to accomplish established objectives, institutions should take into account the size, depth, and liquidity of the markets for specific instruments, and the effect these characteristics may have on achieving an objective. The market liquidity of certain types of instruments may make them entirely inappropriate for achieving certain objectives. Moreover, institutions should consider the effects that market risk can have on the liquidity of different types of instruments. For example, some government agency securities may have embedded options that make them highly illiquid during periods of market volatility and stress, despite their high credit rating. Accordingly, institutions should clearly articulate the market-liquidity characteristics of instruments to be used in accomplishing institutional objectives.

The funding risk of an institution becomes a more important consideration when its unrealized losses are material; therefore, this risk should be a factor in evaluating capital adequacy. Institutions with weak liquidity positions are more likely to be forced to recognize these losses and suffer declines in their accounting and regulatory capital. In extreme cases, these effects could force supervisors to take prompt corrective actions.

Examiners should assess whether the institution adequately considers the potential liquidity risks associated with the liquidation of securities or the early termination of derivative contracts. Many forms of standardized contracts for derivative transactions allow counterparties to request collateral or terminate their contracts early if the institution experiences an adverse credit event or a deterioration in its financial condition. In addition, under situations of market stress, customers may ask for the early termination of some contracts within the context

of the dealer's market-making activities. In these circumstances, an institution that owes money on derivative transactions may be required to deliver collateral or settle a contract early; possibly at a time when the institution may face other funding and liquidity pressures. Early terminations may also open additional, unintended market positions. Management and directors should be aware of these potential liquidity risks and address them in the institution's liquidity plan and in the broader context of the institution's liquidity-management process. In their reviews, examiners should consider the extent to which such potential obligations could present liquidity risks to the institution.

Operating and Legal Risks

Operating risk is the risk that deficiencies in information systems or internal controls will result in unexpected loss. Some specific sources of operating risk include inadequate procedures, human error, system failure, or fraud. Inaccurately assessing or controlling operating risks is one of the more likely sources of problems facing institutions involved in securities and derivative activities.

Adequate internal controls are the first line of defense in controlling the operating risks involved in an institution's securities and derivative activities. Of particular importance are internal controls to ensure that persons executing transactions are separated from those individuals responsible for processing contracts, confirming transactions, controlling various clearing accounts, approving the accounting methodology or entries, and performing revaluations.

Institutions should have approved policies, consistent with legal requirements and internal policies, that specify documentation requirements for transactions and formal procedures for saving and safeguarding important documents. Relevant personnel should fully understand these requirements. Examiners should also consider the extent to which institutions evaluate and control operating risks through internal audits, stress testing, contingency planning, and other managerial and analytical techniques.

An institution's operating policies should establish appropriate procedures to obtain and maintain possession or control of instruments purchased. Institutions should ensure that transactions consummated orally are confirmed as soon as possible. As noted earlier in this section, banking organizations should, to the extent possible, seek to diversify the firms they use for their safekeeping arrangements to avoid concentrations of assets or other types of risk.

Legal risk is the risk that the contracts an institution enters into are not legally enforceable or documented correctly. This risk should be limited and managed through policies developed by the institution's legal counsel. At a minimum, guidelines and processes should be in place to ensure the enforceability of counterparty agreements. Examiners should determine whether an institution is adequately evaluating the enforceability of its agreements before individual transactions are consummated. Institutions should also ensure that a counterparty has sufficient authority to enter into the proposed transaction and that the terms of the agreement are legally sound. Institutions should further ascertain that their netting agreements are adequately documented, have been executed properly, and are enforceable in all relevant jurisdictions. Institutions should know about relevant tax laws and interpretations governing the use of netting instruments.

An institution's policies should also provide conflict-of-interest guidelines for employees who are directly involved in purchasing securities from and selling securities to securities dealers on behalf of their institution. These guidelines should ensure that all directors, officers, and employees act in the best interest of the institution. The board of directors may wish to adopt policies prohibiting these employees from engaging in personal securities transactions with these same securities firms without the specific prior approval of the board. The board of directors may also wish to adopt a policy applicable to directors, officers, and employees that restricts or prohibits them from receiving gifts, gratuities, or travel expenses from approved securities dealer firms and their personnel.

FEDERAL RESERVE ACT SECTIONS 23A AND 23B

In May 2001, the Board published the following rules interpreting sections 23A and 23B of the Federal Reserve Act (FRA):

- a final rule, effective June 11, 2001, that

adopts an interpretation and exemptions from the quantitative limits and collateral requirements of section 23A for certain loans to third parties that are used to purchase securities or other assets through an affiliate of the depository institution
- a final rule, effective June 11, 2001, that adopts an interpretation that expands the types of asset purchases that are eligible for the exemption for purchases from a broker-dealer affiliate of assets with a readily identifiable and publicly available market quotation
- an interim rule, effective January 1, 2002, addressing the treatment under section 23B of derivative transactions between an insured depository institution and its affiliates (interaffiliate derivative transactions) and intraday extensions of credit by an insured depository institution to its affiliates

Loans to Third Parties to Purchase Securities or Assets from an Affiliate

The final rule provides three exemptions from section 23A. First, an exemption from is provided for extensions of credit by an insured depository institution to customers that use the loan proceeds to purchase a security or other asset through an affiliate of the depository institution, provided that the affiliate is acting exclusively as a broker in the transaction and retains no portion of the loan proceeds in excess of a market-rate brokerage commission or agency fee. To take advantage of this exemption, the security or other asset cannot be issued, underwritten by, or sold from the inventory of an affiliate of the depository institution.

Second, the rule adopts an exemption from section 23A for extensions of credit by an insured depository institution to customers that use the proceeds to purchase a security issued by a third party through an SEC-registered broker-dealer affiliate of the institution that is acting as riskless principal in the securities transaction, provided that the markup for executing the trade is on or below market terms. The security cannot be issued, underwritten by, or sold from the inventory of an affiliate. This limitation does not preclude a broker-dealer affiliate from selling to the customer a security it purchased immediately before the sale to effect the riskless-principal transaction initiated by the customer. However, the broker-dealer affiliate should not have purchased the security from another affiliate of the insured depository institution.

Finally, the rule provides an exemption for extensions of credit by an insured depository institution to customers that use the proceeds to purchase securities from a broker-dealer affiliate of the institution when the extension of credit is made pursuant to a preexisting line of credit not entered into in contemplation of the purchase of securities from the affiliate. The extension of credit should be consistent with any restrictions imposed by the line of credit. In determining whether this exemption is being used in good faith, examiners should consider the timing of the line of credit, the conditions imposed on the line, and whether the line of credit has been used for purposes other than the purchase of securities from an affiliate. The fact that a line of credit has been preapproved does not necessarily lead to a conclusion that the line is preexisting. Rather, the line should be actively used by the customer.

Purchases of Assets with a Readily Identifiable and Publicly Available Market Quotation

The rule exempts from section 23A the purchase of a security by an insured depository institution from an affiliated SEC-registered broker-dealer if the following conditions are met:

- the security has a ready market, as defined by the SEC[5]
- the security is eligible for purchase directly by a state member bank, and the transaction is recorded as a purchase of securities on the institution's call report
- the security is not a low-quality asset
- if an affiliate is the underwriter of the security, the security is not purchased during or within 30 days of an underwriting; however, this restriction does not apply to the purchase of obligations of, or fully guaranteed as to prin-

5. The SEC defines a "ready market" as including a recognized established securities market (1) in which there exists independent bona fide offers to buy and sell so that a price reasonably related to the last sales price or current bona fide competitive bid and offer quotations can be determined for a particular security almost instantaneously, and (2) in which payment will be received in settlement of a sale at such price within a relatively short time conforming to trade custom.

cipal and interest by, the United States or its agencies
- the security's price is quoted routinely on an unaffiliated electronic service that provides real-time financial data, provided that—
  - — the price paid by the depository institution is at or below the current market quotation for the security, and
  - — the size of the transaction does not cast doubt on the appropriateness of relying on the current market quotation
- the security is not issued by an affiliate

Any such purchases remain subject to the provisions of section 23B that require the transaction to be on market terms and consistent with safe and sound banking practices. Records relating to such purchases must be maintained by the depository institution for a period of two years after the purchase.

Derivative Transactions with Affiliates and Intraday Extensions of Credit to Affiliates

The interim rule confirms that interaffiliate derivative transactions (IDTs) and intraday extensions of credit by an insured depository institution to an affiliate are subject to the market-terms requirement of section 23B.[6] An insured depository institution must establish and maintain policies and procedures that, at a minimum, provide for the monitoring and control of the bank's credit exposure from these transactions, with each affiliate and with all affiliates in the aggregate. Policies should also ensure that the transactions comply with section 23B. To comply with section 23B, the transactions should be on terms and conditions at least as favorable to the insured depository institution as those transactions conducted with unaffiliated counterparties that are engaged in similar business and substantially equivalent in size and credit quality. Specifically, credit limits imposed on IDTs and intraday extensions of credit to affiliates should be at least as strict as those imposed on comparable unaffiliated companies. The institution should monitor exposures to affiliates at least as rigorously as it monitors unaffiliated exposures to comparable companies. Finally, the pricing and collateral requirements imposed on IDTs and intraday extensions of credit to affiliates should be at least as favorable to the institution as those imposed on comparable unaffiliated companies.

6. IDTs are defined under the interim rule as any derivative contract subject to the Board's risk-based capital guidelines (that is, most interest-rate, currency, equity, or commodities derivatives and other similar contracts, including credit derivatives.)

INTERNATIONAL DIVISION INVESTMENTS

The same types of instruments exist in international banking as in domestic banking. Securities and derivative contracts may be acquired by a bank's international division and overseas branches, and foreign equity investments may be held by the bank directly or through Edge Act corporations. The investments held by most international divisions are predominately securities issued by various governmental entities of the countries in which the bank's foreign branches are located. These investments are held for a variety of purposes:

- They are required by various local laws.
- They are used to meet foreign reserve requirements.
- They result in reduced tax liabilities.
- They enable the bank to use new or increased rediscount facilities or benefit from greater deposit or lending authorities.
- They are used by the bank as an expression of ''goodwill'' toward a country.

The examiner should be familiar with the applicable sections of Regulation K (12 CFR 211) governing a member bank's international investment holdings, as well as with other regulations discussed in this section. Because of the mandatory investment requirements of some countries, securities held cannot always be as ''liquid'' and ''readily marketable'' as required in domestic banking. However, the amount of a bank's ''mandatory'' international holdings will normally be a relatively small amount of its total investments or capital funds.

A bank's international division may also hold securities strictly for investment purposes; these are expected to provide a reasonable rate of return commensurate with safety considerations. As with domestic investment securities, the bank's safety must take precedence, followed by liquidity and marketability require-

ments. Securities held by international divisions are considered to be liquid if they are readily convertible into cash at their approximate carrying value. They are marketable if they can be sold in a very short time at a price commensurate with yield and quality. Speculation in marginal foreign securities to generate more favorable yields is an unsound banking practice and should be discouraged.

Banks are generally prohibited from investing in stocks. However, a number of exceptions (detailed earlier in this section) are often applicable to the international division. For example, the bank may, under section 24A of the Federal Reserve Act (12 USC 371d), hold stock in overseas corporations that hold title to foreign bank premises. A foreign branch of a member bank may invest in the securities of the central bank, clearinghouses, governmental entities, and government-sponsored development banks of the country where the branch is located and may make other investments necessary to the business of the branch. Other sections of Regulation K permit the bank to make equity investments in Edge Act and agreement corporations and in foreign banks, subject to certain limitations.

Standard & Poor's, Moody's, and other publications from U.S. rating services rate Canadian and other selected foreign securities that are authorized for U.S. commercial bank investment purposes under 12 USC 24 (seventh). However, in many other countries, securities-rating services are limited or nonexistent. When they do exist, the ratings are only indicative and should be supplemented with additional information on legality, credit soundness, marketability, and foreign-exchange and country-risk factors. The opinions of local attorneys are often the best source of determining whether a particular foreign security has the full faith and credit backing of a country's government.

Sufficient analytical data must be provided to the bank's board of directors and senior management so they can make informed judgments about the effectiveness of the international division's investment policy and procedures. The institution's international securities and derivative contracts should be included on all board and management reports detailing domestic securities and derivative contracts. These reports should be timely and sufficiently detailed to allow the board of directors and senior management to understand and assess the credit, market, and liquidity risks facing the institution and its securities and derivative positions.

UNSUITABLE INVESTMENT PRACTICES

Institutions should categorize each of their security activities as trading, available-for-sale, or held-to-maturity consistent with GAAP (that is, Statement of Financial Accounting Standards No. 115, "Accounting for Certain Investments in Debt and Equity Securities," as amended) and regulatory reporting standards. Management should reassess the categorizations of its securities periodically to ensure that they remain appropriate.

Securities that are intended to be held principally for the purpose of selling in the near term should be classified as trading assets. Trading activity includes the active and frequent buying and selling of securities for the purpose of generating profits on short-term fluctuations in price. Securities held for trading purposes must be reported at fair value, with unrealized gains and losses recognized in current earnings and regulatory capital. The proper categorization of securities is important to ensure that trading gains and losses are promptly recognized—which will not occur when securities intended to be held for trading purposes are categorized as held-to-maturity or available-for-sale.

It is an unsafe and unsound practice to report securities held for trading purposes as available-for-sale or held-to-maturity securities. A close examination of an institution's actual securities activities will determine whether securities it reported as available-for-sale or held-to-maturity are, in reality, held for trading. When the following securities activities are conducted in available-for-sale or held-to-maturity accounts, they should raise supervisory concerns. The first five practices below are considered trading activities and should not occur in available-for-sale or held-to-maturity securities portfolios, and the sixth practice is wholly unacceptable under all circumstances.

Gains Trading

Gains trading is the purchase of a security and the subsequent sale of that security at a profit after a short holding period. However, at the same time, securities acquired for gains trading that cannot be sold at a profit are retained in the available-for-sale or held-to-maturity portfolio; unrealized losses on debt securities in these two categories do not directly affect regulatory capi-

tal and are not reported in income until the security is sold. Examiners should note institutions that exhibit a pattern or practice of reporting significant amounts of realized gains on sales of nontrading securities (typically, available-for-sale securities) after short holding periods, while continuing to hold other nontrading securities with significant amounts of unrealized losses. In these situations, examiners may designate some or all of the securities reported outside of the trading category as trading assets.

When-Issued Securities Trading

When-issued securities trading is the buying and selling of securities in the period between the announcement of an offering and the issuance and payment date of the securities. A purchaser of a when-issued security acquires all of the risks and rewards of owning a security and may sell this security at a profit before having to take delivery and pay for it. These transactions should be regarded as trading activities.

Pair-Offs

Pair-offs are security purchases that are closed out or sold at or before settlement date. In a pair-off, an institution commits to purchase a security. Then before the predetermined settlement date, the institution will pair off the purchase with a sale of the same security. Pair-offs are settled net when one party to the transaction remits the difference between the purchase and sale price to the counterparty. Other pair-off transactions may involve the same sequence of events using swaps, options on swaps, forward commitments, options on forward commitments, or other derivative contracts.

Extended Settlements

Regular-way settlement for U.S. government and federal-agency securities (except mortgage-backed securities and derivative contracts) is one business day after the trade date. Regular-way settlement for corporate and municipal securities is three business days after the trade date, and settlement for mortgage-backed securities can be up to 60 days or more after the trade date. Using a settlement period that exceeds the regular-way settlement periods to facilitate speculation is considered a trading activity.

Short Sales

A short sale is the sale of a security that is not owned. Generally, the purpose of a short sale is to speculate on a fall in the price of the security. Short sales should be conducted in the trading portfolio. A short sale that involves the delivery of the security sold short by borrowing it from the depository institution's available-for-sale or held-to-maturity portfolio should not be reported as a short sale. Instead, it should be reported as a sale of the underlying security with gain or loss recognized. Short sales are not permitted for federal credit unions.

Adjusted Trading

Adjusted trading involves the sale of a security to a broker or dealer at a price above the prevailing market value and the simultaneous purchase and booking of a different security, frequently a lower-grade issue or one with a longer maturity, at a price above its market value. Thus, the dealer is reimbursed for its losses on the initial purchase from the institution and ensured a profit. Adjusted-trading transactions inappropriately defer the recognition of losses on the security sold and establish an excessive reported value for the newly acquired security. Consequently, these transactions are prohibited and may be in violation of 18 USC 1001 (False Statements or Entries) and 1005 (False Entries).

1. To determine if policies, practices, procedures, and internal controls for investments are adequate.
2. To determine if bank officers are operating in conformance with the established guidelines.
3. To determine the scope and adequacy of the audit function.
4. To determine the overall quality of the investment portfolio and how that quality relates to the soundness of the bank.
5. To determine compliance with laws and regulations.
6. To initiate corrective action when policies, practices, procedures, or internal controls are deficient or when violations of laws or regulations have been noted.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

1. Based on the evaluation of internal controls and the work performed by internal and external auditors, determine the scope of the examination.
2. Test for compliance with policies, practices, procedures, and internal controls in conjunction with performing the examination procedures. Also, obtain a listing of any deficiencies noted in the latest review conducted by internal and external auditors and determine if corrections have been accomplished. Determine the extent and effectiveness of investment-policy supervision by—
   a. reviewing the abstracted minutes of board of directors meetings and minutes of appropriate committee meetings;
   b. determining that proper authorizations have been made for investment officers or committees;
   c. determining any limitations or restrictions on delegated authorities;
   d. evaluating the sufficiency of analytical data used by the board or investment committee;
   e. reviewing the reporting methods used by department supervisors and internal auditors to ensure compliance with established policy; and
   f. preparing a memo for the examiner who is assigned to review the duties and responsibilities of directors and for the examiner responsible for the international examination, if applicable. This memo should state conclusions on the effectiveness of directors' supervision of the domestic and international-division investment policy. All conclusions should be documented.
3. Obtain the following:
   a. trial balances of investment-account holdings, money market instruments, and end-user derivative positions including commercial paper, banker's acceptances, negotiable certificates of deposit, securities purchased under agreements to resell, and federal funds sold (Identify any depository instruments placed through money brokers.)
   b. a list of any assets carried in loans and any discounts on which interest is exempt from federal income taxes and which are carried in the investment account on call reports
   c. a list of open purchase-and-sale commitments
   d. a schedule of all securities, forward placement contracts, and derivative contracts including contracts on exchange-traded puts and calls, option contracts on futures puts and calls, and standby contracts purchased or sold since the last examination
   e. a maturity schedule of securities sold under repurchase agreements
   f. a list of pledged assets and secured liabilities
   g. a list of the names and addresses of all securities dealers doing business with the bank
   h. a list of the bank's personnel authorized to trade with dealers
   i. a list of all U.S. government–guaranteed loans which are recorded and carried as an investment-account security
   j. for international division and overseas branches, a list of investments—
      - held to comply with various foreign governmental regulations requiring such investments,
      - used to meet foreign reserve requirements,
      - required as stock exchange guarantees or used to enable the bank to provide securities services,

- representing investment of surplus funds,
- used to obtain telephone and telex services,
- representing club and school memberships,
- acquired through debts previously contracted,
- representing minority interests in nonaffiliated companies,
- representing trading-account securities,
- representing equity interests in Edge Act and agreement corporations and in foreign banks, and
- held for other purposes.

4. Using updated data available from reports of condition, UBPR printouts, and investment advisor and correspondent bank portfolio analysis reports, obtain or prepare an analysis of investment, money market, and end-user derivative holdings that includes—
   a. a month-by-month schedule of par, book, and market values of issues maturing in one year;
   b. schedules of par, book, and market values of holdings in the investment portfolio (these schedules should be indexed by maturity date, and the schedule should be detailed by maturity dates over the following time periods: over 1 through 5 years, over 5 through 10 years, and over 10 years);
   c. book value totals of holdings by obligor or industry, related obligors or industries, geographic distribution, yield, and special characteristics, such as moral obligations, conversion, or warrant features;
   d. par value schedules of type I, II, and III investment holdings, by those legally defined types; and
   e. for the international division, a list of international investment holdings (foreign-currency amounts and U.S. dollar equivalents) to include—
      - descriptions of securities held (par, book, and market values),
      - names of issuers,
      - issuers' countries of domicile,
      - interest rates, and
      - pledged securities.
5. Review the reconcilement of the trial balances investment and money market accounts to general-ledger control accounts.
6. Using either an appropriate sampling technique or the asset-coverage method, select from the trial balances the international investments, municipal investments, and money market and derivative holdings for examination. If transaction volume permits, include in the population of items to be reviewed all securities purchased since the last general examination.
7. Perform the following procedures for each investment and money market holding selected in step 6.
   a. Check appropriate legal opinions or published data outlining legal status.
   b. If market prices are provided to the bank by an independent party (excluding affiliates and securities dealers selling investments to the bank), or if they are independently tested as a documented part of the bank's audit program, those prices should be accepted. If the independence of the prices cannot be established, test market values by referring to one of the following sources:
      - published quotations, if available
      - appraisals by outside pricing services, if performed
   c. For investments and money market obligations in the sample that are rated, compare the ratings provided to the most recent published ratings.

Before continuing, refer to steps 15 through 17. They should be performed in conjunction with steps 8 through 14. International-division holdings should be reviewed with domestic holdings to ensure compliance, when combined, with applicable legal requirements.

8. To the extent practicable under the circumstances, test that the institution has analyzed the following:
   a. the obligors on securities purchased under agreements to resell, when the readily marketable value of the securities is not sufficient to satisfy the obligation
   b. all international investments, nonrated securities, derivatives, and money market instruments selected in step 6 or acquired since the last examination
   c. all previously detailed or currently known speculative issues
   d. all defaulted issues
   e. any issues in the current Interagency Country Exposure Review Committee credit schedule (obtained from the international loan portfolio manager):

- compare the schedule to the foreign securities trial balance obtained in step 3 to ascertain which foreign securities are to be included in Interagency Country Exposure Review Committee credits
- for each security so identified, transcribe the following appropriate information to a separate examiner's line sheet or a related examiner's credit line sheet:
  - — amount (and U.S. dollar equivalent if a foreign currency) to include par, book, and market values
  - — how and when acquired
  - — maturity dates
  - — default date, if appropriate
  - — any pertinent comments
- return the schedule and appropriate examiner's line sheets to the examiner who is assigned to international—loan portfolio management.

9. Review the most recent reports of examination of the bank's Edge Act and agreement corporation affiliates and foreign subsidiaries to determine their overall conditions. Also, compile data on Edge Act and agreement corporations and foreign subsidiaries that are necessary for the commercial report of examination (such as asset criticisms, transfer risk, and other material examination findings).
10. Classify speculative and defaulted issues according to the following standards (except those securities in the Interagency Country Exposure Review and other securities on which special instructions have been issued):
    a. The entire book value of speculative-grade municipal general obligation securities which are not in default will be classified substandard. Market depreciation on other speculative issues should be classified doubtful. The remaining book value usually is classified substandard.
    b. The entire book value of all defaulted municipal general obligation securities will be classified doubtful. Market depreciation on other defaulted bonds should be classified loss. The remaining book value usually is classified substandard.
    c. Market depreciation on nonexempt stock should be classified loss.
    d. Report comments should include:
       - description of issue
       - how and when each issue was acquired
       - default date, if appropriate
       - date interest was paid to the issue
       - rating at time of acquisition
       - comments supporting the classification
11. Review the bank's maturity program.
    a. Review the maturity schedules by—
       - comparing book and market values and, after considering the gain or loss on year-to-date sales, determine if the costs of selling intermediate and long-term issues appear prohibitive, and
       - determine if recent acquisitions show a trend toward lengthened or shortened maturities. Discuss such trends with management, particularly with regard to investment objectives approved by the investment committee.
    b. Review the pledged-asset and secured-liability schedules and isolate pledged securities by maturity segment, then determine the market value of securities pledged in excess of net secured liabilities.
    c. Review the schedule of securities sold under repurchase agreement and determine—
       - if financing for securities purchases is provided via repurchase agreement by the securities dealer who originally sold the security to the bank,
       - if funds acquired through the sale of securities under agreement to repurchase are invested in money market assets or if short-term repurchase agreements are being used to fund longer-term, fixed-rate assets,
       - the extent of matched-asset repo and liability repo maturities and the overall effect on liquidity resulting from unmatched positions,
       - if the interest rate paid on securities sold under agreement to repurchase is appropriate relative to current money market rates, and
       - if the repurchase agreement is at the option of the buying or selling bank.
    d. Review the list of open purchase-and-sale commitments and determine the effect of their completion on maturity scheduling.
    e. Submit investment portfolio information regarding the credit quality and practical liquidity of the investment portfolio to the examiner who is assigned to asset/liability management.

12. Consult with the examiner responsible for the asset/liability management analysis to determine what information is needed to assess the bank's sensitivity to interest-rate fluctuations and its ability to meet short-term funding requirements. If requested, compile the information using bank records or other appropriate sources. (See the Instructions for the Report of Examination section of this manual for factors to be taken into account when compiling this information.) Information which may be required to be furnished includes—
    a. the market value of unpledged government and federal-agency securities maturing within one year;
    b. the market value of other unpledged government and federal-agency securities which would be sold without loss;
    c. the market value of unpledged municipal securities maturing within one year;
    d. the book value of money market instruments, such as banker's acceptances, commercial paper, and certificates of deposit (provide amounts for each category); and
    e. commitments to purchase and sell securities, including futures, forward, and standby contracts. (Provide a description of the security contract, the purchase or sales price, and the settlement or expiration date.)
13. Determine whether the bank's investment policies and practices are balancing earnings and risk satisfactorily.
    a. Use UBPR or average call report data to calculate investments as a percentage of total assets and average yields on U.S. government and nontaxable investments.
        • Compare results to peer-group statistics.
        • Determine the reasons for significant variances from the norm.
        • Determine if trends are apparent and the reasons for such trends.
    b. Calculate current market depreciation as a percentage of gross capital funds.
    c. Review the analysis of municipal and corporate issues by rating classification.
        • Determine the total in each rating class and the total of nonrated issues.
        • Determine the total of nonrated investment securities issued by obligors located outside of the bank's service area (exclude U.S. government–guaranteed issues).
        • Review acquisitions since the prior examination and ascertain reasons for trends that may suggest a shift in the rated quality of investment holdings.
    d. Review coupon rates or yields (when available) and compare those recently acquired investments and money market holdings with coupon rates or yields that appear high or low to similarly acquired instruments of analogous types, ratings, and maturity characteristics. Discuss significant rate or yield variances with management.
    e. Review the schedule of securities, futures, forward, and standby contracts purchased and sold since the last examination and determine whether the volume of trading is consistent with policy objectives. If the bank does not have a separate trading account, determine whether such an account should be established, including appropriate recordkeeping and controls.
    f. If the majority of sales resulted in gains, determine if profit-taking is consistent with stated policy objectives or is motivated by anxiety for short-term income.
    g. Determine whether the bank has discounted or has plans to discount future investment income by selling interest coupons in advance of interest-payment dates.
    h. Review the list of commitments to purchase or sell investments or money market investments. Determine the effect of completion of these contracts on future earnings.
14. Review the bank's federal income tax position.
    a. Determine, by discussion with appropriate officers, if the bank is taking advantage of procedures to minimize tax liability in view of other investment objectives.
    b. Review or compute the bank's actual and budgeted tax-exempt holdings as a percentage of total assets and its applicable income taxes as a percentage of net operating income before taxes.
    c. Discuss with management the tax implications of losses resulting from securities sales.

15. Determine that proper risk diversification exists within the portfolio.
    a. Review totals of holdings by single obligor or industry, related obligors or industries, geographic distribution, yields, and securities that have special characteristics (include individual due from bank accounts from the list received from the bank or from the examiner who is assigned to due from banks and all money market instruments).
       • Detail, as concentrations, all holdings equaling 25 percent or more of capital funds.
       • List all holdings equaling at least 10 percent but less than 25 percent of capital funds and submit that information to the examiner who is assigned to loan portfolio management. These holdings will be combined with any additional advances in the lending areas.
    b. Perform a credit analysis of all nonrated holdings determined to be a concentration (if not performed in step 8).
16. If the bank is engaged in financial futures, exchange-traded puts and calls, forward placements, or standby contracts, determine the following.
    a. The policy is specific enough to outline permissible contract strategies and their relationships to other banking activities.
    b. Recordkeeping systems are sufficiently detailed to permit a determination of whether operating personnel have acted in accordance with authorized objectives.
    c. The board of directors or its designee has established specific contract-position limits and reviews contract positions at least monthly to ascertain conformance with those limits.
    d. Gross and net positions are within authorized positions and limits, and trades were executed by persons authorized to trade futures.
    e. The bank maintains general-ledger memorandum accounts or commitment registers which, at a minimum, include—
       • the type and amount of each contract,
       • the maturity date of each contract,
       • the current market price and cost of each contract, and
       • the amount held in margin accounts, including—
         — all futures contracts and forward, standby, and options contracts revalued on the basis of market or the lower of cost or market at each month-end;
         — securities acquired as the result of completed contracts valued at the lower of cost or market upon settlement;
         — fee income received by the bank on standby contracts accounted for properly;
         — financial reports disclosing futures, forwards, options, and standby activity;
         — a bank-instituted system for monitoring credit-risk exposure in forward and standby contract activity; and
         — the bank's internal controls, management reports, and audit procedures to ensure adherence to policy.
17. If the bank is engaged in financial futures, forward placement, options, or standby contracts, determine if the contracts have a reasonable correlation to the bank's business needs (including gap position) and if the bank fulfills its obligations under the contracts.
    a. Compare the contract commitment and maturity dates to anticipated offset.
    b. Report significant gaps to the examiner who is assigned to asset/liability management (see step 12).
    c. Compare the amounts of outstanding contracts to the amounts of the anticipated offset.
    d. Ascertain the extent of the correlation between expected interest-rate movements on the contracts and the anticipated offset.
    e. Determine the effect of the loss recognition on future earnings, and, if significant, report it to the examiner who is assigned to analytical review and income and expense.
18. On the basis of the pricings, ratings, and credit analyses performed above, and using the investments selected in step 6 or from lists previously obtained, test for compliance with applicable laws and regulations.
    a. Determine if the bank holds type II or III investments that are predominantly speculative or if it holds securities that are not marketable (12 CFR 1.3(b)).
    b. Review the recap of investment securities by legal types, as defined by 12 CFR

1, on the basis of the legal restrictions of 12 USC 24 and competent legal opinions.

c. For those investment securities that are convertible into stock or which have stock purchase warrants attached—
   - determine if the book value has been written down to an amount that represents the investment value of the security, independent of the conversion or warrant provision (12 CFR 1.10) and
   - determine if the par values of other securities that have been ruled eligible for purchase are within specified capital limitations.

d. Review pledge agreements and secured liabilities and determine that—
   - proper custodial procedures have been followed,
   - eligible securities are pledged,
   - securities pledged are sufficient to secure the liability that requires securing,
   - Treasury tax and loan remittance options and note options are properly secured, and
   - private deposits are not being secured.

(Information needed to perform the above steps will be in the pledge agreement; Treasury circulars 92 and 176, as amended.)

e. Review accounting procedures to determine that—
   - investment premiums are being extinguished by maturity or call dates (12 CFR 1.11);
   - premium amortization is charged to operating income (12 CFR 1.11);
   - accretion of discount is included in current income for banks required to use accrual accounting for reporting purposes;
   - accretion of bond discount requires a concurrent accrual of deferred income tax payable; and
   - securities gains or losses are reported net of applicable taxes, and net gains or losses are reflected in the period in which they are realized.

f. Determine if securities purchased under agreement to resell are in fact securities (not loans), are eligible for investment by the bank, and are within prescribed limits (12 USC 24 and 12 CFR 1). If not, determine whether the transaction is within applicable legal lending limits in the state.

g. Review securities sold under agreement to repurchase and determine whether they are, in fact, deposits (Regulation D, 12 CFR 204.2(a)(1)).

h. Determine that securities and money market investments held by foreign branches comply with section 211.3 of Regulation K—Foreign Branches of Member Banks (12 CFR 211.3) as to—
   - acquiring and holding securities (section 211.3(b)(3)) and
   - underwriting, distributing, buying, and selling obligations of the national government of the country in which the branch is located (section 211.3(b)(4)).

(Further considerations relating to the above are in other sections of Regulation K. Also review any applicable sections of Regulation T—Credit by Brokers and Dealers (12 CFR 220), Regulation X—Borrowers of Securities Credit (12 CFR 224), and Board interpretations 6150 (regarding securities issued or guaranteed by the International Bank for Reconstruction and Development) and 6200 (regarding borrowing by a domestic broker from a foreign broker). Edge Act and agreement corporations are discussed in the bank-related organizations section.

i. Determine that the bank's equity investments in foreign banks comply with the provisions of section 25 of the Federal Reserve Act and section 211.5 of Regulation K as to—
   - investment limitations (section 211.5(b)) and
   - investment procedures (section 211.5(c)).

19. Test for compliance with other laws and regulations as follows.

a. Review lists of affiliate relationships and lists of directors and principal officers and their interests.
   - Determine if the bank is an affiliate of a firm that is primarily engaged in underwriting or selling securities (12 USC 377).
   - Determine if directors or officers are engaged in or employed by firms that are engaged in similar activities (12 USC 78, 377, and 378). (It is an acceptable practice for bank officers to

act as directors of securities companies not doing business in the United States, the stock of which is owned by the bank as authorized by the Board of Governors of the Federal Reserve System.)
- Review the list of federal funds sold, securities purchased under agreements to resell, interest-bearing time deposits, and commercial paper, and determine if the bank is investing in money market instruments of affiliated banks or firms (section 23A, Federal Reserve Act and 12 USC 371(c)).
- Determine if transactions involving affiliates, insiders, or their interests have terms that are less favorable to the bank than transactions involving unrelated parties (sections 23A and 22 of the Federal Reserve Act (12 USC 371c, 375, 375a, and 375b)).

b. Determine if Federal Reserve stock equals 3 percent of the subject bank's booked capital and surplus accounts (Regulation I and 12 CFR 209).
c. Review the nature and duration of federal funds sales to determine if term federal funds are being sold in an amount exceeding the limit imposed by state legal lending limits.

20. With regard to potential unsafe and unsound investment practices and possible violations of the Securities Exchange Act of 1934, review the list of securities purchased and/or sold since the last examination.
    a. Determine if the bank engages one securities dealer or salesperson for virtually all transactions. If so—
       - evaluate the reasonableness of the relationship on the basis of the dealer's location and reputation and
       - compare purchase and sale prices to independently established market prices as of trade dates, if appropriate.
    b. Determine if investment-account securities have been purchased from the bank's own trading department. If so—
       - independently establish the market price as of trade date,
       - review trading-account purchase and sale confirmations and determine if the security was transferred to the investment portfolio at market price, and
       - review controls designed to prevent dumping.
    c. Determine if the volume of trading activity in the investment portfolio appears unwarranted. If so—
       - review investment-account daily ledgers and transaction invoices to determine if sales were matched by a like amount of purchases,
       - determine whether the bank is financing a dealer's inventory,
       - compare purchase and sale prices with independently established market prices as of trade dates, if appropriate (the carrying value should be determined by the market value of the securities as of the trade date), and
       - cross reference descriptive details on investment ledgers and purchase confirmations to the actual bonds or safekeeping receipts to determine if the bonds delivered are those purchased.
21. Discuss with appropriate officers and prepare report comments on—
    a. defaulted issues;
    b. speculative issues;
    c. incomplete credit information;
    d. the absence of legal opinions;
    e. significant changes in maturity scheduling;
    f. shifts in the rated quality of holdings;
    g. concentrations;
    h. unbalanced earnings and risk considerations;
    i. unsafe and unsound investment practices;
    j. apparent violations of laws, rulings, and regulations and the potential personal liability of the directorate;
    k. significant variances from peer-group statistics;
    l. market-value depreciation, if significant;
    m. weaknesses in supervision;
    n. policy deficiencies; and
    o. material problems being encountered by the bank's Edge Act and agreement corporation affiliates and other related international concerns that could affect the condition of the bank.
22. The following guidelines are to be implemented while reviewing securities participations, purchases and sales, swaps, or other transfers. The guidelines are designed to ensure that securities transfers involving state member banks, bank holding companies, and nonbank affiliates are carefully evaluated to determine if they were carried out to avoid classification and to determine

the effect of the transfer on the condition of the institution. In addition, the guidelines are designed to ensure that the primary regulator of the other financial institution involved in the transfer is notified.

a. Investigate any situations in which securities were transferred before the date of examination to determine if any were transferred to avoid possible criticism during the examination.
b. Determine whether any of the securities transferred were nonperforming at the time of transfer, classified at the previous examination, depreciated or subinvestment-grade, or for any other reason considered to be of questionable quality.
c. Review the bank's policies and procedures to determine whether securities purchased by the bank are given an independent, complete, and adequate credit evaluation. If the bank is a holding company subsidiary or a member of a chain banking organization, review securities purchases or participations from affiliates or other known members of the chain to determine if the securities purchases are given an arm's-length and independent credit evaluation by the purchasing bank.
d. Determine whether bank purchases of securities from an affiliate are in conformance with section 23A, which generally prohibits purchases of low-quality assets from an affiliate.
e. Determine that any securities purchased by the bank are properly reflected on its books at fair market value (fair market value should at a minimum reflect both the rate of return being earned on such assets and an appropriate risk premium). Determine that appropriate write-offs are taken on any securities sold by the bank at less than book value.
f. Determine that transactions involving transfers of low-quality securities to the parent holding company or a nonbank affiliate are properly reflected at fair market value on the books of both the bank and the holding company affiliate.
g. If poor-quality securities were transferred to or from another financial institution for which the Federal Reserve is not the primary regulator, prepare a memorandum to be submitted to Reserve Bank supervisory personnel. The Reserve Bank will then inform the local office of the primary federal regulator of the other institution involved in the transfer. The memorandum should include the following information, as applicable:
   - names of originating and receiving institutions
   - the type of securities involved and type of transfer (such as participation, purchase or sale, or swap)
   - dates of transfer
   - the total number and dollar amount of securities transferred
   - the status of the securities when transferred (for example, rating, depreciation, nonperforming, or classified)
   - any other information that would be helpful to the other regulator

23. Evaluate the quality of department management. Communicate your conclusion to the examiner who is assigned to management assessment and the examiner responsible for the international examination, if applicable.
24. Update workpapers with any information that will facilitate future examinations. If the bank has overseas branches, indicate those securities that will require review during the next overseas examination and the reasons for the review.

Review the bank's internal controls, policies, practices, and procedures regarding purchases, sales, and servicing of the investment portfolio. The bank's system should be documented completely and concisely, and should include, where appropriate, narrative descriptions, flow charts, copies of forms used, and other pertinent information. *Items in the questionnaire marked with an asterisk require substantiation by observation or testing.*

POLICIES

1. Has the board of directors, consistent with its duties and responsibilities, adopted written investment-securities policies, including policies for when-issued securities, futures, and forward placement contracts? Do policies outline the following:
   a. objectives
   b. permissible types of investments
   c. diversification guidelines to prevent undue concentration
   d. maturity schedules
   e. limitations on quality ratings
   f. policies for exceptions to standard policy
   g. valuation procedures and their frequency
2. Are investment policies reviewed at least annually by the board to determine if they are compatible with changing market conditions?
3. At the time of purchase, are securities designated as to whether they are investments for the portfolio or trading account?
4. Have policies been established governing the transfer of securities from the trading account to the investment-securities account?
5. Have limitations been imposed on the investment authority of officers?

*6. Do security transactions require dual authorization?

7. Does the bank have any of the following: due from commercial banks or from other depository institutions, time accounts, federal funds sold, commercial paper, securities purchased under agreements to resell, or any other money market type of investment? If so, determine the following:
   a. Is purchase or sale authority clearly defined?
   b. Are purchases or sales reported to the board of directors or its investment committee?
   c. Are maximums established for the amount of each type of asset?
   d. Are maximums established for the amount of each type of asset that may be purchased from or sold to any one bank?
   e. Do money market investment policies outline acceptable maturities?
   f. Have credit standards and review procedures been established?
8. Are the bank's policies in compliance with sections 23A and 23B of the Federal Reserve Act and the Board's rules thereunder?

CUSTODY OF SECURITIES

*9. Do procedures preclude the custodian of the bank's securities from—
   a. having sole physical access to securities;
   b. preparing release documents without the approval of authorized persons;
   c. preparing release documents not subsequently examined or tested by a second custodian; and
   d. performing more than one of the following transactions: (1) execution of trades, (2) receipt or delivery of securities, (3) receipt and disbursement of proceeds?

*10. Are securities physically safeguarded to prevent loss or their unauthorized removal or use?

11. Are securities, other than bearer securities, held only in the name or nominee of the bank?
12. When a negotiable certificate of deposit is acquired, is the certificate safeguarded in the same manner as any other negotiable investment instrument?

RECORDS

13. Do subsidiary records of investment securities show all pertinent data describing the security; its location; pledged or unpledged status; premium amortization;

discount accretion; and interest earned, collected, and accrued?

*14. Is the preparation and posting of subsidiary records performed or reviewed by persons who do not also have sole custody of securities?

*15. Are subsidiary records reconciled, at least monthly, to the appropriate general-ledger accounts, and are reconciling items investigated by persons who do not also have sole custody of securities?

16. For international division investments, are entries for U.S. dollar carrying values of securities denominated in foreign currencies rechecked at inception by a second person?

PURCHASES, SALES, AND REDEMPTIONS

*17. Is the preparation and posting of the purchase, sale, and redemption records of securities and open contractual commitments performed or reviewed by persons who do not also have sole custody of securities or authorization to execute trades?

*18. Are supporting documents, such as broker's confirmations and account statements for recorded purchases and sales, checked or reviewed subsequently by persons who do not also have sole custody of securities or authorization to execute trades?

*19. Are purchase confirmations compared with delivered securities or safekeeping receipts to determine if the securities delivered are the securities purchased?

DERIVATIVE-CONTRACTS CONTROLS

20. Do *end-user* policies—
    a. outline specific strategies and
    b. relate permissible strategies to other banking activities?
21. Are the formalized procedures used by the trader—
    a. documented in a manual and
    b. approved by the board or an appropriate board committee?
22. Are the bank's futures commission merchants and forward brokers—
    a. notified in writing to trade with only those persons authorized as traders and
    b. notified in writing of revocation of trading authority?
23. Has the bank established end-user limits—
    a. for individual traders and total outstanding contracts?
    b. that are endorsed by the board or an appropriate board committee?
    c. whose basis is fully explained?
24. Does the bank obtain prior written approval detailing the amount of, duration, and reason—
    a. for deviations from individual limits and
    b. for deviations from gross trading limits?
25. Are these exceptions subsequently submitted to the board or an appropriate board committee for ratification?
26. Does the trader prepare a prenumbered trade ticket?
27. Does the trade ticket contain all of the following information:
    a. trade date
    b. purchase or sale
    c. contract description
    d. quantity
    e. price
    f. reason for trade
    g. reference to the position being matched (immediate or future case settlement)
    h. signature of trader
28. Are the accounting records maintained and controlled by persons who cannot initiate trades?
29. Are accounting procedures documented in a procedures manual?
30. Are all incoming trade confirmations—
    a. received by someone independent of the trading and recordkeeping functions and
    b. verified to the trade tickets by this independent party?
31. Does the bank maintain general-ledger control accounts disclosing, at a minimum—
    a. futures or forward contracts memoranda accounts,
    b. deferred gains or losses, and
    c. margin deposits?
32. Are futures and forward contracts activities—
    a. supported by detailed subsidiary records and
    b. agreed daily to general-ledger controls by someone who is not authorized to prepare general-ledger entries?

33. Do periodic statements received from futures commission merchants reflect—
    a. trading activity for the period,
    b. open positions at the end of the period,
    c. the market value of open positions,
    d. unrealized gains and losses, and
    e. cash balances in accounts?
34. Are all of these periodic statements—
    a. received by someone independent of both the trading and recordkeeping functions and
    b. reconciled to all of the bank's accounting records?
35. Are the market prices reflected on the statements—
    a. verified with listed prices from a published source and
    b. used to recompute gains and losses?
36. Are daily reports of unusual increases in trading activity reviewed by senior management?
37. Are weekly reports prepared for an appropriate board committee and do reports reflect—
    a. all trading activity for the week,
    b. open positions at the end of the week,
    c. the market value of open positions,
    d. unrealized gains and losses,
    e. total trading limits outstanding for the bank, and
    f. total trading limits for each authorized trader?
38. Is the futures and forward contracts portfolio revalued monthly to market value or the lower of cost or market?
39. Are revaluation prices provided by persons or sources who are totally independent of the trading function?

OTHER

40. Does the board of directors receive regular reports on domestic and international division investment securities, and do reports include—
    a. valuations,
    b. maturity distributions,
    c. the average yield, and
    d. reasons for holding and benefits received (international division and overseas holdings only)?
41. Are purchases, exchanges, and sales of securities and open contractual commitments ratified by action of the board of directors or its investment committee and thereby made a matter of record in the minutes?

CONCLUSION

42. Is the foregoing information an adequate basis for evaluating internal control? Are there significant deficiencies in areas not covered in this questionnaire that impair any controls? Explain any deficiencies briefly and indicate any additional examination procedures deemed necessary.
43. Based on a composite evaluation, as evidenced by answers to the foregoing questions, is internal control adequate or inadequate?

Interest-rate risk (IRR) is the exposure of an institution's financial condition to adverse movements in interest rates. Accepting this risk is a normal part of banking and can be an important source of profitability and shareholder value. However, excessive levels of IRR can pose a significant threat to an institution's earnings and capital base. Accordingly, effective risk management that maintains IRR at prudent levels is essential to the safety and soundness of banking institutions.

Evaluating an institution's exposure to changes in interest rates is an important element of any full-scope examination and, for some institutions, may be the sole topic for specialized or targeted examinations. Such an evaluation includes assessing both the adequacy of the management process used to control IRR and the quantitative level of exposure. When assessing the IRR management process, examiners should ensure that appropriate policies, procedures, management information systems, and internal controls are in place to maintain IRR at prudent levels with consistency and continuity. Evaluating the quantitative level of IRR exposure requires examiners to assess the existing and potential future effects of changes in interest rates on an institution's financial condition, including its capital adequacy, earnings, liquidity, and, where appropriate, asset quality. To ensure that these assessments are both effective and efficient, examiner resources must be appropriately targeted at those elements of IRR that pose the greatest threat to the financial condition of an institution. This targeting requires an examination process built on a well-focused assessment of IRR exposure before the on-site engagement, a clearly defined examination scope, and a comprehensive program for following up on examination findings and ongoing monitoring.

Both the adequacy of an institution's IRR management process and the quantitative level of its IRR exposure should be assessed. Key elements of the examination process used to assess IRR include the role and importance of a preexamination risk assessment, proper scoping of the examination, and the testing and verification of both the management process and internal measures of the level of IRR exposure.[1]

SOURCES OF IRR

As financial intermediaries, banks encounter IRR in several ways. The primary and most discussed source of IRR is differences in the timing of the repricing of bank assets, liabilities, and off-balance-sheet (OBS) instruments. Repricing mismatches are fundamental to the business of banking and generally occur from either borrowing short-term to fund longer-term assets or borrowing long-term to fund shorter-term assets. Such mismatches can expose an institution to adverse changes in both the overall level of interest rates (parallel shifts in the yield curve) and the relative level of rates across the yield curve (nonparallel shifts in the yield curve).

Another important source of IRR, commonly referred to as basis risk, occurs when the adjustment of the rates earned and paid on different instruments is imperfectly correlated with otherwise similar repricing characteristics (for example, a three-month Treasury bill versus a three-month LIBOR). When interest rates change, these differences can change the cash flows and earnings spread between assets, liabilities, and OBS instruments of similar maturities or repricing frequencies.

An additional and increasingly important source of IRR is the options in many bank asset, liability, and OBS portfolios. An option provides the holder with the right, but not the obligation, to buy, sell, or in some manner alter the cash flow of an instrument or financial contract. Options may be distinct instruments, such as exchange-traded and over-the-counter contracts, or they may be embedded within the contractual terms of other instruments. Examples of instruments with embedded options include bonds and notes with call or put provisions (such as callable U.S. agency notes), loans that

1. This section incorporates and builds on the principles and guidance provided in SR-96-13, "Interagency Guidance on Sound Practices for Managing Interest Rate Risk." It also incorporates, where appropriate, fundamental risk-management principles and supervisory policies and approaches identified in SR-93-69, "Examining Risk Management and Internal Controls for Trading Activities of Banking Organizations"; SR-95-17, "Evaluating the Risk Management of Securities and Derivative Contracts Used in Nontrading Activities"; SR-95-22, "Enhanced Framework for Supervising the U.S. Operations of Foreign Banking Organizations"; SR-95-51, "Rating the Adequacy of Risk Management Processes and Internal Controls at State Member Banks and Bank Holding Companies"; and SR-96-14, "Risk-Focused Safety and Soundness Examinations and Inspections."

give borrowers the right to prepay balances without penalty (such as residential mortgage loans), and various types of nonmaturity deposit instruments that give depositors the right to withdraw funds at any time without penalty (such as core deposits). If not adequately managed, the asymmetrical payoff characteristics of options can pose significant risk to the banking institutions that sell them. Generally, the options, both explicit and embedded, held by bank customers are exercised to the advantage of the holder, not the bank. Moreover, an increasing array of options can involve highly complex contract terms that may substantially magnify the effect of changing reference values on the value of the option and, thus, magnify the asymmetry of option payoffs.

EFFECTS OF IRR

Repricing mismatches, basis risk, options, and other aspects of a bank's holdings and activities can expose an institution's earnings and value to adverse changes in market interest rates. The effect of interest rates on accrual or reported earnings is the most common focal point. In assessing the effects of changing rates on earnings, most banks focus primarily on their net interest income—the difference between total interest income and total interest expense. However, as banks have expanded into new activities to generate new types of fee-based and other noninterest income, a focus on overall net income is becoming more appropriate. The noninterest income arising from many activities, such as loan servicing and various asset-securitization programs, can be highly sensitive to changes in market interest rates. As noninterest income becomes an increasingly important source of bank earnings, both bank management and supervisors need to take a broader view of the potential effects of changes in market interest rates on bank earnings.

Market interest rates also affect the value of a bank's assets, liabilities, and OBS instruments and, thus, directly affect the value of an institution's equity capital. The effect of rates on the economic value of an institution's holdings and equity capital is a particularly important consideration for shareholders, management, and supervisors alike. The economic value of an instrument is an assessment of the present value of its expected net future cash flows, discounted to reflect market rates. By extension, an institution's economic value of equity (EVE) can be viewed as the present value of the expected cash flows on assets minus the present value of the expected cash flows on liabilities plus the net present value of the expected cash flows on OBS instruments. Economic values, which may differ from reported book values due to GAAP accounting conventions, can provide a number of useful insights into the current and potential future financial condition of an institution. Economic values reflect one view of the ongoing worth of the institution and can often provide a basis for assessing past management decisions in light of current circumstances. Moreover, economic values can offer comprehensive insights into the potential future direction of earnings performance since changes in the economic value of an institution's equity reflect changes in the present value of the bank's future earnings arising from its current holdings.

Generally, commercial banking institutions have adequately managed their IRR exposures, and few banks have failed solely as a result of adverse interest-rate movements. Nevertheless, changes in interest rates can have negative effects on bank profitability and must be carefully managed, especially given the rapid pace of financial innovation and the heightened level of competition among all types of financial institutions.

SOUND IRR MANAGEMENT PRACTICES

As is the case in managing other types of risk, sound IRR management involves effective board and senior management oversight and a comprehensive risk-management process that includes the following elements:

- effective policies and procedures designed to control the nature and amount of IRR, including clearly defined IRR limits and lines of responsibility and authority
- appropriate risk-measurement, monitoring, and reporting systems
- systematic internal controls that include the internal or external review and audit of key elements of the risk-management process

The formality and sophistication used in managing IRR depends on the size and sophistication of the institution, the nature and complexity

of its holdings and activities, and the overall level of its IRR. Adequate IRR management practices can vary considerably. For example, a small institution with noncomplex activities and holdings, a relatively short-term balance-sheet structure presenting a low IRR profile, and senior managers and directors who are actively involved in the details of day-to-day operations may be able to rely on relatively simple and informal IRR management systems.

More complex institutions and those with higher interest-rate-risk exposures or holdings of complex instruments may require more elaborate and formal IRR management systems to address their broader and typically more complex range of financial activities, as well as provide senior managers and directors with the information they need to monitor and direct day-to-day activities. More complex processes for interest-rate-risk management may require more formal internal controls, such as internal and external audits, to ensure the integrity of the information senior officials use to oversee compliance with policies and limits.

Individuals involved in the risk-management process should be sufficiently independent of business lines to ensure adequate separation of duties and avoid potential conflicts of interest. The degree of autonomy these individuals have may be a function of the size and complexity of the institution. In smaller and less complex institutions with limited resources, it may not be possible to completely remove individuals with business-line responsibilities from the risk-management process. In these cases, the focus should be on ensuring that risk-management functions are conducted effectively and objectively. Larger, more complex institutions may have separate and independent risk-management units.

Board and Senior Management Oversight

Effective oversight by a bank's board of directors and senior management is critical to a sound IRR management process. The board and senior management should be aware of their responsibilities related to IRR management, understand the nature and level of interest-rate risk taken by the bank, and ensure that the formality and sophistication of the risk-management process is appropriate for the overall level of risk.

Board of Directors

Ultimately, the board of directors is responsible for the level of IRR taken by an institution. The board should approve business strategies and significant policies that govern or influence the institution's interest-rate risk. It should articulate overall IRR objectives and provide clear guidance on the level of acceptable IRR. The board should also approve policies and procedures that identify lines of authority and responsibility for managing IRR exposures.

Directors should understand the nature of the risks to their institution and ensure that management is identifying, measuring, monitoring, and controlling them. Accordingly, the board should monitor the performance and IRR profile of the institution. Information that is timely and sufficiently detailed should be provided to directors to help them understand and assess the IRR facing the institution's key portfolios and the institution as a whole. The frequency of these reviews depends on the sophistication of the institution, the complexity of its holdings, and the materiality of changes in its holdings between reviews. Institutions holding significant positions in complex instruments or with significant changes in their composition of holdings would be expected to have more frequent reviews. In addition, the board should periodically review significant IRR management policies and procedures, as well as overall business strategies that affect the institution's IRR exposure.

The board of directors should encourage discussions between its members and senior management, as well as between senior management and others in the institution, regarding the institution's IRR exposures and management process. Board members need not have detailed technical knowledge of complex financial instruments, legal issues, or sophisticated risk-management techniques. However, they are responsible for ensuring that the institution has personnel available who have the necessary technical skills and that senior management fully understands and is sufficiently controlling the risks incurred by the institution.

A bank's board of directors may meet its responsibilities in a variety of ways. Some board members may be identified to become directly involved in risk-management activities by participating on board committees or gaining a sufficient understanding and awareness of the institution's risk profile through periodic briefings and management reports. Information pro-

vided to board members should be presented in a format that members can readily understand and that will assist them in making informed policy decisions about acceptable levels of risk, the nature of risks in current and proposed new activities, and the adequacy of the institution's risk-management process. In short, regardless of the structure of the organization and the composition of its board of directors or delegated board committees, board members must ensure that the institution has the necessary technical skills and management expertise to conduct its activities prudently and consistently within the policies and intent of the board.

Senior Management

Senior management is responsible for ensuring that the institution has adequate policies and procedures for managing IRR on both a long-range and day-to-day basis and that clear lines of authority and responsibility are maintained for managing and controlling this risk. Management should develop and implement policies and procedures that translate the board's goals, objectives, and risk limits into operating standards that are well understood by bank personnel and that are consistent with the board's intent. Management is also responsible for maintaining (1) adequate systems and standards for measuring risk, (2) standards for valuing positions and measuring performance, (3) a comprehensive IRR reporting and monitoring process, and (4) effective internal controls and review processes.

IRR reports to senior management should provide aggregate information as well as sufficient supporting detail so that management can assess the sensitivity of the institution to changes in market conditions and other important risk factors. Senior management should periodically review the organization's IRR management policies and procedures to ensure that they remain appropriate and sound. Senior management should also encourage and participate in discussions with members of the board and—when appropriate to the size and complexity of the institution—with risk-management staff regarding risk-measurement, reporting, and management procedures.

Management should ensure that analysis and risk-management activities related to IRR are conducted by competent staff whose technical knowledge and experience are consistent with the nature and scope of the institution's activities. There should be enough knowledgeable people on staff to allow some individuals to back up key personnel, as necessary.

Policies, Procedures, and Limits

Institutions should have clear policies and procedures for limiting and controlling IRR. These policies and procedures should (1) delineate lines of responsibility and accountability over IRR management decisions, (2) clearly define authorized instruments and permissible hedging and position-taking strategies, (3) identify the frequency and method for measuring and monitoring IRR, and (4) specify quantitative limits that define the acceptable level of risk for the institution. In addition, management should define the specific procedures and approvals necessary for exceptions to policies, limits, and authorizations. All IRR policies should be reviewed periodically and revised as needed.

Clear Lines of Authority

Through formal written policies or clear operating procedures, management should define the structure of managerial responsibilities and oversight, including lines of authority and responsibility in the following areas:

- developing and implementing strategies and tactics used in managing IRR
- establishing and maintaining an IRR measurement and monitoring system
- identifying potential IRR and related issues arising from the potential use of new products
- developing IRR management policies, procedures, and limits, and authorizing exceptions to policies and limits

Individuals and committees responsible for making decisions about interest-rate risk management should be clearly identified. Many medium-sized and large banks, and banks with concentrations in complex instruments, delegate responsibility for IRR management to a committee of senior managers, sometimes called an asset/liability committee (ALCO). In these institutions, policies should clearly identify the members of an ALCO, the committee's duties and responsibilities, the extent of its decision-making authority, and the form and frequency of

its periodic reports to senior management and the board of directors. An ALCO should have sufficiently broad participation across major banking functions (for example, in the lending, investment, deposit, funding areas) to ensure that its decisions can be executed effectively throughout the institution. In many large institutions, the ALCO delegates day-to-day responsibilities for IRR management to an independent risk-management department or function.

Regardless of the level of organization and formality used to manage IRR, individuals involved in the risk-management process (including separate risk-management units, if present) should be sufficiently independent of the business lines to ensure adequate separation of duties and avoid potential conflicts of interest. Also, personnel charged with measuring and monitoring IRR should have a well-founded understanding of all aspects of the institution's IRR profile. Compensation policies for these individuals should be adequate enough to attract and retain personnel who are well qualified to assess the risks of the institution's activities.

Authorized Activities

Institutions should clearly identify the types of financial instruments that are permissible for managing IRR, either specifically or by their characteristics. As appropriate to its size and complexity, the institution should delineate procedures for acquiring specific instruments, managing individual portfolios, and controlling the institution's aggregate IRR exposure. Major hedging or risk-management initiatives should be approved by the board or its appropriate delegated committee before being implemented.

Before introducing new products, hedging, or position-taking initiatives, management should ensure that adequate operational procedures and risk-control systems are in place. Proposals to undertake these new instruments or activities should—

- describe the relevant product or activity
- identify the resources needed to establish sound and effective IRR management of the product or activity
- analyze the risk of loss from the proposed activities in relation to the institution's overall financial condition and capital levels
- outline the procedures to measure, monitor, and control the risks of the proposed product or activity

Limits

The goal of IRR management is to maintain an institution's interest-rate risk exposure within self-imposed parameters over a range of possible changes in interest rates. A system of IRR limits and risk-taking guidelines provides the means for achieving that goal. This system should set boundaries for the institution's level of IRR and, where appropriate, allocate these limits to individual portfolios or activities. Limit systems should also ensure that limit violations receive prompt management attention.

Aggregate IRR limits should clearly articulate the amount of IRR acceptable to the firm, be approved by the board of directors, and be reevaluated periodically. Limits should be appropriate to the size, complexity, and financial condition of the organization. Depending on the nature of an institution's holdings and its general sophistication, limits can also be identified for individual business units, portfolios, instrument types, or specific instruments. The level of detail of risk limits should reflect the characteristics of the institution's holdings, including the various sources of IRR to which the institution is exposed. Limits applied to portfolio categories and individual instruments should be consistent with and complementary to consolidated limits.

IRR limits should be consistent with the institution's overall approach to measuring and managing IRR and address the potential impact of changes in market interest rates on both reported earnings and the institution's EVE. From an earnings perspective, institutions should explore limits on net income as well as net interest income to fully assess the contribution of noninterest income to the IRR exposure of the institution. Limits addressing the effect of changing interest rates on economic value may range from those focusing on the potential volatility of the value of the institution's major holdings to a comprehensive estimate of the exposure of the institution's EVE.

An institution's limits for addressing the effect of rates on its profitability and EVE should be appropriate for the size and complexity of its underlying positions. Relatively simple limits that identify maximum maturity or repricing gaps, acceptable maturity profiles, or the extent of volatile holdings may be adequate for institutions engaged in traditional banking activities—and those with few holdings of long-term instruments, options, instruments with embedded

options, or other instruments whose value may be substantially affected by changes in market rates. For more complex institutions, quantitative limits on acceptable changes in estimated earnings and EVE under specified scenarios may be more appropriate. Banks that have significant intermediate- and long-term mismatches or complex option positions should, at a minimum, have economic value–oriented limits that quantify and constrain the potential changes in economic value or bank capital that could arise from those positions.

Limits on the IRR exposure of earnings should be broadly consistent with those used to control the exposure of a bank's economic value. IRR limits on earnings variability primarily address the near-term recognition of the effects of changing interest rates on the institution's financial condition. IRR limits on economic value reflect efforts to control the effect of changes in market rates on the present value of the entire future earnings stream arising from the institution's current holdings.

IRR limits and risk tolerances may be keyed to specific scenarios of market-interest-rate movements, such as an increase or decrease of a particular magnitude. The rate movements used in developing these limits should represent meaningful stress situations, taking into account historical rate volatility and the time required for management to address exposures. Moreover, stress scenarios should take account of the range of the institution's IRR characteristics, including mismatch, basis, and option risks. Simple scenarios using parallel shifts in interest rates may be insufficient to identify these risks.

Large, complex institutions are increasingly using advanced statistical techniques to measure IRR across a probability distribution of potential interest-rate movements and express limits in terms of statistical confidence intervals. If properly used, these techniques can be particularly useful in measuring and managing options positions.

Risk-Measurement and Risk-Monitoring Systems

An effective process of measuring, monitoring, and reporting exposures is essential for adequately managing IRR. The sophistication and complexity of this process should be appropriate to the size, complexity, nature, and mix of an institution's business lines and its IRR characteristics.

IRR Measurement

Well-managed banks have IRR measurement systems that measure the effect of rate changes on both earnings and economic value. The latter is particularly important for institutions with significant holdings of intermediate and long-term instruments or instruments with embedded options because the market values of all these instruments can be particularly sensitive to changes in market interest rates. Institutions with significant noninterest income that is sensitive to changes in interest rates should focus special attention on net income as well as net interest income. Since the value of instruments with intermediate and long maturities and embedded options is especially sensitive to interest-rate changes, banks with significant holdings of these instruments should be able to assess the potential longer-term impact of changes in interest rates on the value of these positions—the overall potential performance of the bank.

IRR measurement systems should (1) assess all material IRR associated with an institution's assets, liabilities, and OBS positions; (2) use generally accepted financial concepts and risk-measurement techniques; and (3) have well-documented assumptions and parameters. Material sources of IRR include the mismatch, basis, and option risk exposures of the institution. In many cases, the interest-rate characteristics of a bank's largest holdings will dominate its aggregate risk profile. While all of a bank's holdings should receive appropriate treatment, measurement systems should rigorously evaluate the major holdings and instruments whose values are especially sensitive to rate changes. Instruments with significant embedded or explicit option characteristics should receive special attention.

IRR measurement systems should use generally accepted financial measurement techniques and conventions to estimate the bank's exposure. Examiners should evaluate these systems in the context of the level of sophistication and complexity of the institution's holdings and activities. A number of accepted techniques are available for measuring the IRR exposure of both earnings and economic value. Their complexity ranges from simple calculations and

static simulations using current holdings to highly sophisticated dynamic modeling techniques that reflect potential future business and business decisions. Basic IRR measurement techniques begin with a maturity/repricing schedule, which distributes assets, liabilities, and OBS holdings into time bands according to their final maturity (if fixed-rate) or time remaining to their next repricing (if floating). The choice of time bands may vary from bank to bank. When assets and liabilities do not have contractual repricing intervals or maturities, they are assigned to repricing time bands according to the judgment and analysis of the institution's IRR management staff (or those individuals responsible for controlling IRR).

Simple maturity/repricing schedules can be used to generate rough indicators of the IRR sensitivity of both earnings and economic values to changing interest rates. To evaluate earnings exposures, liabilities arrayed in each time band can be subtracted from the assets arrayed in the same time band to yield a dollar amount of maturity/repricing mismatch or gap in each time band. The sign and magnitude of the gaps in various time bands can be used to assess potential earnings volatility arising from changes in market interest rates.

A maturity/repricing schedule can also be used to evaluate the effects of changing rates on an institution's economic value. At the most basic level, mismatches or gaps in long-dated time bands can provide insights into the potential vulnerability of the economic value of relatively noncomplex institutions. Long-term gap calculations along with simple maturity distributions of holdings may be sufficient for relatively noncomplex institutions. On a slightly more advanced yet still simplistic level, estimates of the change in an institution's economic value can be calculated by applying economic-value sensitivity weights to the asset and liability positions slotted in the time bands of a maturity/repricing schedule. The weights can be constructed to represent estimates of the change in value of the instruments maturing or repricing in that time band given a specified interest-rate scenario. When these weights are applied to the institution's assets, liabilities, and OBS positions and subsequently netted, the result can provide a rough approximation of the change in the institution's EVE under the assumed scenario. These measurement techniques can prove especially useful for institutions with small holdings of complex instruments. Further refinements to simple risk-weighting techniques incorporate the risk of options, the potential for basis risk, and nonparallel shifts in the yield curve by using customized risk weights applied to the specific instruments or instrument types arrayed in the maturity/repricing schedule.

Larger institutions and those with complex risk profiles that entail meaningful basis or option risks may find it difficult to monitor IRR adequately using simple maturity/repricing analyses. Generally, they will need to employ more sophisticated simulation techniques. For assessing the exposure of earnings, simulations that estimate cash flows and resulting earnings streams over a specific period are conducted based on existing holdings and assumed interest-rate scenarios. When these cash flows are simulated over the entire expected lives of the institution's holdings and discounted back to their present values, an estimate of the change in EVE can be calculated.

Static cash-flow simulations of current holdings can be made more dynamic by incorporating more detailed assumptions about the future course of interest rates and the expected changes in a bank's business activity over a specified time horizon. Combining assumptions on future activities and reinvestment strategies with information about current holdings, these simulations can project expected cash flows and estimate dynamic earnings and EVE outcomes. These more sophisticated techniques, such as option-adjusted pricing analysis and Monte Carlo simulation, allow for dynamic interaction of payment streams and interest rates to better capture the effect of embedded or explicit options.

The IRR measurement techniques and associated models should be sufficiently robust to adequately measure the risk profile of the institution's holdings. Depending on the size and sophistication of the institution and its activities, as well as the nature of its holdings, the IRR measurement system should be able to adequately reflect (1) uncertain principal amortization and prepayments; (2) caps and floors on loans and securities, where material; (3) the characteristics of both basic and complex OBS instruments held by the institution; and (4) changing spread relationships necessary to capture basis risk. Moreover, IRR models should provide clear reports that identify major assumptions and allow management to evaluate the reasonableness of and internal consistency among key assumptions.

Data Integrity and Assumptions

The usefulness of IRR measures depends on the integrity of the data on current holdings, validity of the underlying assumptions, and IRR scenarios used to model IRR exposures. Techniques involving sophisticated simulations should be used carefully so that they do not become ''black boxes,'' producing numbers that appear to be precise, but that may be less accurate when their specific assumptions and parameters are revealed.

The integrity of data on current positions is an important component of the risk-measurement process. Institutions should ensure that current positions are delineated at an appropriate level of aggregation (for example, by instrument type, coupon rate, or repricing characteristic) to ensure that risk measures capture all meaningful types and sources of IRR, including those arising from explicit or embedded options. Management should also ensure that all material positions are represented in IRR measures, that the data used are accurate and meaningful, and that the data adequately reflect all relevant repricing and maturity characteristics. When applicable, data should include information on the contractual coupon rates and cash flows of associated instruments and contracts. Manual adjustments to underlying data should be well documented.

Senior management and risk managers should recognize the key assumptions used in IRR measurement, as well as reevaluate and approve them periodically. Assumptions should also be documented clearly and, ideally, the effect of alternative assumptions should be presented so that their significance can be fully understood. Assumptions used in assessing the interest-rate sensitivity of complex instruments, such as those with embedded options, and instruments with uncertain maturities, such as core deposits, should be subject to rigorous documentation and review, as appropriate to the size and sophistication of the institution. Assumptions about customer behavior and new business should take proper account of historical patterns and be consistent with the interest-rate scenarios used.

Nonmaturity Deposits

An institution's IRR measurement system should consider the sensitivity of nonmaturity deposits, including demand deposits, NOW accounts, savings deposits, and money market deposit accounts. Nonmaturity deposits represent a large portion of the industry's funding base, and a variety of techniques are used to analyze their IRR characteristics. The use of these techniques should be appropriate to the size, sophistication, and complexity of the institution.

In general, treatment of nonmaturity deposits should consider the historical behavior of the institution's deposits; general conditions in the institution's markets, including the degree of competition it faces; and anticipated pricing behavior under the scenario investigated. Assumptions should be supported to the fullest extent practicable. Treatment of nonmaturity deposits within the measurement system may, of course, change from time to time based on market and economic conditions. Such changes should be well founded and documented. Treatments used to construct earnings-simulation assessments should be conceptually and empirically consistent with those used to develop EVE assessments of IRR.

IRR Scenarios

IRR exposure estimates, whether linked to earnings or economic value, use some form of forecasts or scenarios of possible changes in market interest rates. Bank management should ensure that IRR is measured over a probable range of potential interest-rate changes, including meaningful stress situations. The scenarios used should be large enough to expose all of the meaningful sources of IRR associated with an institution's holdings. In developing appropriate scenarios, bank management should consider the current level and term structure of rates and possible changes to that environment, given the historical and expected future volatility of market rates. At a minimum, scenarios should include an instantaneous plus or minus 200-basis-point parallel shift in market rates. Institutions should also consider using multiple scenarios, including the potential effects of changes in the relationships among interest rates (option risk and basis risk) as well as changes in the general level of interest rates and changes in the shape of the yield curve.

The risk-measurement system should support a meaningful evaluation of the effect of stressful market conditions on the institution. Stress testing should be designed to provide information on the kinds of conditions under which the institution's strategies or positions would be

most vulnerable; thus, testing may be tailored to the risk characteristics of the institution. Possible stress scenarios include abrupt changes in the term structure of interest rates, relationships among key market rates (basis risk), liquidity of key financial markets, or volatility of market rates. In addition, stress scenarios should include the conditions under which key business assumptions and parameters break down. The stress testing of assumptions used for illiquid instruments and instruments with uncertain contractual maturities, such as core deposits, is particularly critical to achieving an understanding of the institution's risk profile. Therefore, stress scenarios may not only include extremes of observed market conditions but also plausible worst-case scenarios. Management and the board of directors should periodically review the results of stress tests and the appropriateness of key underlying assumptions. Stress testing should be supported by appropriate contingency plans.

IRR Monitoring and Reporting

An accurate, informative, and timely management information system is essential for managing IRR exposure, both to inform management and support compliance with board policy. The reporting of risk measures should be regular and clearly compare current exposures with policy limits. In addition, past forecasts or risk estimates should be compared with actual results as one tool to identify any potential shortcomings in modeling techniques.

A bank's senior management and its board or a board committee should receive reports on the bank's IRR profile at least quarterly. More frequent reporting may be appropriate depending on the bank's level of risk and its potential for significant change. While the types of reports prepared for the board and various levels of management will vary based on the institution's IRR profile, reports should, at a minimum, allow senior management and the board or committee to—

- evaluate the level of and trends in the bank's aggregate IRR exposure;
- demonstrate and verify compliance with all policies and limits;
- evaluate the sensitivity and reasonableness of key assumptions;
- assess the results and future implications of major hedging or position-taking initiatives that have been taken or are being actively considered;
- understand the implications of various stress scenarios, including those involving breakdowns of key assumptions and parameters;
- review IRR policies, procedures, and the adequacy of the IRR measurement systems; and
- determine whether the bank holds sufficient capital for the level of risk being taken.

Comprehensive Internal Controls

An institution's IRR management process should be an extension of its overall structure of internal controls. Banks should have adequate internal controls to ensure the integrity of their interest-rate risk management process. Internal controls consist of procedures, approval processes, reconciliations, reviews, and other mechanisms designed to provide a reasonable assurance that the institution's objectives for interest-rate risk management are achieved. Appropriate internal controls should address all of the various elements of the risk-management process, including adherence to polices and procedures, and the adequacy of risk identification, risk measurement, and risk reporting.

An important element of a bank's internal controls for interest-rate risk is management's comprehensive evaluation and review. Management should ensure that the various components of the bank's interest-rate risk management process are regularly reviewed and evaluated by individuals who are independent of the function they are assigned to review. Although procedures for establishing limits and for operating within them may vary among banks, periodic reviews should be conducted to determine whether the organization complies with its interest-rate risk policies and procedures. Positions that exceed established limits should receive the prompt attention of appropriate management and should be resolved according to approved policies. Periodic reviews of the interest-rate risk management process should also address any significant changes in the types or characteristics of instruments acquired, limits, and internal controls since the last review.

Reviews of the interest-rate risk measurement system should include assessments of the assumptions, parameters, and methodologies used. These reviews should seek to understand,

test, and document the current measurement process, evaluate the system's accuracy, and recommend solutions to any identified weaknesses. The results of this review, along with any recommendations for improvement, should be reported to the board, which should take appropriate, timely action. Since measurement systems may incorporate one or more subsidiary systems or processes, banks should ensure that multiple component systems are well integrated and consistent with each other.

Banks, particularly those with complex risk exposures, are encouraged to have their measurement systems reviewed by *an independent party, whether an internal or external auditor or both*. Reports written by external auditors or other outside parties should be available to relevant supervisory authorities. Any independent reviewer should be sure that the bank's risk-measurement system is sufficient to capture all material elements of interest-rate risk. A reviewer should consider the following factors when making the risk assessment:

- the quantity of interest-rate risk
  - — the volume and price sensitivity of various products
  - — the vulnerability of earnings and capital under differing rate changes, including yield curve twists
  - — the exposure of earnings and economic value to various other forms of interest-rate risk, including basis and optionality risk
- the quality of interest-rate risk management
  - — whether the bank's internal measurement system is appropriate to the nature, scope, and complexities of the bank and its activities
  - — whether the bank has an independent risk-control unit responsible for the design of the risk-management system
  - — whether the board of directors and senior management are actively involved in the risk-control process
  - — whether internal policies, controls, and procedures concerning interest-rate risk are well documented and complied with
  - — whether the assumptions of the risk-management system are well documented, data are accurately processed, and data aggregation is proper and reliable
  - — whether the organization has adequate staffing to conduct a sound risk-management process

The results of reviews, along with any recommendations for improvement, should be reported to the board and acted upon in a timely manner. Institutions with complex risk exposures are encouraged to have their measurement systems reviewed by external auditors or other knowledgeable outside parties to ensure the adequacy and integrity of the systems. Since measurement systems may incorporate one or more subsidiary systems or processes, institutions should ensure that multiple component systems are well integrated and consistent.

The frequency and extent to which an institution should reevaluate its risk-measurement methodologies and models depends, in part, on the specific IRR exposures created by their holdings and activities, the pace and nature of changes in market interest rates, and the extent to which there are new developments in measuring and managing IRR. At a minimum, institutions should review their underlying IRR measurement methodologies and IRR management process annually, and more frequently as market conditions dictate. In many cases, internal evaluations may be supplemented by reviews of external auditors or other qualified outside parties, such as consultants with expertise in IRR management.

RATING THE ADEQUACY OF IRR MANAGEMENT

Examiners should incorporate their assessment of the adequacy of IRR management into their overall rating of risk management, which is subsequently factored into the management component of an institution's CAMELS rating. Ratings of IRR management can follow the general framework used to rate overall risk management:

- A rating of 1 or strong would indicate that management effectively identifies and controls the IRR posed by the institution's activities, including risks from new products.
- A rating of 2 or satisfactory would indicate that the institution's management of IRR is largely effective, but lacking in some modest degree. It reflects a responsiveness and ability to cope successfully with existing and foreseeable exposures that may arise in carrying out the institution's business plan. While the institution may have some minor risk-management weaknesses, these problems have

been recognized and are being addressed. Generally, risks are being controlled in a manner that does not require additional or more than normal supervisory attention.
- A rating of 3 or fair signifies IRR management practices that are lacking in some important ways and, therefore, are a cause for more than normal supervisory attention. One or more of the four elements of sound IRR management are considered fair and have precluded the institution from fully addressing a significant risk to its operations. Certain risk-management practices need improvement to ensure that management and the board are able to identify, monitor, and control adequately all significant risks to the institution.
- A rating of 4 or marginal represents marginal IRR management practices that generally fail to identify, monitor, and control significant risk exposures in many material respects. Generally, such a situation reflects a lack of adequate guidance and supervision by management and the board. One or more of the four elements of sound risk management are considered marginal and require immediate and concerted corrective action by the board and management.
- A rating of 5 or unsatisfactory indicates a critical absence of effective risk-management practices to identify, monitor, or control significant risk exposures. One or more of the four elements of sound risk management is considered wholly deficient, and management and the board have not demonstrated the capability to address deficiencies. Deficiencies in the institution's risk-management procedures and internal controls require immediate and close supervisory attention.

QUANTITATIVE LEVEL OF IRR EXPOSURE

Evaluating the quantitative level of IRR involves assessing the effects of both past and potential future changes in interest rates on an institution's financial condition, including the effects on its earnings, capital adequacy, liquidity, and—in some cases—asset quality. This assessment involves a broad analysis of an institution's business mix, balance-sheet composition, OBS holdings, and holdings of interest rate–sensitive instruments. Characteristics of the institution's material holdings should also be investigated to determine (and quantify) how changes in interest rates might affect their performance. The rigor of the quantitative IRR evaluation process should reflect the size, sophistication, and nature of the institution's holdings.

Assessment of the Composition of Holdings

An overall evaluation of an institution's holdings and its business mix is an important first step to determine its quantitative level of IRR exposure. The evaluation should focus on identifying (1) major on- and off-balance-sheet positions, (2) concentrations in interest-sensitive instruments, (3) the existence of highly volatile instruments, and (4) significant sources of noninterest income that may be sensitive to changes in interest rates. Identifying major holdings of particular types or classes of assets, liabilities, or off-balance-sheet instruments is particularly pertinent since the interest-rate-sensitivity characteristics of an institution's largest positions or activities will tend to dominate its IRR profile. The composition of assets should be assessed to determine the types of instruments held and the relative proportion of holdings they represent, both with respect to total assets and within appropriate instrument portfolios. Examiners should note any specialization or concentration in particular types of investment securities or lending activities and identify the interest-rate characteristics of the instruments or activities. The assessment should also incorporate an evaluation of funding strategies and the composition of deposits, including core deposits. Trends and changes in the composition of assets, liabilities, and off-balance-sheet holdings should be fully assessed—especially when the institution is experiencing significant growth.

Examiners should identify the interest sensitivity of an institution's major holdings. For many instruments, the stated final maturity, coupon interest payment, and repricing frequency are the primary determinants of interest-rate sensitivity. In general, the shorter the repricing frequency (or maturity for fixed-rate instruments), the greater the impact of a change in interest rates on the earnings of the asset, liability, or OBS instrument employed will be because the cash flows derived, either through repricing or reinvestment, will more quickly reflect market rates. From a value perspective,

the longer the repricing frequency (or maturity for fixed-rate instruments), the more sensitive the value of the instrument will be to changes in market interest rates. Accordingly, basic maturity/repricing distributions and gap schedules are important first screens to identify the interest sensitivity of major holdings from both an earnings and value standpoint.

Efforts should be made to identify instruments whose value is highly sensitive to rate changes. Even if these instruments may not make up a major portion of an institution's holdings, their rate sensitivity may be large enough to materially affect the institution's aggregate exposure. Highly interest rate–sensitive instruments generally have fixed-rate coupons with long maturities, significant embedded options, or some elements of both. Identifying explicit options and instruments with embedded options is particularly important; these holdings may exhibit significantly volatile price and earnings behavior (because of their asymmetrical cash flows) when interest rates change. The interest-rate sensitivity of exchange-traded options is usually easy to identify because exchange contracts are standardized. On the other hand, the interest-rate sensitivity of over-the-counter derivative instruments and the option provisions embedded in other financial instruments, such as the right to prepay a loan without penalty, may be less readily identifiable. Instruments tied to residential mortgages, such as mortgage pass-through securities, collateralized mortgage obligations (CMOs), real estate mortgage investment conduits (REMICs), and various mortgage-derivative products, generally entail some form of embedded optionality. Certain types of CMOs and REMICs constitute high-risk mortgage-derivative products and should be clearly identified. U.S. agency and municipal securities, as well as traditional forms of lending and borrowing arrangements, can often incorporate options into their structures. U.S. agency structured notes and municipal securities with long-dated call provisions are just two examples. Many commercial loans also use caps or floors. Over-the-counter OBS instruments, such as swaps, caps, floors, and collars, can involve highly complex structures and, thus, can be quite volatile in the face of changing interest rates.

An evaluation of an institution's funding sources relative to its assets profile is fundamental to the IRR assessment. Reliance on volatile or complex funding structures can significantly increase IRR when asset structures are fixed-rate or long-term. Long-term liabilities used to finance shorter-term assets can also increase IRR. The role of nonmaturity or core deposits in an institution's funding base is particularly pertinent to any assessment of IRR. Depending on their composition and the underlying client base, core deposits can provide significant opportunities for institutions to administer and manage the interest rates paid on this funding source. Thus, high levels of stable core deposit funding may provide an institution with significant control over its IRR profile. Examiners should assess the characteristics of an institution's nonmaturity deposit base, including the types of accounts offered, the underlying customer base, and important trends that may influence the rate sensitivity of this funding source.

In general, examiners should evaluate trends and attempt to identify any structural changes in the interest-rate risk profile of an institution's holdings, such as shifts of asset holdings into longer-term instruments or instruments that may have embedded options, changes in funding strategies and core deposit balances, and the use of off-balance-sheet instruments. Significant changes in the composition of an institution's holdings may reduce the usefulness of its historical performance as an indicator of future performance.

Examiners should also identify and assess material sources of interest-sensitive fee income. Loan-servicing income, especially when related to residential mortgages, can be an important and highly volatile element in an institution's earnings profile. Servicing income is linked to the size of the servicing portfolio and, thus, can be greatly affected by the prepayment rate for mortgages in the servicing portfolio. Revenues arising from securitization of other types of loans, including credit card receivables, can also be very sensitive to changes in interest rates.

An analysis of both on- and off-balance-sheet holdings should also consider potential basis risk, that is, whether instruments with adjustable-rate characteristics that reprice in a similar time period will reprice differently than assumed. Basis risk is a particular concern for offsetting positions that reprice in the same time period. Typical examples include assets that reprice with three-month Treasury bills paired against liabilities repricing with three-month LIBOR or prime-based assets paired against other short-term funding sources. Analyzing the repricing

characteristics of major adjustable-rate positions should help to identify these situations.

EXPOSURE OF EARNINGS TO IRR

When evaluating the potential effects of changing interest rates on an institution's earnings, examiners should assess the key determinants of the net interest margin, the effect that fluctuations in net interest margins can have on overall net income, and the rate sensitivity of noninterest income and expense. Analyzing the historical behavior of the net interest margin, including the yields on major assets, liabilities, and off-balance-sheet positions that make up that margin, can provide useful insights into the relative stability of an institution's earnings. For example, a review of the historical composition of assets and the yields earned on those assets clearly identifies an institution's business mix and revenue-generating strategies, as well as potential vulnerabilities of these revenues to changes in rates. Similarly, an assessment of the rates paid on various types of deposits over time can help identify the institution's funding strategies, how the institution competes for deposits, and the potential vulnerability of its funding base to rate changes.

Understanding the effect of potential fluctuations in net interest income on overall operating performance is also important. At some banks, high overhead costs may require high net interest margins to generate even moderate levels of income. Accordingly, relatively high net interest margins may not necessarily imply a higher tolerance to changes in interest rates. Examiners should fully consider the potential effects of fluctuating net interest margins when they analyze the exposure of net income to changes in interest rates.

Additionally, examiners should assess the contribution of noninterest income to net income, including its interest-rate sensitivity and how it affects the IRR of the institution. Significant sources of rate-insensitive noninterest income provide stability to net income and can mitigate the effect of fluctuations in net interest margins.

A historical review of changes in an institution's earnings—both net income and net interest income—in relation to changes in market rates is an important step in assessing the rate sensitivity of its earnings. When appropriate, this review should assess the institution's performance during prior periods of volatile rates.

Important tools used to gauge the potential volatility in future earnings include basic maturity and repricing gap calculations and income simulations. Short-term repricing gaps between assets and liabilities in intervals of one year or less can provide useful insights on the exposure of earnings. These can be used to develop rough approximations of the effect of changes in market rates on an institution's profitability. Examiners can develop rough gap estimates using available call report information, as well as the bank's own internally generated gap or other earnings exposure calculations if risk-management and measurement systems are deemed adequate. When available, a bank's own earnings-simulation model provides a particularly valuable source of information: a formal estimate of future earnings (a baseline) and an evaluation of how earnings would change under different rate scenarios. Together with historical earnings patterns, an institution's estimate of the IRR sensitivity of its earnings derived from simulation models is an important indication of the exposure of its near-term earnings stability.

As detailed in the preceding subsection, sound risk-management practices require IRR to be measured over a probable range of potential interest-rate changes. At a minimum, an instantaneous shift in the yield curve of plus or minus 200 basis points should be used to assess the potential impact of rate changes on an institution's earnings.

Examiners should evaluate the exposure of earnings to changes in interest rates relative to the institution's overall level of earnings and the potential length of time such exposure might persist. For example, simulation estimates of a small, temporary decline in earnings, while likely an issue for shareholders and directors, may be less of a supervisory concern if the institution has a sound earnings and capital base. On the other hand, exposures that could offset earnings for a significant period (as some thrifts experienced during the 1980s) and even deplete capital would be a great concern to both management and supervisors. Exposures measured by gap or simulation analysis under the minimum 200 basis point scenario that would result in a significant decline in net interest margins or net income should prompt further investigation of the adequacy and stability of earnings and the adequacy of the institution's risk-management process. Specifically, in institutions exhibiting

significant earnings exposures, examiners should focus on the results of the institution's stress tests to determine the extent to which more significant and stressful rate moves might magnify the erosion in earnings identified in the more modest rate scenario. In addition, examiners should emphasize the need for management to understand the magnitude and nature of the institution's IRR and the adequacy of its limits.

While an erosion in net interest margins or net income of more than 25 percent under a 200 basis point scenario should warrant considerable examiner attention, examiners should take into account the absolute level of an institution's earnings both before and after the estimated IRR shock. For example, a 33 percent decline in earnings for a bank with a strong return on assets (ROA) of 1.50 percent would still leave the bank with an ROA of 1.00 percent. In contrast, the same percentage decline in earnings for a bank with a fair ROA of 0.75 percent results in a marginal ROA of 0.50 percent.

Examiners should ensure that their evaluation of the IRR exposure of earnings is incorporated into the rating of earnings under the CAMELS rating system. Institutions receiving an earnings rating of 1 or 2 would typically have minimal exposure to changing interest rates. However, significant exposure of earnings to changes in interest rates may, in itself, provide sufficient basis for a lower rating.

Exposure of Capital and Economic Value

As set forth in the capital adequacy guidelines for state member banks, the risk-based capital ratio focuses principally on broad categories of credit risk and does not incorporate other factors, including overall interest-rate exposure and management's ability to monitor and control financial and operating risks. Therefore, the guidelines point out that in addition to evaluating capital ratios, an overall assessment of capital adequacy must take account of ''a bank's exposure to declines in the economic value of its capital due to changes in interest rates. For this reason, the final supervisory judgment on a bank's capital adequacy may differ significantly from conclusions that might be drawn solely from the level of its risk-based capital ratio.''

Banking organizations with (1) low proportions of assets maturing or repricing beyond five years, (2) relatively few assets with volatile market values (such as high-risk CMOs and structured notes or certain off-balance-sheet derivatives), and (3) large and stable sources of nonmaturity deposits are unlikely to face significant economic-value exposure. Consequently, an evaluation of their economic-value exposure may be limited to reviewing available internal reports showing the asset/liability composition of the institution or the results of internal-gap, earnings-simulation, or economic-value simulation models to confirm that conclusion.

Institutions with (1) fairly significant holdings of assets with longer maturities or repricing frequencies, (2) concentrations in value-sensitive on- and off-balance-sheet instruments, or (3) a weak base of nonmaturity deposits warrant more formal and quantitative evaluations of economic-value exposures. This includes reviewing the results of the bank's own internal reports for measuring changes in economic value, which should address the adequacy of the institution's risk-management process, reliability of risk-measurement assumptions, integrity of the data, and comprehensiveness of any modeling procedures.

For institutions that appear to have a potentially significant level of IRR and that lack a reliable internal economic-value model, examiners should consider alternative means for quantifying economic-value exposure, such as internal-gap measures, off-site monitoring, or surveillance screens that rely on call report data to estimate economic-value exposure. For example, the institution's gap schedules might be used to derive a duration gap by applying duration-based risk weights to the bank's aggregate positions. When alternative means are used to estimate changes in economic value, the relative crudeness of these techniques and lack of detailed data (such as the absence of coupon or off-balance-sheet data) should be taken into account—especially when drawing conclusions about the institution's exposure and capital adequacy.

An evaluation of an institution's capital adequacy should also consider the extent to which past interest-rate moves may have reduced the economic value of capital through the accumulation of net unrealized losses on financial instruments. To the extent that past rate moves have reduced the economic or market value of a bank's claims more than they have reduced the

value of its obligations, the institution's economic value of capital is less than its stated book value.

To evaluate the embedded net loss or gain in an institution's financial structure, fair value data on the securities portfolio can be used as the starting point; this information should be readily available from the call report or bank internal reports. Other major asset categories that might contain material embedded gains or losses include any assets maturing or repricing in more than five years, such as residential, multifamily, or commercial mortgage loans. By comparing a portfolio's weighted average coupon with current market yields, examiners may get an indication of the magnitude of any potential unrealized gains or losses. For companies with hedging strategies that use derivatives, the current positive or negative market value of these positions should be obtained, if available. For banks with material holdings of originated or purchased mortgage-servicing rights, capitalized amounts should be evaluated to ascertain that they are recorded at the lower of cost or fair value and that management has appropriately written down any values that are impaired pursuant to generally accepted accounting rules.

The presence of significant depreciation in securities, loans, or other assets does not necessarily indicate significant embedded net losses; depreciation may be offset by a decline in the market value of a bank's liabilities. For example, stable, low-cost nonmaturity deposits typically become more profitable to banks as rates rise, and they can add significantly to the bank's financial strength. Similarly, below-market-rate deposits, other borrowings, and subordinated debt may also offset unrealized asset losses caused by past rate hikes.

For banks with (1) substantial depreciation in their securities portfolios, (2) low levels of nonmaturity deposits and retail time deposits, or (3) high levels of IRR exposure, unrealized losses can have important implications for the supervisory assessment of capital adequacy. If stressful conditions require the liquidation or restructuring of the securities portfolio, economic losses could be realized and, thereby, reduce the institution's regulatory capitalization. Therefore, for higher-risk institutions, an evaluation of capital adequacy should consider the potential after-tax effect of the liquidation of available-for-sale and held-to-maturity accounts. Estimates of the effect of securities losses on the regulatory capital ratio may be obtained from surveillance screens that use call report data or from the bank's internal reports.

Examiners should also consider the potential effect of declines and fluctuations in earnings on an institution's capital adequacy. Using the results of internal model simulations or gap reports, examiners should determine whether capital-impairing losses might result from changes in market interest rates. In cases where potential rate changes are estimated to cause declines in margins that actually result in losses, examiners should assess the effect on capital over a two- or three-year earnings horizon.

When capital adequacy is rated in the context of IRR exposure, examiners should consider the effect of changes in market interest rates on the economic value of equity, level of embedded losses in the bank's financial structure, and impact of potential rate changes on the institution's earnings. The IRR of institutions that show material declines in earnings or economic value of capital from a 200 basis point shift should be evaluated fully, especially if that decline would lower an institution's pro forma prompt-corrective-action category. For example, a well-capitalized institution with a 5.5 percent leverage ratio and an estimated change in economic value arising from an appropriate stress scenario amounting to 2.0 percent of assets would have an adjusted leverage ratio of 3.5 percent, causing a pro forma two-tier decline in its prompt-corrective-action category to the undercapitalized category. After considering the level of embedded losses in the balance sheet, the stability of the institution's funding base, its exposure to near-term losses, and the quality of its risk-management process, the examiner may need to give the institution's capital adequacy a relatively low rating. In general, sufficiently adverse effects of market interest-rate shocks or weak management and control procedures can provide a basis for lowering a bank's rating of capital adequacy. Moreover, even less severe exposures could contribute to a lower rating if combined with exposures from asset concentrations, weak operating controls, or other areas of concern.

EXAMINATION PROCESS FOR IRR

As the primary market risk most banks face, IRR should usually receive consideration in

full-scope exams. It may also be the topic of targeted examinations. To meet examination objectives efficiently and effectively while remaining sensitive to potential burdens imposed on institutions, the examination of IRR should follow a structured, risk-focused approach. Key elements of a risk-focused approach to the examination process for IRR include (1) off-site monitoring and risk assessment of an institution's IRR profile and (2) appropriate planning and scoping of the on-site examination to ensure that it is as efficient and productive as possible. A fundamental tenet of this approach is that supervisory resources are targeted at functions, activities, and holdings that pose the most risk to the safety and soundness of an institution. Accordingly, institutions with low levels of IRR would be expected to receive relatively less supervisory attention than those with more severe IRR exposures.

Many banks have become especially skilled in managing and limiting the exposure of their earnings to changes in interest rates. Accordingly, for most banks and especially for smaller institutions with less complex holdings, the IRR element of the examination may be relatively simple and straightforward. On the other hand, some banks consider IRR an intended consequence of their business strategies and choose to take and manage that risk explicitly—often with complex financial instruments. These banks, along with banks that have a wide array of activities or complex holdings, generally should receive greater supervisory attention.

Off-Site Risk Assessment

Off-site monitoring and analysis involves developing a preliminary view or "risk assessment" before initiating an on-site examination. Both the level of IRR exposure and quality of IRR management should be assessed to the fullest extent possible during the off-site phase of the examination process. The following information can be helpful in this assessment:

- organizational charts and policies identifying authorities and responsibilities for managing IRR
- IRR policies, procedures, and limits
- asset/liability committee (ALCO) minutes and reports (going back six to twelve months before the examination)
- board of directors reports on IRR exposures
- audit reports (both internal and external)
- position reports, including those for investment securities and off-balance-sheet instruments
- other available internal reports on the bank's risks, including those detailing key assumptions
- reports outlining the key characteristics of concentrations and any material holdings of interest-sensitive instruments
- documentation for the inputs, assumptions, and methodologies used in measuring risk
- Federal Reserve surveillance reports and supervisory screens

The analysis for determining an institution's quantitative IRR exposure can be assessed off-site as much as possible, including assessments of the bank's overall balance-sheet composition and holdings of interest-sensitive instruments. An assessment of the exposure of earnings can be accomplished using supervisory screens, examiner-constructed measures, and internal bank measures obtained from management reports received before the on-site engagement. Similar assessments can be made on the exposure of capital or economic value.

An off-site review of the quality of the risk-management process can significantly improve the efficiency of the on-site engagement. The key to assessing the quality of management is an organized discovery process aimed at determining whether appropriate policies, procedures, limits, reporting systems, and internal controls are in place. This discovery process should, in particular, ascertain whether all the elements of a sound IRR management policy are applied consistently to material concentrations of interest-sensitive instruments. The results and reports of prior examinations provide important information about the adequacy of risk management.

Scope of On-Site Examination

The off-site risk assessment is an informed hypothesis of both the adequacy of IRR management and the magnitude of the institution's exposure. The scope of the on-site examination of IRR should be designed to confirm or reject that hypothesis and should target specific areas of interest or concern. In this way, on-site examination procedures are tailored to the activities and risk profile of the institution, using

flexible and targeted work-documentation programs. Confirmation of hypotheses on the adequacy of the IRR management process is especially important. In general, if off-site analysis identifies IRR management as adequate, examiners can rely more heavily on the bank's internal IRR measures for assessing quantitative exposures.

The examination scope for assessing IRR should be commensurate with the complexity of the institution and consistent with the off-site risk assessment. For example, only baseline examination procedures would be used for institutions whose off-site risk assessment indicates that they have adequate IRR management processes and low levels of quantitative exposure.

For those and other institutions identified as potentially low risk, the scope of the on-site examination would consist of only those examination procedures necessary to confirm the risk-assessment hypothesis. The adequacy of IRR management could be confirmed through a basic review of the appropriateness of policies, internal reports, and controls and the institution's adherence to them. The integrity and reliability of the information used to assess the quantitative level of risk could be confirmed through limited sampling and testing. In general, if the risk assessment is confirmed by basic examination procedures, the examiner may conclude the IRR examination process.

Institutions assessed to have high levels of IRR exposure and strong IRR management may require more extensive examination scopes to confirm the off-site risk assessment. These procedures may entail more analysis of the institution's IRR measurement system and the IRR characteristics of major holdings. When high quantitative levels of exposure are found, examiners should focus special attention on the sources of this risk and on significant concentrations of interest-sensitive instruments. Institutions assessed to have high exposure and weak risk-management systems would require an extensive work-documentation program. The institution's internal measures should be relied on cautiously, if at all.

Regardless of the size or complexity of an institution, care must be taken during the on-site phase of the examination to ensure confirmation of the risk assessment and identification of issues that may have escaped off-site analysis. Accordingly, the examination scope should be adjusted as on-site findings dictate.

CAMELS Ratings

As with other areas of the examination, the evaluation of IRR exposure should be incorporated into an institution's CAMELS rating. Findings on the adequacy of an institution's IRR management process should be reflected in the examiner's rating of risk management—a key component of an institution's management rating. Findings on the quantitative level of IRR exposure should be incorporated into the earnings and capital components of the CAMELS ratings.

An overall assessment of an institution's IRR exposure can be developed by combining assessments of the adequacy of IRR management practices with the evaluation of the quantitative IRR exposure of the institution's earnings and capital base. The assessment of the adequacy of IRR management should provide the primary basis for reaching an overall assessment since it is a leading indicator of potential IRR exposure. Accordingly, overall ratings for IRR sensitivity should be no greater than the rating given to IRR management. Unsafe exposures and management weaknesses should be fully reflected in these ratings. Unsafe exposures and unsound management practices that are not resolved during the on-site examination should be addressed through subsequent follow-up actions by the examiner and other supervisory personnel.

1. To evaluate the policies for interest-rate risk established by the board of directors and senior management, including the limits established for the bank's interest-rate risk profile.
2. To determine if the bank's interest-rate risk profile is within those limits.
3. To evaluate the management of the bank's interest-rate risk, including the adequacy of the methods and assumptions used to measure interest-rate risk.
4. To determine if internal management-reporting systems provide the information necessary for informed interest-rate management decisions and to monitor the results of those decisions.
5. To initiate corrective action when interest-rate management policies, practices, and procedures are deficient in controlling and monitoring interest-rate risk.

These procedures represent a list of processes and activities that may be reviewed during a full-scope examination. The examiner-in-charge will establish the general scope of examination and work with the examination staff to tailor specific areas for review as circumstances warrant. As part of this process, the examiner reviewing a function or product will analyze and evaluate internal audit comments and previous examination workpapers to assist in designing the scope of examination. In addition, after a general review of a particular area to be examined, the examiner should use these procedures, to the extent they are applicable, for further guidance. Ultimately, it is the seasoned judgment of the examiner and the examiner-in-charge as to which procedures are warranted in examining any particular activity.

REVIEW PRIOR EXCEPTIONS AND DETERMINE SCOPE OF EXAMINATION

1. Obtain descriptions of exceptions noted and assess the adequacy of management's response to the most recent Federal Reserve and state examination reports and the most recent internal and external audit reports.

OBTAIN INFORMATION

1. Obtain the following information:
   a. interest-rate risk policy (may be incorporated in the funds management or investment policy) and any other policies related to asset/liability management (such as derivatives)
   b. board and management committee meeting minutes since the previous examination, including packages presented to the board
   c. most recent internal interest-rate risk management reports (these may include gap reports and internal-model results, including any stress testing)
   d. organization chart
   e. current corporate strategic plan
   f. detailed listings of off-balance-sheet derivatives used to manage interest-rate risk
   g. copies of reports from external auditors or consultants who have reviewed the validity of various interest-rate risk, options-pricing, and other models used by the institution in managing market-rate risks, if available
   h. other management reports and first-day letter items

REVIEW POLICIES AND PROCEDURES

1. Review the bank's policies and procedures (written or unwritten) for adequacy. (See item 1 of the internal control questionnaire.)

ASSESS MANAGEMENT PRACTICES

1. Determine if the function is managed on a bank-only or a consolidated basis.
2. Determine who is responsible for interest-rate risk review (an individual, ALCO, or other group) and whether this composition is appropriate for the function's decision-making structure.
3. Determine who is responsible for implementing strategic decisions (for example, with a flow chart). Ensure that the scope of that function's authority is reasonable.
4. Review the background of individuals responsible for IRR management to determine their level of experience and sophistication (obtain resumes if necessary).
5. Review appropriate committee minutes and board packages since the previous examination and detail significant discussions in workpapers. Note the frequency of board and committee meetings to discuss interest-rate risk.
6. Determine if and how the asset liability management function is included in the institution's overall strategic planning process.

ASSESS BOARD OF DIRECTORS OVERSIGHT

1. Determine how frequently the IRR policy is reviewed and approved by the board (at least annually).

2. Determine whether the results of the measurement system provide clear and reliable information and whether the results are communicated to the board at least quarterly. Board reports should identify the institution's current position and its relationship to policy limits.
3. Determine the extent to which exceptions to policies and resulting corrective measures are reported to the board, including the promptness of reporting.
4. Determine the extent to which the board or a board committee is briefed on underlying assumptions (major assumptions should be approved when established or changed, and at least annually thereafter) and any significant limitations of the measurement system.
5. Assess the extent that major new products are reviewed and approved by the board or a board committee.

INTEREST-RATE RISK PROFILE OF THE INSTITUTION

1. Identify significant holdings of on- and off-balance-sheet instruments and assess the interest-rate risk characteristics of these items.
2. Note relevant trends of on- and off-balance-sheet instruments identified as significant holdings. Preparing a sources and uses schedule may help determine changes in the levels of interest-sensitive instruments.
3. Determine whether the institution offers or holds products with embedded interest-rate floors and caps (investments, loans, deposits). Evaluate their potential effect on the institution's interest-rate exposure.
4. For those institutions using high-risk mortgage derivative securities to manage interest-rate risk—
   a. determine whether a significant holding of these securities exists and
   b. assess management's awareness of the risk characteristics of these instruments.
5. Evaluate the purchases and sales of securities since the previous examination to determine whether the transactions and any overall changes in the portfolio mix are consistent with management's stated interest-rate risk objectives and strategies.
6. Review the UBPR, interim financial statements, and internal management reports for trend and adequacy of the net interest margin and economic value.
7. Based on the above items, determine the institution's risk profile. (What are the most likely sources of interest-rate risk?) Determine if the profile is consistent with stated interest-rate risk objectives and strategies.
8. Determine whether changes in the net interest margin are consistent with the interest-rate risk profile developed above.

EVALUATE THE INSTITUTION'S RISK-MEASUREMENT SYSTEMS AND INTEREST-RATE RISK EXPOSURE

The institution's risk-measurement system and corresponding limits should be consistent with the size and complexity of the institution's on- and off-balance-sheet activities.

1. Review previous examinations and audits of the IRR management system and model.
   a. Review previous examination workpapers and reports concerning the model to determine which areas may require especially close analysis.
   b. Review reports and workpapers (if available) from internal and external audits of the model, and, if necessary, discuss the audit process and findings with the institution's audit staff. Depending on the sophistication of the institution's on- and off-balance-sheet activities, a satisfactory audit may not necessarily address each of the items listed below. The scope of the procedures may be adjusted if they have been addressed satisfactorily by an audit or in previous exams. Determine whether the audits accomplished the following:
      - Identified the individual or committee that is responsible for making primary model assumptions, and whether this person or committee regularly reviews and updates these assumptions.
      - Reviewed data integrity. Auditors should verify that critical data were accurately downloaded from computer subsystems or the general ledger.
      - Reviewed the primary model assumptions and evaluated whether these assumptions were reasonable given past activity and current conditions.

- Reviewed whether the assumptions were incorporated into the model as management indicated.
- Reviewed assumptions concerning how account balances will be replaced as items mature for models that calculate earnings or market values. Assumptions should be reasonable given past patterns of account balances and current conditions.
- Reviewed methodology for determining cash flows from or market values of off-balance-sheet items, such as futures, forwards, swaps, options, caps, and floors.
- Reviewed current yields or discount rates for critical account categories. (Determine whether the audit reviewed the interest-rate scenarios used to measure interest-rate risk.)
- Verified the underlying calculations for the model's output.
- Verified that summary reports presented to the board of directors and senior management accurately reflect the results of the model.

c. Determine whether adverse comments in the audit reports have been addressed by the institution's management and whether corrective actions have been implemented.

d. Discuss weaknesses in the audit process with senior management.

2. Review management and board of directors oversight of model operation.
   a. Identify which individual or committee is responsible for making the principal assumptions and parameters used in the model.
   b. Determine whether this individual or committee reviews the principal assumptions and parameters regularly (at least annually) and updates them as needed. If reviews have taken place, state where this information is documented.
   c. Determine the extent to which the appropriate board or management committee is briefed on underlying assumptions (major assumptions should be approved when established or changed, and at least annually thereafter) and any significant limitations of the measurement system.
3. Review the integrity of data inputs.
   a. Determine how the data on existing financial positions and contracts are entered into the model. Data may be downloaded from computer subsystems or the general ledger or they may be manually entered (or a combination of both).
   b. Determine who has responsibility for inputting or downloading data into the model. Assess whether appropriate internal controls are in place to ensure data integrity. For example, the institution may have procedures for reconciling data with the general ledger, comparing data with data from previous months, or error checking by an officer or other analyst.
   c. Check data integrity by comparing data for broad account categories with—
      - the general ledger, and
      - appropriate call report schedules.
   d. Ensure that data from all relevant nonbank subsidiaries have been included.
   e. Assess the quality of the institution's financial data. For example, data should allow the model to distinguish maturity and repricing, identify embedded options, include coupon and amortization rates, identify current asset yields or liability costs.
4. Review selected rate-sensitive items.
   a. Review how the model incorporates residential mortgages and mortgage-related products, including adjustable-rate mortgages, mortgage pass-throughs, CMOs, and purchased and excess mortgage-servicing rights.
      - Determine whether the level of data aggregation for mortgage-related products is appropriate. Data for pass-throughs, CMOs, and servicing rights should identify the type of security, coupon range, and maturity to capture prepayment risk.
      - Identify the sources of data or assumptions on expected cash flows, including prepayment rates and cash flows on CMOs. Data may be provided by brokerage firms, independent industry information services, or internal estimates.
      - If internal prepayment and cash-flow estimates are used for mortgages and mortgage-related products, note how the estimates are derived and review them for reasonableness.

- If internal prepayment estimates are used, determine who has responsibility for reviewing these assumptions. Determine whether this person or committee reviews prepayment rates regularly (at least quarterly) and updates the prepayment assumptions as needed.
- For each interest-rate scenario, determine if the model adjusts key assumptions and parameters to account for possible changes in—
  — prepayment rates,
  — amortization rates,
  — cash flows and yields, and
  — prices and discount rates.
- Determine if the model appropriately incorporates the effects of annual and lifetime caps and floors on adjustable-rate mortgages. In market-value models, determine whether these option values are appropriately reflected.

b. Determine whether the institution has structured notes or other instruments with similar characteristics.
   - Identify the risk characteristics of these instruments, with special attention to embedded call/put provisions, caps and floors, or repricing opportunities.
   - Determine if the interest-rate risk model is capable of accounting for these risks and, if a simplified representation of the risk is used, whether that treatment adequately reflects the risk of the instruments.

c. Review how the model incorporates nonmaturity deposits. Review the repricing or sensitivity assumptions. Review and evaluate the documentation provided.

d. If the institution has significant levels of noninterest income and expense items that are sensitive to changes in interest rates, determine whether these items are incorporated appropriately in the model. This would include items such as amortization of core deposit intangibles and purchased or excess servicing rights for credit card receivables.

e. Review how the model incorporates futures, forwards, and swaps.
   - For simulation models, review the methodology for determining cash flows of futures, forwards, and swaps under various rate scenarios.
   - For market-value models—
     — determine if the durations of futures and forward contracts reflect the duration of the underlying instrument (durations should be negative for net sold positions) and
     — review the methodology for determining market values of swaps under different interest-rate scenarios. Compare results with prices obtained or calculated from standard industry information services.

f. Review how the model incorporates options, caps, floors, and collars.
   - For simulation models, review the methodology for determining cash flows of options, caps, floors, and collars under various rate scenarios.
   - For market-value models, review the methodology used to obtain prices for options, caps, and floors under different interest-rate scenarios. Compare results with prices obtained or calculated from standard industry information services.

g. Identify any other instruments or positions that tend to exhibit significant sensitivity, including those with significant embedded options (such as loans with caps or rights of prepayment) and review model treatment of these items for accuracy and rigor.

5. Review other modeling assumptions.

   a. For simulation models that calculate earnings, review the assumptions concerning how account balances change over time, including assumptions about replacement rates for existing business and growth rates for new business. (These items should be reviewed for models that estimate market values in future periods.)
      - Determine whether the assumptions are reasonable given current business conditions and the institution's strategic plan.
      - Determine whether assumptions about future business are sensitive to changes in interest rates.
      - If the institution uses historical performance or other studies to determine changes in account balances caused by interest-rate movements, review this documentation for reasonableness.

   b. For market-value models, review the treatment of balances not sensitive to interest-rate changes (building and prem-

ises, other long-term fixed assets). Identify whether these balances are included in the model and whether the effect is material to the institution's exposure.

6. Review the interest-rate scenarios.
   a. Determine the interest-rate scenarios used in the internal model to check the interest-rate sensitivity of those scenarios. If there is flexibility concerning the scenarios to be used, determine who is responsible for selecting the scenario.
   b. Determine whether the institution uses scenarios that encompass a significant rate movement, both increasing and decreasing.
   c. Review yields/costs for significant account categories for future periods (base case or scenario) for reasonableness. The rates should be consistent with the model's assumptions and with the institution's historical experience and strategic plan.
   d. For market-value models, indicate how the discount rates in the base case and alternative scenarios are determined.
   e. For Monte Carlo simulations or other models that develop a probability distribution for future interest rates, determine whether the volatility factors used to generate interest-rate paths and other parameters are reasonable.
7. Provide an overall evaluation of the internal model.
   a. Review ''variance reports,'' reports that compare predicted and actual results. Comment on whether the model has made reasonably accurate predictions in earlier periods.
   b. Evaluate whether the model's structure and capabilities are adequate to
      • accurately assess the risk exposure of the institution and
      • support the institution's risk-management process and serve as a basis for internal limits and authorizations.
   c. Evaluate whether the model is operated with sufficient discipline to—
      • accurately assess the risk exposure of the institution and
      • support the institution's risk-management process and serve as a basis for internal limits and authorizations.

If the institution uses a gap report, continue with question 8. Otherwise skip to question 9.

8. Review the most recent rate-sensitivity report (gap), evaluating whether the report reasonably characterizes the interest-rate risk profile of the institution. Assumptions underlying the reporting system should also be evaluated for reasonableness. This evaluation is particularly critical for categories, on- or off-balance-sheet, in which the institution has significant holdings.
   a. Review the reasonableness of the assumptions used to slot nonmaturity deposits in time bands.
   b. Determine whether residential mortgages, pass-through securities, or CMOs are slotted by weighted average life or maturity. (Generally, weighted average life is preferred.)
   c. If applicable, review the assumptions for the slotting of securities available for sale.
   d. If the institution has significant holdings of other highly rate-sensitive instruments (such as structured notes), review how these items are incorporated into the measurement system.
   e. If applicable, review the slotting of the trading account for reasonableness.
   f. If applicable, evaluate how the report incorporates futures, forwards, and swaps. The data should be entered in the correct time bands using offsetting entries, ensuring that each cash flow has the appropriate sign (positive or negative).
   g. Ensure all assumptions are well documented, including a discussion of how the assumptions were derived.
   h. Confirm that management, at least annually, tests, reviews, and updates, as needed, the assumptions for reasonableness.
   i. Determine if the measurement system used is able to adequately model new products that the institution may be using since the previous examination.
   j. Determine whether the report accurately measures the interest-rate exposure of the institution.
   k. Assess management's review and understanding of the assumptions used in the institution's rate-sensitivity report (gap), as well as the system's strengths and weaknesses.

Highly sensitive instruments, including structured notes, have interest-rate risk characteristics that may not be easily measured in a static gap framework. If the institution has a significant holding of these instruments, gap may not be an appropriate way to measure interest-rate risk.

9. Review the current interest-sensitivity position for compliance with internal policy limits.
10. Evaluate the institution's overall interest-rate risk exposure. If the institution uses a gap schedule, analyze the institution's gap position. If the institution uses an internal model to measure interest-rate risk—
    a. indicate whether the model shows significant risks in the following areas:
       • changing level of rates
       • basis or shape risk
       • velocity of rate changes
       • customer reactions;
    b. for simulation models, determine whether the model indicates a significant level of income at risk as a percentage of current income or capital; and
    c. for market-value models, determine whether the model indicates significant market value at risk relative to assets or capital.
11. Determine the adequacy of the institution's method of measuring and monitoring interest-rate exposure, given the institution's size and complexity.
12. Review management reports.
    a. Evaluate whether the reports on interest-rate risk provide an appropriate level of detail given the institution's size and the complexity of its on- and off-balance-sheet activities. Review reports to—
       • senior management and
       • the board of directors or board committees.
    b. Indicate whether the reports discuss exposure to changes in the following:
       • level of interest rates
       • shape of yield curve and basis risk
       • customer reactions
       • velocity of rate changes
13. Review management's future plans for new systems, improvements to the existing measurement system, and use of vendor products.

EVALUATE INSTRUMENTS USED IN RISK MANAGEMENT

1. Review the institution's use of various instruments for risk-management purposes (such as derivatives). Assess the extent that policies require the institution to—
    a. document specific objectives for instruments used in risk management;
    b. prepare an analysis showing the intended results of each risk-management program before the inception of the program; and
    c. assess at least quarterly the effectiveness of each risk-management program in achieving its stated objectives.
2. Review the institution's use of derivative products. Determine if the institution has entered into transactions as an end-user to manage interest-rate risk, or is acting in an intermediary or dealer capacity.
3. When the institution has entered into a transaction to reduce its own risk, evaluate the effectiveness of the hedge.
4. Determine whether transactions involving derivatives are accounted for properly and in accordance with the institution's stated policy.
5. Complete the internal control questionnaire on derivative products used in the management of interest-rate risk.

ASSESS STRESS TESTING AND CONTINGENCY PLANNING

1. Determine if the institution conducts stress testing and what kinds of market stress conditions management has identified that would seriously affect the financial condition of the institution. These conditions may include (1) abrupt and significant shifts in the term structure of interest rates or (2) movements in the relationships among other key rates.
2. Assess management's ability to adjust the institution's interest-rate risk position under—
    a. normal market conditions and
    b. under conditions of significant market stress.
3. Determine the extent to which management or the board has considered these risks (normal and significant market stress) and evaluate contingency plans for adjusting the interest-rate risk position should positions approach or exceed established limits.

VERIFY FINDINGS WITH DEPARTMENT OFFICIALS

1. Verify examination findings with department officials to ensure the accuracy and completeness of conclusions, particularly negative conclusions.

SUMMARIZE FINDINGS

1. Summarize the institution's overall interest-rate risk exposure.
2. Ensure that the method of measuring interest-rate risk reflects the complexity of the institution's interest-rate risk profile.
3. Assess the extent management and the board of directors understand the level of risk and sources of exposure.
4. Evaluate the appropriateness of policy limits relative to (1) earnings and capital-at-risk, (2) the adequacy of internal controls, and (3) the risk-measurement systems.
5. If the institution has an unacceptable interest-rate risk exposure or an inadequate interest-rate risk management process, discuss findings with the examiner-in-charge.
6. Prepare comments for the workpapers and examination report, as appropriate, concerning the findings of the examination of this section including the following:
   a. scope of the review
   b. adequacy of written policies and procedures, including—
      - the consistency of limits and parameters with the stated objectives of the board of directors;
      - the reasonableness of these limits and parameters given the institution's capital, sophistication and management expertise, and the complexity of its balance sheet;
   c. instances of noncompliance with written policies and procedures;
   d. apparent violations of laws and regulations, indicating those noted at previous examinations;
   e. internal control deficiencies and exceptions, indicating those noted during previous examinations or audits;
   f. other matters of significance; and
   g. corrective actions planned by management.

ASSEMBLE AND REVIEW WORKPAPERS

1. Ensure that the workpapers adequately document the work performed and conclusions of this assignment.
2. Forward the assembled workpapers to the examiner-in-charge for review and approval.

MANAGEMENT, POLICIES, AND PROCEDURES

1. Has the board of directors, consistent with its duties and responsibilities, adopted written policies and procedures related to interest-rate risk that establish
   a. the risk-management philosophy and objectives regarding interest-rate risk,
   b. clear lines of responsibility,
   c. definition and setting of limits on interest-rate risk exposure,
   d. specific procedures for reporting and the approvals necessary for exceptions to policies and limits,
   e. plans or procedures the board and management will implement if interest-rate risk falls outside established limits,
   f. specific interest-rate risk measurement systems,
   g. acceptable activities used to manage or adjust the institution's interest-rate risk exposure,
   h. the individuals or committees who are responsible for interest-rate risk management decisions, and
   i. a process for evaluating major new products and their interest-rate risk characteristics?
2. Is the bank in compliance with its policies, and is it adhering to its written procedures? If not, are exceptions and deviations—
   a. approved by appropriate authorities,
   b. made infrequently, and
   c. nonetheless consistent with safe and sound banking practices?
3. Does the board review and approve the policy at least annually?
4. Did the board and management review IRR positions and the relationship of these positions to established limits at least quarterly?
5. Were exceptions to policies promptly reported to the board?
6. Does one individual exert undue influence over interest-rate risk management activities?

INTERNAL MODELS

1. Has the internal model been audited (by internal or external auditors)?
2. Does one individual control the modeling process or otherwise exert undue influence over the risk-measurement process?
3. Is the model reconciled to source data to ensure data integrity?
4. Are principal assumptions and parameters used in the model reviewed periodically by the board and senior management?
5. Are the workings of and the assumptions used in the internal model adequately documented and available for examiner review?
6. Is the model run on the same scenarios on which the institution's limits are established?
7. Does management compare the historical results of the model with actual backtesting results?

CONCLUSIONS

1. Is the foregoing information an adequate basis for evaluating the systems of internal controls? Are there significant deficiencies in areas not covered in this questionnaire that impair any controls? If so, explain answers briefly, indicate additional internal control questions or elements deemed necessary, and forward recommendations to the supervisory examiner or designee.
2. Based on a composite evaluation, as evidenced by answers to the foregoing questions, are the systems of internal control considered adequate?

In recent years, the secondary-market credit activities of many institutions have increased substantially. As the name implies, secondary-market credit activities involve the transformation of traditionally illiquid loans, leases, and other assets into instruments that can be bought and sold in secondary capital markets. It also involves the isolation of credit risk in various types of derivative instruments. Secondary-market credit activities include asset securitizations, loan syndications, loan sales and participations, and credit derivatives, as well as the provision of credit enhancements and liquidity facilities to these transactions. Secondary-market credit activities can enhance both credit availability and bank profitability, but managing the risks of these activities poses increasing challenges: The risks involved, while not new to banking, may be less obvious and more complex than the risks of traditional lending activities. Some secondary-market credit activities involve credit, liquidity, operational, legal, and reputational risks in concentrations and forms that may not be fully recognized by bank management or adequately incorporated in an institution's risk-management systems. In reviewing these activities, supervisors and examiners should assess whether banking organizations fully understand and adequately manage the full range of the risks involved in secondary-market credit activities.

ASSET SECURITIZATION

Banking organizations have long been involved in asset-backed securities (ABS), both as investors and as major participants in the securitization process. In recent years, banks have both increased their participation in the long-established residential mortgage-backed securities market and expanded their activities in securitizing other types of assets, such as credit card receivables, automobile loans, boat loans, commercial real estate loans, student loans, nonperforming loans, and lease receivables.

While the objectives of securitization may vary from institution to institution, several benefits can be derived from securitized transactions. First, the sale of assets may reduce regulatory costs by reducing both risk-based capital requirements and the reserves held against the deposits used to fund the sold assets. Second, securitization provides originators with an additional source of funding or liquidity since the process of securitization converts an illiquid asset into a security with greater marketability. Securitized issues often require a credit enhancement, which results in a higher credit rating than what would normally be obtainable by the institution itself. Consequently, securitized issues may provide the institution with a cheaper form of funding. Third, securitization may be used to reduce interest-rate risk by improving the institution's asset/liability mix. This is especially true if the institution has a large investment in fixed-rate, low-yield assets. Finally, the ability to sell these securities worldwide diversifies the institution's funding base, which reduces the bank's dependence on local economies.

While securitization activities can enhance both credit availability and bank profitability, the risks of these activities must be known and managed. Asset securitization may involve credit, liquidity, operational, legal, and reputational risks in concentrations and forms that may not be fully recognized by bank management or adequately incorporated in an institution's risk-management systems. Accordingly, banking institutions should ensure that their overall risk-management process explicitly incorporates the full range of the risks involved in their securitization activities.

In reviewing asset securitization activities, examiners should assess whether banking organizations fully understand and adequately manage the full range of the risks involved in their activities. Specifically, supervisors and examiners should determine whether institutions are recognizing the risks of securitization activities by (1) adequately identifying, quantifying, and monitoring these risks; (2) clearly communicating the extent and depth of risks in reports to senior management and the board of directors and in regulatory reports; (3) conducting ongoing stress testing to identify potential losses and liquidity needs under adverse circumstances; and (4) setting adequate minimum internal standards for allowances or liabilities for losses, capital, and contingency funding. Incorporating asset securitization activities into banking organizations' risk-management systems and internal capital-adequacy allocations is particularly

important; current regulatory capital rules may not fully capture the economic substance of the risk exposures arising from many of these activities.

An institution's failure to adequately understand the risks inherent in its secondary-market credit activities and to incorporate risks into its risk-management systems and internal capital allocations may constitute an unsafe and unsound banking practice. Accordingly, for those institutions involved in asset securitization or providing credit enhancements in connection with loan sales and securitization, examiners should assess whether the institutions' systems and processes adequately identify, measure, monitor, and control *all* of the risks involved in the secondary-market credit activities.[1]

Securitization Process

In its simplest form, asset securitization is the transformation of generally illiquid assets into securities that can be traded in the capital markets. The asset securitization process begins with the segregation of loans or leases into pools that are relatively homogeneous with respect to their cash-flow characteristics and risk profiles, including both credit and market risks. These pools of assets are then transferred to a bankruptcy-remote entity such as a grantor trust or special-purpose corporation that issues securities or ownership interests in the cash flows of the underlying collateral. These ABS may take the form of debt, certificates of beneficial ownership, or other instruments. The issuer is typically protected from bankruptcy by various structural and legal arrangements. Normally, the sponsor that establishes the issuer is the originator or provider of the underlying assets.

Each issue of ABS has a servicer that is responsible for collecting interest and principal payments on the loans or leases in the underlying pool of assets and for transmitting these funds to investors (or a trustee representing them). A trustee is responsible for monitoring the activities of the servicer to ensure that it properly fulfills its role. A guarantor may also be involved to ensure that principal and interest payments on the securities will be received by investors on a timely basis, even if the servicer does not collect these payments from the obligors of the underlying assets. Many issues of mortgage-backed securities are either guaranteed directly by the Government National Mortgage Association (GNMA or GinnieMae), which is backed by the full faith and credit of the U.S. government, or by the Federal National Mortgage Association (FNMA or FannieMae), or the Federal Home Loan Mortgage Corporation (FHLMC or FreddieMac), which are government-sponsored agencies that are perceived by the credit markets to have the implicit support of the federal government. Privately issued, mortgage-backed securities and other types of ABS generally depend on some form of credit enhancement provided by the originator or third party to insulate the investor from a portion of or all credit losses. Usually, the amount of the credit enhancement is based on several multiples of the historical losses experienced on the particular asset backing the security.

The structure of an asset-backed security and the terms of the investors' interest in the collateral can vary widely depending on the type of collateral, the desires of investors, and the use of credit enhancements. Often ABS are structured to re-allocate the risks entailed in the underlying collateral (particularly credit risk) into security tranches that match the desires of investors. For example, senior-subordinated security structures give holders of senior tranches greater credit-risk protection (albeit at lower yields) than holders of subordinated tranches. Under this structure, at least two classes of asset-backed securities, a senior class and a junior or subordinated class, are issued in connection with the same pool of collateral. The senior class is structured so that it has a priority claim on the cash flows from the underlying pool of assets. The subordinated class must absorb credit losses on the collateral before losses can be charged to the senior portion. Because the senior class has this priority claim, cash flows from the underlying pool of assets must first satisfy the requirements of the senior class. Only after these requirements have been met will the cash flows be directed to service the subordinated class.

1. The Federal Reserve System has developed a three-volume set that contains educational material concerning the process of asset securitization and examination guidelines (see SR-90-16). The volumes are (1) *An Introduction to Asset Securitization*, (2) *Accounting Issues Relating to Asset Securitization*, and (3) *Examination Guidelines for Asset Securitization*.

Credit Enhancements

ABS can use various forms of credit enhancements to transform the risk-return profile of underlying collateral. These include third-party credit enhancements, recourse provisions, overcollateralization, and various covenants and indentures. Third-party credit enhancements include standby letters of credit, collateral or pool insurance, or surety bonds from third parties. Recourse provisions are guarantees that require the originator to cover any losses up to a contractually agreed-on amount. One type of recourse provision, usually seen in securities backed by credit card receivables, is the ''spread account.'' This account is actually an escrow account, the funds of which are derived from a portion of the spread between the interest earned on the assets in the underlying pool of collateral and the lower interest paid on securities issued by the trust. The amounts that accumulate in this escrow account are used to cover credit losses in the underlying asset pool, up to several multiples of historical losses on the particular asset collateralizing the securities.

Overcollateralization is another form of credit enhancement that covers a predetermined amount of potential credit losses. When the value of the underlying assets exceeds the face value of the securities, the securities are said to be overcollateralized. A similar form of credit enhancement is the cash-collateral account, which is established when a third party deposits cash into a pledged account. The use of cash-collateral accounts, which are considered to be loans, grew as the number of highly rated banks and other credit enhancers declined in the early 1990s. Cash-collateral accounts eliminate ''event risk,'' or the risk that the credit enhancer will have its credit rating downgraded or that it will not be able to fulfill its financial obligation to absorb losses. Thus, credit protection is provided to the investors of a securitization.

Generally, an investment banking firm or other organization serves as an ABS underwriter. In addition, for asset-backed issues that are publicly offered, a credit rating agency will analyze the policies and operations of the originator and servicer, as well as the structure, underlying pool of assets, expected cash flows, and other attributes of the securities. Before assigning a rating to the issue, the rating agency will also assess the extent of loss protection provided to investors by the credit enhancements associated with the issue.

Types of Asset-Backed Securities

The many different varieties of asset-backed securities are often customized to the terms and characteristics of the underlying collateral. Most common are securities collateralized by (1) revolving credit lines such as card receivables, (2) closed-end installment loans such as automobile and student loans, and (3) lease receivables. The instrument profiles on asset-backed securities and mortgage-backed securities in this manual (sections 4105.1 and 4110.1, respectively) present specific information on the nature and structure of various types of securitized assets.

In addition to specific ABS, other types of financial instruments may arise as a result of asset securitization, such as loan-servicing rights, excess-servicing-fee receivables, and ABS residuals. Loan-servicing rights are created in one of two ways.[2] Servicing rights can be purchased outright from other institutions or can be created when organizations (1) purchase or originate loans or (2) sell or securitize these loans and retain the right to act as servicers for the pools of loans. The capitalized servicing asset is treated as an identified intangible asset for purposes of regulatory capital. Excess-servicing-fee receivables generally arise when the present value of any additional cash flows from the underlying assets that a servicer expects to receive exceeds standard servicing fees. ABS residuals (sometimes referred to as ''residuals'' or ''residual interests'') represent claims on any cash flows that remain after all obligations to investors and any related expenses have been met. The excess cash flows may arise as a result of overcollateralization or from reinvestment income. Residuals can be retained by sponsors or purchased by investors in the form of securities.

Securitization of Commercial Paper

Bank involvement in the securitization of commercial paper has increased significantly over time. However, asset-backed commercial paper

2. In May 1995, the Financial Accounting Standards Board issued its Statement of Financial Accounting Standards No. 122 (FAS 122), ''Accounting for Mortgage Servicing Rights.'' FAS 122 eliminated the accounting distinctions between originated servicing rights, which were not allowed to be recognized on the balance sheet, and purchased servicing rights, which were capitalized as a balance-sheet asset. See section 2120.1, ''Accounting.''

programs differ from other methods of securitization. One difference is that more than one type of asset may be included in the receivables pool. Moreover, in certain cases, the cash flow from the receivables pool may not necessarily match the payments to investors because the maturity of the underlying asset pool does not always parallel the maturity of the structure of the commercial paper. Consequently, when the paper matures, it is usually rolled over or funded by another issue. In certain circumstances, a maturing issue of commercial paper cannot be rolled over. To address this problem, many banks have established back-up liquidity facilities. Certain banks have classified these back-up facilities as pure liquidity facilities, despite the credit-enhancement element present in them. As a result, the risks associated with these facilities are incorrectly assessed. In these cases, the back-up liquidity facilities are more similar to direct credit substitutes than to loan commitments.

RISKS OF ASSET SECURITIZATION

While banking organizations that engage in securitization activities and invest in ABS accrue clear benefits, these activities can potentially increase the overall risk profile of the banking organization. For the most part, the types of risks that financial institutions encounter in the securitization process are identical to those faced in traditional lending transactions, including credit risk, concentration risk, interest-rate risk (including prepayment risk), operational risk, liquidity risk, moral-recourse risk, and funding risk. However, since the securitization process separates the traditional lending function into several limited roles, such as originator, servicer, credit enhancer, trustee, and investor, the types of risks that a bank will encounter will differ depending on the role it assumes.

Senior management and the board of directors should have the requisite knowledge of the effects of securitization on the banking organization's risk profile and should be fully aware of the accounting, legal, and risk-based capital implications of this activity. Banking organizations need to fully and accurately distinguish and measure the risks that are transferred versus those retained, and they must adequately manage the retained portion. Banking organizations engaging in securitization activities must have appropriate back- and front-office staffing; internal and external accounting and legal support; audit or independent-review coverage; information systems capacity; and oversight mechanisms to execute, record, and administer these transactions.

Risks to Investors

Investors in ABS will be exposed to varying degrees of credit risk, just as they are in direct investments in the underlying assets. Credit risk is the risk that obligors will default on principal and interest payments. ABS investors are also subject to the risk that the various parties in the securitization structure, for example, the servicer or trustee, will be unable to fulfill its contractual obligations. Moreover, investors may be susceptible to concentrations of risks across various asset-backed security issues through overexposure to an organization performing various roles in the securitization process or as a result of geographic concentrations within the pool of assets providing the cash flows for an individual issue. Since the secondary markets for certain ABS are limited, investors may encounter greater than anticipated difficulties when seeking to sell their securities (liquidity risk). Furthermore, certain derivative instruments, such as stripped asset-backed securities and residuals, may be extremely sensitive to interest rates and exhibit a high degree of price volatility. Therefore, derivative instruments may dramatically affect the risk exposure of investors unless these instruments are used in a properly structured hedging strategy. Examiner guidance in section 3000.1, "Investment Securities and End-User Activities," is directly applicable to ABS held as investments.

Risks to Issuers and Institutions Providing Credit Enhancements

Banking organizations that issue ABS may be subject to pressures to sell only their best assets, thus reducing the quality of their loan portfolios. On the other hand, some banking organizations may feel pressured to relax their credit standards because they can sell assets with higher risk than they would normally want to retain for their own portfolios. To protect their names in the market, issuers may also face pressures to provide "moral

recourse'' by repurchasing securities backed by loans or leases they have originated that have deteriorated and become nonperforming. Funding risk may also be a problem for issuers when market aberrations do not permit asset-backed securities that are in the securitization pipeline to be issued.

Credit Risks

The partial, first-loss recourse obligations an institution retains when selling assets, and the extension of partial credit enhancements (for example, 10 percent letters of credit) in connection with asset securitization, can be sources of concentrated credit risk. Institutions are exposed

to the full amount of expected losses on the protected assets. For instance, the credit risk associated with whole loans or pools of assets that are sold to secondary-market investors can often be concentrated within the partial, first-loss recourse obligations retained by the banking organizations selling and securitizing the assets. In these situations, even though institutions may have reduced their exposure to catastrophic loss on the assets sold, they generally retain the same credit-risk exposure as if they continued to hold the assets on their balance sheets.

In addition to recourse obligations, institutions assume concentrated credit risk through the extension of partial direct credit substitutes, such as through the purchase (or retention) of subordinated interests in their own asset securitizations or through the extension of letters of credit. For example, banking organizations that sponsor certain asset-backed commercial paper programs, or so-called ''remote origination'' conduits, can be exposed to high degrees of credit risk even though their notional exposure may seem minimal. This type of remote origination conduit lends directly to corporate customers that are referred to it by the sponsoring banking organization that used to lend directly to these same borrowers. The conduit funds this lending activity by issuing commercial paper that, in turn, the sponsoring banking organization guarantees. The net result is that the sponsoring institution's credit-risk exposure through this guarantee is about the same as it would have been if it had made the loans directly and held them on its books. However, this is an off-balance-sheet transaction, and its associated risks may not be fully reflected in the institution's risk-management system.

Furthermore, banking organizations that extend liquidity facilities to securitized transactions, particularly to asset-backed commercial paper programs, may be exposed to high degrees of credit risk subtly embedded within a facility's provisions. Liquidity facilities are commitments to extend short-term credit to cover temporary shortfalls in cash flow. While all commitments embody some degree of credit risk, certain commitments extended to asset-backed commercial paper programs to provide liquidity may subject the extending institution to the credit risk of the underlying asset pool (often trade receivables) or a specific company using the program for funding. Often the stated purpose of liquidity facilities is to provide funds to the program to retire maturing commercial paper when a mismatch occurs in the maturities of the underlying receivables and the commercial paper, or when a disruption occurs in the commercial paper market. However, depending on the provisions of the facility—such as whether the facility covers dilution of the underlying receivable pool—credit risk can be shifted from the program's explicit credit enhancements to the liquidity facility.[3] Such provisions may enable certain programs to fund riskier assets and maintain the credit rating on the program's commercial paper without increasing the program's credit-enhancement levels.

The structure of various securitization transactions can also result in an institution's retaining the underlying credit risk in a sold pool of assets. Examples of this contingent credit-risk retention include credit card securitization, in which the securitizing organization explicitly sells the credit card receivables to a master trust, but, in substance, retains the majority of the economic risk of loss associated with the assets because of the credit protection provided to investors by the excess yield, spread accounts, and structural provisions of the securitization. Excess yield provides the first level of credit protection that can be drawn on to cover cash shortfalls between (1) the principal and coupon owed to investors and (2) the investors' pro rata share of the master trust's net cash flows. The excess yield is equal to the difference between the overall yield on the underlying credit card portfolio and the master trust's operating expenses.[4] The second level of credit protection is provided by the spread account, which is essentially a reserve initially funded from the excess yield.

In addition, the structural provisions of credit card securitization generally provide credit protection to investors through the triggering of early amortization events. Such an event usually is triggered when the underlying pool of credit card receivables deteriorates beyond a certain

3. Dilution essentially occurs when the receivables in the underlying asset pool—before collection—are no longer viable financial obligations of the customer. For example, dilution can arise from returns of consumer goods or unsold merchandise by retailers to manufacturers or distributors.

4. The monthly excess yield is the difference between the overall yield on the underlying credit card portfolio and the master trust's operating expenses. It is calculated by subtracting from the gross portfolio yield the (1) coupon paid to investors, (2) charge-offs for that month, and (3) servicing fee, usually 200 basis points paid to the banking organization sponsoring the securitization.

point and requires that the outstanding credit card securities begin amortizing early to pay off investors before the prior credit enhancements are exhausted. The early amortization accelerates the redemption of principal (paydown) on the security, and the credit card accounts that were assigned to the master credit-card trust return to the securitizing institution more quickly than had originally been anticipated. Thus, the institution is exposed to liquidity pressures and any further credit losses on the returned accounts.

Reputational Risks

The securitization activities of many institutions may expose them to significant reputational risks. Often, banking organizations that sponsor the issuance of asset-backed securities act as a servicer, administrator, or liquidity provider in the securitization transaction. These institutions must be aware of the potential losses and risk exposure associated with reputational risk from securitization activities. The securitization of assets whose performance has deteriorated may result in a negative market reaction that could increase the spreads on an institution's subsequent issuances. To avoid a possible increase in their funding costs, institutions have supported their securitization transactions by improving the performance of the securitized asset pool. This has been accomplished, for example, by selling discounted receivables or adding higher quality assets to the securitized asset pool. Thus, an institution's voluntary support of its securitization to protect its reputation can adversely affect the sponsoring or issuing organization's earnings and capital.

Liquidity Risks

The existence of recourse provisions in asset sales, the extension of liquidity facilities to securitization programs, and the early amortization triggers of certain asset securitization transactions can involve significant liquidity risk to institutions engaged in these secondary-market credit activities. Institutions should ensure that their liquidity contingency plans fully incorporate the potential risk posed by their secondary-market credit activities. When new asset-backed securities are issued, the issuing banking organization should determine their potential effect on its liquidity at the inception of each transaction and throughout the life of the securities to better ascertain its future funding needs.

An institution's contingency plans should consider the need to obtain replacement funding and specify possible alternative funding sources, in the event of the amortization of outstanding asset-backed securities. Replacement funding is particularly important for securitization with revolving receivables, such as credit cards, in which an early amortization of the asset-backed securities could unexpectedly return the outstanding balances of the securitized accounts to the issuing institution's balance sheet. An early amortization of a banking organization's asset-backed securities could impede its ability to fund itself—either through re-issuance or other borrowings—since the institution's reputation with investors and lenders may be adversely affected.

Servicer-Specific Risks

Banking organizations that service securitization issues must ensure that their policies, operations, and systems will not permit breakdowns that may lead to defaults. Substantial fee income can be realized by acting as a servicer. An institution already has a fixed investment in its servicing systems; achieving economies of scale relating to that investment is in its best interest. The danger, though, lies in overloading the system's capacity, thereby creating enormous out-of-balance positions and cost overruns. Servicing problems may precipitate a technical default, which in turn could lead to the premature redemption of the security. In addition, expected collection costs could exceed fee income. (For further guidance, see section 2040.3, ''Loan Portfolio Management,'' examination procedure 14b, of the *Commercial Bank Examination Manual*.)

ACCOUNTING ISSUES

Asset securitization transactions are frequently structured to obtain certain accounting treatments, which in turn affect reported measures of profitability and capital adequacy. In transferring assets into a pool to serve as collateral for ABS, a key question is whether the transfer should be treated as a sale of the assets or as a collateralized borrowing, that is, a financing

transaction secured by assets. Treating these transactions as a sale of assets results in their being removed from the banking organization's balance sheet, thus reducing total assets relative to earnings and capital, and thereby producing higher performance and capital ratios. Treating these transactions as financings, however, means that the assets in the pool remain on the balance sheet and are subject to capital requirements and the related liabilities-to-reserve requirements.

CAPITAL ADEQUACY

As with all risk-bearing activities, institutions should fully support the risk exposures of their securitization activities with adequate capital. Banking organizations should ensure that their capital positions are sufficiently strong to support *all* of the risks associated with these activities on a fully consolidated basis and should maintain adequate capital in all affiliated entities engaged in these activities. The Federal Reserve's risk-based capital guidelines establish *minimum* capital ratios, and those banking organizations exposed to high or above-average degrees of risk are, therefore, expected to operate significantly above the minimum capital standards.

The current regulatory capital rules may not fully incorporate the economic substance of the risk exposures involved in many securitization activities. Therefore, when evaluating capital adequacy, examiners should ensure that banking organizations that sell assets with recourse, that assume or mitigate credit risk through the use of credit derivatives, and that provide direct-credit substitutes and liquidity facilities to securitization programs are accurately identifying and measuring these exposures—and maintaining capital at aggregate levels sufficient to support the associated credit, market, liquidity, reputational, operational, and legal risks.

Examiners should also review the substance of securitization transactions when assessing underlying risk exposures. For example, partial, first-loss direct-credit substitutes that provide credit protection to a securitization transaction can, in substance, involve the same credit risk as the risk involved in holding the entire asset pool on the institution's balance sheet. However, under current rules, regulatory capital is explicitly required only against the amount of the direct-credit substitute, which can be significantly different from the amount of capital that the institution should maintain against the concentrated credit risk in the guarantee. Supervisors and examiners should ensure that banking organizations have implemented reasonable methods for allocating capital against the economic substance of credit exposures arising from early-amortization events and liquidity facilities associated with securitized transactions. These facilities are usually structured as short-term commitments to avoid a risk-based capital requirement, even though the inherent credit risk may be approaching that of a guarantee.[5]

If, in the supervisor's judgment, an institution's capital level is not sufficient to provide protection against potential losses from such credit exposures, this deficiency should be reflected in the banking organization's CAMELS or BOPEC ratings. Furthermore, supervisors and examiners should discuss the capital deficiency with the institution's management and, if necessary, its board of directors. The institution will be expected to develop and implement a plan for strengthening the organization's overall capital adequacy to levels deemed appropriate given all the risks to which it is exposed.

RISK-BASED CAPITAL PROVISIONS AFFECTING ASSET SECURITIZATION

Recourse Obligations, Residual Interests, and Direct-Credit Substitutes

The risk-based capital framework for recourse obligations, residual interests, and direct-credit substitutes resulting from asset securitization was revised effective January 1, 2002.[6] A one-year transition period applies to existing transactions, but banks may elect early adoption of the new rules. All transactions settled on or after January 1, 2002, are subject to the revised rule (the rule).

The rule seeks to treat recourse obligations and direct-credit substitutes more consistently and in a way that is more closely aligned to the

5. For further guidance on distinguishing, for risk-based capital purposes, whether a facility is a short-term commitment or a direct-credit substitute, see SR-92-11, "Asset-Backed Commercial Paper Programs." Essentially, facilities that provide liquidity, but which also provide credit protection to secondary-market investors, are to be treated as direct-credit substitutes for purposes of risk-based capital.

6. 66 *Fed. Reg.* 59614 (November 29, 2001).

credit-risk profile of these instruments. The rule emphasizes the economic substance of a transaction over its form, and allows regulators to recharacterize transactions or change the capital treatment to reflect the exposure's actual risk profile and to prevent regulatory arbitrage or evasion of the capital requirements.

Coverage of the Rule

The rule applies to banks, their holding companies, and thrift institutions. It covers recourse obligations, residual interests, direct-credit substitutes, and asset-backed and mortgage-backed securities held in both the banking and trading books (to the extent that the institution is not subject to the market-risk rule).

The rule defines "recourse" as an arrangement in which a banking organization retains, in form or substance, the credit risk in connection with an asset sale in accordance with GAAP, if the credit risk exceeds the pro rata share of the banking organization's claim on the assets. If the banking organization has no claim on a transferred asset, then the retention of any credit risk is also recourse. The purchase of credit enhancements for a securitization, in which the banking organization is completely removed from any credit risk, will not, in most instances, constitute recourse.

Residual interests are on-balance-sheet assets that represent an interest (including a beneficial interest) created by a transfer that qualifies as a sale of financial assets under GAAP. This transfer exposes the banking organization to any credit risk that exceeds a pro rata share of the organization's claim on the asset. Examples of residual interests include credit-enhancing interest-only (I/O) strips, spread accounts, cash-collateral accounts, retained subordinated interests, and other assets that function as credit enhancements. Interests retained in a transaction accounted for as a financing under GAAP are not included within the definition of residual interests. In addition, the rule excludes seller's interest (common to revolving transactions) from the definition of residual interest if the seller's interest does not act as a credit enhancement and is exposed to only a pro-rated share of loss.

Credit-enhancing I/O strips are on-balance-sheet assets that, in form or substance, represent the contractual right to receive some or all of the interest due on transferred assets, and that expose the banking organization to credit risk that exceeds its pro rata claim on the underlying assets. This type of residual interest is created when assets are transferred in a securitization transaction that qualifies for sale treatment under GAAP, and it typically results in the recognition of a gain-on-sale on the seller's income statement. Generally, credit-enhancing I/O strips are held on the balance sheet at the present value of expected future net cash flows, adjusted for expected prepayments and losses and discounted at an appropriate market interest rate. Regulators will look to the economic substance of these residual assets and reserve the right to identify other cash flows or similar spread-related assets as credit-enhancing I/O strips on a case-by-case basis. Credit-enhancing I/O strips include both purchased and retained interest-only strips that serve in a credit-enhancing capacity.

Direct-credit substitutes are arrangements in which a banking organization assumes, in form or in substance, credit risk associated with an on- or off-balance-sheet asset or exposure that it did not previously own (third-party asset), and the risk assumed by the banking organization exceeds the pro rata share of its interest in the third-party asset. This definition includes guarantees, letters of credit, purchased subordinated interests, agreements to cover credit losses that arise from purchased loan-servicing rights, credit derivatives, and lines of credit that provide credit enhancement. For direct-credit substitutes that take the form of syndications in which each bank is obligated only for its pro rata share of the risk and there is no recourse to the originating bank, each bank includes only its pro rata share of the assets supported by the direct-credit substitute in its risk-based capital calculation.

Representations and warranties that function as credit enhancements to protect asset purchasers or investors from credit risk are treated as recourse or direct-credit substitutes. However, early-default clauses that permit the return of 50 percent of risk-weighted one- to four-family residential mortgage loans for a maximum period of 120 days are excluded from the definition of recourse or direct-credit substitutes. Also excluded from coverage are premium-refund clauses on loans guaranteed by U.S. government agencies or U.S. government–sponsored enterprises (for example, one- to four-family residential mortgages) that provide for a maximum 120-day put period. Warranties that cover losses due to fraud or incomplete documentation are

also excluded from the definition of recourse or direct-credit substitutes.

The rule provides a limited exemption from the definition of recourse or direct-credit substitute for clean-up calls when the remaining balance of the loans is equal to or less than 10 percent of the original pool balance. This allows for the timely maturity of the related securities to accommodate transaction efficiency or administrative cost savings.

The definitions of recourse and direct-credit substitute include loan-servicing arrangements if the banking organization, as servicer, is responsible for credit losses on the serviced loans. However, the definitions do not apply to cash advances servicers make to ensure an uninterrupted flow of payments to investors or the timely collection of residential mortgage loans, provided that the servicer is entitled to reimbursement of these amounts and the right to reimbursement is not subordinated to other claims. The banking organization is required to make an independent credit assessment of the likelihood of repayment, and the maximum possible amount of any nonreimbursed advances must be ''insignificant.''

Ratings-Based Approach

The rule imposes a multilevel, ratings-based approach to assessing capital requirements on asset-backed securities, mortgage-backed securities, recourse obligations, direct-credit substitutes, and residual interests (other than credit-enhancing I/O strips) based on their relative exposure to credit risk. The approach generally uses credit ratings from the ratings agencies.[7] The capital requirement is computed by multiplying the face amount of the position by the appropriate risk weight as determined from table 1.

Different rules apply to traded and untraded positions under the ratings-based approach.[8] Traded positions need to be rated by only one rating agency. A position is "traded" if, at the time of rating by the external credit agency, there is a reasonable expectation that in the near future either (1) the position may be sold to unaffiliated investors relying on the rating or (2) an unaffiliated third party relying on the rating may enter into a transaction involving the position. If multiple ratings have been received on a position, the lowest rating must be used.

Rated, but untraded, positions are eligible for the ratings-based approach if the ratings are (1) provided by more than one rating agency; (2) as provided by each rating agency from which a rating is received, one category below

7. Ratings agencies are those organizations recognized by the Division of Market Regulation of the SEC as nationally recognized statistical rating organizations for various purposes, including the SEC's uniform net capital requirements for brokers and dealers.

8. Traded positions are those that are retained, assumed, or issued in connection with an asset securitization and that are externally rated. There must be a reasonable expectation that, in the near future, unaffiliated third parties will rely on the rating.

Table 1—Rating Categories

	Examples	*Risk weight*
Long-term rating category		
Highest or second-highest investment grade	AAA or AA	20%
Third-highest investment grade	A	50%
Lowest investment grade	BBB	100%
One category below investment grade	BB	200%
More than one category below investment grade or unrated	B or unrated	Not eligible for ratings-based approach
Short-term rating category		
Highest investment grade	A-1, P-1	20%
Second-highest investment grade	A-2, P-2	50%
Lowest investment grade	A-3, P-3	100%
Below investment grade	Not prime	Not eligible for ratings-based approach

investment grade or better, for long-term positions, or investment grade or better, for short-term positions; (3) publicly available; and (4) based on the same criteria used to rate traded positions. Again, the lowest rating will determine the applicable risk weight.

An unrated position that is senior or preferred in all respects (including collateralization and maturity) to a rated and traded subordinated position may be treated as if it has the same rating assigned to the subordinated position. Before using this approach, the banking organization must demonstrate to its supervisor's satisfaction that such treatment is appropriate.

A banking organization may use a program or computer rating obtained from a rating agency for unrated direct-credit substitutes or recourse obligations (but not residual interests) in certain structured-finance programs.[9] Before using this approach, a banking organization must demonstrate to its primary regulator that the rating generally meets the standards used by the rating agency for rating similarly traded positions. In addition, the banking organization must demonstrate that it is reasonable and consistent with the rule to rely on the ratings assigned under the structured-finance program. Risk weights derived in this manner may not be lower than 100 percent.

Interests ineligible for the ratings-based approach. Banking organizations that hold recourse obligations and direct-credit substitutes (other than residual interests) that do not qualify for the ratings-based approach must hold capital against the amount of the position plus all more senior positions, subject to the low-level-recourse rule.[10] This is referred to as "gross-up treatment." The grossed-up amount is placed in a risk-weight category by reference to the obligor, or, if applicable, the guarantor or nature of the collateral. The grossed-up amount is multiplied by the risk weight and 8 percent, but is never greater than the full capital charge that would apply if the assets were held on the balance sheet.

Residual interests that are not eligible for the ratings-based approach require dollar-for-dollar treatment; that is, for every dollar of residual interest, one dollar of capital must be held. A banking organization is permitted to net from the capital requirement any deferred tax liability held on its balance sheet that is directly associated with the residual interests.

A special concentration limit of 25 percent of tier 1 capital applies to retained and purchased credit-enhancing I/O strips. The gross dollar amount (before netting any deferred tax liability) of credit-enhancing I/O strips that exceeds 25 percent of tier 1 capital must be deducted from tier 1 capital. The deduction may be made net of any related deferred tax liabilities. This concentration limit affects both leverage and risk-based capital ratios.

Permissible uses of banking organizations' internal risk ratings. The rule provides limited opportunities for banking organizations to use their internal risk-rating systems to assign risk-based capital charges to a narrow range of exposures. A banking organization with a qualifying internal risk-rating system may use its internal rating system to apply the ratings-based approach to its unrated direct-credit substitutes extended to asset-backed commercial paper programs. The risk weight assigned under this approach may not be less than 100 percent.

A qualifying internal risk-rating system is one that is approved by the organization's primary regulator (that is, the applicable Reserve Bank and the Board, for Federal Reserve–supervised entities) before use. In general, a qualifying system is an integral part of an effective risk-management system that explicitly incorporates the full range of risks from securitization activities. The system must (1) be capable of linking ratings to measurable outcomes; (2) separately consider the risk associated with the underlying loans and borrowers and the risks associated with specific positions in the securitization transaction; (3) identify gradations of risk among "pass" assets; and (4) classify assets into risk grades using clear, explicit factors. The banking organization must have an independent review function to assign or review credit-risk ratings, periodically verify ratings, track ratings performance over time, and make adjustments when

9. Structured-finance programs are programs in which receivable interests and asset-backed securities issued by multiple participants are purchased by a special-purpose entity that repackages these exposures into securities that can be sold to investors.

10. The low-level-recourse rule provides that if the maximum contractual exposure to loss in connection with a recourse obligation or direct-credit substitute is less than the risk-based capital requirement for the assets, the risk-based capital requirement is limited to the maximum contractual exposure, less any recourse liability account established in accordance with GAAP. The low-level-recourse rule does not apply when a banking organization provides credit enhancement beyond any contractual obligation to support the assets it has sold.

warranted. Ratings assumptions must be consiswent with, or more conservative than, those applied by the rating agencies.

Small-Business Obligations

Another divergence from the general risk-based capital treatment for assets sold with recourse concerns small-business obligations. Qualifying institutions that transfer small-business obligations with recourse are required, for risk-based capital purposes, to maintain capital only against the amount of recourse retained, provided two conditions are met. First, the transactions must be treated as a sale under GAAP, and second, the transferring institutions must establish, pursuant to GAAP, a noncapital reserve sufficient to meet the reasonably estimated liability under their recourse arrangements.

Banking organizations will be considered qualifying if, pursuant to the Board's prompt-corrective-action regulation (12 CFR 208.30), they are well capitalized or, by order of the Board, adequately capitalized. To qualify, an institution must be determined to be well capitalized or adequately capitalized without taking into account the preferential capital treatment for any previous transfers of small-business obligations with recourse. The total outstanding amount of recourse retained by a qualifying banking organization on transfers of small-business obligations receiving the preferential capital treatment cannot exceed 15 percent of the institution's total risk-based capital.

Standby Letters of Credit

Banking organizations that issue standby letters of credit as credit enhancements for ABS issues must hold capital against these contingent liabilities under the risk-based capital guidelines. According to the guidelines, financial standby letters of credit are direct-credit substitutes, which are converted in their entirety to credit-equivalent amounts. The credit-equivalent amounts are then risk-weighted according to the type of counterparty or, if relevant, to any guarantee or collateral.

SOUND RISK-MANAGEMENT PRACTICES

Examiners should verify that an institution incorporates the risks involved in its securitization activities into its overall risk-management process. The process should entail (1) inclusion of risk exposures in reports to the institution's senior management and board to ensure proper management oversight; (2) adoption of appropriate policies, procedures, and guidelines to manage the risks involved; (3) appropriate measurement and monitoring of risks; and (4) assurance of appropriate internal controls to verify the integrity of the management process with respect to these activities. The formality and sophistication of an institution's risk-management system should be commensurate with the nature and volume of its securitization activities. Institutions with significant activities in this area are expected to have more elaborate and formal approaches to manage the risk of their secondary-market credit activities.

Board and Senior Management Oversight

Both the board of directors and senior management are responsible for ensuring that they fully understand the degree to which the organization is exposed to the credit, market, liquidity, operational, legal, and reputational risks involved in the institution's securitization activities. They are also responsible for ensuring that the formality and sophistication of the techniques used to manage these risks are commensurate with the level of the organization's activities. The board should approve all significant policies relating to risk management of securitization activities and should ensure that risk exposures are fully incorporated in board reports and risk-management reviews.

Policies and Procedures

Senior management is responsible for ensuring that the risks arising from securitization activities are adequately managed on both a short-term and long-run basis. Management should ensure that there are adequate policies and procedures in place for incorporating the risk of these activities into the overall risk-management process of the institution. Policies should ensure that the economic substance of the risk exposures generated by these activities is fully recognized and appropriately managed. In addition, banking organizations involved in securitization

activities should have appropriate policies, procedures, and controls for underwriting asset-backed securities; funding the possible return of revolving receivables (for example, credit card receivables and home equity lines); and establishing limits on exposures to individual institutions, types of collateral, and geographic and industrial concentrations. Policies should specify a consistently applied accounting methodology and valuation methods, including FAS 140 residual-value assumptions and the procedures to change those assumptions.

Risk Measurement and Monitoring

An institution's management information and risk-measurement systems should fully incorporate the risks involved in its securitization activities. Banking organizations must be able to identify credit exposures from all securitization activities and to measure, quantify, and control those exposures on a fully consolidated basis. The economic substance of the credit exposures of securitization activities should be fully incorporated into the institution's efforts to quantify its credit risk, including efforts to establish more formal grading of credits to allow for statistical estimation of loss-probability distributions. Securitization activities should also be included in any aggregations of credit risk by borrower, industry, or economic sector.

An institution's information systems should identify and segregate those credit exposures arising from the institution's loan-sale and securitization activities. These exposures include the sold portions of participations and syndications; exposures arising from the extension of credit-enhancement and liquidity facilities; the effects of an early-amortization event; and the investment in asset-backed securities. Management reports should provide the board and senior management with timely and sufficient information to monitor the institution's exposure limits and overall risk profile.

Stress Testing

The use of stress testing, including combinations of market events that could affect a banking organization's credit exposures and securitization activities, is another important element of risk management. Stress testing involves identifying possible events or changes in market behavior that could have unfavorable effects on the institution and then assessing the organization's ability to withstand them. Stress testing should consider not only the probability of adverse events, but also likely worst-case scenarios. Analysis should be on a consolidated basis and consider, for instance, the effect of higher than expected levels of delinquencies and defaults, as well as the consequences of early-amortization events for credit card securities, that could raise concerns about the institution's capital adequacy and its liquidity and funding capabilities. Stress-test analyses should also include contingency plans for possible management actions in certain situations.

Valuation of Retained Interests

Retained interests from securitization activities, including interest-only strips receivable, arise when a banking organization keeps an interest in the assets sold to a securitization vehicle that, in turn, issues bonds to investors. The methods and models that banking organizations use to value retained interests, as well as the difficulties in managing exposure to these volatile assets, can raise supervisory concerns. SR-99-37 and its reference interagency guidance (included in the ''Selected Federal Reserve SR-Letters'' at the end of this section) address the risk management and valuation of retained interests arising from asset-securitization activities.

Appropriate valuation and modeling methodologies should be used in valuing retained interests. The carrying value of a retained interest should be fully documented, based on reasonable assumptions, and regularly analyzed for any impairment in value. When quoted market prices are not available, accounting rules allow fair value to be estimated. An estimate must be based on the ''best information available in the circumstances'' and supported by reasonable and current assumptions. If a best estimate of fair value is not practicable, the asset is to be recorded at zero in financial and regulatory reports.

Internal Controls

One of management's most important responsibilities is establishing and maintaining an effective system of internal controls. Among other things, internal controls should enforce the offi-

cial lines of authority and the appropriate separation of duties in managing the institution's risks. These internal controls must be suitable for the type and level of risks at the institution, given the nature and scope of its activities. Moreover, internal controls should ensure that financial reporting is reliable (in published financial reports and regulatory reports), including the reporting of adequate allowances or liabilities for expected losses.

The internal-control and risk-management function should also ensure that appropriate management information systems (MIS) exist to monitor securitization activities. Reporting and documentation methods must support the initial valuation of retained interests and ongoing impairment analyses of these assets. Pool-performance information will help well-managed banking organizations ensure, on a qualitative basis, that a sufficient amount of economic capital is being held to cover the various risks inherent in securitization transactions. The absence of quality MIS will hinder management's ability to monitor specific pool performance and securitization activities.

At a minimum, MIS reports should address the following:

- *Securitization summaries for each transaction.* The summary should include relevant transaction terms such as collateral type, facility amount, maturity, credit-enhancement and subordination features, financial covenants (termination events and spread-account capture ''triggers''), right of repurchase, and counterparty exposures. Management should ensure that the summaries for each transaction are distributed to all personnel associated with securitization activities.
- *Performance reports by portfolio and specific product type.* Performance factors include gross portfolio yield, default rates and loss severity, delinquencies, prepayments or payments, and excess spread amounts. The reports should reflect the performance of assets, both on an individual-pool basis and for total managed assets. These reports should segregate specific products and different marketing campaigns.
- *Vintage analysis for each pool using monthly data.* Vintage analysis will help management understand historical performance trends and their implications for future default rates, prepayments, and delinquencies, and therefore retained interest values. Management can use these reports to compare historical performance trends with underwriting standards, including the use of a validated credit-scoring model, to ensure loan pricing is consistent with risk levels. Vintage analysis also helps in the comparison of deal performance at periodic intervals and validates retained-interest valuation assumptions.
- *Static-pool cash-collection analysis.* A static-pool cash-collection analysis involves reviewing monthly cash receipts relative to the principal balance of the pool to determine the cash yield on the portfolio, comparing the cash yield with the accrual yield, and tracking monthly changes. Management should compare monthly the timing and amount of cash flows received from the trust with those projected as part of the FAS 140 retained-interest valuation analysis. Some master-trust structures allow excess cash flow to be shared between series or pools. For revolving-asset trusts with this master-trust structure, management should perform a cash-collection analysis for each master-trust structure. These analyses are essential in assessing the actual performance of the portfolio in terms of default and prepayment rates. If cash receipts are less than those assumed in the original valuation of the retained interest, this analysis will provide management and the board with an early warning of possible problems with collections or extension practices and impairment of the retained interest.
- *Sensitivity analysis.* A sensitivity analysis measures the effect of changes in default rates, prepayment or payment rates, and discount rates to assist management in establishing and validating the carrying value of the retained interest. Stress tests should be performed at least quarterly. Analyses should consider potential adverse trends and determine ''best,'' ''probable,'' and ''worst-case'' scenarios for each event. Other factors that need to be considered are the impact of increased defaults on collections staffing, the timing of cash flows, spread-account capture triggers, over-collateralization triggers, and early-amortization triggers. An increase in defaults can result in higher than expected costs and a delay in cash flows, thus decreasing the value of the retained interests. Management should periodically quantify and document the potential impact to both earnings and capital, and report the results to the board of directors. Management should incorporate this analysis

into their overall interest-rate risk measurement system.[11]

- *Statement of covenant compliance.* Ongoing compliance with deal-performance triggers as defined by the pooling and servicing agreements should be affirmed at least monthly. Performance triggers include early amortization, spread capture, changes to overcollateralization requirements, and events that would result in servicer removal.

EXAMINATION GUIDELINES

A banking organization may be involved in asset securitization in many ways: originating the assets to be pooled, packaging the assets for securitization, servicing the pooled assets, acting as trustee for the pool, providing credit enhancements, underwriting or placing the ABS, or investing in the securities. Individual securitization arrangements often possess unique features, and the risks addressed in this abbreviated version of the examiner guidelines do not apply to all securitization arrangements.[12] Arrangements may also entail risks not summarized

11. The Joint Agency Policy Statement on Interest-Rate Risk (see SR-96-13) advises institutions with a high level of exposure to interest-rate risk relative to capital that they will be directed to take corrective action.

12. A complete version of the Examination Guidelines for Asset Securitization is attached to SR-90-16.

here. Examiners should judge a banking organization's exposure to securitization with reference to the specific structures in which the organization is involved, and the degree to which the organization has identified exposures and implemented policies and controls to manage them. Examiners may tailor the scope of their examinations if the banking organization's involvement in securitization is immaterial relative to its size and financial strength.

Examiners should determine if a banking organization involved in the issuance of ABS as originator, packager, servicer, credit enhancer, underwriter, or trustee has adequately analyzed the assets underlying the asset-backed security and the structure of its transactions, including—

- the characteristics and expected performance of the underlying assets,
- the banking organization's ability to meet its obligations under the securitization arrangement, and
- the ability of the other participants in the arrangement to meet their obligations.

Analysis of the underlying assets should be conducted independently by each participant in the process, giving consideration to yield, maturity, credit risk, prepayment risk, and the accessibility of collateral in cases of default. An originator should further consider the impact of securitization on the remaining asset portfolio and on the adequacy of loan-loss reserves and overall capital.

The financial position and operational capacity should be adequate to meet obligations to other parties in a securitization arrangement, even under adverse scenarios. Accordingly, a banking organization should ensure that the pricing of services is adequate to cover costs over the term of the obligation, as well as to compensate for associated risks. Furthermore, the organization should have contingency plans to transfer responsibilities to another institution in the event that those responsibilities can no longer be fulfilled.

SELECTED FEDERAL RESERVE SR-LETTERS

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 97-21 (SUP)
July 11, 1997

TO THE OFFICER IN CHARGE OF SUPERVISION
AT EACH FEDERAL RESERVE BANK

SUBJECT: Risk Management and Capital Adequacy of Exposures Arising from Secondary Market Credit Activities

Introduction and Overview

In recent years, some banking organizations have substantially increased their secondary market credit activities such as loan syndications, loan sales and participations, credit derivatives, and asset securitizations, as well as the provision of credit enhancements and liquidity facilities to such transactions. These activities can enhance both credit availability and bank profitability, but managing the risks of these activities poses increasing challenges. This is because the risks involved, while not new to banking, may be less obvious and more complex than the risks of traditional lending activities. Some secondary market credit activities involve credit, liquidity, operational, legal, and reputational risks in concentrations and forms that may not be fully recognized by bank management or adequately incorporated in an institution's risk management systems. In reviewing these activities, supervisors and examiners should assess whether banking organizations fully understand and adequately manage the full range of the risks involved in secondary market credit activities.

The heightened need for management attention to these risks is underscored by reports from examiners, senior lending officer surveys, and discussions with trade and advisory groups that have indicated that competitive conditions over the past few years have encouraged an easing of credit terms and conditions in both commercial and consumer lending. In addition, indications are that some potential participants in loan syndications have felt it necessary to make complex credit decisions within a much shorter timeframe than has been customary. Although the recent easing may not be imprudent, the incentives and pressures to lower credit standards have increased as competition has intensified and borrowers have experienced generally favorable business and economic conditions. Supervisors and bank management alike should remain alert to the possibility that loan performance could deteriorate if certain

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sectors of the economy experience problems. The recent rise in consumer bankruptcies, credit card delinquencies, and credit charge-offs illustrates this concern. These types of developments could have significant implications for the risks associated with secondary market credit activities.

This letter identifies some of the important risks involved in several of the more common types of secondary market credit activities. It also provides guidance on sound practices and discusses special considerations supervisors should take into account in assessing the risk management systems for these activities. A copy of this letter should be sent to each state member bank, bank holding company, Edge corporation, and U.S. branch or agency of a foreign bank. A suggest transmittal letter is attached.

A fundamental principle advanced by this guidance is that banking institutions should explicitly incorporate the full range of risks of their secondary market credit activities into their overall risk management systems. In particular, supervisors and examiners should determine whether institutions are recognizing the risks of secondary market credit activities by: 1) adequately identifying, quantifying, and monitoring these risks; 2) clearly communicating the extent and depth of these risks in reports to senior management and the board of directors and in regulatory reports; 3) conducting ongoing stress testing to identify potential losses and liquidity needs under adverse circumstances; and 4) setting adequate minimum internal standards for allowances or liabilities for losses, capital, and contingency funding. Incorporating secondary market credit activities into banking organizations' risk management systems and internal capital adequacy allocations is particularly important since the current regulatory capital rules do not fully capture the economic substance of the risk exposures arising from many of these activities.

Failure to understand adequately the risks inherent in secondary market credit activities and to incorporate them into risk management systems and internal capital allocations may constitute an unsafe and unsound banking practice.

Scope

This guidance applies to the secondary market credit activities conducted by state member banks, bank holding companies, Edge corporations and U.S. branches and agencies of foreign banks.[1] For purposes of this guidance, secondary market credit activities include, but are not limited to, loan syndications, loan participations, loan sales and purchases, credit derivatives, asset securitization, and

[1] This guidance applies to U.S. branches and agencies of foreign banks with recognition that appropriate adaptations may be necessary to reflect that: 1) those offices are an integral part of a foreign bank, which should be managing its risks on a consolidated basis and recognizing possible obstacles to cash movements among branches, and 2) the foreign bank is subject to overall supervision by its home country authorities.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

both implied and direct credit enhancements that may support these or the related activities of the institution, its affiliates, or third parties. Asset securitization activities refer to issuance, underwriting, and servicing of asset-backed securities; provision of credit or liquidity enhancements to securitized transactions; and investment in asset-backed securities. This guidance builds on, supports, and is fully consistent with existing guidance on risk management issued by the Federal Reserve.[2]

Background

Improvements in technology, greater standardization of lending products, and the use of credit enhancements have helped to increase dramatically the volume of loan syndications, loan sales, loan participations, asset securitizations, and credit guarantees undertaken by commercial banks, affiliates of bank holding companies, and some U.S. branches and agencies of foreign banks. In addition, the advent of credit derivatives permits banking organizations to trade credit risk, manage it in isolation from other types of risk, and maintain credit relationships while transferring the associated credit risk. These developments have improved the availability of credit to businesses and consumers, allowed management to better tailor the mix of credit risk within loan and securities portfolios, and helped to improve overall bank profitability.

At the same time, however, certain credit and liquidity enhancements that banking organizations provide to facilitate various secondary market credit activities may make the evaluation of the risks of these activities less straightforward than the risks involved in traditional banking activities in which assets are held in their entirety on the balance sheet of the originating institution. These enhancements, or guarantees, generally manifest themselves as recourse provisions, securitization structures that entail credit-linked early amortization and collateral replacement events, and direct credit substitutes such as letters of credit and subordinated interests that, in effect, provide credit support to secondary market instruments and transactions.[3]

[2] For a more detailed discussion of risk management, refer to SR letter 95-51, "Rating the Adequacy of Risk Management Processes and Internal Controls at State Member Banks and Bank Holding Companies;" SR letter 95-17, "Evaluating the Risk Management and Internal Controls of Securities and Derivative Contracts Used in Nontrading Activities;" SR letter 93-69, "Risk Management and Internal Controls for Trading Activities of Banking Organizations;" and SR letter 90-16, "Implementation of Examination Guidelines for the Review of Asset Securitization Activities."

[3] Examiners should also review SR letter 96-30, "Risk-Based Capital Treatment for Spread Accounts that Provide Credit Enhancement for Securitized Receivables." In addition, banking organizations have retained the risk of loss, i.e., recourse, on sales and securitizations of assets when, in accordance with generally accepted accounting principles, they record on their balance sheets interest-only strip receivables or other assets that serve as credit enhancements. For more information, see Statement of Financial Accounting Standard No. 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities"* and the instructions to the Reports of Income and Condition.

* FAS 140 has superseded FAS 125.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

The transactions that such enhancements are associated with tend to be complex and may expose institutions extending the enhancements to hidden obligations that may not become evident until the transactions deteriorate. In substance, such activities move the credit risk off the balance sheet by shifting risks associated with traditional on-balance-sheet assets into off-balance-sheet contingent liabilities. Given the potential complexity and, in some cases, the indirect nature of these enhancements, the actual credit risk exposure can be difficult to assess, especially in the context of traditional credit risk limit, measurement, and reporting systems.

Moreover, many secondary market credit activities involve new and compounded dimensions of reputational, liquidity, operational and legal risks that are not readily identifiable and may be difficult to control. For example, recourse provisions and certain asset-backed security structures can give rise to significant reputational and liquidity risk exposures and ongoing management of underlying collateral in securitization transactions can expose an institution to unique operating and legal risks.

Accordingly, for those institutions involved in providing credit enhancements in connection with loan sales and securitizations, and those involved in credit derivatives and loan syndications, supervisors and examiners should assess whether the institutions' systems and processes adequately identify, measure, monitor, and control all of the risks involved in the secondary market credit activities. In particular, the risk management systems employed should include the identification, measurement, and monitoring of these risks as well as an appropriate methodology for the internal allocation of capital and reserves. The stress testing conducted within the risk measurement element of the management system should fully incorporate the risk exposures of these activities under various scenarios to identify their potential effect on an institution's liquidity, earnings, and capital adequacy. Moreover, management reports should adequately communicate to senior management and the board of directors the risks associated with these activities and the contingency plans that are in place to deal with adverse conditions.

Credit Risks in Secondary Market Credit Activities

Institutions should be aware that the credit risk involved in many secondary market credit activities may not always be obvious. For certain types of loan sales and securitization transactions, a banking organization may actually be exposed to essentially the same credit risk as in traditional lending activities, even though a particular transaction may, superficially, appear to have isolated the institution from any risk exposure. In such cases, removal of an asset from the balance sheet may not result in a commensurate reduction in credit risk. Transactions that can give rise to

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such instances include loan sales with recourse, credit derivatives, direct credit substitutes, such as letters of credit, and liquidity facilities extended to securitization programs, as well as certain asset securitization structures, such as the structure typically used to securitize credit card receivables.

Loan Syndications - Recently, the underwriting standards of some syndications have been relaxed through the easing or elimination of certain covenants or the use of interest-only arrangements. Bank management should continually review syndication underwriting standards and pricing practices to ensure that they remain consistent over time with the degree of risk associated with the activity and the potential for unexpected economic developments to affect adversely borrower creditworthiness.

In some cases, potential participants in loan syndications have felt it necessary to make decisions to commit to the syndication within a shorter period of time than is customary. Supervisors and examiners should determine whether syndicate participants are performing their own independent credit analysis of the syndicated credit and make sure they are not placing undue reliance on the analysis of the lead underwriter or commercial loan credit ratings. Banking organizations should not feel pressured to make an irrevocable commitment to participate in a syndication until such an analysis is complete.

Credit Derivatives - Credit derivatives are off-balance sheet financial instruments that are used by banking organizations to assume or mitigate the credit risk of loans and other assets.[4] Banking organizations are increasingly employing these instruments either as end-users, purchasing credit protection from--or providing credit protection to--third parties, or as dealers intermediating such protection. In reviewing credit derivatives, supervisors should consider the credit risk associated with the reference asset, as well as general market risk and the risk of the counterparty to the contract.

With respect to credit derivative transactions where banking organizations are mitigating their assets' credit risk, supervisors and examiners should carefully review those situations where the reference assets are not identical to the assets actually owned by the institutions. Supervisors should consider whether the reference asset is an appropriate proxy for the loan or other asset whose credit exposure the banking organizations intend to offset.

[4] See SR letter 96-17, "Supervisory Guidance for Credit Derivatives," for a discussion of supervisory issues regarding credit derivatives, including the risk-based capital treatment of credit derivatives held in the banking book. SR letter 97-18, "Application of Market Risk Capital Requirements to Credit Derivatives," provides guidance on the risk-based capital treatment of credit derivatives held in the trading book.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Recourse Obligations and Direct Credit Substitutes - Partial, first loss recourse obligations retained when selling assets, and the extension of partial credit enhancements (e.g., 10 percent letters of credit) can be a source of concentrated credit risk by exposing institutions to the full amount of expected losses on the protected assets. For instance, the credit risk associated with whole loans or pools of assets that are sold to secondary market investors can often be concentrated within the partial, first loss recourse obligations retained by banking organizations selling and securitizing the assets. In these situations, even though institutions may have reduced their exposure to catastrophic loss on the assets sold, they generally retain the same credit risk exposure as if they continued to hold the assets on their balance sheets.

In addition to recourse obligations, institutions assume concentrated credit risk through the extension of partial direct credit substitutes such as through the purchase of subordinated interests and extension of letters of credit. For example, banking organizations that sponsor certain asset-backed commercial paper programs, or so-called "remote origination" conduits, can be exposed to high degrees of credit risk even though it may seem that their notional exposure is minimal. Such a remote origination conduit lends directly to corporate customers referred to it by the sponsoring banking organization that used to lend directly to these same borrowers. The conduit funds this lending activity by issuing commercial paper that, in turn, is guaranteed by the sponsoring banking organization. The net result is that the sponsoring institution has much the same credit risk exposure through this guarantee as if it had made the loans directly and held them on its books. However, such credit extension is an off-balance-sheet transaction and the associated risks may not be fully reflected in the institution's risk management system.

Furthermore, banking organizations that extend liquidity facilities to securitized transactions, particularly asset-backed commercial paper programs, may be exposed to high degrees of credit risk which may be subtly embedded within the facilities' provisions. Liquidity facilities are commitments to extend short-term credit to cover temporary shortfalls in cash flow. While all commitments embody some degree of credit risk, certain commitments extended to asset-backed commercial paper programs in order to provide liquidity may subject the extending institution to the credit risk of the underlying asset pool, often trade receivables, or of a specific company using the program for funding. Often the stated purpose of such liquidity facilities is to provide funds to the program to retire maturing commercial paper when a mismatch occurs in the maturities of the underlying receivables and the commercial paper, or when a disruption occurs in the commercial paper market. However, depending upon the provisions of the facility--such as whether the facility covers dilution of the underlying receivable pool--credit risk can be shifted from the program's explicit credit

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enhancements to the liquidity facility.[5] Such provisions may enable certain programs to fund riskier assets and yet maintain the credit rating on the program's commercial paper without increasing the program's credit enhancement levels.

Asset Securitization Structures - The structure of various securitization transactions can also result in an institution retaining the underlying credit risk in a sold pool of assets. Examples of this contingent credit risk retention include credit card securitizations where the securitizing organization explicitly sells the credit card receivables to a master trust, but, in substance, retains the majority of the economic risk of loss associated with the assets because of the credit protection provided to investors by the excess yield, spread accounts, and structural provisions of the securitization. Excess yield provides the first level of credit protection that can be drawn upon to cover cash shortfalls between the principal and coupon owed to investors and the investors' pro rata share of the master trust's net cash flows. The excess yield is equal to the difference between the overall yield on the underlying credit card portfolio and the master trust's operating expenses.[6] The second level of credit protection is provided by the spread account, which is essentially a reserve funded initially from the excess yield.

In addition, the structural provisions of credit card securitizations generally provide credit protection to investors through the triggering of early amortization events. Such an event usually is triggered when the underlying pool of credit card receivables deteriorates beyond a certain point and requires that the outstanding credit card securities begin amortizing early in order to pay off investors before the prior credit enhancements are exhausted. As the early amortization accelerates the redemption of principal (paydown) on the security, the credit card accounts that were assigned to the master credit card trust return to the securitizing institution more quickly than had originally been anticipated, thus, exposing the institution to liquidity pressures and any further credit losses on the returned accounts.

Reputational Risks

The secondary market credit activities of many institutions may also expose them to significant reputational risks. Loan syndication underwriting may present significant reputational risk exposure to lead underwriters because syndicate participants may seek to hold the lead underwriter responsible for actual or perceived

[5] Dilution essentially occurs when the receivables in the underlying asset pool--prior to collection--are no longer viable financial obligations of the customer. For example, dilution can arise from returns of consumer goods or unsold merchandise by retailers to manufacturers or distributors.

[6] The monthly excess yield is the difference between the overall yield on the underlying credit card portfolio and the master trust's operating expenses. It is calculated by subtracting from the gross portfolio yield the (1) coupon paid to investors, (2) charge-offs for that month, and (3) servicing fee, usually 200 basis points paid to the banking organization sponsoring the securitization.

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inadequacies in the loan's underwriting even though participants are responsible for conducting an independent due diligence evaluation of the credit. Such risk may be compounded by the rapid growth of new investors in this market, usually nonbanks that may not have previously endured a downturn in the loan market.

There is the potential that pressure may be brought to bear on the lead participant to repurchase portions of the syndication if the credit deteriorates in order to protect its reputation in the market even though the syndication was sold without recourse. In addition, the deterioration of the syndicated credit also exposes the lead organization to possible litigation, as well as increased operational and credit risk. One way to mitigate reputational risk with respect to syndications is for banking organizations to know their customers and to determine whether syndication customers are in a position to conduct their own evaluation of the credit risks involved in the transaction.

Asset securitization programs also can be a source of increasing reputational risk. Often, banking organizations sponsoring the issuance of asset-backed securities act as servicer, administrator, or liquidity provider in the securitization transaction. It is imperative that these institutions are aware of the potential losses and risk exposure associated with reputational risk. The securitization of assets whose performance has deteriorated may result in a negative market reaction that could increase the spreads on an institution's subsequent issuances. In order to avoid a possible increase in their funding costs, institutions have supported their securitization transactions by improving the performance of the securitized asset pool. This has been accomplished, for example, by selling discounted receivables or adding higher quality assets to the securitized asset pool. Thus, an institution's voluntary support of its securitization in order to protect its reputation can adversely affect the sponsoring/issuing organization's earnings and capital.

These and other methods of improving the credit quality of securitized asset pools have been used recently by banking organizations providing voluntary support to their securitizations, especially for credit card master trusts. Such actions generally are taken to avoid either a rating downgrade or an early amortization of the outstanding asset-backed securities.

Liquidity Risks

The existence of recourse provisions in asset sales, the extension of liquidity facilities to securitization programs, and the early amortization triggers of certain asset securitization transactions can involve significant liquidity risk to institutions engaged in these secondary market credit activities. Institutions should ensure that their liquidity contingency plans fully incorporate the potential risk posed by their secondary market credit activities. With the issuance of new asset-backed

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

securities, the issuing banking organization should determine the potential effect on its liquidity at the inception of each transaction and throughout the life of the securities in order to better ascertain its future funding needs.

An institution's contingency plans should take into consideration the need to obtain replacement funding, and specify the possible alternative funding sources, in the event of the amortization of outstanding asset-backed securities. This is particularly important for securitizations with revolving receivables, such as credit cards, where an early amortization of the asset-backed securities could unexpectedly return the outstanding balances of the securitized accounts to the issuing institution's balance sheet. It should be recognized that an early amortization of a banking organization's asset-backed securities could impede its ability to fund itself--either through re-issuance or other borrowings--since the institution's reputation with investors and lenders may be adversely affected.

Incorporating the Risks of Secondary Market Credit Activities Into Risk Management

Supervisors should verify that an institution incorporates in its overall risk management system the risks involved in its secondary market credit activities. The system should entail: 1) inclusion of risk exposures in reports to the institution's senior management and board to ensure proper management oversight; 2) adoption of appropriate policies, procedures, and guidelines to manage the risks involved; 3) appropriate measurement and monitoring of risks; and 4) assurance of appropriate internal controls to verify the integrity of the management process with respect to these activities. The formality and sophistication with which the risks of these activities are incorporated into an institution's risk management system should be commensurate with the nature and volume of its secondary market credit activities. Institutions with significant activities in this area are expected to have more elaborate and formal approaches to manage the risk of their secondary market credit activities.

Both the board of directors and senior management are responsible for ensuring that they fully understand the degree to which the organization is exposed to the credit, market, liquidity, operational, legal, and reputational risks involved in the institution's secondary market credit activities. They are also responsible for ensuring that the formality and sophistication of the techniques used to manage these risks are commensurate with the level of the organization's activities. The board should approve all significant polices relating to the management of risk arising from secondary market credit activities and should ensure that the risk exposures are fully incorporated in board reports and risk management reviews.

Senior management is responsible for ensuring that the risks arising from secondary market credit activities are adequately managed on both a short-term and

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

long-run basis. Management should ensure that there are adequate policies and procedures in place for incorporating the risk of these activities into the overall risk management process of the institution. Such policies should ensure that the economic substance of the risk exposures generated by these activities is fully recognized and appropriately managed. In addition, banking organizations involved in securitization activities should have appropriate policies, procedures, and controls with respect to underwriting asset-backed securities; funding the possible return of revolving receivables (e.g., credit card receivables and home equity lines); and establishing limits on exposures to individual institutions, types of collateral, and geographic and industrial concentrations. Lead banking organizations in loan syndications should have policies and procedures in place that address whether or in what situations portions of syndications may be repurchased. Furthermore, banking organizations participating in a loan syndication should not place undue reliance on the credit analysis performed by the lead organization. Rather, the participant should have clearly defined policies and procedures to ensure that it performs its own due diligence in analyzing the risks inherent in the transaction.

An institution's management information and risk measurement systems should fully incorporate the risks involved in its secondary market credit activities. Banking organizations must be able to identify credit exposures from all secondary market credit activities, and be able to measure, quantify, and control those exposures on a fully consolidated basis. The economic substance of the credit exposures of secondary market credit activities should be fully incorporated into the institution's efforts to quantify its credit risk, including efforts to establish more formal grading of credits to allow for statistical estimation of loss probability distributions. Secondary market credit activities should also be included in any aggregations of credit risk by borrower, industry, or economic sector.

It is particularly important that an institution's information systems can identify and segregate those credit exposures arising from the institution's loan sale and securitization activities. Such exposures include the sold portions of participations and syndications; exposures arising from the extension of credit enhancement and liquidity facilities; the effects of an early amortization event; and the investment in asset-backed securities. The management reports should provide the board and senior management with timely and sufficient information to monitor the institution's exposure limits and overall risk profile.

Stress Testing

The use of stress testing, including combinations of market events that could affect a banking organization's credit exposures and securization activities, is another important element of risk management. Such testing involves identifying possible events or changes in market behavior that could have unfavorable effects on

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

the institution and assessing the organization's ability to withstand them. Stress testing should not only consider the probability of adverse events, but also likely "worst case" scenarios. Such an analysis should be done on a consolidated basis and consider, for instance, the effect of higher than expected levels of delinquencies and defaults as well as the consequences of early amortization events with respect to credit card securities that could raise concerns regarding the institution's capital adequacy and its liquidity and funding capabilities. Stress test analyses should also include contingency plans regarding the actions management might take given certain situations.

One of management's most important responsibilities is establishing and maintaining an effective system of internal controls that, among other things, enforces the official lines of authority and the appropriate separation of duties in managing the risks of the institution. These internal controls must be suitable for the type and level of risks given the nature and scope of the institution's activities. Moreover, these internal controls should provide reasonable assurance of reliable financial reporting (in published financial reports and regulatory reports), including adequate allowances or liabilities for expected losses.

Capital Adequacy

As with all risk-bearing activities, institutions should fully support the risk exposures of their secondary market credit activities with adequate capital. Banking organizations should ensure that their capital positions are sufficiently strong to support all of the risks associated with these activities on a fully consolidated basis and should maintain adequate capital in all affiliated entities engaged in these activities. The Federal Reserve's risk-based capital guidelines establish *minimum* capital ratios, and those banking organizations exposed to a high or above average degrees of risk are, therefore, expected to operate significantly above the minimum capital standards.

The current regulatory capital rules do not fully incorporate the economic substance of the risk exposures involved in many secondary market credit activities. Therefore, when evaluating capital adequacy, supervisors should ensure that banking organizations that sell assets with recourse, assume or mitigate credit risk through the use of credit derivatives, and provide direct credit substitutes and liquidity facilities to securitization programs, are accurately identifying and measuring these exposures and maintaining capital at aggregate levels sufficient to support the associated credit, market, liquidity, reputational, operational, and legal risks.

Supervisors and examiners should review the substance of secondary market transactions when assessing underlying risk exposures. For example, partial, first loss direct credit substitutes providing credit protection to a securitization transaction can, in substance, involve much the same credit risk as that involved in holding the entire asset pool on the institution's balance sheet. However, under current

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

rules, regulatory capital is explicitly required only against the amount of the direct credit substitute, which can be significantly different from the amount of capital that the institution should maintain against the concentrated credit risk in the guarantee. Supervisors and examiners should ensure that banking organizations have implemented reasonable methods for allocating capital against the economic substance of credit exposures arising from early amortization events and liquidity facilities associated with securitized transactions since such facilities are usually structured as short-term commitments in order to avoid a risk-based capital requirement, even though the inherent credit risk may be approaching that of a guarantee.[7]

If, in the supervisor's judgment, an institution's capital level is not sufficient to provide protection against potential losses from such credit exposures, this deficiency should be reflected in the banking organization's CAMELS or BOPEC ratings. Furthermore, supervisors and examiners should discuss the capital deficiency with the institution's management and, if necessary, its board of directors. Such an institution will be expected to develop and implement a plan for strengthening the organization's overall capital adequacy to levels deemed appropriate given all the risks to which it is exposed.

Please forward this letter to each state member bank, bank holding company, Edge corporation and U.S. branch or agency of a foreign bank located in your District--a suggested transmittal letter is attached. If you have any questions, please contact Roger Cole, Deputy Associate Director (202/452-2618), Tom Boemio, Supervisory Financial Analyst, (202/452-2982) or Jim Embersit, Manager, (202/452-5249).

Richard Spillenkothen
Director

[7] For further guidance on distinguishing, for risk-based capital purposes, whether a facility is a short-term commitment or a direct credit substitute, refer to SR letter 92-11, "Asset-Backed Commercial Paper Programs." Essentially, facilities that provide liquidity, but which also provide credit protection to secondary market investors, are to be treated as direct credit substitutes for purposes of risk-based capital.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 97-18 (GEN)
June 13, 1997

TO THE OFFICER IN CHARGE OF SUPERVISION
AT EACH FEDERAL RESERVE BANK

SUBJECT: Application of Market Risk Capital Requirements to Credit Derivatives

In December 1995, the Basle Supervisors Committee approved an amendment to the Basle Accord that sets forth capital requirements for exposure to general market risk for all positions held in an institution's trading account and for foreign exchange and commodity positions wherever located, as well as for specific risk of debt and equity positions held in the trading account.[1] In addition, this amendment requires capital to cover counterparty credit exposure associated with over-the-counter (OTC) derivative positions in accordance with the credit risk capital requirements set forth in the Basle Accord and implemented in the Federal Reserve's risk-based capital guidelines (12 CFR Parts 208 and 225, Appendix A). The requirements of the U.S. rules implementing the market risk amendment, contained in 12 CFR Parts 208 and 225, Appendix E,[2] were effective on an optional basis beginning January 1, 1997, with mandatory compliance for certain banking organizations with significant market risk exposure required as of January 1, 1998.[3]

[1] General market risk refers to changes in the market value of on-balance sheet assets and liabilities, and off-balance sheet items resulting from broad market movements, such as changes in the general level of interest rates, equity prices, foreign exchange rates, and commodity prices. Specific risk refers to changes in the market value of individual positions due to factors other than broad market movements and includes such risks as the credit risk of an instrument's issuer.

[2] See "Risk-Based Capital Standards: Market Risk," 61 Federal Register 47,358 (1996).

[3] The market risk amendment applies to banking organizations whose trading activity (on a worldwide, consolidated basis) equals 1) 10 percent or more of total assets or 2) $1 billion or more. Trading activity means the gross sum of trading assets and liabilities as reported in the bank's most recent quarterly Consolidated Report of Condition and Income (Call Report). Banking supervisors may require an institution to comply with the market risk capital requirements if deemed necessary for safety and soundness purposes. An institution that does not meet the applicability criteria may, subject to supervisory approval, comply voluntarily with the amendment.

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This SR letter provides guidance on how credit derivatives held in the trading account should be treated under the market risk capital requirements by state member banks and bank holding companies. Specifically, the SR letter defines the risks to which credit derivative transactions are exposed and sets forth the risk-based capital requirements for each type of risk. In addition, the SR letter supplements SR letter 96-17 (GEN), dated August 12, 1996, which provides a detailed discussion of the more prevalent credit derivative structures,[4] and provides guidance on a number of supervisory issues pertaining to the use of credit derivatives, including the appropriate risk-based capital treatment for credit derivatives held in the banking book. The risk-based capital guidance set forth in SR letter 96-17 will continue to apply to credit derivatives held in the trading book of banks that have not implemented the market risk capital rule.

Credit derivatives are financial instruments used to assume or mitigate the credit risk of loans and other assets through off-balance sheet transactions. Banking organizations may employ these off-balance sheet instruments either as end-users, purchasing credit protection or acquiring credit exposure from third parties, or as dealers intermediating such activity. End-user banking organizations may use credit derivatives to reduce credit concentrations, improve portfolio diversification, or manage overall credit risk exposure. Although the market for these instruments is relatively small, banking organizations are entering into credit derivative transactions with increasing frequency.

U.S. banking supervisors, together with banking supervisors abroad, have been assessing the use and development of credit derivatives, as well as risk management practices and risk modeling at major banks for some time. U.S. and international supervisors intend to continue studying credit derivatives in the marketplace, which may result in additional or revised guidance on regulatory issues, including the appropriate banking book and trading book capital treatment.

Definitions

Credit derivative transactions held in the trading account are exposed to counterparty credit risk and general market risk. In addition, they are exposed to the specific risk of the underlying reference asset. This specific risk is the same as that associated with a cash position in a loan or bond. Table 1 defines each of the three risks as they relate to derivatives.

This SR letter describes the three risk elements of credit derivatives against which banking organizations should hold risk-based capital, based upon three defined types of positions. These three position types are 1) open positions, 2) matched positions, and 3) offsetting positions. Matched positions encompass long and short positions in

[4] These include total rate of return swaps, credit default swaps and credit-linked notes.

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Definitions

- Counterparty Credit Risk - The risk arising from the possibility that the counterparty may default on amounts owed on a derivative transactions.

- General Market Risk - The risk arising from changes in the reference asset's value due to broad market movements such as changes in the general level of interest rates.

- Specific Risk - The risk arising from changes in the reference asset's value due to factors other than broad market movements, including changes in the reference asset's credit risk.

Table 1

identical credit derivative structures over *identical* maturities referencing *identical* assets.[5] Offsetting positions encompass long and short credit derivative positions in reference assets of the same obligor with the same level of seniority in bankruptcy. Offsetting positions include positions that would otherwise be matched except that the long and short credit derivative positions have different maturities or one leg is a total return product and the other is purely a default product (i.e., credit default swap). Positions that do not qualify as matched or offsetting are open positions. Table 2 identifies which of the three risk elements is present for each of the three defined position types.

[5] Position structures are matched only if both legs are either total rate of return products or credit default products. Matching treatment also requires that default definitions include the same credit events, and that materiality thresholds and other relevant contract terms in the matched positions are not substantially different. For purposes of this letter, cash instruments are considered total return products. Hence, a long position in a bond and a short total return swap of identical maturity referencing that bond is a matched position. If the maturities do not match, or if the swap is a credit default swap, the position is offsetting (as long as the reference asset has the same obligor and level of seniority as the bond).

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Table 2

Credit Derivatives
Market Risk Capial Framework

	Counterparty Credit Risk	General Market Risk	Specific Risk
Open Position	Y	Y	Y
Matched Position	Y	N	N
Offsetting Position	Y	Y (Some)	Y (Some)

Y - Risk is present; capital charge is indicated.
N - Risk is not present; no capital charge is indicated.

In summarizing Table 2, it is clear that all credit derivative positions create exposures to counterparties and, thus, have counterparty risk.[6] In the case of matched positions, counterparty risk is the only risk present. The matched nature of the position eliminates the general market and specific risk of the reference asset. Both open and offsetting positions have all three risk elements, but general market and specific risk are present to a significantly lesser degree in offsetting positions than in open positions.

Market Risk Capital Approach for Credit Derivatives in the Trading Account

General Market Risk

Beginning January 1, 1998, a banking organization subject to the market risk amendment must use internal models to measure its daily value-at-risk (VAR) for covered positions located in its trading account and for foreign exchange and commodity positions

[6] An exception involves written options where the seller receives the premium at origination. In such instances, risk-based capital is not required since there is no counterparty risk to the banking organization writing the option.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

wherever located.[7] General market risk capital charges for credit derivatives are to be calculated using internal models in the same manner as for cash market debt instruments.

Specific Risk

As set out in the market risk capital rule, if a banking organization can demonstrate to the Federal Reserve that its internal model measures the specific risk of its debt and equity positions in the trading account, and this measure is included in its VAR-based capital charge, then the bank may reduce or eliminate its specific risk capital charges, subject to the minimum specific risk charges prescribed in the amendment.[8] This SR letter applies the same treatment to credit derivatives. The Federal Reserve intends to continue discussions with the banking industry on the measurement and management of specific risk.

Alternatively, standard specific risk charges for credit derivatives may be calculated using the specific risk weighting factors that apply to the referenced asset. As set forth in the market risk amendment, matched positions do not incur specific risk charges. For offsetting positions, standard specific risk charges are to be applied only against the largest leg of the offsetting credit derivative and cash positions.[9] That is, standard specific risk charges are not to be applied to each leg separately. Open positions attract the same standard specific risk charges that a cash position in the reference asset would incur.

Counterparty Risk

Counterparty risk is calculated by summing the mark-to-market value of the credit derivative and an "add-on" factor representing potential future credit exposure. Under the Basle Accord and the Federal Reserve's risk-based capital guidelines, the add-on factor is a specified percentage of notional amount, depending on the type and maturity of the derivative transaction. In order to calculate a capital charge for counterparty risk for credit derivatives, an appropriate add-on factor is needed. However, the current matrix of add-on factors in the Basle Accord and the Federal Reserve's guidelines does not include a specific factor for credit or other derivatives for which the underlying transaction is a debt instrument.

[7] An institution's VAR is the estimate of the maximum amount that the value of covered positions could decline during a fixed holding period within a stated confidence level. Covered positions encompass all positions in a banking organization's trading account, as well as all foreign exchange and commodity positions, whether or not in the trading account. Positions include on-balance-sheet assets and liabilities and off-balance sheet items. See 12 CFR Parts 208 and 225, Appendix E.

[8] The amount of capital held to cover specific risk must be equal to at least 50 percent of the specific risk charge that would result from the standardized calculation.

[9] Exposure is measured by notional amount for credit derivatives or by market value for cash instruments.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Based on an analysis of typical debt instruments underlying credit derivative transactions, the Federal Reserve has determined that the following add-on factors will apply to credit derivative transactions. The equity add-on factors are to be used when the reference asset is an investment grade instrument (or its bank-internal equivalent), or where the reference asset is unrated but well-secured by high-quality collateral. The commodity add-on factor is to be used when the reference asset is either below investment grade (or its bank-internal equivalent) or is unrated and unsecured.

If you have questions on the supervisory or capital issues related to credit derivatives, please contact Roger Cole, Deputy Associate Director (202/452-2618), Norah Barger, Manager (202/452-2402), or Tom Boemio, Supervisory Financial Analyst (202/452-2982).

Richard Spillenkothen
Director

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 96-30 (SUP)
November 7, 1996

TO THE OFFICER IN CHARGE OF SUPERVISION
AT EACH FEDERAL RESERVE BANK

SUBJECT: Risk-Based Capital Treatment for Spread Accounts that Provide Credit Enhancement for Securitized Receivables

Overview

This letter provides guidance on the risk-based capital treatment for transactions in which a bank holding company sells assets and recognizes on its balance sheet a spread account that furnishes credit enhancement to the assets old. Such transactions are most commonly found in connection with the securitization of credit card receivables and are deemed to be asset sales with recourse. The treatment set forth in this letter is a clarification and reiteration of existing policy and is consistent with the effective risk-based capital treatment of spread accounts for commercial banks.

In accordance with the Federal Reserve's capital adequacy guidelines, a bank holding company that has recorded on its balance sheet a spread account associated with assets it has sold must hold 8 percent capital against the full amount of assets transferred, and not just against the amount of the spread account. However, in most cases, the total capital charge may be limited to the dollar amount of the spread account in accordance with the low level recourse capital treatment.

Role of Spread Accounts in Absorbing Losses

A spread account is an escrow account that a banking organization typically establishes to absorb losses on receivables it has sold in a securitization, thereby providing credit enhancement to investors in the securities backed by the receivables. The account is funded up to a pre-determined specified amount by the excess spread created when the expenses of the trust -- including the yield passed on to investors, the servicing fee (typically 200 basis points for credit card

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receivables), and the expected credit losses -- are less than the yield earned on the assets in the pool. The funds in the escrow or spread account are used to absorb losses on the underlying receivables and must be exhausted before investors in the securities backed by those receivables are exposed to losses.

Regulatory Reporting and Capital Treatment

Despite the fact that holding companies file their regulatory reports (e.g., the FR Y-9C) in accordance with generally accepted accounting principles (GAAP), which allows transferred assets to be removed from the balance sheet even if the related spread amount is booked, these assets are still subject to a capital charge under the Federal Reserve's risk-based capital guidelines for bank holding companies.

Under the bank holding company risk-based capital guidelines (12 CFR 225, appendix A), a sale of assets is not deemed to be a true sale unless it meets the same criteria that apply to banks. These criteria are set forth in the instructions to the commercial bank Reports of Income and Condition (Call Reports). The Call Report instructions state that a transfer of assets is not a true sale for capital adequacy purposes unless the transferring institution (1) retains no risk of loss from the assets transferred from any cause and (2) has no obligation to any party for the payment of principal or interest on the assets transferred.[1]

Since a bank holding company is at risk of loss in a transaction in which it has transferred assets and recorded on its balance sheet a spread account serving as a credit enhancement, the company must treat the transaction as an asset sale with recourse for risk-based capital purposes. Under the guidelines, capital must be held against the entire risk-weighted amount of any assets sold with recourse. Since assets that bank holding companies have sold with recourse usually have been removed from the balance sheet, the risk-weighted amount of such assets is typically calculated by converting the assets to an on-balance sheet credit equivalent amount and assigning that amount to the appropriate risk category.

For asset transfers that involve recognition of a spread account on the balance sheet, a bank holding company may use the low level recourse capital

[1] A bank that transfers loans "without recourse" and maintains a residual interest in an escrow account established to absorb losses on the transferred loans (e.g., a spread account) has not retained the risk of loss or an obligation for payment for purposes of the Call Report as long as the spread account is not recognized on the balance sheet. (See Federal Financial Institution Examination Council (FFIEC) press release dated November 26, 1986.)

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treatment that applies to asset sales with recourse in general.[2] Under the low level recourse rule, a banking organization that contractually limits its maximum recourse obligation to less than the full effective risk-based capital requirement for the transferred assets would be required to hold risk-based capital equal only to the contractual maximum amount of its recourse obligation. For example, under this dollar-for-dollar capital requirement, the capital charge for a 100 percent risk-weighted asset transferred with 1 percent recourse would be 1 percent of the value of the transferred assets, rather than the 8 percent requirement that would be applied to the assets if they were retained on the transferring institution's balance sheet.

The size of spread accounts (relative to the assets that they protect) is often smaller than the effective risk-based capital requirement, e.g., 8 percent, on the securitized assets. Thus, the low level recourse capital rule typically would apply. In addition, an institution may reduce the dollar-for-dollar capital charge held against the recourse exposure on assets transferred with low level recourse for a transaction recognized as a sale under GAAP and for regulatory reporting purposes by the balance of any associated non-capital GAAP recourse liability account.[3]

In March 1997, commercial banks will begin filing their Call Reports in accordance with GAAP. However, this reporting change will not change the effective treatment of recourse transactions under the banking agencies' risk-based capital guidelines.[4] To compensate for the change in reporting treatment beginning with the March 1997 Call Report, the Federal Reserve and the other banking agencies intend to apply to commercial banks the risk-based capital off-balance sheet treatment for recourse transactions that is currently applied to bank holding companies. Included in the application of this treatment are transactions where the transferring institution has recognized on its balance sheet a spread account that provides credit protection to the transferred assets.

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[2] See parts 208 and 225, appendix A, section III.B for the specific capital requirements that apply to small business obligations that are transferred with recourse by qualifying banking organizations.

[3] Under GAAP, the transferor must establish a separate non-capital recourse liability account that is equal to the estimated probable losses under the recourse provision.

[4] Under the current regulatory reporting requirements for commercial banks set forth in the instructions to the Call Reports, banks selling assets with recourse generally are required to treat the transaction as a financing. Thus, until the March Call Report date, assets a bank has sold with recourse typically are incorporated directly into the on-balance sheet portion of the bank's calculation of its risk-weighted assets.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

In order to facilitate the dissemination of this guidance to bank holding companies engaged in securitization activities, a suggested transmittal letter is attached. If you have any questions, please contact Tom Boemio, Supervisory Financial Analyst, at 202/452-2982 or David Elkes, Supervisory Financial Analyst, at 202/452-5218.

Richard Spillenkothen
Director

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 96-17 (GEN)
August 12, 1996

TO THE OFFICER IN CHARGE OF SUPERVISION
AT EACH FEDERAL RESERVE BANK

SUBJECT: Supervisory Guidance for Credit Derivatives

Overview

In recent months, examiners have encountered credit derivative transactions at several dealer and end-user banking organizations. Credit derivatives are financial instruments used to assume or lay off credit risk on loans and other assets, sometimes to only a limited extent. Banking organizations are increasingly employing these off-balance sheet instruments either as end-users, purchasing credit protection from -- or providing credit protection to -- third parties, or as dealers intermediating such protection. Banking organizations use credit derivatives to reduce credit concentrations and manage overall credit risk exposure. Although the market for these instruments is still quite small, banking organizations are entering into credit derivative transactions with increasing frequency. Questions have been raised about how credit derivatives should be treated in light of existing supervisory capital and reporting rules and prudential guidance.

This SR letter provides guidance on supervisory issues pertaining to the use of credit derivatives for such purposes as risk management, yield enhancement, reduction of credit concentrations, or diversification of overall risk. It is essential that banks, bank holding companies, and U.S. branches and agencies of foreign banks that use credit derivatives establish sound risk management policies and procedures and effective internal controls. Federal Reserve staff will continue to review credit derivatives as their use and structure evolve in the marketplace.

The analytical techniques used to manage credit derivatives may provide new insights into credit risk and its management. For this reason, U.S. banking supervisors, as well as banking supervisors abroad, intend to continue assessing the use and development of credit derivatives in the marketplace. Discussions with the other U.S. and international banking supervisors may result in

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

revised or additional guidance on the appropriate supervisory treatment of credit derivatives. This is particularly true with respect to the treatment of dealer banking organizations' positions in credit derivatives and how such transactions, if held in banks' trading books, would be treated as market-risk instruments for capital purposes once the proposed market risk capital rules become effective.[1]

Background

Credit derivatives are off-balance sheet arrangements that allow one party (the "beneficiary") to transfer the credit risk of a "reference asset," which it often actually owns, to another party (the "guarantor").[2] This arrangement allows the guarantor to assume the credit risk associated with the reference asset without directly purchasing it. Unlike traditional guarantee arrangements, credit derivatives transactions often are documented using master agreements developed by the International Swaps and Derivatives Association (ISDA) similar to those governing swaps or options.

Under some credit derivative arrangements, the beneficiary may pay the total return on a reference asset, including any appreciation in the asset's price, to a guarantor in exchange for a spread over funding costs plus any depreciation in the value of the reference asset (a "total rate-of-return swap"). Alternatively, a beneficiary may pay a fee to the guarantor in exchange for a guarantee against any loss that may occur if the reference asset defaults (a "credit default swap"). These

[1] Once the proposed market risk capital rules are effective, credit derivatives that are held in a bank's trading book would be subject to those rules. These rules are scheduled to be effective by January 1, 1998, although supervisors will have the discretion to permit institutions to adopt the rules early. Under the market risk rules for derivatives, the risk of the reference asset generally is included in the calculation of general market risk and specific risk. In addition, capital is required to cover the counterparty credit exposure on the transaction. The assumptions that were used in the development of the specific risk factors included in the proposed market risk capital rules and the potential future exposure conversion factors under the credit risk capital rules, however, did not take into account credit derivatives and may need to be reviewed if the market risk capital treatment is applied to these instruments.

[2] For purposes of this supervisory letter, where the beneficiary owns the reference asset it will be referred to as the "underlying" asset. However, in some cases, the reference asset and the underlying asset are not the same. For example, the credit derivative contract may reference the performance of an ABC Company bond, while the beneficiary bank may actually own an ABC Company loan.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

two structures are the most prevalent types of credit derivatives and are described in greater detail in the Appendix.[3]

The credit derivative market has been evolving rapidly, and credit derivative structures are likely to take on new forms. For example, very recently a market has developed for put options on specific corporate bonds or loans. While the payoffs of these puts are expressed in terms of a strike price, rather than a default event, if the strike price is sufficiently high, credit risk effectively could be transferred from the buyer of the put to the writer of the put.

Overview of Guidance

In reviewing credit derivatives, examiners should consider the credit risk associated with the reference asset as the primary risk, as they do for loan participations or guarantees. A banking organization providing credit protection through a credit derivative can become as exposed to the credit risk of the reference asset as it would if the asset were on its own balance sheet. Thus, for supervisory purposes, the exposure generally should be treated as if it were a letter of credit or other off-balance sheet guarantee.[4] This treatment would apply, for example, in determining an institution's overall credit exposure to a borrower for purposes of evaluating concentrations of credit. The institution's overall exposure should include exposure it assumes by acting as a guarantor in a credit derivative transaction where the borrower is the obligor of the reference asset.[5]

In addition, banking organizations providing credit protection through a credit derivative should hold capital and reserves against their exposure to the reference asset. This broad principle holds for all credit derivatives, except for credit derivative contracts that incorporate periodic payments for depreciation or appreciation, including most total rate of return swaps. For these transactions, the guarantor can deduct the amount of depreciation paid to the beneficiary from the

[3] The Appendix provides a detailed discussion on the mechanics and cash flows of the two most prevalent types of credit derivatives; guidance on how credit derivatives are to be treated for purposes of regulatory capital and other supervisory purposes, such as credit exposure, asset classification, allowance for loan and lease losses, and transactions involving affiliates; and guidance on the appropriate accounting and regulatory reporting treatment for credit derivatives.

[4] Credit derivatives that are based on a broad based index, such as the Lehman Brothers Bond Index or the S&P 500 stock index, could be treated for capital and other supervisory purposes as a derivative contract. This determination should be made on a case-by-case basis.

[5] Legal lending limits are established by the individual states for state-chartered banks and by the Office of the Comptroller of the Currency (OCC) for national banks. The determination of whether credit derivatives are guarantees to be included in the legal lending limits are the purview of the state banking regulators and the OCC.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

notional amount of the contract in determining the amount of reference exposure subject to a capital charge.

In some cases, such as total rate of return swaps, the guarantor also is exposed to the credit risk of the counterparty, which for derivative contracts generally is measured as the replacement cost of the credit derivative transaction plus an add-on for the potential future exposure of the derivative to market price changes. For banks acting as dealers that have matching offsetting positions, the counterparty risk stemming from credit derivative transactions could be the principal risk to which the dealer banks are exposed.

In reviewing a credit derivative entered into by a beneficiary banking organization the examiner should review the organization's credit exposure to the guarantor, as well as to the reference asset -- if the asset is actually owned by the beneficiary. The degree to which a credit derivative, unlike most other credit guarantee arrangements, transfers the credit risk of an underlying asset from the beneficiary to the guarantor may be uncertain or limited. The degree of risk transference depends upon the terms of the transaction. For example, some credit derivatives are structured so that a payout only occurs when a pre-defined event of default or a downgrade below a pre-specified credit rating occurs. Others may require a payment only when a defined default event occurs and a pre-determined materiality (or loss) threshold is exceeded. Default payments themselves may be based upon an average of dealer prices for the reference asset during some period of time after default using a pre-specified sampling procedure or may be specified in advance as a set percentage of the notional amount of the reference asset. Finally, the term of many credit derivative transactions is shorter than the maturity of the underlying asset and, thus, provides only temporary credit protection to the beneficiary.

Examiners must ascertain whether the amount of credit protection a beneficiary receives by entering into a credit derivative is sufficient to warrant treatment of the derivative as a guarantee for regulatory capital and other supervisory purposes. Those arrangements that provide virtually complete credit protection to the underlying asset will be considered effective guarantees for purposes of asset classification and risk-based capital calculations. On the other hand, if the amount of credit risk transferred by the beneficiary is severely limited or uncertain, then the limited credit protection provided by the derivative should not be taken into account for these purposes.

In this regard, examiners should carefully review credit derivative transactions in which the reference asset is not identical to the asset actually owned by the beneficiary banking organization. In order to determine that the derivative contract provides effective credit protection, the examiner must be satisfied that the reference asset is an appropriate proxy for the loan or other asset

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

whose credit exposure the banking organization intends to offset. In making this determination, examiners should consider, among other factors, whether the reference asset and owned asset have the same obligor and seniority in bankruptcy and whether both contain mutual cross-default provisions.

The supervisory and regulatory treatment that is currently outlined will continue to be reviewed to ensure the appropriate treatment for credit derivatives transactions. Such a review will take into consideration the potential offsetting of credit exposures within the portfolio and how the proposed market risk capital rules would be applied to credit derivative transactions once they become effective.

An institution should not enter into credit derivative transactions unless its management has the ability to understand and manage the credit and other risks associated with these instruments in a safe and sound manner. Accordingly, examiners should determine the appropriateness of these instruments on an institution-by-institution basis. Such a determination should take into account management's expertise in evaluating such instruments; the adequacy of relevant policies, including position limits; and the quality of the institution's relevant information systems and internal controls.[6]

If you have any questions on the supervisory or capital issues related to credit derivatives, please contact Norah Barger, Manager (202/452-2402), or Tom Boemio, Supervisory Financial Analyst (202/452-2982). Questions concerning the accounting treatment for these products may be addressed to Charles Holm, Project Manager (202/452-3502), or Greg Eller, Supervisory Financial Analyst (202/452-5277).

Richard Spillenkothen
Director

[6] Further guidance on examining the risk management practices of banking organizations, including guidance on derivatives, which examiners may find helpful in reviewing an organization's management of its credit derivative activity, is contained in the Commercial Bank Examination Manual; Bank Holding Company Supervision Manual; Trading Activities Manual; SR Letter 93-69 (12/20/93), "Examining Risk Management and Internal Controls for Trading Activities of Banking Organizations;" SR Letter 94-45 (8/5/94), "Supervisory Policies Relating to Structured Notes;" SR Letter 95-17 (3/28/95), "Evaluating the Risk Management and Internal Controls of Securities and Derivatives Contracts Used in Nontrading Activities;" and SR Letter 95-51 (11/14/95), "Rating the Adequacy of Risk Management Processes and Internal Controls at State Member Banks and Bank Holding Companies."

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Appendix

Supervisory and Accounting Guidance Relating to Credit Derivatives

I. Description of Credit Derivatives

The most widely used types of credit derivatives to date are credit default swaps and total rate-of-return (TROR) swaps.[1] While the timing and structure of the cash flows associated with credit default and TROR swaps differ, the economic substance of both arrangements is that they seek to transfer the credit risk on the asset(s) referenced in the transaction.

The use of credit derivatives may allow a banking organization to mitigate its concentration to a particular borrower or industry without severing the customer relationship. In addition, organizations that are approaching established in-house limits on counterparty credit exposure could continue to originate loans to a particular industry and use credit derivatives to transfer the credit risk to a third party. Furthermore, institutions may use credit derivatives to diversify their portfolios by assuming credit exposures to different borrowers or industries without actually purchasing the underlying assets. Nonbank institutions may serve as counterparties to credit derivative transactions with banks in order to gain access to the commercial bank loan market. These institutions either do not lend or do not have the ability to administer a loan portfolio.

Credit Default Swaps

The purpose of a credit default swap, as its name suggests, is to provide protection against credit losses associated with a default on a specified reference asset. The swap purchaser, i.e., the beneficiary, "swaps" the credit risk with the provider of the swap, i.e., the guarantor. While the transaction is called a "swap," it is very similar to a guarantee or financial standby letter of credit.

[1] Another less common form of credit derivative is the credit linked note which is an obligation that is based on a reference asset. Credit linked notes are similar to structured notes with embedded credit derivatives. The payment of interest and principal are influenced by credit indicators rather than market price factors. If there is a credit event, the repayment of the bond's principal is based on the price of the reference asset. When reviewing these transactions, examiners should consider the purchasing bank's exposure to the underlying reference asset as well as the exposure to the issuing entity.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

In a credit default swap, illustrated in Figure 1, the beneficiary (Bank A) agrees to pay to the guarantor (Bank B) a fee typically amounting to a certain number of basis points on the par value of the reference asset either quarterly or annually. In return, the guarantor agrees to pay the beneficiary an agreed upon, market-based, post-default amount or a predetermined fixed percentage of the value of the reference asset if there is a default. The guarantor makes no payment until there is a default. A default is strictly defined in the contract to include, for example, bankruptcy, insolvency, or payment default, and the event of default itself must be publicly verifiable. In some instances, the guarantor is not obliged to make any payments to the beneficiary until a pre-established amount of loss has been exceeded in conjunction with a default event; this is often referred to as a materiality threshold.

The swap is terminated if the reference asset defaults prior to the maturity of the swap. The amount owed by the guarantor is the difference between the reference asset's

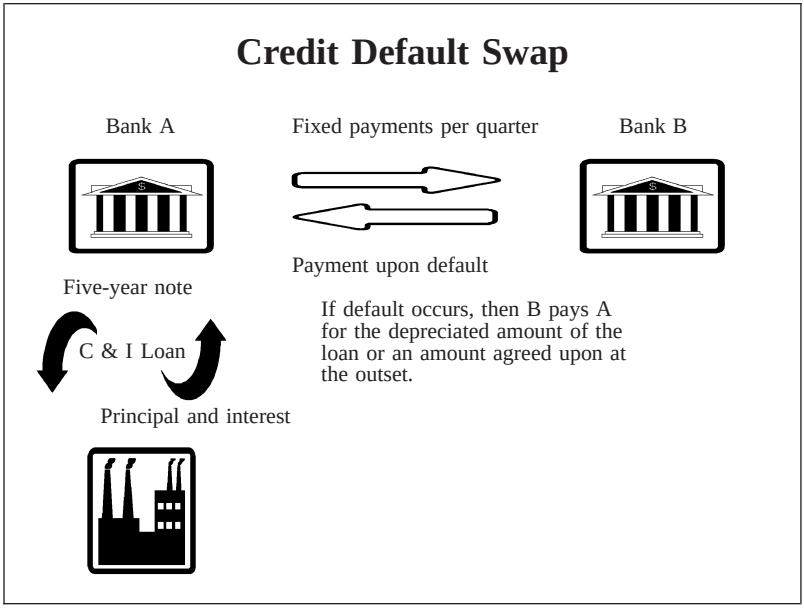

Figure 1 Credit Default Swap Cash Flow Diagram.

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

initial principal (or notional) amount and the actual market value of the defaulted, reference asset. The methodology for establishing the post-default market value of the reference asset should be set out in the contract. Often, the market value of the defaulted reference asset may be determined by sampling dealer quotes. The guarantor may have the option to purchase the defaulted, underlying asset and pursue a workout with the borrower directly, an action it may take if it believes that the "true" value of the reference asset is higher than that determined by the swap pricing mechanism. Alternatively, the swap may call for a fixed payment in the event of default, for example, 15 percent of the notional value of the reference asset.

Total Rate-of-Return Swap

In a total rate-of-return (TROR) swap, illustrated in Figure 2, the beneficiary (Bank A) agrees to pay the guarantor (Bank B) the "total return" on the reference

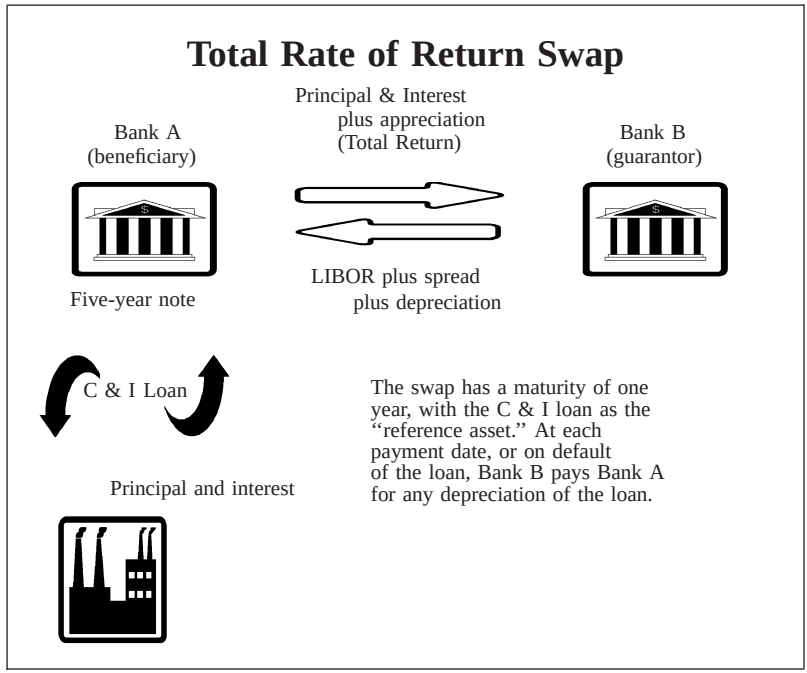

Figure 2 Total Return Swap Cash Flow Diagram

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asset, which consists of all contractual payments, as well as any appreciation in the market value of the reference asset. To complete the swap arrangement, the guarantor agrees to pay LIBOR plus a spread and any depreciation to the beneficiary.[2] The guarantor in a TROR swap could be viewed as having synthetic ownership of the reference asset since it bears the risks and rewards of ownership over the term of the swap.

At each payment exchange date (including when the swap matures) -- or upon default, at which point the swap may terminate -- any depreciation or appreciation in the amortized value of the reference asset is calculated as the difference between the notional principal balance of the reference asset and the "dealer price."[3] The dealer price is generally determined either by referring to a market quotation source or by polling a group of dealers and reflects changes in the credit profile of the reference obligor and reference asset.

If the dealer price is less than the notional amount (i.e., the hypothetical original price of the reference asset) of the contract, then the guarantor must pay the difference to the beneficiary, absorbing any loss caused by a decline in the credit quality of the reference asset.[4] Thus, a TROR swap differs from a standard direct credit substitute in that the guarantor is guaranteeing not only against default of the reference obligor, but also against a deterioration in that obligor's credit quality, which can occur even if there is no default.

II. Supervisory Issues Relating to Credit Derivatives Risk-Based Capital Treatment

For purposes of risk-based capital, credit derivatives generally are to be treated as off-balance sheet direct credit substitutes. The notional amount of the contract should be converted at 100 percent to determine the credit equivalent amount to be included in risk weighted assets of the guarantor.[5] A banking organization providing a

[2] The reference asset is often a floating rate instrument, e.g., a prime-based loan. Thus, if both sides of a TROR swap are based on floating rates, interest rate risk is effectively eliminated with the exception of some basis risk.

[3] Depending upon contract terms, a TROR swap may not terminate upon default of the reference asset. Instead, payments would continue to be made on subsequent payment dates based on the reference asset's post-default prices until the swap's contractual maturity.

[4] As in a credit default swap, the guarantor may have the option of purchasing the underlying asset from the beneficiary at the dealer price and trying to collect from the borrower directly.

[5] Guarantor banks which have made cash payments representing depreciation on reference assets may deduct such payments from the notional amount when computing credit equivalent amounts for capital purposes. For example, if a guarantor bank makes a depreciation payment of $10 on a $100 notional total rate-of-return swap, the credit equivalent amount would be $90.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

guarantee through a credit derivative transaction should assign its credit exposure to the risk category appropriate to the obligor of the reference asset or any collateral. On the other hand, a banking organization that owns the underlying asset upon which effective credit protection has been acquired through a credit derivative may under certain circumstances assign the unamortized portion of the underlying asset to the risk category appropriate to the guarantor, e.g., the 20 percent risk category if the guarantor is a bank.

Whether the credit derivative is considered an eligible guarantee for purposes of risk-based capital depends upon the degree of credit protection actually provided. As explained earlier, the amount of credit protection actually provided by a credit derivative may be limited depending upon the terms of the arrangement. In this regard, for example, a relatively restrictive definition of a default event or a materiality threshold that requires a comparably high percentage of loss to occur before the guarantor is obliged to pay could effectively limit the amount of credit risk actually transferred in the transaction. If the terms of the credit derivative arrangement significantly limit the degree of risk transference, then the beneficiary bank cannot reduce the risk weight of the "protected" asset to that of the guarantor bank. On the other hand, even if the transfer of credit risk is limited, a banking organization providing limited credit protection through a credit derivative should hold appropriate capital against the underlying exposure while it is exposed to the credit risk of the reference asset.

Banking organizations providing a guarantee through a credit derivative may mitigate the credit risk associated with the transaction by entering into an offsetting credit derivative with another counterparty, a so-called "back-to-back" position. Organizations that have entered into such a position may treat the first credit derivative as guaranteed by the offsetting transaction for risk-based capital purposes. Accordingly, the notional amount of the first credit derivative may be assigned to the risk category appropriate to the counterparty providing credit protection through the offsetting credit derivative arrangement, e.g., the 20 percent risk category if the counterparty is an OECD bank.

In some instances, the reference asset in the credit derivative transaction may not be identical to the underlying asset for which the beneficiary has acquired credit protection. For example, a credit derivative used to offset the credit exposure of a loan to a corporate customer may use a publicly-traded corporate bond of the customer as the reference asset, whose credit quality serves as a proxy for the on-balance sheet loan. In such a case, the underlying asset will still generally be considered guaranteed for capital purposes as long as both the underlying asset and the reference asset are obligations of the same legal entity and have the same level of seniority in bankruptcy. In addition, banking organizations offsetting credit exposure in this manner would be obligated to demonstrate to examiners that there is a high degree of correlation between the two instruments; the reference instrument is a reasonable and sufficiently liquid proxy for the underlying asset so that the instruments can be reasonably expected to behave in a similar manner in the event of default; and, at a minimum, the reference asset and underlying asset are subject to mutual cross-default provisions. A banking organization that uses

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

a credit derivative, which is based on a reference asset that differs from the protected underlying asset, must document the credit derivative being used to offset credit risk and must link it directly to the asset or assets whose credit risk the transaction is designed to offset. The documentation and the effectiveness of the credit derivative transaction are subject to examiner review. Banking organizations providing credit protection through such arrangements must hold capital against the risk exposures that are assumed.

Some credit derivative transactions provide credit protection for a group or basket of reference assets and call for the guarantor to absorb losses on only the first asset in the group that defaults. Once the first asset in the group defaults, the credit protection for the remaining assets covered by the credit derivative ceases. If examiners determine that the credit risk for the basket of assets has effectively been transferred to the guarantor and the beneficiary banking organization owns all of the reference assets included in the basket, then the beneficiary may assign the asset with the smallest dollar amount in the group -- if less than or equal to the notional amount of the credit derivative -- to the risk category appropriate to the guarantor. Conversely, a banking organization extending credit protection through a credit derivative on a basket of assets must assign the contract's notional amount of credit exposure to the highest risk category appropriate to the assets in the basket.

Other Supervisory Issues

The decision to treat credit derivatives as guarantees could have significant supervisory implications for the way examiners treat concentration risk, classified assets, the adequacy of the allowance for loan and lease losses (ALLL), and transactions involving affiliates. Examples of how credit derivatives that effectively transfer credit risk could affect supervisory procedures are discussed below.

Credit Exposure

For internal credit risk management purposes, banks are encouraged to develop policies to determine how credit derivative activity will be used to manage credit exposures. For example, a bank's internal credit policies may set forth situations in which it is appropriate to reduce credit exposure to an underlying obligor through credit derivative transactions. Such policies need to address when credit exposure is effectively reduced and how all credit exposures will be monitored, including those resulting from credit derivative activities.

For supervisory purposes, a concentration of credit generally exists when a bank's loans and other exposures -- e.g., fed funds sold, securities, and letters of credit -- to a single obligor, geographic area, or industry exceed 25 percent of the bank's Tier 1 capital and ALLL.[6] Examiners will not consider a bank's asset concentration to a particular

[6] See Section 2050.1 of the Commercial Bank Examination Manual.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

borrower reduced because of the existence of a non-government guarantee on one of the borrower's loans because the underlying concentration to the borrower still exists. However, examiners should consider how the bank manages the concentration, which could include the use of non-governmental guarantees. Asset concentrations are to be listed in the examination report to highlight that the ultimate risk to the bank stems from these concentrations, although the associated credit risk may be mitigated by the existence of non-governmental guarantees.

Any non-government guarantee will be included with other exposures to the guarantor to determine if there is an asset concentration with respect to the guarantor. Thus, the use of credit derivatives will increase the beneficiary's concentration exposure to the guarantor without reducing concentration risk of the underlying borrower. Similarly, a guarantor bank's exposure to all reference assets will be included in its overall credit exposure to the reference obligor.

Classification

The criteria used to classify assets are primarily based upon the degree of risk and the likelihood of repayment as well as on the assets' potential effect on the bank's safety and soundness.[7] When evaluating the quality of a loan, examiners should review the overall financial condition of the borrower; the borrower's credit history; any secondary sources of repayment, such as guarantees; and other factors. The primary focus in the review of a loan's quality is the original source of payment. The assessment of the credit quality of a troubled loan, however, should take into account support provided by a "financially responsible guarantor."[8]

The protection provided on an underlying asset by a credit derivative from a financially responsible guarantor may be sufficient to preclude classification of the underlying asset, or reduce the severity of classification. Sufficiency depends upon the extent of credit protection that is provided. In order for a credit derivative to be considered a guarantee for purposes of determining the classification of assets, the credit risk must be transferred from the beneficiary to the financially responsible guarantor; the financially responsible guarantor must have both the financial capacity and willingness to provide support for the credit; the guarantee (i.e., the credit derivative contract) must be legally enforceable; and the guarantee must provide support for repayment of the indebtedness, in whole or in part, during the remaining term of the underlying asset.

[7] Loans that exhibit potential weaknesses are categorized as "special mention," while those with well-defined weaknesses and a distinct possibility of loss are assigned to the general category of "classified." The classified category is divided into the more specific subcategories of "substandard," "doubtful," and "loss." The amount of classified loans as a percent of capital is the standard measure of the overall quality of a bank's loan portfolio.

[8] See Section 2060.1 of the Commercial Bank Examination Manual.

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

However, credit derivatives tend to have a shorter maturity than the underlying asset being protected. Furthermore, there is uncertainty as to whether the credit derivative will be renewed once it matures. Thus, examiners need to consider the term of the credit derivative relative to the maturity of the protected underlying asset, the probability that the protected underlying asset will default while the guarantee is in force, as well as whether the credit risk has actually been transferred, when determining whether to classify an underlying asset protected by a credit derivative. In general, the beneficiary banking organization continues to be exposed to the credit risk of the classified underlying asset when the maturity of the credit derivative is shorter than the underlying asset. Thus, in situations of a maturity mismatch, the presumption may be against a diminution of the severity of the classification of the underlying asset.

For guarantor banking organizations, examiners should review the credit quality of individual reference assets in derivative contracts in the same manner as other credit instruments, such as standby letters of credit. Thus, examiners should evaluate a credit derivative, in which a banking organization provides credit protection, based upon the overall financial condition and resources of the reference obligor; the obligor's credit history; and any secondary sources of repayment, such as collateral. As a rule, exposure from providing credit protection through a credit derivative should be classified if the reference asset is classified.[9]

Allowance for Loan and Lease Losses

In accordance with the Interagency Policy Statement on the Allowance for Loan and Lease Losses (ALLL), institutions must maintain an ALLL at a level that is adequate to absorb estimated credit losses associated with the loan and lease portfolio. Federal Reserve staff continues to review accounting issues related to credit derivatives and reserving practices and may issue additional guidance upon completion of this review or when more definitive guidance is provided by accounting authorities. Likewise, consideration will be given to improving disclosures in regulatory reports to improve the transparency of credit derivatives and their effects on the credit quality of the loan portfolio, particularly if the market for credit derivatives grows significantly.

Transactions Involving Affiliates

Although examiners have not seen credit derivative transactions involving two or more legal entities within the same banking organization, the possibility of such transactions exists. Transactions between or involving affiliates raise important

[9] A guarantor banking organization providing credit protection through the use of a credit derivative on a classified asset of a beneficiary bank may preclude classification of its derivative contract by laying off the risk exposure to another financially responsible guarantor. This could be accomplished through the use of a second offsetting credit derivative transaction.

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supervisory issues, especially whether such arrangements are effective guarantees of affiliate obligations, or transfers of assets and their related credit exposure between affiliates. Thus, banking organizations should carefully consider existing supervisory guidance on interaffiliate transactions before entering into credit derivative arrangements involving affiliates, particularly when substantially the same objectives could be met using traditional guarantee instruments.

III. Accounting and Regulatory Reporting Treatment for Credit Derivatives

The instructions to the bank and bank holding company regulatory reports do not contain explicit accounting guidance on credit derivatives at this time. Furthermore, there is no authoritative accounting guidance under GAAP that directly applies to credit derivatives. Accordingly, as a matter of sound practice, banking organizations entering into credit derivative transactions should have a written accounting policy that has been approved by senior management for credit derivatives and any asset (e.g., a loan or security) for which protection has been purchased. Banking organizations are strongly encouraged to consult with their outside accountants to ensure appropriate accounting practices in this area.

Pending any authoritative guidance from the accounting profession, banking organizations should report credit derivatives in the commercial bank Reports of Condition and Income ("Call Reports") in accordance with the following instructions.[10] Beneficiary banking organizations that purchase credit protection on an asset through a credit derivative should continue to report the amount and nature of the underlying asset for regulatory reporting purposes, without regard to the credit derivative transaction. That is, all underlying assets should be reported in the category appropriate for that transaction and obligor. Furthermore, the underlying asset should be reported as past due or nonaccrual, as appropriate, in Schedule RC-N in the Call Report, regardless of the existence of an associated credit derivative transaction.

The notional amount of all credit derivatives entered into by beneficiary banking organizations should be reported in Schedule RC-L, item 13, "All other

[10] The accounting principles for the Call Reports are generally based on GAAP, and effective March 1997 will be consistent with GAAP. When supervisory concerns arise with respect to the lack of authoritative guidance under GAAP, the banking agencies may issue reporting guidance that is more specific than, but within the range of, GAAP. As indicated in the Call Report instructions, institutions should promptly seek a specific ruling from their primary federal bank supervisory agency when reporting events and transactions are not covered by the instructions.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

off-balance-sheet assets," of the Call Report.[11] Furthermore, institutions may report the amount of credit derivatives that provide effective protection for their past due and nonaccrual assets in "Optional Narrative Statement Concerning the Amounts Reported in the Reports of Condition and Income" or in item 9 of Schedule RI-E, "Other explanations" of the Call Reports.[12]

In Schedule RC-R, the carrying value of all specifically identified underlying assets that are effectively guaranteed through credit derivative transactions may be assigned to the risk category of the guarantor or obligor, whichever is lower.

Both at inception and each reporting period thereafter, banking organizations that extend credit protection through credit derivatives (guarantors) should report in the Call Report the notional amount of the credit derivatives in Schedule RC-L, item 12, "All other off-balance sheet liabilities," and Schedule RC-R, "credit equivalent amounts of off-balance sheet items," in the appropriate risk category. In addition, all liabilities for expected losses arising from these contracts should be reflected in financial statements promptly. For regulatory reporting purposes, the notional value of credit derivative transactions should not be reported as interest rate, foreign exchange, commodity, or equity derivative transactions. Institutions that have been reporting credit derivatives as such derivative transactions in the Call Report do not have to restate past reports.

In Schedule RC-R, the guarantor bank must report the carrying value of reference assets whose credit risk has been assumed in the risk category of the reference asset obligor or any guarantor, whichever is lower. For example, a bank that assumes the credit risk of a corporate bond would assign the exposure to the 100 percent risk category. However, if the bank laid off the corporate bond's credit risk by purchasing a credit derivative from another bank, the exposure would instead be assigned to the 20 percent risk category.

[11] For credit derivatives where the apparent notional amount differs from the effective notional amount, banking organizations must use the effective notional amount. For example, the effective notional amount of a credit derivative that is based on a $100 million bond, the value of which changes $2 for every $1 change in the value of the bond, is $200 million.

[12] Consideration may be given to capturing new information related to credit derivatives and other guarantee arrangements in specific line items in regulatory reports. The amount of past due and nonaccrual assets that are wholly or partially guaranteed by the U.S. Government is currently collected in regulatory reports.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 92-11
April 2, 1992

TO THE OFFICER IN CHARGE OF SUPERVISION
AT EACH FEDERAL RESERVE BANK

SUBJECT: Asset-Backed Commercial Paper Programs

A number of commercial banks have become involved in asset-backed commercial paper programs. These securitization programs enable banks to help arrange short-term financing support for their customers without having to extend credit directly. This provides borrowers with an alternative source of funding and allows banks to earn fee income for managing the programs. Banks also earn fees for providing credit and liquidity enhancements to these programs.

It is important to emphasize that involvement in such programs can have potentially significant implications for the organizations' credit and liquidity risk exposure. Therefore, examiners should be fully informed on the fundamentals of these programs, on the risks associated with these programs, and on the procedures for examining banks and inspecting bank holding companies engaged in this activity.[1]

Asset-backed commercial paper programs have been in existence since the early 1980s and have grown substantially over the last few years. These programs use a special purpose entity (SPE) to acquire receivables generally originated either by corporations or sometimes by the advising bank itself.[2] The SPEs, which are owned by third

[1] SR letter 89-12 (July 6, 1989) originally provided guidance to examiners with respect to asset securitization. Examination guidelines for the review of asset securitization and supplemental background information on securitization was distributed as an attachment to SR letter 90-16 (May 25, 1990).

[2] To date, the type of receivables that have been included in such programs are trade receivables, installment sales contracts, financing leases, and non-cancelable portions of operating leases and credit card receivables.

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

parties,[3] fund their acquisitions of receivables by issuing commercial paper that is to be repaid from the cash flow of the receivables.

Bank involvement in an asset-backed commercial paper program can range from advising the program to advising and providing all of the required credit and liquidity enhancements in support of the SPE's commercial paper. Typically, the advising bank, or an affiliate, performs a review to determine if the receivables of potential program participants (i.e., corporate sellers) are eligible for purchase by the SPE. The scope of the review is similar to that used in structuring credit card or automobile-loan-backed transactions.

Once the bank (or its affiliate) determines that a receivables portfolio has an acceptable credit risk profile, it approves the purchase of the portfolio at a discounted price by the SPE. The bank or its affiliate may also act as the operating agent for the SPE. This entails structuring the sale of receivable pools to the SPE and then overseeing the performance of the pools on an ongoing basis.

The SPE pays for the receivables by issuing commercial paper in an amount equal to the discounted price paid for the receivables. The difference between the face value of the receivables and the discounted price paid provides, as discussed below, the first level of credit protection for the commercial paper. The individual companies selling their receivables traditionally act as the servicer for receivables sold to an SPE; that is, they are responsible for collecting principal and interest payments from the obligors and passing these funds on to the SPE on a periodic basis. The SPE then distributes the proceeds to the holders of the commercial paper.

Asset-backed commercial paper programs typically have several levels of credit enhancement cushioning the commercial paper purchaser from potential loss. As noted above, the first level of loss protection is provided by the difference between the face value of the receivables purchased and the discounted price paid for them, known as a "holdback" or "overcollateralization." In some cases, the terms of the sale also give the SPE recourse back to the seller if there are defaults on the receivables. The amount of overcollateralization and recourse varies from pool to pool and depends, in part, upon the quality of the receivables in the pool and the desired credit rating for the paper to be issued. Usually, the level of credit protection provided by overcollateralization is specified in terms of some multiple of historical loss experience for similar assets.

In addition to overcollateralization and recourse, secondary credit enhancements are also customarily provided. Secondary credit enhancements include letters of credit, surety bonds, or other backup facilities that obligate a third party to purchase pools of receivables from the SPE at a specified price. In addition to credit enhancements, the

[3] Employees of an investment banking firm or some other third party generally own the equity of the SPE. The advising bank specifically avoids owning the stock as it does not want to raise the issue of whether it must consolidate the SPE for accounting purposes.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

programs also generally have liquidity enhancements to ensure that the SPE can meet maturing paper obligations.

The rating agencies typically require an SPE's commercial paper to have secondary enhancements aggregating 100 percent of the amount outstanding in order to receive the highest credit rating. These enhancements are generally structured in one of two ways. In the first, a commercial bank enters into a single agreement under which it is unconditionally obligated to provide funding for all or any portion of maturing commercial paper that an SPE cannot pay from other sources. The obligation to fund may be triggered by credit losses, a liquidity shortfall, or both. In the second, two separate a greements that jointly cover 100 percent of an SPE's outstanding commercial paper are established. The first, typically an irrevocable letter of credit, is primarily intended to absorb credit losses that exceed the first tier of credit enhancement for the commercial paper. The second arrangement is a "liquidity" facility that may or may not provide credit support. This second structure will often have a letter of credit equalling 10 to 15 percent of outstandings, with the liquidity facility covering the remaining 85 to 90 percent.

Risk-Based Capital Treatment

Generally, a single funding agreement that has no escape clause, such as a material adverse change clause, which requires a bank to unconditionally provide funding to repay maturing commercial paper when the need arises because of either credit or liquidity problems should be treated as a direct credit substitute, or guarantee. The risk-based capital guidelines specify that the full amount of such obligations are to be converted to an on-balance sheet credit equivalent amount using a 100 percent conversion factor. No part of these arrangements should be considered commitments (either short-term or long-term) for risk-based capital purposes and assigned the conversion factor of a commitment. In the case of enhancements provided by separate facilities, a 100 percent conversion factor should be assigned to a letter of credit or any other form of credit guarantee provided by the bank. The accompanying liquidity facility, on the other hand, should be treated as a commitment and assigned a 50 percent conversion factor if over one year in maturity and a zero percent conversion factor if one year or less in maturity. One of the characteristics of liquidity facilities is that such arrangements generally have some reasonable asset quality test that must be met before extending funds to the SPE to ensure that the bank is not providing credit protection.

Policies

A banking organization (i.e., a bank or bank holding company) participating in an asset-backed commercial paper program should ensure that such participation is clearly and logically integrated into its overall strategic objectives. Furthermore, the management should assure that the risks associated with the various roles that the institution may play in such programs are fully understood and that safeguards are in place to properly manage these risks.

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Appropriate policies, procedures, and controls should be established by a banking organization prior to participating in asset-backed commercial paper programs. Significant policies and procedures should be approved and reviewed periodically by the organization's board of directors. These policies and procedures should ensure that the organization follows prudent standards of credit assessment and approval regardless of the role an institution plays in an asset-backed commercial paper program. Such policies and procedures would be applicable to all pools of receivables to be purchased by the SPE as well as the extension of any credit enhancements and liquidity facilities. Procedures should include an initial, thorough credit assessment of each pool for which it had assumed credit risk, followed by periodic credit reviews to monitor performance throughout the life of the exposure. Furthermore, the policies and procedures should outline the credit approval process and establish "in-house" exposure limits, on a consolidated basis, with respect to particular industries or organizations, i.e., companies from which the SPE purchased the receivables as well as the receivable obligors themselves. Controls should include well-developed management information systems and monitoring procedures.

Institutions should analyze the receivables pools underlying the commercial paper as well as the structure of the arrangement. This analysis should include a review of:

(i) the characteristics, credit quality, and expected performance of the underlying receivables;

(ii) the banking organization's ability to meet its obligations under the securitization arrangement; and

(iii) the ability of the other participants in the arrangement to meet their obligations.

Banking organizations providing credit enhancements and liquidity facilities should conduct a careful analysis of their funding capabilities to ensure that they will be able to meet their obligations under all foreseeable circumstances. The analysis should include a determination of the impact that fulfillment of these obligations would have on their interest rate risk exposure, asset quality, liquidity position, and capital adequacy.

Reserve Banks are requested to review carefully the asset-backed commercial paper facilities provided by banks in their Districts to ensure that banks are applying, for risk-based capital purposes, the proper conversion factors to their obligations supporting asset-backed. commercial paper programs. In addition, examiners should review that the policies discussed above are operative and that institutions are adequately managing their risk exposure. A discussion of the size, effectiveness and risks associated with these programs should be included in the confidential section of the examination report if not appropriate for the open section.

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Should you have any questions, contact Roger T. Cole (202-452-2618), Rhoger H. Pugh (202-728-5883) or Thomas R. Boemio (202-452-2982).

Stephen C. Schemering
Deputy Director

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D.C. 20551

DIVISION OF BANKING
SUPERVISION AND REGULATION

SR 99-37 (SUP)
December 13, 1999

TO THE OFFICER IN CHARGE OF SUPERVISION AND APPROPRIATE SUPERVISORY AND EXAMINATION STAFF AT EACH FEDERAL RESERVE BANK AND TO CERTAIN BANKING ORGANIZATIONS SUPERVISED BY THE FEDERAL RESERVE

SUBJECT: Risk Management and Valuation of Retained Interest Arising from Securitization Activities

Significant weaknesses in the asset securitization practices of some banking organizations have raised concerns about the general level of understanding and controls in institutions that engage in such activities. Securitization activities present unique and sometimes complex risks that require the attention of senior management and the board of directors. The purpose of this SR letter is to underscore the importance of sound risk management practices in all aspects of asset securitization. This letter and the attached guidance, developed jointly by the federal banking agencies, should be distributed to state member banks, bank holding companies, and foreign banking organizations supervised by the Federal Reserve that engage in securitization activities.

Retained interests, including interest-only strips receivable, arise when a selling institution keeps an interest in assets sold to a securitization vehicle that, in turn, issues bonds to investors. Supervisors are concerned about the methods and models banking organizations use to value these interests and the difficulties in managing exposure to these volatile assets. Under generally accepted accounting principles (GAAP), a banking organization recognizes an immediate gain (or loss) on the sale of assets by recording its retained interest at fair value. The valuation of the retained interest is based upon the present value of future cash flows in excess of amounts needed to service the bonds and cover credit losses and other fees of the securitization vehicle.[1] Determination of fair value should be based on reasonable, conservative assumptions about such factors as discount rates, projected credit losses, and prepayment rates. Bank supervisors expect retained interests to be supported by verifiable documentation of fair value in accordance with GAAP. In

Notes:

1 See Financial Accounting Standard No. 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities."

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

the absence of such support, the retained interests should not be carried as assets on an institution's books, but instead should be charged off. Other supervisory concerns include failure to recognize and hold sufficient capital against recourse obligations generated by securitizations, and the absence of an adequate independent audit function.

The concepts underlying the attached guidance are not new. They reflect the long-standing supervisory principles that i) a banking organization should have in place risk management systems and controls that are adequate in relation to the nature and volume of its risks, and ii) asset values that cannot be supported should be written off. The guidance incorporates fundamental concepts of risk-focused supervision: active oversight by an institution's senior management and board of directors, effective policies and limits, accurate and independent procedures to measure and assess risk, and strong internal controls.[2] Bank supervisors are particularly concerned about institutions that are relatively new users of securitization techniques and institutions whose senior management and directors are not fully aware of the risks, as well as the accounting, legal, and risk-based capital nuances, of this activity. The interagency guidance discusses sound risk management, modeling, valuation, and disclosure practices for asset securitization, and complements previous supervisory guidance on this subject.[3]

The federal banking agencies will continue to study supervisory issues relating to securitization, including the valuation of retained interests, and may in the future make adjustments to their regulatory capital requirements to reflect the riskiness, volatility, and uncertainty in the value of retained interests. Questions pertaining to this letter should be directed to Tom Boemio, Senior Supervisory Financial Analyst, (202) 452-2982, or Anna Lee Hewko, Financial Analyst, (202) 530-6260.

Richard Spillenkothen
Director

Attachment (36K PDF3)

Notes:

2 See SR letters 96-14, ''Risk-focused Safety and Soundness Examinations and Inspections,'' and 95-51, ''Rating the Adequacy of Risk Management Processes and Internal Controls at State Member Banks and Bank Holding Companies.''

3 See SR letters 97-21, ''Risk Management and Capital Adequacy of Exposures Arising from Secondary Market Credit Activities,'' 96-40, ''Interim Guidance for Purposes of Applying FAS 125 for Regulatory Reporting in 1997 and for the Treatment of Servicing Assets for Regulatory Capital;'' and 96-30, ''Risk-Based Capital Treatment for Spread Accounts that Provide Credit Enhancement for Securitized Receivables.''

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SELECTED FEDERAL RESERVE SR-LETTERS—Continued

Office of the Comptroller of the Currency
Federal Deposit Insurance Corporation
Board of Governors of the Federal Reserve System
Office of Thrift Supervision

INTERAGENCY GUIDANCE ON ASSET SECURITIZATION ACTIVITIES

BACKGROUND AND PURPOSE

Recent examinations have disclosed significant weaknesses in the asset securitization practices of some insured depository institutions. These weaknesses raise concerns about the general level of understanding and controls among institutions that engage in such activities. The most frequently encountered problems stem from: (1) the failure to recognize and hold sufficient capital against explicit and implicit recourse obligations that frequently accompany securitizations, (2) the excessive or inadequately supported valuation of ''retained interests,'' [1] (3) the liquidity risk associated with over reliance on asset securitization as a funding source, and (4) the absence of adequate independent risk management and audit functions.

The Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, the Board of Governors of the Federal Reserve System, and the Office of Thrift Supervision, hereafter referred to as ''the Agencies,'' are jointly issuing this statement to remind financial institution managers and examiners of the importance of fundamental risk management practices governing asset securitization activities. This guidance supplements existing policy statements and examination procedures issued by the Agencies and emphasizes the specific expectation that any securitization- related retained interest claimed by a financial institution will be supported by documentation of the interest's fair value, utilizing reasonable, conservative valuation assumptions that can be objectively verified. Retained interests that lack such objectively verifiable support or that fail to meet the supervisory standards set forth in this document will be classified as loss and disallowed as assets of the institution for regulatory capital purposes.

The Agencies are reviewing institutions' valuation of retained interests and the concentration of these assets relative to capital. Consistent with existing supervisory authority, the Agencies may, on a case-by-case basis, require institutions that have high concentrations of these assets relative to their capital, or are otherwise at risk from impairment of these assets, to hold additional capital commensurate with their risk exposures. Furthermore, given the risks presented

[1] In securitizations, a seller typically retains one or more interests in the assets sold. *Retained interests* represent the right to cash flows and other assets not used to extinguish bondholder obligations and pay credit losses, servicing fees and other trust related fees. For the purpose of this statement, *retained interests* include over-collateralization, spread accounts, cash collateral accounts, and interest only strips (IO strips). Although servicing assets and liabilities also represent a retained interest of the seller, they are currently determined based on different criteria and have different accounting and risk-based capital requirements. See applicable comments in Statement of Financial Accounting Standard No. 125, ''Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities'' (FAS 125), for additional information about these interests and associated accounting requirements.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

by these activities, the Agencies are actively considering the establishment of regulatory restrictions that would limit or eliminate the amount of certain retained interests that may be recognized in determining the adequacy of regulatory capital. An excessive dependence on securitizations for day-to-day core funding can also present significant liquidity problems—either during times of market turbulence or if there are difficulties specific to the institution itself. As applicable, the Agencies will provide further guidance on the liquidity risk associated with over reliance on asset securitizations as a funding source and implicit recourse obligations.

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DESCRIPTION OF ACTIVITY

Asset securitization typically involves the transfer of on-balance sheet assets to a third party or trust. In turn the third party or trust issues certificates or notes to investors. The cash flow from the transferred assets supports repayment of the certificates or notes. For several years, large financial institutions, and a growing number of regional and community institutions, have been using asset securitization to access alternative funding sources, manage concentrations, improve financial performance ratios, and more efficiently meet customer needs. In many cases, the discipline imposed by investors who buy assets at their fair value has sharpened selling institutions' credit risk selection, underwriting, and pricing practices. Assets typically securitized by institutions include credit card receivables, automobile receivable paper, commercial and residential first mortgages, commercial loans, home equity loans, and student loans.

* Page numbers have been updated for this format.

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

While the Agencies continue to view the use of securitization as an efficient means of financial intermediation, we are concerned about events and trends uncovered at recent examinations. Of particular concern are institutions that are relatively new users of securitization techniques and institutions whose senior management and directors do not have the requisite knowledge of the effect of securitization on the risk profile of the institution or are not fully aware of the accounting, legal and risk-based capital nuances of this activity. Similarly, the Agencies are concerned that some institutions have not fully and accurately distinguished and measured the risks that have been transferred versus those retained, and accordingly are not adequately managing the retained portion. It is essential that institutions engaging in securitization activities have appropriate front and back office staffing, internal and external accounting and legal support, audit or independent review coverage, information systems capacity, and oversight mechanisms to execute, record, and administer these transactions correctly.

Additionally, we are concerned about the use of inappropriate valuation and modeling methodologies to determine the initial and ongoing value of retained interests. Accounting rules provide a method to recognize an immediate gain (or loss) on the sale through booking a ''retained interest;'' however, the carrying value of that interest must be fully documented, based on reasonable assumptions, and regularly analyzed for any subsequent value impairment. The best evidence of fair value is a quoted market price in an active market. In circumstances where quoted market prices are not available, accounting rules allow fair value to be estimated. This estimate must be based on the ''best information available in the circumstances.''[2] An estimate of fair value must be supported by reasonable and current assumptions. If a best estimate of fair value is not practicable, the asset is to be recorded at zero in financial and regulatory reports.

History shows that unforeseen market events that affect the discount rate or performance of receivables supporting a retained interest can swiftly and dramatically alter its value. Without appropriate internal controls and independent oversight, an institution that securitizes assets may inappropriately generate ''paper profits'' or mask actual losses through flawed loss assumptions, inaccurate prepayment rates, and inappropriate discount rates. Liberal and unsubstantiated assumptions can result in material inaccuracies in financial statements, substantial write-downs of retained interests, and, if interests

[2] FAS 125, at par.43

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

represent an excessive concentration of the institution's capital, the demise of the sponsoring institution.

Recent examinations point to the need for institution managers and directors to ensure that:

- Independent risk management processes are in place to monitor securitization pool performance on an aggregate and individual transaction level. An effective risk management function includes appropriate information systems to monitor securitization activities.

- Conservative valuation assumptions and modeling methodologies are used to establish, evaluate and adjust the carrying value of retained interests on a regular and timely basis.

- Audit or internal review staffs periodically review data integrity, model algorithms, key underlying assumptions, and the appropriateness of the valuation and modeling process for the securitized assets retained by the institution. The findings of such reviews should be reported directly to the board or an appropriate board committee.

- Accurate and timely risk-based capital calculations are maintained, including recognition and reporting of any recourse obligation resulting from securitization activity.

- Internal limits are in place to govern the maximum amount of retained interests as a percentage of total equity capital.

- The institution has a realistic liquidity plan in place in case of market disruptions.

The following sections provide additional guidance relating to these and other critical areas of concern. Institutions that lack effective risk management programs or that maintain exposures in retained interests that warrant supervisory concern may be subject to more frequent supervisory review, more stringent capital requirements, or other supervisory action.

INDEPENDENT RISK MANAGEMENT FUNCTION

Institutions engaged in securitizations should have an independent risk management function commensurate with the complexity and volume of their securitizations and their overall risk exposures. The risk management function should ensure that securitization policies and operating procedures, including clearly articulated risk limits, are in place and appropriate for the institution's circumstances. A sound asset securitization policy should include or address, at a minimum:

- A written and consistently applied accounting methodology;

- Regulatory reporting requirements;

SELECTED FEDERAL RESERVE SR-LETTERS—Continued

- Valuation methods, including FAS 125 residual value assumptions, and procedures to formally approve changes to those assumptions;
- Management reporting process; and
- Exposure limits and requirements for both aggregate and individual transaction monitoring.

It is essential that the risk management function monitor origination, collection, and default management practices. This includes regular evaluations of the quality of underwriting, soundness of the appraisal process, effectiveness of collections activities, ability of the default management staff to resolve severely delinquent loans in a timely and efficient manner, and the appropriateness of loss recognition practices. Because the securitization of assets can result in the current recognition of anticipated income, the risk management function should pay particular attention to the types, volumes, and risks of assets being originated, transferred and serviced. Both senior management and the risk management staff must be alert to any pressures on line managers to originate abnormally large volumes or higher risk assets in order to sustain ongoing income needs. Such pressures can lead to a compromise of credit underwriting standards. This may accelerate credit losses in future periods, impair the value of retained interests and potentially lead to funding problems.

The risk management function should also ensure that appropriate management information systems (MIS) exist to monitor securitization activities. Reporting and documentation methods must support the initial valuation of retained interests and ongoing impairment analyses of these assets. Pool performance information has helped well-managed institutions to ensure, on a qualitative basis, that a sufficient amount of economic capital is being held to cover the various risks inherent in securitization transactions. The absence of quality MIS hinders management's ability to monitor specific pool performance and securitization activities more broadly. At a minimum, MIS reports should address the following:

Securitization summaries for each transaction - The summary should include relevant transaction terms such as collateral type, facility amount, maturity, credit enhancement and subordination features, financial covenants (termination events and spread account capture "triggers"), right of repurchase, and counterparty exposures. Management should ensure that the summaries are distributed to all personnel associated with securitization activities.

Performance reports by portfolio and specific product type - Performance factors include gross portfolio yield, default rates and loss severity, delinquencies, prepayments or payments, and excess spread amounts. The reports should reflect performance of assets, both on an individual pool basis and total managed assets. These reports should segregate specific products and different marketing campaigns.

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Vintage analysis for each pool using monthly data - Vintage analysis helps management understand historical performance trends and their implications for future default rates, prepayments, and delinquencies, and therefore retained interest values. Management can use these reports to compare historical performance trends to underwriting standards, including the use of a validated credit scoring model, to ensure loan pricing is consistent with risk levels. Vintage analysis also helps in the comparison of deal performance at periodic intervals and validates retained interest valuation assumptions.

Static pool cash collection analysis - This analysis entails reviewing monthly cash receipts relative to the principal balance of the pool to determine the cash yield on the portfolio, comparing the cash yield to the accrual yield, and tracking monthly changes. Management should compare the timing and amount of cash flows received from the trust with those projected as part of the FAS 125 retained interest valuation analysis on a monthly basis. Some master trust structures allow excess cash flow to be shared between series or pools. For revolving asset trusts with this master trust structure, management should perform a cash collection analysis for each master trust structure. These analyses are essential in assessing the actual performance of the portfolio in terms of default and prepayment rates. If cash receipts are less than those assumed in the original valuation of the retained interest, this analysis will provide management and the board with an early warning of possible problems with collections or extension practices, and impairment of the retained interest.

Sensitivity analysis - Measuring the effect of changes in default rates, prepayment or payment rates, and discount rates will assist management in establishing and validating the carrying value of the retained interest. Stress tests should be performed at least quarterly. Analyses should consider potential adverse trends and determine ''best,'' ''probable,'' and ''worst case'' scenarios for each event. Other factors to consider are the impact of increased defaults on collections staffing, the timing of cash flows, ''spread account'' capture triggers, over-collateralization triggers, and early amortization triggers. An increase in defaults can result in higher than expected costs and a delay in cash flows, decreasing the value of the retained interests. Management should periodically quantify and document the potential impact to both earnings and capital, and report the results to the board of directors. Management should incorporate this analysis into their overall interest rate risk measurement system.[3] Examiners will review the analysis conducted by the institution and the volatility associated with retained interests when assessing the Sensitivity to Market Risk component rating.

Statement of covenant compliance - Ongoing compliance with deal performance triggers as defined by the pooling and servicing agreements should be affirmed at least monthly. Performance triggers include early amortization, spread capture, changes to overcollateralization requirements, and events that would result in servicer removal.

[3] Under the Joint Agency Policy Statement on the Interest Rate Risk, institutions with a high level of exposure to interest rate risk relative to capital will be directed to take corrective action. Savings associations can find OTS guidance on interest rate risk in Thrift Bulletin 13a - Management of Interest Rate Risk, Investment Securities, and Derivative Activities.

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VALUATION AND MODELING PROCESSES

The method and key assumptions used to value the retained interests and servicing assets or liabilities must be reasonable and fully documented. The key assumptions in all valuation analyses include prepayment or payment rates, default rates, loss severity factors, and discount rates. The Agencies expect institutions to take a logical and conservative approach when developing securitization assumptions and capitalizing future income flows. It is important that management quantifies the assumptions on a pool-by-pool basis and maintains supporting documentation for all changes to the assumptions as part of the valuation process, which should be done no less than quarterly. Policies should define the acceptable reasons for changing assumptions and require appropriate management approval.

An exception to this pool-by-pool valuation analysis may be applied to revolving asset trusts if the master trust structure allows excess cash flows to be shared between series. In a master trust, each certificate of each series represents an undivided interest in all of the receivables in the trust. Therefore, valuations are appropriate at the master trust level.

In order to determine the value of the retained interest at inception, and make appropriate adjustments going forward, the institution must implement a reasonable modeling process to comply with FAS 125. The Agencies expect management to employ reasonable and conservative valuation assumptions and projections, and to maintain verifiable objective documentation of the fair value of the retained interest. Senior management is responsible for ensuring the valuation model accurately reflects the cash flows according to the terms of the securitization's structure. For example, the model should account for any cash collateral or overcollateralization triggers, trust fees, and insurance payments if appropriate. The board and management are accountable for the "model builders" possessing the necessary expertise and technical proficiency to perform the modeling process. Senior management should ensure that internal controls are in place to provide for the ongoing integrity of MIS associated with securitization activities.

As part of the modeling process, the risk management function should ensure that periodic validations are performed in order to reduce vulnerability to model risk. Validation of the model includes testing the internal logic, ensuring empirical support for the model assumptions, and back-testing the models with actual cash flows on a pool-by-pool basis. The validation process should be documented to support conclusions. Senior management should ensure the validation process is independent from line management as well as the modeling process. The audit scope should include procedures to ensure that the modeling process and validation mechanisms are both appropriate for the institution's circumstances and executed consistent with the institution's asset securitization policy.

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USE OF OUTSIDE PARTIES

Third parties are often engaged to provide professional guidance and support regarding an institution's securitization activities, transactions, and valuing of retained interests. The use of outside resources does not relieve directors of their oversight responsibility, or senior management of its responsibilities to provide supervision, monitoring, and oversight of securitization activities, and the management of the risks associated with retained interests in particular. Management is expected to have the experience, knowledge, and abilities to discharge its duties and understand the nature and extent of the risks presented by retained interests and the policies and procedures necessary to implement an effective risk management system to control such risks. Management must have a full understanding of the valuation techniques employed, including the basis and reasonableness of underlying assumptions and projections.

INTERNAL CONTROLS

Effective internal controls are essential to an institution's management of the risks associated with securitization. When properly designed and consistently enforced, a sound system of internal controls will help management safeguard the institution's resources, ensure that financial information and reports are reliable, and comply with contractual obligations, including securitization covenants. It will also reduce the possibility of significant errors and irregularities, as well as assist in their timely detection when they do occur. Internal controls typically: (1) limit authorities, (2) safeguard access to and use of records, (3) separate and rotate duties, and (4) ensure both regular and unscheduled reviews, including testing.

The Agencies have established operational and managerial standards for internal control and information systems.[4] An institution should maintain a system of internal controls appropriate to its size and the nature, scope, and risk of its activities. Institutions that are subject to the requirements of FDIC regulation 12 CFR Part 363 should include an assessment of the effectiveness of internal controls over their asset securitization activities as part of management's report on the overall effectiveness of the system of internal controls over financial reporting. This assessment implicitly includes the internal controls over financial information that is included in regulatory reports.

AUDIT FUNCTION OR INTERNAL REVIEW

It is the responsibility of an institution's board of directors to ensure that its audit staff or independent review function is competent regarding securitization activities. The audit function should perform periodic reviews of securitization activities, including transaction testing and verification, and report all findings to the board or appropriate board committee. The audit function also may be useful to senior management in identifying and measuring risk related to securitization activities. Principal audit targets

[4] Safety and Soundness Standards 12 CFR Part 30 (OCC), 12 CFR Part 570 (OTS).

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should include compliance with securitization policies, operating and accounting procedures (FAS 125), and deal covenants, and accuracy of MIS and regulatory reports. The audit function should also confirm that the institution's regulatory reporting process is designed and managed in such a way to facilitate timely and accurate report filing. Furthermore, when a third party services loans, the auditors should perform an independent verification of the existence of the loans to ensure balances reconcile to internal records.

REGULATORY REPORTING

The securitization and subsequent removal of assets from an institution's balance sheet requires additional reporting as part of the regulatory reporting process. Common regulatory reporting errors stemming from securitization activities include:

- Failure to include off-balance sheet assets subject to recourse treatment when calculating risk-based capital ratios;
- Failure to recognize retained interests and retained subordinate security interests as a form of credit enhancement;
- Failure to report loans sold with recourse in the appropriate section of the regulatory report; and
- Over-valuing retained interests.

An institution's directors and senior management are responsible for the accuracy of its regulatory reports. Because of the complexities associated with securitization accounting and risk-based capital treatment, attention should be directed to ensuring that personnel who prepare these reports maintain current knowledge of reporting rules and associated interpretations. This often will require ongoing support by qualified accounting and legal personnel.

Institutions that file the Report of Condition and Income (Call Report) should pay particular attention to the following schedules on the Call Report when institutions are involved in securitization activities: *Schedule RC-F: Other Assets*; *Schedule RC-L: Off Balance Sheet Items*; and *Schedule RC-R: Regulatory Capital*. Institutions that file the Thrift Financial Report (TFR) should pay particular attention to the following TFR schedules: *Schedule CC: Consolidated Commitments and Contingencies*, *Schedule CCR: Consolidated Capital Requirement*, and *Schedule CMR: Consolidated Maturity and Rate*.

Under current regulatory report instructions, when an institution's supervisory agency's interpretation of how generally accepted accounting principles (GAAP) should be applied to a specified event or transaction differs from the institution's interpretation, the supervisory agency may require the institution to reflect the event or transaction in its regulatory reports in accordance with the agency's interpretation and amend previously submitted reports.

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MARKET DISCIPLINE AND DISCLOSURES

Transparency through public disclosure is crucial to effective market discipline and can reinforce supervisory efforts to promote high standards in risk management. Timely and adequate information on the institution's asset securitization activities should be disclosed. The information contained in the disclosures should be comprehensive; however, the amount of disclosure that is appropriate will depend on the volume of securitizations and complexity of the institution. Well-informed investors, depositors, creditors and other bank counterparties can provide a bank with strong incentives to maintain sound risk management systems and internal controls. Adequate disclosure allows market participants to better understand the financial condition of the institution and apply market discipline, creating incentives to reduce inappropriate risk taking or inadequate risk management practices. Examples of sound disclosures include:

- Accounting policies for measuring retained interests, including a discussion of the impact of key assumptions on the recorded value;
- Process and methodology used to adjust the value of retained interests for changes in key assumptions;
- Risk characteristics, both quantitative and qualitative, of the underlying securitized assets;
- Role of retained interests as credit enhancements to special purpose entities and other securitization vehicles, including a discussion of techniques used for measuring credit risk; and
- Sensitivity analyses or stress testing conducted by the institution showing the effect of changes in key assumptions on the fair value of retained interests.

RISK-BASED CAPITAL FOR RECOURSE AND LOW LEVEL RECOURSE TRANSACTIONS

For regulatory purposes, recourse is generally defined as an arrangement in which an institution retains the risk of credit loss in connection with an asset transfer, if the risk of credit loss exceeds a pro rata share of the institution's claim on the assets.[5] In addition to broad contractual language that may require the selling institution to support a securitization, recourse can also arise from retained interests, retained subordinated security interests, the funding of cash collateral accounts, or other forms of credit enhancements that place an institution's earnings and capital at risk.

These enhancements should generally be aggregated to determine the extent of an institution's support of securitized assets. Although an asset securitization qualifies for

[5] The risk-based capital treatment for sales with recourse can be found at 12 CFR Part 3 Appendix A, Section (3)(b)(1)(iii) {OCC}, 12 CFR Part 567.6(a)(2)(i)(c) {OTS}. For a further explanation of recourse see the glossary entry ''Sales of Assets for Risk-Based Capital Purposes'' in the instructions for the Call Report.

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sales treatment under GAAP, the underlying assets may still be subject to regulatory risk-based capital requirements. Assets sold with recourse should generally be risk-weighted as if they had not been sold.

Securitization transactions involving recourse may be eligible for ‘‘low level recourse’’ treatment.[6] The Agencies’ risk-based capital standards provide that the dollar amount of riskbased capital required for assets transferred with recourse should not exceed the maximum dollar amount for which an institution is contractually liable. The ‘‘low level recourse’’ treatment applies to transactions accounted for as sales under GAAP in which an institution contractually limits its recourse exposure to less than the full risk-based capital requirements for the assets transferred. Under the low level recourse principle, the institution holds capital on approximately a dollar-for-dollar basis up to the amount of the aggregate credit enhancements.

Low level recourse transactions should be reported in Schedule RC-R of the Call Report or Schedule CCR of the TFR using either the "direct reduction method" or the ‘‘gross-up method’’ in accordance with the regulatory report instructions.

If an institution does not contractually limit the maximum amount of its recourse obligation, or if the amount of credit enhancement is greater than the risk-based capital requirement that would exist if the assets were not sold, the low level recourse treatment does not apply. Instead, the institution must hold risk-based capital against the securitized assets as if those assets had not been sold.

Finally, as noted earlier, retained interests that lack objectively verifiable support or that fail to meet the supervisory standards set forth in this document will be classified as loss and disallowed as assets of the institution for regulatory capital purposes.

INSTITUTION IMPOSED CONCENTRATION LIMITS ON RETAINED INTERESTS

The creation of a retained interest (the debit) typically also results in an offsetting ‘‘gain on sale’’ (the credit) and thus generation of an asset. Institutions that securitize high yielding assets with long durations may create a retained interest asset value that exceeds the risk-based capital charge that would be in place if the institution had not sold the assets (under the existing riskbased capital guidelines, capital is not required for the amount over eight percent of the securitized assets). Serious problems can arise for institutions that distribute contrived earnings only later to be faced with a downward valuation and charge-off of part or all of the retained interests.

As a basic example, an institution could sell $100 in subprime home equity loans and book a retained interest of $20 using liberal "gain on sale" assumptions. Under the cur-

[6] The banking agencies’ low level recourse treatment is described in the Federal Register in the following locations: 60 Fed. Reg. 17986 (April 10, 1995) (OCC); 60 Fed. Reg. 8177 (February 13, 1995)(FRB); 60 Fed. Reg. 15858 (March 28, 1995)(FDIC). OTS has had a low level recourse rule in 12 CFR Part 567.6(a)(2)(i)(c) since 1989. A brief explanation is also contained in the instructions for regulatory reporting in section RC-R for the Call Report or schedule CCR for the TFR.

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rent capital rules, the institution is required to hold approximately $8 in capital. This $8 is the current capital requirement if the loans were never removed from the balance sheet (eight percent of $100 = $8). However, the institution is still exposed to substantially all of the credit risk, plus the additional risk to earnings and capital from the volatility of the retained interest. If the value of the retained interest decreases to $10 due to inaccurate assumptions or changes in market conditions, the $8 in capital is insufficient to cover the entire loss.

Normally, the sponsoring institution will eventually receive any excess cash flow remaining from securitizations after investor interests have been met. However, recent experience has shown that retained interests are vulnerable to sudden and sizeable write-downs that can hinder an institution's access to the capital markets, damage its reputation in the market place, and in some cases, threaten its solvency. Accordingly, the Agencies expect an institution's board of directors and management to develop and implement policies that limit the amount of retained interests that may be carried as a percentage of total equity capital, based on the results of their valuation and modeling processes. Well constructed internal limits also serve to lessen the incentive of institution personnel to engage in activities designed to generate near term ''paper profits'' that may be at the expense of the institution's long term financial position and reputation.

SUMMARY

Asset securitization has proven to be an effective means for institutions to access new and diverse funding sources, manage concentrations, improve financial performance ratios, and effectively serve borrowing customers. However, securitization activities also present unique and sometimes complex risks that require board and senior management attention. Specifically, the initial and ongoing valuation of retained interests associated with securitization, and the limitation of exposure to the volatility represented by these assets, warrant immediate attention by management.

Moreover, as mentioned earlier in this statement, the Agencies are studying various issues relating to securitization practices, including whether restrictions should be imposed that would limit or eliminate the amount of retained interests that qualify as regulatory capital. In the interim, the Agencies will review affected institutions on a case-by-case basis and may require, in appropriate circumstances, that institutions hold additional capital commensurate with their risk exposure. In addition, the Agencies will study, and issue further guidance on, institutions' exposure to implicit recourse obligations and the liquidity risk associated with over reliance on asset securitization as a funding source.

Bank holding company subsidiaries, banks (generally through operating subsidiaries), Edge Act corporations, and foreign banking organizations (FBOs) operating in the United States may operate futures brokerage and clearing services involving a myriad of financial and nonfinancial futures contracts and options on futures. These activities can involve futures exchanges and clearinghouses throughout the world. In general, most institutions conduct these activities as futures commission merchants (FCMs). FCM is the term used in the Commodity Exchange Act to refer to registered firms that are in the business of soliciting or accepting orders, *as broker,* for the purchase or sale of any exchange-traded futures contract and options on futures contracts. In connection with these activities, institutions may hold customer funds, assets, or property and may be members of futures exchanges and their associated clearinghouses. They may also offer related advisory services as registered commodity trading advisors (CTAs).

The Federal Reserve has a supervisory interest in ensuring that the banking organizations subject to its oversight conduct their futures brokerage activities safely and soundly consistent with Regulations Y and K (including any terms and conditions contained in Board orders for a particular organization). Accordingly, a review of futures brokerage activities is an important element for inspections of bank holding companies (BHCs), examinations of state member banks, and reviews of FBO operations. The following guidance on evaluating the futures brokerage activities of bank holding company subsidiaries, branches and agencies of foreign banks operating in the United States, or any operating subsidiaries of state member banks provides a list of procedures that may be used to tailor the scope of an examination or inspection of these activities at individual institutions. For the purposes of this discussion, the term *FCM activities* is used in a broad context and refers to all of an institution's futures brokerage activities and operations.

SCOPE OF GUIDANCE

Examiners are instructed to take a risk-based examination approach to evaluating FCM activities—including brokerage, clearing, funds management, and advisory activities. Significant emphasis should be placed on evaluating the adequacy of management and the management processes used to control the credit, market, liquidity, legal, reputational, and operations risks entailed in these operations. Both the adequacy of risk management and the quantitative level of risk exposures should be assessed as appropriate to the scope of the FCM's activities. The objectives of a particular inspection or examination should dictate the FCM activities to be reviewed and set the scope of the inspection.

Examiners are also instructed to take a functional-regulatory approach to minimize duplicative inspection and supervisory burdens. Reviews and reports of functional regulators should be used to their fullest extent. However, absent recent oversight inspection, or if an examiner believes particular facts and circumstances at the banking organization or in the marketplace deem it necessary, a review of operations that would normally be assessed by the appropriate commodities regulator may be appropriate (such as review of front- or back-office operations).

When futures brokerage occurs in more than one domestic or foreign affiliate, examiners should assess the adequacy of the management of the futures brokerage activities of the consolidated financial organization to ensure that the parent organization recognizes and effectively manages the risks posed by its various futures subsidiaries. Accordingly, in reviewing futures brokerage operations, examiners should identify all bank holding company, bank operating, or FBO subsidiaries that engage in FCM activities and the scope of those activities. Not all subsidiaries may need to be reviewed to assess the risk management of the consolidated organization. Selection of the particular FCM subsidiaries to be reviewed should be based on an assessment of the risks posed by their activities to the consolidated organization.

This guidance primarily addresses the assessment of activities associated with futures brokerage operations. Any proprietary trading that occurs at an FCM should be assessed in connection with the review of proprietary trading activities of the consolidated financial organization, using the appropriate guidance from other sections of this manual. Similarly, when a review of futures advisory activities is planned, exam-

iners should refer to investment advisory inspection guidance in the *Bank Holding Company Supervision Manual* and the *Trust Examination Manual* as appropriate.

EVALUATION OF FCM RISK MANAGEMENT

Consistent with existing Federal Reserve policies, examiners should evaluate the risk-management practices of FCM operations and ensure that this evaluation is incorporated appropriately in the rating of risk management under the bank (CAMELS), BHC (BOPEC), and FBO (ROCA) rating systems. Accordingly, examiners should place primary consideration on findings related to the adequacy of (1) board and senior management oversight; (2) policies, procedures, and limits used to control risks; (3) risk measurement, monitoring, and reporting systems; and (4) internal controls and audit programs. General considerations in each of these areas are discussed below.

Board and Senior Management Oversight

The board of directors has the ultimate responsibility for the level of risks taken by the institution. Accordingly, the board, a designated subcommittee of the board, or a high level of senior management should approve overall business strategies and significant policies that govern risk-taking in the institution's FCM activities. In particular, the board or a committee thereof should approve policies that identify authorized activities and managerial oversight, and articulate risk tolerances and exposure limits of FCM activities. The board should also actively monitor the performance and risk profile of its FCM activities. Directors and senior management should periodically review information that is sufficiently detailed and timely to allow them to understand and assess the various risks involved in these activities. In addition, the board or a delegated committee should periodically reevaluate the institution's business strategies and major risk-management policies and procedures, emphasizing the institution's financial objectives and risk tolerances.

For their part, senior management is responsible for ensuring that policies and procedures for conducting FCM activities on both a long-range and day-to-day basis are adequate. These policies should be approved and reviewed annually by senior management or a designated subcommittee of the board; the consistency of these policies with parent-company limits or other directions pertaining to the FCM's activities should be confirmed. Management must also maintain (1) clear lines of authority and responsibility for managing operations and the risks involved, (2) appropriate limits on risk-taking, (3) adequate systems and standards for measuring and tracking risk exposures and measuring finanical performance, (4) effective internal controls, and (5) a comprehensive risk-reporting and risk-management review process. To provide adequate oversight, management should fully understand the risk profile of their FCM activities. Examiners should review reports to senior management and evaluate whether the reports provide both good summary information and sufficient detail to enable management to assess and manage the FCM's risk. As part of their oversight responsibilities, senior management should periodically review the organization's risk-management procedures to ensure that they remain appropriate and sound.

Management should also ensure that activities are conducted by competent staff whose technical knowledge and experience are consistent with the nature and scope of the institution's activities. There should be sufficient depth in staff resources to manage these activities if key personnel are not available. Management should also ensure that back-office and financial-control resources are sufficient to effectively manage and control risks. Risk-measurement, monitoring, and control functions should have clearly defined duties. Separation of duties in key elements of the risk-management process should be adequate to avoid potential conflicts of interest. The nature and scope of these safeguards should be in accordance with the scope of the FCM's activities.

Policies, Procedures, and Limits

FCMs should maintain written policies and procedures that clearly outline their approach for managing futures brokerage and related activities. Such policies should be consistent

with the organization's broader business strategies, capital adequacy, technical expertise, and general willingness to take risk. Policies, procedures, and limits should address the relevant credit, market, liquidity, reputation, and operations risks in light of the scope and complexity of the FCM's activities. Policies and procedures should establish a logical framework for limiting the various risks involved in an FCM's activities and clearly delineate lines of responsibility and authority over these activities. They should also address the approval of new product lines, strategies, and other activities; conflicts of interest including transactions by employees; and compliance with all applicable legal requirements. Procedures should incorporate and implement the parent company's relevant policies, and should be consistent with Federal Reserve Board regulations and any applicable Board orders.

A sound system of integrated limits and risk-taking guidelines is an essential component of the risk-management process. This system should set boundaries for organizational risk-taking and ensure that positions that exceed certain predetermined levels receive prompt management attention, so they can be either reduced or prudently addressed.

Risk Measurement, Monitoring, and Reporting

An FCM's system for measuring the credit, market, liquidity, and other risks involved in its activities should be as comprehensive and accurate as practicable and should be commensurate with the nature of its activities. Risk exposures should be aggregated across customers, products, and activities to the fullest extent possible. Examiners should evaluate whether the risk measures and the risk-measurement process are sufficiently robust to reflect accurately the different types of risks facing the institution. Institutions should establish clear standards for measuring risk exposures and financial performance. Standards should provide a common framework for limiting and monitoring risks and should be understood by all relevant personnel.

An accurate, informative, and timely management information system is essential to the prudent operation of an FCM. Accordingly, the examiner's assessment of the quality of the management information system is an important factor in the overall evaluation of the risk-management process. Appropriate mechanisms should exist for reporting risk exposures and the financial performance of the FCM to its board and parent company, as well as for internal management purposes. FCMs must establish management reporting policies to apprise their boards of directors and senior management of material developments, the adequacy of risk management, operating and financial performance, and material deficiencies identified during reviews by regulators and by internal or external audits. The FCM should also provide reports to the parent company (or in the case of foreign-owned FCMs, to its U.S. parent organization, if any) of financial performance; adherence to risk parameters and other limits and controls established by the parent for the FCM; and any material developments, including findings of material deficiencies by regulators. Examiners should determine the adequacy of an FCM's monitoring and reporting of its risk exposure and financial performance to appropriate levels of senior management and to the board of directors.

Internal Controls

An FCM's internal-control structure is critical to its safe and sound functioning in general and to its risk-management system, in particular. Establishing and maintaining an effective system of controls, including the enforcement of official lines of authority and appropriate separation of duties—such as trading, custodial, and back-office—is one of management's more important responsibilities. Appropriately segregating duties is a fundamental and essential element of a sound risk-management and internal-control system. Failure to implement and maintain an adequate separation of duties can constitute an unsafe and unsound practice, possibly leading to serious losses or otherwise compromising the financial integrity of the FCM.

When properly structured, a system of internal controls promotes effective operations and reliable financial and regulatory reporting, safeguards assets, and helps to ensure compliance with relevant laws, regulations, and institutional policies. Ideally, internal controls are tested by an independent internal auditor who reports directly to either the institution's board of directors or its designated committee. Personnel who

perform these reviews should generally be independent of the function they are assigned to review. Given the importance of appropriate internal controls to banking organizations of all sizes and risk profiles, the results of audits or reviews, whether conducted by an internal auditor or by other personnel, should be adequately documented, as should management's responses to them. In addition, communication channels should allow negative or sensitive findings to be reported directly to the board of directors or the relevant board committee.

FUTURES EXCHANGES, CLEARINGHOUSES, AND FCMs

Futures exchanges provide auction markets for standardized futures and options on futures contracts. In the United States and most other countries, futures exchanges and FCMs are regulated by a governmental agency. Futures exchanges are membership organizations and impose financial and other regulatory requirements on members, particularly those that do business for customers as brokers. In the United States and most other countries, futures exchanges also have quasi-governmental (self-regulatory) responsibilities to monitor trading and prevent fraud, with the authority to discipline or sanction members that violate exchange rules. FCMs may be members of the exchange on which they effect customers' trades. When they are not members, FCMs must use other firms who are exchange members to execute customer trades.[1]

Each futures exchange has an affiliated clearinghouse responsible for clearing and settling trades on the exchange and managing associated risks. When a clearinghouse accepts transaction information from its clearing members, it generally guarantees the performance of the transaction to each member and becomes the counterparty to the trade (that is, the buyer to every seller and the seller to every buyer). Daily cash settlements are paid or collected by clearing members through the clearinghouse. The cash transfers represent the difference between the original trade price and the daily official closing settlement price for each commodity futures contract. The two members settle their sides of the transaction with the clearinghouse, usually by closing out the position before delivery of the futures contract or the expiration of the option on the futures contract.

An exchange member that wishes to clear or settle transactions for itself, customers, other FCMs, or commodity professionals (locals or market makers) may become a member of the affiliated clearinghouse (clearing member) if it is able to meet the clearinghouse's financial-eligibility requirements. In general, these requirements are more stringent than those required for exchange membership. For example, a clearing member usually is required to maintain a specified amount of net capital in excess of the regulatory required minimum and to make a guaranty deposit as part of the financial safeguards of the clearinghouse. The size of the deposit is related to the scale of the clearing member's activity. If it is not a member of the clearinghouse for the exchange on which a contract is executed, an FCM must arrange for another FCM that is a clearing member to clear and settle its transactions.[2]

Margin requirements are an important risk-management tool for maintaining the financial integrity of clearinghouses and their affiliated exchanges. Clearinghouses require that their members post initial margin (performance bond) on a new position to cover potential credit exposures borne by the clearinghouse. The clearing firm, in turn, requires its customers to post margin. At the end of each day, and on some exchanges on an intraday basis, all positions are *marked to the market*. Clearing members with positions that have declined in value pay that amount in cash to the clearinghouse, which then pays the clearing members holding positions that have increased in value on that day. This process of transferring gains and losses among clearing-member firms, known as *collecting variation margin*, is intended to periodically

1. A firm or trading company that maintains only a proprietary business may become a member of an exchange without registering as an FCM.

2. The nonmember FCM opens an account, usually on an *omnibus* basis, with the clearing-member FCM. Separate omnibus accounts have to be maintained for customer and noncustomer or proprietary trading activity. If the FCM does not *carry* customer accounts by holding customer funds and maintaining account records, the clearing member will carry the customer's account on a *fully disclosed* basis and issue confirmations, account statements, and margin calls directly to the customer on behalf of the introducing FCM. In such cases, the introducing FCM operates as an introducing broker (IB) and could have registered with Commodity Futures Trading Commission as such.

eliminate credit-risk exposure from the clearinghouse.[3] In volatile markets, a clearinghouse may call for additional variation margin during the trading day, sometimes with only one hour's notice, and failure to meet a variation (or initial) margin call is treated as a default to the clearinghouse.

Some clearinghouses also require that their members be prepared to pay loss-sharing assessments to cover losses sustained by the clearinghouse in meeting the settlement obligations of a clearing member that has defaulted on its (or its customers') obligations. Such assessments arise when losses exceed the resources of defaulting members, the guaranty fund, and other surplus funds of the clearinghouse. Each clearinghouse has its own unique loss-sharing rules.[4] At least one U.S. and one foreign exchange have unlimited loss-sharing requirements. Most U.S. clearinghouses relate loss-sharing requirements to the size of a member's business at the clearinghouse. Given the potential drain on an institution's financial resources, the exposure to loss-sharing agreements should be a significant consideration in an institution's decision to become a clearing member.

COMMODITY EXCHANGE ACT, COMMODITY FUTURES TRADING COMMISSION, AND SELF-REGULATORY ORGANIZATIONS

In the United States, the primary regulator of exchange-traded futures activities is the Commodity Futures Trading Commission (CFTC), which was created by and derives its authority from the Commodity Exchange Act (CEA). The CFTC has adopted registration,[5] financial responsibility, antifraud, disclosure, and other rules for FCMs and CTAs, and has general enforcement authority over commodities firms and professionals that buy or sell exchange-traded futures contracts.

The futures exchanges, in addition to providing a marketplace for futures contracts, are deemed to be self-regulatory organizations (SROs) under the CEA. For example, a number of SROs have adopted detailed uniform practice rules for FCMs, including ''know your customer'' recordkeeping rules and other formal customer-disclosure requirements. The National Futures Association (NFA) also is an SRO, although it does not sponsor a futures exchange or other marketplace. The NFA has adopted sales-practice rules applicable to members who do business with customers. All FCMs that wish to accept orders and hold customer funds and assets must be members of the NFA.

The CEA and rules of the CFTC require the SROs to establish and maintain enforcement and surveillance programs for their markets and to oversee the financial responsibility of their members.[6] The CFTC has approved an arrangement under which a designated SRO (DSRO) is responsible for performing on-site audits and reviewing periodic reports of a member FCM that is a member of more than one futures exchange. The NFA is the DSRO for FCMs that are not members of any futures exchange.

Oversight of FCMs is accomplished through annual audits by the DSRO and the filing of periodic financial statements and early warning reports by FCMs, in compliance with CFTC and SRO rules. In summary, this oversight encompasses the following three elements.

1. *Full-scope audits at least once every other year of each FCM that carries customer accounts.* Audit procedures conform to a Uniform Audit Guide developed jointly by the SROs. The full-scope audit focuses on the firm's net capital computations, segregation of customer funds and property, financial reporting, recordkeeping, and operations.[7]

3. Some foreign exchanges do not allow the withdrawal of unrealized profits as mark-to-market variation.

4. Clearinghouses usually retain the right to use assets owned by clearing members, but under the control of the clearinghouse (for example, proprietary margin); require additional contributions of funds or assets or require the member to purchase additional shares of the clearinghouse; or perfect a claim against the member for its share of the loss.

5. Many FCMs also are SEC-registered as broker-dealers and are subject to SEC and CFTC financial responsibility rules.

6. CFTC Rule 1.51, contract market program for enforcement, requires that SROs monitor market activity and trading practices in their respective markets, perform on-site examinations (audits) of members' books and records, review periodic financial reports filed by members, and bring disciplinary and corrective actions against members for violations of the CEA, and of CFTC and SRO rules.

7. If an FCM is also a broker-dealer, the DSRO is not required to examine the FCM for compliance with net capital requirements if the DSRO confers with the broker-dealer's examining authority at least annually to determine that the FCM is in compliance with the broker-dealer's net capital requirements and receives the DSRO copies of all examinations.

The audit also reviews sales practices (including customer records, disclosures, advertisements, and customer complaints) and the adequacy of employee supervision. The audit's scope should reflect the FCM's prior compliance history as well as the examiner's on-site evaluation of the firm's internal controls. During the off-year, the DSROs perform limited scope audits of member FCMs. This audit is limited to financial matters such as a review of the FCM's net capital computations, segregation of customer funds, and its books and records.

2. *FCM quarterly financial reporting requirements.* FCMs are required to file quarterly financial statements (form 1-FR-FCM) with their DSROs. The fourth-quarter statement must be filed as of the close of the FCM's fiscal year and must be certified by an independent public accountant. The filings generally include statements regarding changes in ownership equity, current financial condition, changes in liabilities subordinated to claims of general creditors, computation of minimum net capital, segregation requirements and funds segregated for customers, secured amounts and funds held in separate accounts, and any other material information relevant to the firm's financial condition. The certified year-end financial report also must contain statements of income and cash flows.
3. *Early warning reports.* FCMs are required to notify the CFTC and the SROs when certain financial weaknesses are experienced.[8] For example, if an FCM's net capital falls to a specified warning level, it must file a written notice within five business days and file monthly financial reports (form 1-FR-FCM) until its net capital meets or exceeds the warning level for a full three months. If an FCM's net capital falls below the minimum required, it must cease doing business and give telegraphic notice to the CFTC and any commodities or securities SRO of which it is a member. Similar notices must be given by a clearing organization or carrying FCM when it determines that a position of an FCM must be liquidated for failure to meet a margin call or other required deposit.

8. CFTC Rule 1.12 requires the maintenance of minimum financial requirements by FCMs and introducing brokers. These requirements are similar to those applicable to broker-dealers under SEC rules.

FEDERAL RESERVE REGULATION OF FCMs AND CTAs

Bank holding companies are permitted, under Regulation Y, to engage in FCM and CTA activities on both domestic and foreign futures exchanges through separately incorporated nonbank subsidiaries. As a general matter, the nonbank subsidiaries of bank holding companies (and some foreign banks) provide services to unaffiliated customers in the United States under section 4(c)(8) of the Bank Holding Company Act (BHC Act) and to unaffiliated customers outside the United States under Regulation K.[9] Banks and the operating subsidiaries of banks usually provide futures-related services to unaffiliated parties in the United States under the general powers of the bank and to unaffiliated parties outside the United States under Regulation K. These various subsidiaries may provide services to affiliates under section 4(c)(1)(C) of the BHC Act.

Regulation Y permits a bank holding company subsidiary that acts as an FCM to engage in other activities in the subsidiary, including futures advisory services and trading, as well as other permissible securities and derivative activities as defined in sections 225.28(b)(6) (financial and investment advisory activities) and 225.28(b)(7) (agency transactional services for customer investments). Section 225.28(b)(7) specifically authorizes FCMs to provide agency services for unaffiliated persons in execution, clearance, or execution and clearance of *any* futures contract and option on a futures contract traded on an exchange in the United States and abroad. It also includes the authority to engage in other agency-type transactions, (for example, riskless principal), involving a forward contract, option, future, option on a future, and similar instruments. Furthermore, this section codifies the longstanding prohibition against a parent bank holding company's issuing any guarantees or otherwise becoming liable to an exchange or clearinghouse for transactions effected through

9. Those nonbank subsidiaries that operate in the United States may open offices outside the United States if (1) the bank holding company's authority under Regulation Y is not limited geographically, (2) the foreign office is not a separately incorporated entity, and (3) the activities conducted by the foreign office are within the scope of the bank holding company's authority under Regulation Y. In addition, a bank holding company may operate a limited foreign-based business in the United States under Regulation K.

an FCM, except for the proprietary trades of the FCM and those of affiliates.

A *well-capitalized* and *well-managed* bank holding company, as defined in sections 225.2(r) and (s) of Regulation Y, respectively, may commence activities as an FCM or a CTA by filing a notice prescribed under section 225.23(a) of Regulation Y. Bank holding companies that are not eligible to file notices or wish to act in a capacity other than as an FCM or CTA, such as a commodities pool operator, must follow the specific application process for these activities. Examiners should ensure that all of these activities are conducted in accordance with the Board's approval order.

A bank holding company, bank, or FBO parent company of an FCM is expected to establish specific risk parameters and other limits and controls on the brokerage operation. These limits and controls should be designed to manage financial risk to the consolidated organization and should be consistent with its business objectives and overall willingness to assume risk.

PARTICIPATION IN FOREIGN MARKETS

Institutions frequently transact business on foreign exchanges as either exchange or clearinghouse members or through third-party brokers that are members of the foreign exchange. The risks of doing business in foreign markets generally parallel those in U.S. markets; however, some unique issues of doing business on foreign futures exchanges must be addressed by the FCM and its parent company to ensure that the activity does not pose undue risks to the consolidated financial organization.

Before doing business on a foreign exchange, an FCM should understand the legal and operational differences between the foreign exchange and U.S. exchanges. For example, the FCM should know about local business practices and legal precedents that pertain to business in the foreign market. In addition, the FCM should know how the foreign exchange is regulated and how it manages risk, and should develop policies and the appropriate operational infrastructure of controls, procedures, and personnel to manage these risks. Accordingly, examiners should confirm that, in considering whether and how to participate in a foreign market, an FCM performs due diligence on relevant legal and regulatory issues, as well as on local business practices. Foreign-exchange risks should be understood and authorized by the FCM's parent company, and any limits set by the parent company or FCM management should be carefully monitored. The FCM and its parent company also should assess the regulatory and financial risks associated with exchange and clearinghouse membership in a foreign market, including an understanding of the extent to which the foreign clearinghouse monitors and controls day-to-day credit risk and its loss-sharing requirements.

SPECIFIC RISKS AND THEIR RISK-MANAGEMENT CONSIDERATIONS

In general, FCMs face five basic categories of risk—credit risk, market risk, liquidity risk, reputation risk, and operations risk. The following discussions highlight specific considerations in evaluating the key elements of sound risk management as they relate to these risks. The compliance and internal-controls functions provide the foundation for managing the risks of an FCM.

Credit Risk

FCMs encounter a number of different types of credit risks. The following discussions identify some of these risks and discuss sound risk-management practices applicable to each.

Customer-Credit Risk

Customer-credit risk is the potential that a customer will fail to meet its variation margin calls or its payment or delivery obligations. An FCM should establish a credit-review process for new customers that is independent of the marketing and sales function. It is not unusual for the FCM's parent company (or banking affiliate) to perform the credit evaluation and provide the necessary internal approvals for the FCM to execute and clear futures contracts for particular customers. In some situations, however, the FCM may have the authority to perform the credit review internally. Examiners should

determine how customers are approved and confirm that documentation in the customer's credit files is adequate even when the approval is performed by the parent. Customer-credit files should indicate the scope of the credit review and contain approval of the customer's account and credit limits. For example, customer-credit files may contain recent financial statements, sources of liquidity, trading objectives, and any other pertinent information used to support the credit limits established for the customer. In addition, customer-credit files should be updated periodically.

FCM procedures should describe how customer-credit exposures will be identified and controlled. For example, an FCM could monitor a customer's transactions, margin settlements, or open positions as a means of managing the customer's credit risk. Moreover, procedures should be in place to handle situations in which the customer has exceeded credit limits. These procedures should give senior managers who are independent of the sales and marketing function the authority to approve limit exceptions and require that such exceptions be documented.

Customer-Financing Risk

Several exchanges, particularly in New York and overseas, allow FCMs to finance customer positions. These exchanges allow an FCM to lend initial and variation margin to customers subject to taking the capital charges under the CFTC's (or SEC's) capital rules if the charges are not repaid within three business days. In addition, some exchanges allow FCMs to finance customer deliveries, again subject to a capital charge.

An FCM providing customer-financing services should adopt financing policies and procedures that identify customer-credit standards. The financing policies should be approved by the parent company and should be consistent with the FCM's risk tolerance. In addition, an FCM should establish overall lending limits for each customer based on a credit review that is analogous to that performed by a bank with similar lending services. The process should be independent of the FCM's marketing, sales, and financing functions but may be performed by the FCM's banking affiliate. Examiners should determine how customer-financing decisions are made and confirm that documentation is adequate, even when an affiliate approves the financing. In addition, the FCM should review financial information on its customers periodically and adjust lending limits when appropriate.

Clearing-Only Risk

FCMs often enter into agreements to clear, but not execute, trades for customers. Under a ''clearing-only'' arrangement, the customer gives its order directly to an executing FCM. The executing FCM then gives the executed transaction to the clearing FCM, which is responsible for accepting and settling the transaction. Customers often prefer this arrangement because it provides the benefits of centralized clearing (recordkeeping and margin payments) with the flexibility of using a number of specialized brokers to execute transactions.

FCMs entering into clearing-only arrangements execute written *give-up* agreements, which are triparty contracts that set forth the responsibilities of the clearing FCM, the executing FCM, and the customer. Most FCMs use the *uniform give-up agreement* prepared by the Futures Industry Association, although some FCMs still use their own give-up contracts. The uniform give-up agreement permits a clearing FCM, upon giving prior notice to the customer and the executing FCM, to place limits or conditions on the transactions it will accept to clear or terminate the arrangement. If an executed transaction exceeds specified limits, the FCM may decline to clear the transaction unless it is acting as the *qualifying* or *primary* clearing FCM for the customer and has not given prior notice of termination, as discussed further below.

Clearing-only arrangements can present significant credit risks for an FCM. An FCM's risk-management policies and procedures for clearing-only activities should address the qualifications required of clearing-only customers and their volume of trading, the extent to which customer-trading activities can be monitored by the clearing-FCM at particular exchanges, and how aggregate risk will be measured and managed.

The FCM should establish trading limits for each of its clearing-only customers and have procedures in place to monitor their intraday trading exposures. The FCM should take appropriate action to limit its liability if a clearing-only customer has exceeded acceptable trading limits either by reviewing and approving a limit exception or by rejecting the trade. Examiners

should confirm that the FCM formally advises (usually in the give-up agreement) its customers and their executing FCMs of the trading parameters established for the customer. Examiners should also confirm that the FCM personnel responsible for accepting or rejecting an executed trade for clearance have sufficient current information to determine whether the trade is consistent with the customer's trading limits. Give-up agreements (or other relevant documents such as the customer account agreement) should permit the FCM to adjust the customer's transaction limits when appropriate in light of market conditions or changes in the customer's financial condition.

Some FCMs act as the primary clearing firm (also referred to as the sponsoring or qualifying firm) for customers.[10] A primary clearing firm guarantees to the clearinghouse that it will accept and clear *all* trades submitted by the customer or executing FCM, even if the trade is outside the agreed-on limits. Because an FCM is obligated to accept and clear all trades submitted by its primary clearing customers, the FCM must be able to monitor its customers' trading activities on an intraday basis for compliance with agreed-on trading limits. Monitoring is especially important during times of market stress. The FCM should be ready and able to take immediate steps to address any unacceptable risks that arise, for example, by contacting the customer to obtain additional margin or other assurances, approving a limit exception, taking steps to liquidate open customer positions, or giving appropriate notice of termination of the clearing arrangement to enable the FCM to reject future transactions.

Intraday monitoring techniques will vary depending on the technology available at the particular exchange. A number of the larger, more automated U.S. exchanges have developed technologies that permit multiple intraday collection, matching, and reporting of trades—although the frequency of such reconciliations varies. On exchanges that are less automated, the primary clearing FCM must develop procedures for monitoring clearing-only risks. For example, the FCM could maintain a significant physical presence on the trading floor to monitor customer trading activities and promote more frequent collection (and tallying) of trade information from clearing-only customers. The resources necessary for such monitoring obviously will depend on the physical layout of the exchange—the size of the trading floor and the number of trading pits, the floor population and daily trading volumes, and the level of familiarity the FCM has with the trading practices and objectives of its primary clearing customers. The FCM should be able to increase its floor presence in times of market stress.

Carrying-Broker Risk

An FCM may enter into an agreement with another FCM to execute and clear transactions on behalf of the first FCM (typically, when the first FCM is not an exchange or clearing member of an exchange). In such cases, the FCM seeking another or carrying FCM to execute its transactions should have procedures for reviewing the creditworthiness of the carrying FCM. If the FCM reasonably expects that the carrying FCM will use yet another FCM to clear its transactions (for example, if the carrying FCM enters into its own carrying-broker relationship with another firm for purposes of executing or clearing transactions on another exchange), the first FCM should try to obtain an indemnification from the carrying FCM for any losses incurred on these transactions.[11] When carrying transactions occur on a foreign exchange, an FCM should know about the legal ramifications of the carrying relationship under the rules of the exchange and laws of the host country. Moreover, it may be appropriate for an FCM to reach an agreement with its customers that addresses liabilities relative to transactions effected on a non-U.S. exchange by a carrying broker.

Executing-FCM Risk

When an FCM uses an unaffiliated FCM to execute customer transactions under a give-up

10. Primary clearing customers include institutions and individuals, as well as other nonclearing futures professionals (locals or floor traders), who execute their own trades on the exchange and other nonclearing FCMs that execute trades for unaffiliated customers.

11. The CFTC takes the position that an FCM is responsible to its customers for losses arising from the failure of the performance of a carrying broker. The industry disagrees with this position, and the issue has not been resolved by the courts.

arrangement, the clearing firm that sponsors the executing FCM guarantees its performance. Therefore, the first FCM should review the subcontracting risk of its executing FCMs and their sponsoring clearing firms. However, unlike the clearing risk inherent in a carrying-broker relationship, the subcontracting risk for an FCM using an executing FCM is limited to transaction risk (execution errors). An FCM's management should approve each executing broker it uses, considering the broker's reputation for obtaining timely executions and the financial condition of its sponsoring clearing firm.

Pit-Broker Risk

Usually, FCMs will subcontract the execution of their orders to unaffiliated pit brokers who accept and execute transactions for numerous FCMs during the trading day. The risk associated with using a pit broker is similar to that of using an executing broker: the risk is limited to the broker's performance in completing the transaction. If the pit broker fails, then the primary clearing firm is responsible for completing the transaction. Therefore, an FCM should approve each pit broker it uses, considering the pit broker's reputation for obtaining timely executions and the resources of its sponsoring clearing firm.

Clearinghouse Risk

Clearinghouse risk is the potential that a clearinghouse will require a member to meet loss-sharing assessments caused by another clearing member's failure. Before authorizing membership in an exchange or clearinghouse, an FCM's board of directors and its parent company must fully understand the initial and ongoing regulatory and financial requirements for members. The FCM's board of directors should approve membership in a clearinghouse only after a thorough consideration of the financial condition, settlement and default procedures, and loss-sharing requirements of the clearinghouse.

Particularly when it is considering membership in a foreign exchange or clearinghouse, an FCM's board should examine any regulatory and legal precedents related to how the exchange, clearinghouse, or host country views loss-sharing arrangements. As in the United States, some foreign clearinghouses have unlimited loss-sharing requirements, and some have ''limited'' requirements that are set at very high percentages. However, the loss-sharing provisions of some of the foreign clearinghouses have not yet been applied, which means that there are no legal and regulatory precedents for applying the stated requirements. In addition, the board should be apprised of any differences in how foreign accounts are viewed, for example, whether customer funds are considered separate from those of the FCM, whether the relationship between an FCM and its customer is viewed as an agency rather than a principal relationship, and whether there are material differences in the way futures activities are regulated.

The board also should be apprised of any material changes in the financial condition of every clearinghouse of which the FCM is a member. Senior management should monitor the financial condition of its clearinghouses as part of its risk-management function.

Guarantees

FCM parent companies often are asked to provide assurances to customers and clearinghouses that warrant the FCM's performance. These arrangements may take the form of formal guarantees or less formal letters of comfort.

Under Regulation Y, a bank holding company may not provide a guarantee to a clearinghouse for the performance of the FCM's customer obligations. A bank holding company may provide a letter of comfort or other agreement to the FCM's customers that states the parent (or affiliate) will reimburse the customers' funds on deposit with the FCM if they are lost as a result of the FCM's failure or default. Customers may seek this assurance to avoid losses that could arise from credit exposure created by another customer of the FCM, since the clearinghouse may use some or all of the FCM's customer-segregated funds in the event of a default by the FCM stemming from a failing customer's obligations.[12] Examiners should note any permissible guarantees for purposes of the consolidated report of the parent bank holding company, as

12. The letter of comfort would protect customers whose funds were used to cover other customer losses by the clearinghouse. U.S. clearinghouses also have guarantee funds that can be used to reimburse customers at the clearinghouse's discretion.

they are relevant to calculating the consolidated risk-based capital of the bank holding company.

Market Risk

When an FCM acts as a broker on behalf of customers, it generally is only subject to market risk if it executes customers' transactions in error. In this regard, operational problems can expose the FCM to market fluctuations in contract values. However, when an FCM engages in proprietary trading, such as market making and other position-taking, it will be directly exposed to market risk. Potential market-risk exposure should be addressed appropriately in an FCM's policies and procedures.

An FCM that engages in proprietary trading should establish market-risk and trading parameters approved by its parent company. The FCM's senior management should establish an independent risk-management function to control and monitor proprietary trading activities. Finally, the FCM should institute procedures to control potential conflicts of interest between its brokerage and proprietary trading activities.

Liquidity Risk

Liquidity risk is the risk that the FCM will not be able to meet its financial commitments (end-of-day and intraday margin calls) to its clearing FCM or clearinghouse. Clearing FCMs are required to establish an account at one of the settlement banks used by the clearinghouse for its accounts and the accounts of its clearing members. In some foreign jurisdictions, the central bank fulfills this settlement function. An FCM should establish and monitor daily settlement limits for its customers and should ensure that there are back-up liquidity facilities to meet any unexpected shortfalls in same-day funds. To ensure the safety of its funds and assets, an FCM should also monitor the financial condition of the settlement bank it has chosen and should be prepared to transfer its funds and assets to another settlement bank, if necessary.

To control other types of liquidity risks, an FCM should adopt contingency plans for liquidity demands that may arise from dramatic market changes. An FCM, to the extent posible, should monitor the markets it trades in to identify undue concentrations by others that could create an illiquid market, thereby creating a risk that the FCM could not liquidate its positions. Most U.S. clearinghouses monitor concentrations and will contact an FCM that holds more than a certain percentage of the open interest in a product. In some situations, the exchange could sanction or discipline the FCM if it finds that the FCM, by holding the undue concentration, was attempting to manipulate the market. These prudential safeguards may not be in place on foreign exchanges; consequently, an FCM will have to establish procedures to monitor its liquidity risk on those exchanges.

Reputation Risk

FCMs should have reporting procedures in place to ensure that any material events that harm its reputation, and the reputations of its bank affiliates, are brought to the attention of senior management; the FCM's board of directors; and, when appropriate, its parent company. Reports of potentially damaging events should be sent to senior management at the parent bank holding company who will evaluate their effect on the FCM to determine what, if any, steps should be taken to mitigate the impact of the event on the whole organization.

Commodity Trading Advisor

Acting as a commodity trading advisor (including providing discretionary investment advice to retail and institutional customers or commodity pools) may pose reputational and litigation risks to a CTA or FCM, particularly when retail customers are involved. Accordingly, the FCM's board should adopt policies and procedures addressing compliance with CFTC and NFA sales-practice rules (including compliance with the know-your-customer recordkeeping rules).

Operations Risk

Operations risk is the potential that deficiencies in information systems or internal controls will result in unexpected loss. Some specific sources of operating risk at FCMs include inadequate procedures, human error, system failure, or fraud. For FCMs, failure to assess or control operating

risks accurately can be a likely source of problems.

Adequate internal controls are the first line of defense in controlling the operations risks involved in FCM activities. Internal controls that ensure the separation of duties involving account acceptance, order receipt, execution, confirmation, margin processing, and accounting are particularly important.

An FCM's approved policies should specify documentation requirements for transactions and formal procedures for saving and safeguarding important documents, consistent with legal requirements and internal policies. Relevant personnel should fully understand documentation requirements. Examiners should also consider the extent to which institutions evaluate and control operations risks through internal audits, contingency planning, and other managerial and analytical techniques.

Back-office or transaction-processing operations are an important source of operations-risk exposures. In conducting reviews of back-office operations, examiners should consult the appropriate chapters of this manual for further guidance.

Operations risk also includes potential losses from computer and communication systems that are unable to handle the volume of FCM transactions, particularly in periods of market stress. FCMs should have procedures that address the operations risks of these systems, including contingency plans to handle systems failures and back-up facilities for critical parts of risk management, communications, and accounting systems.

When FCMs execute or clear transactions in nonfinancial commodities, they may have to take delivery of a commodity because a customer is unable or unwilling to make or take delivery on its contract. To address this situation, the FCM should have in place the procedures it will follow to terminate its position and avoid dealing in physical commodities. Internal controls should also be established to record, track, and resolve errors and discrepancies with customers and other parties.

INTERNAL AUDITS

An FCM should be subject to regular internal audits to confirm that it complies with its policies and procedures and is managed in a safe and sound manner. In addition, the internal-audit function should review any significant issues raised by compliance personnel to ensure that they are resolved. Other staff within the FCM should be able to reach internal audit staff to discuss any serious concerns they might have. Internal audit reports should be forwarded to the FCM's senior management and material findings should be reported to the FCM's board of directors and the parent company. Frequently, the internal audit function is located at the parent company, and audit reports are routinely sent to senior management at the parent company.

EXAMINATION AND INSPECTION PROCEDURES

The review of an FCM's functions should take a functional regulatory approach, using the findings of the FCM's primary regulators as much as possible. Examiners should especially focus on the risks that the FCM poses to the parent company and affiliated banks. These risks should be assessed by reviewing the adequacy of the FCM's policies and procedures, internal controls, and risk-management functions. Compliance with policies and procedures, and with any conditions on the FCM's activities imposed by regulatory authorities (including the Federal Reserve Board), should be fully reviewed.

Bank holding companies, banks, and FBOs may have more than one subsidiary that acts as an FCM in the United States or that engages in futures transactions for customers in foreign markets. To ensure that the FCM/CTA activities of a banking organization are evaluated on a consolidated basis, a cross-section of affiliated futures brokerage and advisory firms should be reviewed periodically—particularly those that present the greatest risk to the consolidated financial organization. Relevant factors to consider when identifying firms for review include (1) the volume of business; (2) whether the FCM has unaffiliated customers; (3) the number of customers; (4) whether the firm provides customer financing; (5) the number of brokers effecting transactions; (6) whether exchange or clearinghouse memberships are involved; (7) whether the FCM provides clearing-only services; and (8) the date and scope of the last review conducted by the Federal Reserve, SRO, or other regulator.

The scope of any review to be conducted depends on the size of the FCM and the scope of its activities. The draft first-day letter should provide an overview of an FCM's authorized activities and conditions, as well as a description of the actual scope of its business. Examiners should review the most recent summary of management points or other inspection results issued by the FCM's SRO or other regulator, as well as any correspondence between the FCM and any federal agency or SRO. If examiners should have any questions about the findings of an SRO's or a regulator's results, they should contact the organization to determine whether the matter is material and relevant to the current inspection. The status of any matters left open after the SRO's or regulator's review should also be inquired about.

An important factor in determining the scope of the inspection is whether the FCM has unaffiliated customers or conducts transactions solely for affiliates. Other factors include whether the FCM is a clearing member of an exchange, particularly of a non-U.S. exchange; it acts as a carrying broker on behalf of other FCMs; it has omnibus accounts with other brokers in markets in which it is not a member (U.S. or foreign); it provides advisory or portfolio management services, including discretionary accounts, or has been authorized to act as a commodity pool operator (CPO); it provides clearing services to locals or market-makers; and it provides financing services to customers.[13]

Examiners are not expected to routinely perform a front- or back-office inspection unless (1) the FCM's primary regulator found material deficiencies in either office during its most recent examination or (2) if front- or back-office operations have not been examined by the primary regulator within the last two years. However, examiners may still choose to review a small sample of accounts and transactions to confirm that appropriate controls are in place. In addition, net capital computations of U.S. FCMs do not need to be reviewed; they are reviewed by the FCM's DSRO, and the FCM is subject to reporting requirements if capital falls below warning levels. Examiners should perform a front- and back-office review of the FCM's operations outside of the United States.[14]

Examiners may rely on well-documented internal-audit reports and workpapers to verify the adequacy of risk management at the FCM. If an examiner finds that an internal audit adequately documents the FCM's compliance with a policy or procedure pertaining to the management of the various risk assessments required by the current inspection, he or she should document the audit finding in the workpapers and complete inspection procedures in any area not adequately addressed by the internal audit report. Examiners should periodically spot check areas covered by internal audits to ensure the ongoing integrity of the audit process. Examiners should also review internal-audit reports and workpapers for their scope and thoroughness in complying with FCM policies and procedures. Finally, examiners should ensure that internal auditors have adequate training to evaluate the FCM's compliance with its policies and procedures and with applicable laws and regulations (both inside and, if applicable, outside the United States).

If an examiner has determined that it is not necessary to perform a routine back-office review, he or she should confirm that the FCM has addressed operations risks in its policies and procedures. Examiners also should review the internal controls of an FCM to ensure that the firm is operated safely and soundly according to industry standards and that it complies with any Board regulations or conditions placed on the FCM's activities. Examiners should be alert to any ''red flags'' that might indicate inadequate internal controls. An FCM must be organized so that its sales, operations, and compliance functions are separate and managed independently. If an FCM engages in proprietary trading, examiners should confirm that the firm has procedures that protect against conflicts of interest in the handling of customer orders (examples of these conflicts of interest include front-running or ex-pit transactions). To make an overall assessment of the FCM's future business, the results of any review should be consolidated with the results of reviews by other FCMs inspected during this cycle.

13. If the FCM engages in proprietary trading for its own account, particularly for purposes other than hedging (market making or position-taking), or if the FCM acts as an intermediary in any over-the-counter futures or other derivative activities, the examiner should advise the examiner in charge of the inspection so that the firm's proprietary trading can be evaluated in connection with similar activities of the consolidated financial organization.

14. The inspection procedures for reviewing front- and back-office operations may be found in sections 2050.3 and 2060.3, respectively.

1. To identify the potential for and extent of various risks associated with the FCM's activities, particularly credit, market, liquidity, operations, and reputation risks.
2. To evaluate the adequacy of the audit function and review significant findings, the method of follow-up, and management's response to correct any deficiencies.
3. To assess the adequacy of the risk-management function at the FCM.
4. To assess the adequacy of and compliance with the FCM's policies and procedures and the adequacy of the internal-control function.
5. To evaluate and determine the FCM's level of compliance with relevant Board regulations, orders, and policies.
6. To assess the adequacy of risk management of affiliated FCMs on a consolidated basis.

1. Identify all bank holding company subsidiaries that engage in FCM- or CTA-type activities in the United States or abroad or identify U.S. FCM or CTA subsidiaries of FBOs. Determine which firms should be inspected to provide a global view of the adequacy of management of these activities on a consolidated basis, based on the scope of activities and degree of supervision by other regulators. Complete applicable procedures below for firms selected for inspection.
2. Review first-day letter documents; notices filed under Regulation Y; Board orders and letters authorizing activities; previous inspection reports and workpapers; and previous audits by futures regulators (CFTC, designated self-regulatory organization (DSRO), National Futures Association, foreign futures regulator); and reports by internal or external auditors or consultants.
3. Note the scope of the FCM's activities, including—
   a. execution and clearing;
   b. execution only for affiliates and third parties;
   c. clearing only for affiliates, third parties, professional floor traders (locals);
   d. pit brokerage;
   e. advisory;
   f. discretionary portfolio management;
   g. commodities pool operator (in an FCM or affiliate);
   h. margin financing;
   i. proprietary trading;
   j. exchange market maker or specialist;
   k. types of instruments (financial, agricultural, precious metals, petroleum);
   l. contract markets where business is directed;
   m. other derivative products (interest rate swaps and related derivative contracts, foreign-exchange derivative contracts, foreign government securities, and others);
   n. other futures-related activities, including off-exchange transactions;
   o. riskless-principal transactions; and
   p. registered broker-dealers.
4. Review exchange and clearinghouse memberships here and abroad, noting any financial commitments and guarantees by the FCM or its parent to the exchange or clearinghouse with respect to proprietary, affiliate, or customer transactions.
5. Note any new lines of business or activities occurring at the FCM or any changes to exchange and clearinghouse memberships since the last inspection.
6. Note what percentage of business is conducted for—
   a. affiliate banks,
   b. nonbank affiliates,
   c. customers (note the breakdown between institutional and retail, and any guarantee or letter of comfort to customers in which the parent company provides that it will reimburse customers for loss as a result of the FCM's failure or other default),
   d. proprietary accounts (hedging, position-taking), and
   e. professional floor traders (locals, market makers).
7. Determine the quality of the internal audit program. Assess the scope, frequency, and quality of the audit program for the FCM and related activities.
   a. Review the most recent audit report, noting any exceptions and their resolution.
   b. Verify that audit findings have been communicated to senior management and that material findings have been reported to the FCM's board of directors and parent company.
   c. Identify any areas covered by these procedures that are not adequately addressed by the internal audit report.
   d. Identify areas of the internal audit report that should be verified as part of the current inspection.
8. Determine the scope of review that is appropriate to the activities and allocate resources, considering the adequacy of internal audit workpapers. Complete appropriate front- or back-office inspection procedures if—
   a. front- and back-office operations have not been examined by the designated self-regulatory organization (DSRO) within the last two years,

b. material deficiencies in front- or back-office operations were found by the DSRO during the most recent audit, or
c. the primary regulator for the FCM is not a U.S. entity.

9. Advise the examiner who is in charge of inspection of the parent company if the FCM engages in proprietary trading or over-the-counter futures or derivative business as principal or agent.

BOARD AND SENIOR MANAGEMENT OVERSIGHT

10. Review the background and experience of the FCM's board of directors and senior management, noting prior banking and futures brokerage experience.
11. Determine if the board of directors of the FCM has approved written policies summarizing the firm's activities and addressing oversight by the board or a board designated committee of—
    a. the risk appropriate for the FCM, including credit, market, liquidity, operations, reputation, and legal risk (see SR-95-51);
    b. the monitoring of compliance with risk parameters;
    c. exchange and clearinghouse memberships; and
    d. the internal audit function.
12. Determine if senior management of the FCM has adopted procedures implementing the board's policies for—
    a. approval of new-product lines and other activities;
    b. transactions with affiliates;
    c. transactions by employees;
    d. compliance with applicable regulations, policies, and procedures;
    e. management information reports;
    f. the separation of sales, operations, back-office, and compliance functions; and
    g. reports to FCM boards of directors that describe material findings of the complaint or audit functions and material deficiencies identified during the course of regulatory audits or inspections.
13. Determine if policies and procedures are periodically reviewed by the board of directors or senior management, as appropriate, to ensure that they comply with existing regulatory and supervisory standards and address all of the FCM's activities.
14. Review management information reporting systems and determine whether the board of directors of the parent company (or a designated committee of the parent's board) is apprised of—
    a. material developments at the FCM;
    b. the financial position of the firm, including significant credit exposures;
    c. the adequacy of risk management;
    d. material findings of the audit or compliance functions; or
    e. material deficiencies identified during the course of regulatory reviews or inspections.
15. Review the FCM's strategic plan.
    a. Assess whether there are material inconsistencies between the stated plans and the FCM's stated risk tolerances.
    b. Verify that the strategic plan is reviewed and updated periodically.

CREDIT RISK

16. Review credit-risk policies and procedures.
    a. Verify the independence of credit-review approval from the limit-exceptions approval.
    b. Verify that the procedures designate a senior officer who has responsibility to monitor and approve limit-exception approvals.
17. Determine whether the FCM has authority to open customer accounts without parent-company approval.
18. Review the customer base (affiliates, third parties) for credit quality in terms of affiliation and business activity (affiliates, corporate, retail, managed funds, floor traders).
19. Evaluate the process for customer-credit review and approval. Determine whether customer-credit review identifies credit risks associated with the volume of transactions executed or cleared for the customer.
20. Evaluate the adequacy of credit-risk-management policies. Determine that they—
    a. establish credit limits for each customer that reflect the respective financial strengths, liquidity, trading objectives, and potential market risk associated with the products traded,
    b. require periodic updates of such credit limits in light of changes in the financial

condition of each customer and market conditions, and
   c. do not permit the FCM to waive important broker safeguards, such as the right to liquidate customer positions upon default or late payment of margin.
21. Verify this information by sampling customer credit files.
22. Verify that up-to-date customer credit files are maintained on site or are available for review during the inspection. If the customer credit approval was performed by the parent company or an affiliate bank, verify that the FCM's files contain information indicating the scope of the credit review, the approval, and credit limits.
23. Review notifications and approval of limit exceptions for compliance with FCM procedures.
24. Determine whether the FCM has adopted procedures identifying when the FCM should take steps to limit its customer credit exposure (for example, when to refuse a trade, grant a limit exception, transfer positions to another FCM, or liquidate customer positions).
25. Evaluate the adequacy of risk management of customer-financing activities.
   a. Determine that the credit-review process is independent from the marketing and sales and financing functions.
   b. Verify that the FCM has policies that identify customer-credit standards and establish overall lending limits for each customer.
   c. Assess the adequacy of the credit-review process and its documentation, even when credit review is performed by an affiliate.
26. Review the instances when the FCM has lent margin to customers on an unsecured basis. If the FCM does not engage in margin financing as a business line, verify that extensions are short term and within the operational threshold set for the customer.

CLEARING-ONLY RISK

27. Determine whether each clearing arrangement is in writing and that it—
   a. identifies the customer and executing brokers, and defines the respective rights and obligations of each party;
   b. establishes overall limits for the customer that are based on the customer's creditworthiness and trading objectives; and
   c. permits transaction limits to be adjusted to accommodate market conditions or changes in the customer's financial condition.
28. When the FCM has entered into a clearing-only agreement with a customer, verify that it has reviewed the creditworthiness of each executing broker or its qualifying clearing firm identified in the agreement.
29. If the FCM acts as the primary clearing firm for locals or other customers, confirm that the firm has adopted procedures for monitoring and controlling exposure. Note whether the firm monitors customer positions throughout the trading day and how this monitoring is accomplished.

CARRYING BROKERS, EXECUTING BROKERS, AND PIT BROKERS

30. If the FCM uses other brokers to execute or clear transactions, either on an omnibus or a fully disclosed basis, determine that it has adequately reviewed the creditworthiness and approved the use of the other brokers. If the FCM uses nonaffiliated executing brokers, confirm that it also has considered the reputation of the broker's primary clearing firm. If the other broker is likely to use another broker, determine whether the broker has given the FCM an indemnification against any loss that results from the performance or failure of the other broker.
31. If the FCM uses other brokers to execute or clear transactions in non-U.S. markets, determine whether senior management understands the legal risks pertinent to doing business in those markets and has adopted policies for managing those risks.
32. When the FCM utilizes third-party ''pit brokers'' to execute transactions, verify that the FCM has reviewed and approved each broker after considering the reputation of the pit broker's primary clearing firm.

EXCHANGE AND CLEARINGHOUSE MEMBERSHIP

33. Verify that the FCM completes a due diligence study of each exchange and clearing-

house before applying for membership in the organization.
   a. Determine whether board minutes approving membership demonstrate a thorough understanding of the loss-assessment provisions and other obligations of membership for each exchange and clearinghouse, as well as a general understanding of the regulatory scheme.
   b. Determine whether, in approving membership in a non-U.S. exchange or clearinghouse, the minutes indicate a discussion of the regulatory environment and any relevant credit, liquidity, and legal risks associated with doing business in the particular jurisdiction. Minutes also should reflect discussion of any material differences from U.S. precedent in how foreign accounts are viewed. For example, are customer funds held in an omnibus account considered separate (segregated) from those of the FCM, or is the relationship between the FCM and its customers viewed as an agency or principal relationship in the host country?
34. Verify that the FCM has apprised its parent company of the results of its study of the exchange or clearinghouse and that it has written authorization from the senior management of its parent company to apply for membership.
35. Verify that the FCM monitors the financial condition of each exchange and clearing organization for which it is a member.
36. Review all guarantees, letters of comfort, or other forms of potential contingent liability. Verify that the parent company has not provided a guarantee to the clearinghouse for the performance of the FCM's customer obligations. Note any guarantees against losses the parent bank holding company incurred from the failure of the FCM and advise the examiner who is in charge of the parent company's examination, who can confirm that guarantees are included in the bank holding company's calculation of consolidated risk-based capital.

MARKET RISK

37. If an FCM engages in proprietary trading, determine whether policies and procedures are in place to control potential conflicts of interest between its brokerage business and trading activities.

LIQUIDITY RISK

38. Verify that the FCM has established and monitors daily settlement limits for each customer to ensure that its liquidity is sufficient to meet clearinghouse obligations.
39. Determine whether the FCM has established back-up liquidity facilities to meet unexpected shortfalls.
40. Verify that the FCM monitors by product the amount of open interest (concentrations) that it, holds at each exchange either directly or indirectly through other brokers. If positions are held on foreign exchanges in which concentrations are not monitored, verify that the FCM is able to monitor its positions and manage its potential liquidity risks arising from that market.
41. Review liquidity contingency plans for dealing with dramatic market changes.

REPUTATION RISK

42. Review management information reporting systems to determine whether the FCM is able to assess the extent of any material exposure to legal or reputation risk arising from its activities.
43. Review management information reporting systems to determine whether the parent company receives sufficient information from the FCM to assess the extent of any material exposure to litigation or reputation risk arising from the FCM's activities.
44. If the FCM provides investment advice to customers or commodities pools, determine whether it has procedures designed to minimize the risks associated with advisory activities. Procedures might address the delivery of risk disclosures to customers, the types of transactions and trading strategies that could be recommended or effected for retail customers, compliance with the know-your-customer recordkeeping and other sales practice rules of the SROs, and conformance to any trading objectives established by the customer or fund.

45. If the FCM acts as a commodities pool operator, verify that it has obtained prior Board approval and is in compliance with any conditions contained in the Board order.

OPERATIONS, INTERNAL CONTROLS, AND COMPLIANCE

46. Review the most recent summary of management points or similar document issued by the FCM's DSRO or other primary futures regulator. Discuss any criticism with FCM management and confirm that corrective action has been taken.
47. Review the organizational structure and reporting lines within the FCM, and verify separation of sales, trading, operations, compliance, and audit functions.
48. Determine that FCM policies and procedures address the booking of transactions by affiliates and employees and other potential conflicts of interest.
49. If the FCM is authorized to act as a commodity pool operator, review the most recent NFA or other primary futures regulator's audit, including any informal findings by examiners. Discuss any criticism with FCM management and confirm that corrective action has been taken.
50. If the FCM executes and clears nonfinancial futures, verify that it has procedures to avoid taking physical possession of the nonfinancial product when effecting "exchange for physical transactions" for customers.
51. When the FCM takes physical delivery of commodities due to the failure or unwillingness of a customer to make or take delivery of its contracts, determine whether the FCM has and follows procedures to close out its position. Note if the FCM frequently takes delivery of physical commodities.
52. Assess the adequacy of customer-complaint review by reviewing the complaint file and how complaints are resolved. Note if the FCM receives repeat or multiple complaints involving one or more of its activities or employees.
53. Determine whether the FCM has developed contingency plans that describe actions to be taken in times of market disruptions and whether plans address management responsibilities including communications with its parent bank holding company, liquidity, the effect on customer credit quality, and communications with customers.

CONCLUSIONS

54. Prepare inspection findings and draw conclusions on the adequacy of the FCM's risk-management, compliance, operations, internal controls, and audit functions.
55. Present findings to FCM management and submit inspection findings to the examiner who is in charge of the parent company's inspection.

INTRODUCTION

Equity investment activities have had a significant impact on earnings and business relationships at a number of banking organizations. The Gramm-Leach-Bliley Act (GLB Act), enacted in November 1999, enhanced the potential growth of equity investment activities, as well as the potential for institutions new to the equity-investing business to undertake these activities. The merchant banking provisions of the GLB Act authorized financial holding companies (FHCs) to make investments, in any amount, in the shares, assets, or ownership interests of any type of nonfinancial company. While equity-investing activities can contribute substantially to earnings when market conditions are favorable, they can entail significant market, liquidity, and other risks and give rise to increased volatility of earnings and capital. Accordingly, sound investment- and risk-management practices are critical to successfully conducting equity investment activities in banking organizations.

This section provides a supervisory framework and examination procedures for reviewing the soundness of the investment-management and risk-management techniques used to conduct equity investment activities. Guidance on evaluating the impact of these activities on the risk profile and financial condition of the banking organization is included. The section incorporates and expands on guidance on sound practices for managing the risk of equity investments that was provided in SR-00-9, issued on June 22, 2000.

Goals of Supervision

As in the examination or review of any financial activity that a banking organization conducts, the supervisory assessment of equity investment activities should be risk-focused and structured to identify material risks to the safety and soundness of the depository institution that is conducting the activity, or to identify risks that are attributable to affiliates of FHCs and bank holding companies (BHCs) engaged in these business lines. Consistent with the Federal Reserve's role as umbrella supervisor of FHCs and BHCs, examiners should, where appropriate and available, use the findings of primary bank supervisors and functional regulators of holding company affiliates in reviewing the potential risks of equity investment activities. The supervisory assessment should include a review of the banking organization's compliance with the laws, regulations, and supervisory guidance applicable to this business line. (See ''Compliance with Laws and Regulations'' below.)

TYPES OF EQUITY INVESTMENTS

Banking organizations may make a variety of equity investments with different characteristics and risk profiles, under different regulatory authorities. Equity investments may provide seed or early-stage investment funds to start-up companies, or they may finance changes in ownership, middle-market business expansions, and mergers and acquisitions. Alternatively, banking organizations may hold interests in mature companies for long-term investment.

Equity investments may be in publicly traded securities or privately held equity interests. The investment may be made as a direct investment in a specific portfolio company or may be made indirectly through a pooled investment vehicle, such as a private equity fund. In general, private equity funds are investment companies, typically organized as limited partnerships, that pool capital from third-party investors to invest in shares, assets, and ownership interests in companies for resale or other disposition.

Direct investment holdings can be in the form of common stock, preferred stock, convertible securities, and options or warrants to purchase the stock of a particular portfolio company. Direct equity investors often play an active role in the strategic direction (but not the day-to-day management) of the portfolio company, typically through board representation or board visitation rights.

A banking organization may make indirect equity investments by acquiring equity interests in either a single company or a portfolio of different companies as a partner in a limited partnership. Indirect investments are typically made in the form of commitments to limited partnership funds; these commitments are funded when capital calls are made by the fund's general partner (or partners). The liquidity of

indirect fund investments may be more constricted since fund managers may limit investors' ability to sell investments. However, these fund investments often provide the advantages of increased diversification.

Indirect ownership interests can also be made through limited partnerships that in turn hold only ownership interests in other limited partnerships of equity investments. Such tiered partnership entities are often termed "funds of funds." Fund-of-funds investments are professionally managed limited partnerships that pool the capital of investors for investment in other equity investment limited partnerships. While fund-of-funds investments may generally involve high administrative costs, they also have the benefit of providing generally high levels of diversification.

A banking organization can act as the general partner or manager of a limited partnership fund. As the general partner of a fund, the banking organization earns management fees and a percentage of the earnings of the fund, often termed "carried interest." Management fees can range between 1.5 percent and 2.5 percent of fund net asset value (NAV) or committed capital, and these fees may decline in later years of the partnership as investments mature. Carried interest, generally ranging from 20 percent to 25 percent of earnings, is the general partner's share of the fund profits.

Banking organizations may offer fund investments as an asset-management product to high net worth private-banking and institutional clients. Fund investments provide private-banking and institutional investors with access to investments that they may not otherwise have access to because of minimum investment size and marketing restrictions. However, securities laws and regulations may apply to these sales, and banks engaged in sales of fund investments to customers should establish a comprehensive securities law compliance program. (See "Other Laws and Regulations" at "Compliance with Laws and Regulations" below.) In addition, when a banking organization acts as a general partner of a limited partnership fund, it must have adequate operational and system support capabilities in place. System support capabilities may be established internally or outsourced.

ACCOUNTING AND VALUATION

The accounting for and valuation of equity investments can be varied and complex. The supervisory review of accounting and valuation methodologies is critical, as the methodology used can have a significant impact on the earnings and earnings volatility of the banking organization. For some equity investments, valuation can be more of an art than a science. Many equity investments are made in privately held companies, for which independent price quotations are either unavailable or not available in sufficient volume to provide meaningful liquidity or a market valuation. Valuations of some equity investments may involve a high degree of judgment on the part of management or may involve the skillful use of peer comparisons. Similar circumstances may exist for publicly traded securities that are thinly traded or subject to resale and holding-period restrictions or when the institution holds a significant block of a company's shares.

Accordingly, clearly articulated policies and procedures on the accounting and valuation methodologies used for equity investments are of paramount importance. Formal valuation policies that specify appropriate and sound portfolio-valuation methodologies should be established for investments in public companies; direct private investments; indirect fund investments; and, where appropriate and to the extent possible, other types of investments with special characteristics. Portfolio-valuation methodologies should conform to generally accepted accounting principles (GAAP) and be based on sound, empirically based approaches that are clearly articulated, well documented, and applied consistently across similar investments over time.

Accounting Methods

Several methods are used in accounting for equity investments. The key methods are (1) mark-to-market accounting, (2) available-for-sale (AFS) accounting, (3) cost-basis accounting, and (4) equity-method accounting.

Mark-to-Market Accounting

Under GAAP, equity investments held by investment companies or broker-dealers, as well as securities held in the trading account, are reported at fair value, with any unrealized appreciation or depreciation included in earnings and

flowing to tier 1 capital. Securities for which market quotations are readily available are valued at prevailing closing prices derived from market-pricing sources or at an average market price. Banking organizations that employ average price ranges typically do so for varying periods after the initial public offering (IPO) for issues in more volatile sectors, such as technology, media, and telecommunications. Most institutions revert to closing prices after an issue is seasoned.

When the resale or transfer of securities is not restricted, current market value is the quoted market price. Some publicly traded securities may not be freely liquidated because of securities law restrictions, underwriting lock-up provisions, or significant concentrations of holdings. The market value of restricted securities must be determined in good faith by the board of directors, taking into account factors such as (1) the fundamental analytical data relating to the investment, (2) the nature and duration of restrictions on disposition of the securities, and (3) an evaluation of the forces that influence the market in which the securities are purchased and sold.[1]

Liquidity discounts generally are applied to restricted holdings, based on the severity of the restrictions and the estimated period of time the investment must be held before it can be liquidated. Regardless of the method used, discounts should be consistently applied. Changes in discount rates should generally be based on objective and verifiable transactions or events.

While most banking organizations employ an objective approach for identifying appropriate discounts when specific discounts are applied to a given set of parameters, a limited number have adopted a model-driven approach. The model-driven approach considers the marketability discount as the value of a put option based on assumptions about volatility, trading volumes, market absorption, and interest rates.

The marketability discount increases as the length of the restriction period and the volatility of the share price increase. Discount ranges suggested by the model are reviewed for overall reasonableness and to evaluate additional factors not considered by the model, such as proprietary information, historical discount rates, hedging or exit opportunities, and other empirical data.

A banking organization using a model-driven approach should have policies and procedures that clearly specify the instruments for which the model is appropriate and should provide guidance for appropriate use of the model. Banking organizations that use models should maintain comprehensive written documentation of the assumptions, methodologies, and quantitative and qualitative factors contained in the model. Independent reviews of models should be conducted periodically to verify model inputs and results. (See ''Valuation Reviews'' below.)

Available-for-Sale Accounting

Equity investments (1) not held with the intent to hold to maturity or (2) held in the trading account that have a readily determinable fair value (quoted market value) are generally reported as available-for-sale (AFS). They are marked to market with unrealized appreciation or depreciation recognized in a separate component of equity (other comprehensive income), but not earnings. Appreciation or depreciation flows to equity, but for regulatory capital purposes only, depreciation is included in tier 1 capital. Under regulatory capital rules, tier 2 capital may include up to 45 percent of the unrealized appreciation of AFS equity investments with readily determinable fair values.

Under Statement of Financial Accounting Standards No. 115 (FAS 115), a firm must determine whether any decline in fair value below the cost basis of an equity investment held AFS is ''other than temporary.'' If the decline in fair value is judged to be other than temporary, the cost basis of the individual security must be written down to fair value to establish a new cost basis. The amount of the write-down must be charged against earnings. The new cost basis remains unchanged for subsequent fair-value recoveries.

Increases in the fair value of AFS securities after the purchase date are included in other comprehensive income. Subsequent decreases in fair value, if not an other-than-temporary impairment, are also included in other comprehensive income. SEC Staff Accounting Bulletin

1. More specific factors may include the type of security, the financial condition of the company, the cost of the securities at the date of purchase, the size of the holding, the discount from market value of unrestricted securities of the same class at the time of purchase, special reports prepared by analysts, information about any transactions or offers on the security, the existence of merger proposals or tender offers affecting the security, the price and extent of public trading in similar securities of the issuer or comparable companies, and other relevant matters.

(SAB) 59 specifies that declines in the valuation of marketable investment securities of SEC-registered companies caused by general market conditions or by specific information pertaining to an industry or individual company should cause management to consider all evidence to evaluate the realizable value of the investment. Under SAB 59, SEC-registered companies are expected to employ a systematic methodology that documents all of the factors, in addition to impairment, considered in valuing the security. These factors include the length of time and extent to which the market value has been less than cost, the financial condition and near-term prospects of the issuer, and the intent and ability of the holder to retain the investment for a period of time sufficient to allow for any anticipated market-value recovery.

It is a sound practice for banking organizations to clearly articulate events, criteria, or conditions that trigger an other-than-temporary impairment of value. Examples of criteria that may indicate other-than-temporary impairment of value include—

- a business model that is no longer viable;
- a material internal risk-rating decline;
- sustained cash flow or financial-performance problems (for more than one year);
- a dilutive subsequent private equity round of financing;
- major loan-provision defaults;
- management, customer, and competitive changes;
- a debt restructuring; and
- a material, adverse industry change.

Cost-Basis Accounting

For equity investments without readily determinable fair values, including many privately held companies, fair value generally is the cost of the investment, adjusted for write-downs reflecting subsequent impairments to the value of the assets. Periodic evaluations of the valuation are performed to confirm or reestablish fair value based on one or a combination of the following events or factors:

- a subsequent, significant round of financing in which a majority of the new funding is provided by unrelated, sophisticated investors, and the new securities issued are similar to the types and classes of existing shares held
- a recent IPO of the company
- a binding offer to purchase the company
- a transaction involving the sale of a comparable company
- comparable information on publicly traded companies that is based on meaningful industry statistics, such as multiples or earnings-performance ratios, and that takes into account appropriate liquidity or restricted-security discounts
- if comparable information for the public market is not available or relevant, private transactions involving comparable companies or indices of small-cap companies could provide benchmarks for valuation purposes
- net asset or liquidation values
- company-specific developments indicating an other-than-temporary impairment in the value of the investment
- market developments

Valuations of equity investments are highly affected by assumed and actual exit strategies. The principal means of exiting an equity investment in a privately held company include initial public stock offerings, sales to other investors, and share repurchases. An institution's assumptions regarding exit strategies can significantly affect the valuation of the investment. The importance of reasonable and comprehensive primary and contingent exit, or take-out, strategies for equity investments should be emphasized. Secondary-market sales typically are made at a discount. A secondary sale of a limited partnership interest generally needs to be approved by the general partner or a percentage of the limited partners. Management should periodically review investment-exit strategies, with particular focus on larger or less-liquid investments. Policies and procedures should be established to govern the sale, exchange, transfer, or other disposition of the institution's investments. These policies and procedures should state clearly the level of management or board approval required for the disposition of investments. In the case of investments held under the merchant banking provisions of the GLB Act, policies and procedures should take into account the time limits for holding merchant banking investments, as specified in the rules and regulations of the Board and the Department of the Treasury.

In addition, a discounted cash-flow approach may be used to value private portfolio companies with operating revenue. This approach to

valuation estimates the value of the stream of future cash flows expected to be realized from the investment. The application of appropriate multiples and discounts should be well documented and reasonably similar to industry data for comparable companies. Any differences from industry data should be explicitly rationalized.

The valuation of private investment fund companies and private investment companies is based on fair value as determined by the general partner, or the valuation is developed internally through financial information produced by the general partner. Each portfolio company prepares financial statements, which are used to value the investments within the fund. Most financial statements are audited annually by independent auditors who express an opinion on the fair-value methodology of the limited partnership, in accordance with GAAP. Auditors' opinions are typically qualified. Private investment companies maintain capital accounts that reflect their proportional ownership in each fund and that are reconciled periodically (not less than annually) to fund financial statements. Write-downs are appropriate when this reconciliation process indicates unrealized losses in the fund.

Many banking organizations adjust the value reported by the general partner to account for management fees and carried interest, as well as liquidity discounts. Other banking organizations carry their investments in limited partnership funds at cost and write down investments to recognize other-than-temporary impairments in value below the cost basis.

Equity-Method Accounting

For investments in which the banking organization holds an ownership interest of between 20 and 50 percent, or for investments that are managed or significantly influenced by the banking organization, the equity method of accounting is appropriate. A banking organization using the equity method initially records an investment at cost. Subsequently, the carrying amount of the investment is increased to reflect the banking organization's share of the company's income and is reduced to reflect the organization's share of the company's losses or for dividends received from the company. The banking organization also records its share of the other comprehensive income of the company and adjusts its investment by an equal amount.

A loss in the value of an investment that is an other-than-temporary decline is recognized. In applying the equity method, a banking organization's share of losses may equal or exceed the carrying value of the investment plus advances made by the institution. The banking organization ordinarily should discontinue applying the equity method when the investments (and net advances) have been reduced to zero and should not provide for additional losses, unless the banking organization has guaranteed obligations of the company or is otherwise committed to provide further financial support. A banking organization should, however, provide for additional losses when the company appears to be positioned for an imminent return to profitability. For example, a company may incur a material, nonrecurring loss that may reduce the banking organization's investment below zero even though the underlying profitable pattern of the company is unimpaired. If the company subsequently reports net income, the banking organization should resume applying the equity method only after its share of the net income equals the share of the net losses not recognized during the period when the use of the equity method was suspended.

Valuation Reviews

Large complex banking institutions with material equity investment activities should have periodic independent reviews of their investment process and valuation methodologies by internal auditors or independent outside parties. In smaller, less complex institutions with immaterial equity holdings and in which limited resources may preclude independent review, alternative checks and balances may be established. In general, a banking organization should conduct valuation reviews semiannually. However, an immediate review should be initiated if deterioration in the value of an investment is identified. Valuation reviews should be documented in writing and readily available for examiner or auditor review. Examiners should review the frequency, scope, and findings of audits or reviews to determine whether they are commensurate with the size and complexity of the banking organization's equity-investing activities.

The two major components used to measure earnings, net income to assets (ROA) and net

income to equity (ROE), generally are not used as a performance measurement for equity investments. ROA and ROE indicate the extent to which invested capital increased in value, but do not reflect how long it took the increase to occur. In addition, the volatility of earnings from equity investments makes net income-based measures a less reliable indicator.

The standard method of measuring the performance of private equity investments is the internal rate of return (IRR). The use of IRR has one major advantage over traditional profitability measurement tools: it incorporates assumptions about both reinvestment and the time value of money, thereby providing a more accurate measure of performance. IRR measures both the degree to which invested capital increases in value and the time it takes for the increase to occur. While increases in invested capital contribute to a higher IRR, the effect of the time is inversely related to IRR. Thus, the shorter the time for an increase to occur, the higher the IRR.

IRR is determined by a process of trial and error. When net present values of the cash outflows (the cost of the investment) and cash inflows (returns on the investment) equal zero, the discount rate used is the IRR. When IRR is greater than the required return, or the ''hurdle rate,'' the investment is considered acceptable. In other words, an IRR can be thought of as a yield to maturity. The longer an investment exists in an illiquid portfolio, the greater its appreciation must be to maintain a high IRR.

COMPLIANCE WITH LAWS AND REGULATIONS

In conducting equity investment and merchant banking activities, banking organizations should ensure compliance with the laws and regulations under which investments are made. Investments made under different laws and regulations may be subject to very different guidelines and limitations.

The board of directors and senior management of the banking organization should establish a compliance function that is commensurate with the complexity and risks of the equity investment activities the institution conducts. If the compliance function for the equity investment business line is decentralized, appropriate mechanisms should be in place to coordinate the equity investment compliance function with the corporate-wide compliance function. Compliance reports should be furnished to the board and senior management on a periodic basis and in a timely manner. The frequency and content of these reports necessarily depends on the complexity and risk of the institution's activities.

Investment Authorities

BHCs, FHCs, and depository institutions are permitted to make direct and indirect equity investments under various statutory and regulatory authorities. The form and nature of equity investments are subject to the provisions of law and regulations that govern specific types of investments.

Bank Holding Companies and Regulation Y

Under section 4(c) of the Bank Holding Company Act (BHC Act), Congress exempted a limited number of investments from the general prohibition against bank holding companies' owning or controlling shares of nonbanking companies. Section 4(c)(6) of the BHC Act authorizes ownership or control of 5 percent or less of the outstanding voting shares of any one company. The Board has interpreted section 4(c)(6) to authorize only noncontrolling investments. In this regard, the Board has indicated that a BHC cannot own or control 25 percent or more of the total equity of a company under section 4(c)(6). In addition, section 4(c)(7) of the BHC Act authorizes ownership or control of all of the shares of an investment company that restricts its investments to those permissible under section 4(c)(6).

Small Business Investment Companies

The Small Business Investment Act and section 4(c)(5) of the BHC Act permit bank holding companies and banks to make equity investments through small business investment companies (SBICs), which may be subsidiaries of banks or bank holding companies. Congress authorized the creation of SBICs to provide debt and equity financing to small businesses in the United States. SBICs are licensed and regulated by the Small Business Administration (SBA).

SBIC activities are subject to the following guidelines:

- An SBIC generally is permitted to own up to 49.9 percent of the outstanding voting shares of a portfolio company.
- An SBIC generally is not permitted to exercise control over the portfolio company. However, a presumption of control may be rebutted when the portfolio company's management owns at least 25 percent of the voting securities and can elect at least 40 percent of the directors and when the SBIC investor group cannot elect more than 40 percent of the directors. Moreover, temporary control may be permitted in certain circumstances, such as a material breach of the financing agreement by the portfolio company or a substantial change in the operations or products of the portfolio company.
- Portfolio companies must meet specific SBA criteria, which define a small business.
- Aggregate investment in the stock of SBICs is limited to 5 percent of the bank's capital and surplus or, in the case of a bank holding company, 5 percent of the bank holding company's proportionate interest in the capital and surplus of its subsidiary banks.

If the SBIC takes temporary control of a small business, a control certification (a divestiture plan) must be filed with the SBA within 30 days. The certification must state the date on which the control was taken and the basis for taking control.

Portfolio companies must meet the SBA definition of a small business, which requires that (1) the business be independently owned and operated, (2) the business not be dominant in its field of operation, and (3) the business meets either of the two SBA methods of determining compliance with its size and income limitations. Under the first method, a business, together with its affiliates, must have a consolidated net worth of less than $18 million and after-tax income of less than $6 million. The second method applies number-of-employee and revenue limits to the business based on standards set by the SBA for the particular industry.

There are also restrictions on the type of businesses in which an SBIC can invest: Investments cannot be made in offshore companies. SBICs may not provide financing to a small business that engages in re-lending or re-investing activities. At the time of the investment or within one year thereafter, no more than 49 percent of the employees or tangible assets of the business can be located outside of the United States.

Edge Corporations and Regulation K

Regulation K implements sections 25 and 25A of the Federal Reserve Act, which authorize banking organizations to invest in Edge corporations. One power of an Edge corporation is the ability to make investments in foreign portfolio companies, subject to the following limitations:

- Ownership may not exceed 19.9 percent of the portfolio company's voting equity or 40 percent of the portfolio company's total equity.
- The aggregate level of portfolio investments may not exceed 25 percent of the BHC's tier 1 capital. For state member banks, the relevant limitation is 20 percent of tier 1 capital.
- Investments may be made under the Board's general-consent provisions (which do not require prior notice or approval) if the total amount invested does not exceed the greater of $25 million or 1 percent of the tier 1 capital of the investor.

As a general rule, Edge corporations are prohibited from investing in foreign companies that engage in the general business of buying or selling goods, wares, merchandise, or commodities in the United States. In addition, an Edge corporation is limited to a 5 percent interest in the shares of a foreign company that engages directly or indirectly in business in the United States that is impermissible for an Edge corporation.

With Board approval, Edge corporations can hold investments in foreign companies that do business in the United States if (1) the foreign company is engaged predominantly in business outside the United States or in internationally related activities in the United States, (2) the direct or indirect activities of the foreign company in the United States are either banking or closely related to banking, and (3) the U.S. banking organization does not own 25 percent or more of the voting stock or otherwise control the foreign company.

Section 24 of the Federal Deposit Insurance Act

Section 24 of the Federal Deposit Insurance Act

(FDI Act) governs the equity investments made by insured state nonmember banks and generally prohibits such investments unless the equity investment is permissible for a national bank. Section 24(f) of the FDI Act permits state banks to retain equity investments in nonfinancial companies if the investments are made pursuant to state law under certain circumstances. Other provisions of section 24 of the FDI Act permit a state bank to hold equity investments in nonfinancial companies if the FDIC determines that the investment does not pose a significant risk to the deposit insurance fund.

Merchant Banking and the Gramm-Leach-Bliley Act

The GLB Act authorizes BHCs and foreign banks subject to the BHC Act to engage in merchant banking activities if the banking organization files with the Board a declaration that it elects to be an FHC and a certification that all of its depository institution subsidiaries are well capitalized and well managed. To continue conducting merchant banking activities, each of the depository institution subsidiaries of the BHC or foreign bank must continue to meet the well-capitalized and well-managed criteria. In addition, at the time it commences any new merchant banking activity or acquires control of any company engaged in merchant banking activities, a domestic bank subsidiary must have at least a satisfactory rating under the Community Reinvestment Act (CRA).

A BHC or foreign bank must provide notice to the Board within 30 days after commencing merchant banking activities or acquiring any company that makes merchant banking investments. SR-00-1 (February 8, 2000) details the information required to be provided by BHCs and foreign banks electing FHC status and the procedures for processing FHC elections.

Merchant banking investments may be conducted by a securities affiliate of the FHC or by an insurance company affiliate that provides investment advice to the insurance company and is registered under the Investment Advisers Act of 1940, or by an affiliate of such an adviser. Merchant banking investments may also be made by other nonbank affiliates of FHCs, but may not be acquired or held by a depository institution affiliate or subsidiary of a depository institution. A U.S. branch or agency of a foreign bank is considered a depository institution for purposes of the rule and, therefore, may not acquire or hold merchant banking investments.

FHCs may make merchant banking investments only as part of a bona fide underwriting, merchant banking, or investment banking activity—that is, for resale or other disposition. Investments may not be made for purposes of engaging in the nonfinancial activities conducted by the entity in which the investment is made.

Rules adopted by the Board and the Department of the Treasury, effective February 15, 2001, impose the following limitations and requirements on the conduct of merchant banking activities.

Limitations on routine management. The GLB Act prohibits an FHC and its subsidiaries from being involved in the day-to-day ''routine management'' of a portfolio company. Certain activities, however, are deemed not to constitute routine management. These activities include (1) having one or more representatives on the board of directors of the portfolio company; (2) entering into covenants concerning actions outside of the ordinary course of business of the portfolio company; and (3) providing advisory and underwriting services to, and consulting with, a portfolio company. A December 21, 2001, staff opinion describes examples of covenants that Board staff believe would generally be permissible under the GLB Act and the implementing regulations. (See www.federalreserve.gov/boarddocs/legalint.) These include covenants that restrict the ability of the portfolio company to—

- alter its capital structure through the issuance, redemption, authorization, or sale of any equity or debt securities of the portfolio company;[2]
- establish the general purpose for funds sought to be raised through the issuance or sale of any equity or debt securities of the portfolio company (for example, retirement of existing debt, acquisition of another company, or general corporate use);
- amend the terms of any equity or debt securities issued by the company;
- declare a dividend on any class of securities of the portfolio company or change the dividend-

2. For these purposes, the phrase ''equity and debt securities'' includes options, warrants, obligations, or other instruments that give the holder the right to acquire securities of the portfolio company.

payment rate on any class of securities of the portfolio company;
- engage in a public offering of securities of the portfolio company;
- register a class of securities of the portfolio company under federal or state securities laws;
- list (or de-list) any securities of the portfolio company on a securities exchange;
- create, incur, assume, guarantee, refinance, or prepay any indebtedness outside the ordinary course of business of the portfolio company;
- voluntarily file for bankruptcy, or consent to the appointment of a receiver, liquidator, assignee, custodian, or trustee of the portfolio company for purposes of winding up its affairs;
- significantly alter the regulatory, tax, or liability status of the portfolio company (examples of actions that would significantly alter the regulatory, tax, or liability status of the portfolio company include the registration of the portfolio company as an investment company under the Investment Company Act of 1940, or the conversion of the portfolio company from a corporation to a partnership or limited-liability company);
- make, or commit to make, any capital expenditure that is outside the ordinary course of business of the portfolio company, such as, the purchase or lease of a significant manufacturing facility, an office building, an asset, or another company;
- engage in, or commit to engage in, any purchase, sale, lease, transfer, or other transaction outside the ordinary course of business of the portfolio company, which may include for example—
  - — entering into a contractual arrangement (including a property lease or consulting agreement) that imposes significant financial obligations on the portfolio company;
  - — the sale of a significant asset of the portfolio company (for example, a significant patent, manufacturing facility, or parcel of real estate);
  - — the establishment of a significant new subsidiary by the portfolio company;
  - — the transfer by the portfolio company of significant assets to a subsidiary or to a person affiliated with the portfolio company; or
  - — the establishment by the portfolio company of a significant new joint venture with a third party;
- hire, remove, or replace any or all of the executive officers of the portfolio company;[3]
- establish, accept, or modify the terms of an employment agreement with an executive officer of the portfolio company, including the terms setting forth the executive officer's salary, compensation, and severance;
- adopt or significantly modify the portfolio company's policies or budget concerning the salary, compensation, or employment of the officers or employees of the portfolio company generally;
- adopt or significantly modify any benefit plan covering officers or employees of the portfolio company, including defined benefit and defined contribution retirement plans, stock option plans, profit sharing, employee stock ownership plans, or stock appreciation rights plans;
- alter significantly the business strategy or operations of the portfolio company, for example, by entering or discontinuing a significant line of business or by altering significantly the tax, cash-management, dividend, or hedging policies of the portfolio company; or
- establish, dissolve, or materially alter the duties of a committee of the board of directors of the portfolio company.

Moreover, an FHC may routinely manage a portfolio company when it is necessary or required to obtain a reasonable return on the investment upon resale or disposition. The FHC may only operate the portfolio company for the period of time necessary to address the specific cause prompting the FHC's involvement, to obtain suitable alternative management arrangements, to dispose of the investment, or to otherwise obtain a reasonable return upon resale or disposition of the investment. Written notice to the Board is required for extended involvement, which is defined as over nine months. The FHC must maintain and make available to the Board upon request a written record describing its involvement in routinely managing the portfolio company.

Permissible holding periods. An FHC may, without any prior approval, own or control a direct merchant banking investment for up to 10 years, and own or control an investment held through a private equity fund for up to 15 years. If an FHC wants to hold an investment longer

3. The term "executive officer" is defined in section 225.177(d) of Regulation Y.

than the regulatory holding periods, a request for approval must be submitted to the Board at least 90 days before the expiration of the applicable time period. When reviewing requests to hold investments in excess of the statutory time limits, the Board will consider all of the facts related to the particular investment, including (1) the cost of disposing of the investment within the applicable holding period, (2) the total exposure of the FHC to the portfolio company and the risks that disposing of the investment may pose to the FHC, (3) market conditions, (4) the nature of the portfolio company's business, (5) the extent and history of FHC involvement in the management and operations of the portfolio company, and (6) the average holding period of the FHC's merchant banking investments. The FHC must deduct from tier 1 capital an amount equal to 25 percent of the carrying value of the investment held beyond the regulatory holding period and abide by any additional restrictions that the Board may impose in connection with granting approval to hold the interest in excess of the time limit.

An FHC must provide a written notice to the Board within 30 days after acquiring more than 5 percent of the voting shares, assets, or ownership interests of any company under this subpart, including interest in a private equity fund, at a total cost to the FHC that exceeds the lesser of 5 percent of the tier 1 capital of the FHC or $200 million. No post-acquisition notice under section 4(k)(6) of the BHC Act is required by an FHC in connection with a merchant banking investment if the FHC has previously filed a notice under section 225.87 of Regulation Y indicating that it had commenced merchant banking investment activities, except for the notice of large individual investment requirements.

Equity investment policies and procedures. FHCs engaging in merchant banking activities must have appropriate policies, procedures, and management information systems. SR-00-9 identifies the structure of such policies and procedures not only for merchant banking activities but for all equity investments. The formality of these policies and procedures should be commensurate with the scope, complexity, and nature of the institution's equity investment activities and risk profile. The required policies, discussed in depth in subsequent sections, should address the following:

- types and amounts of merchant banking investments
- parameters governing portfolio diversification
- guidelines for holding periods and exit strategies
- hedging activities
- investment valuation and accounting
- investment-rating process
- compensation and co-investment arrangements
- periodic audits of compliance with established limits and policies and applicable laws

In addition to limiting and monitoring exposure to portfolio companies that arises from traditional banking transactions, banking organizations should adopt policies and practices that limit the legal liability of the banking organization and its affiliates to the financial obligations and liabilities of portfolio companies. These policies and practices may include the use of limited-liability corporations or special-purpose vehicles to hold certain types of investments, the insertion of corporations that insulate liability between a bank holding company and a partnership controlled by the holding company, and contractual limits on liability.

Sections 23A and 23B. Sections 23A and 23B of the Federal Reserve Act impose specific quantitative, qualitative, and collateral requirements on certain types of transactions between an insured depository institution and companies that are under common control with the insured depository institution. The GLB Act includes a presumption that an FHC controls a company for purposes of sections 23A and 23B if it owns or controls 15 percent or more of the equity capital of the company. This ownership threshold is lower than the ordinary definition of an affiliate, which is typically 25 percent. The final rule identifies three ways that the GLB Act presumption-of-control provision will be considered rebutted:

- No officer, director, or employee of the FHC serves as a director, trustee, or general partner (or as an individual exercising similar functions) of the portfolio company.
- An independent third party owns or controls more than 50 percent of the voting shares of the portfolio company, and the officers and employees of the FHC do not constitute a majority of the directors, trustees, or general

partners (or individuals exercising similar functions) of the portfolio company.
- An independent third party owns or controls a greater percentage of the equity capital of the portfolio company than the FHC, and no more than one officer or employee of the holding company serves as a director, trustee, or general partner (or as an individual exercising similar functions) of the portfolio company.

If the FHC investment meets any of these conditions and there are no other circumstances that indicate that the FHC controls the portfolio company, the presumption of control will be deemed rebutted. However, if the FHC's investment does not meet one of these criteria, the holding company may still request a determination from the Board that it does not control the company.

Cross-marketing limitations. A depository institution controlled by an FHC may not cross-market the products or services of a portfolio company if more than 5 percent of the company's voting shares, assets, or ownership interests are owned or controlled by the FHC under the merchant banking authority. A portfolio company that meets the foregoing ownership criterion may not cross-market the products or services of the depository institution subsidiaries of the FHC. Management should ensure that these limits are observed through internal controls to monitor transactions with portfolio companies that are deemed affiliates.

Regulatory Capital Requirements

In January 2002, the Board, Office of the Comptroller of the Currency, and Federal Deposit Insurance Corporation (the agencies) jointly published a rule establishing special minimum regulatory capital requirements for equity investments in nonfinancial companies. The new capital requirements, which apply symmetrically to banks and bank holding companies, impose a series of marginal capital charges on covered equity investments that increase with the level of a banking organization's overall exposure to equity investments relative to tier 1 capital. The capital rules apply to equity investments made under—

- the merchant banking authority of section 4(k)(4)(H) of the BHC Act (12 USC 1843(k)(4)(H)) and subpart J of the Board's Regulation Y;
- the authority to acquire up to 5 percent of the voting shares of any company under section 4(c)(6) or 4(c)(7) of the BHC Act (12 USC 1843(c)(6) and (c)(7));
- the authority to invest in SBICs under section 302(b) of the Small Business Investment Act of 1958 (15 USC 682(b));
- the portfolio investment provisions of Regulation K (12 CFR 211.8(c)(3)), including the authority to make portfolio investments through Edge and agreement corporations; and
- the authority to make investments under section 24 of the FDI Act (other than under section 24(f)) (12 USC 1831a).

An equity investment includes the purchase, acquisition, or retention of any equity instrument (including common stock, preferred stock, partnership interests, interests in limited-liability companies, trust certificates, and warrants and call options that give the holder the right to purchase an equity instrument), any equity feature of a debt instrument (such as a warrant or call option), and any debt instrument that is convertible into equity. The rule generally does not apply to investments in nonconvertible senior or subordinated debt. The agencies, however, may impose the rule's higher charges on any instrument if an agency, based on a case-by-case review of the instrument in the supervisory process, determines that the instrument serves as the functional equivalent of equity or exposes the banking organization to essentially the same risks as an equity investment.

The capital charge applies to investments held directly or indirectly in ''nonfinancial companies'' under one of the authorities listed above. A nonfinancial company is defined as an entity that engages in any activity that has not been determined to be financial in nature or incidental to financial activities under section 4(k) of the BHC Act. For investments held directly or indirectly by a bank, the term ''nonfinancial company'' does not include a company that engages only in activities that are permissible for the parent bank to conduct directly.

The rule does not impose an additional regulatory capital charge on SBIC investments held directly or indirectly by a bank to the extent that the aggregate adjusted carrying value of all such investments does not exceed 15 percent of the tier 1 capital of the bank. For BHCs, no additional regulatory capital charge is imposed on

SBIC investments held directly or indirectly by the holding company to the extent the aggregate adjusted carrying value of all such investments does not exceed 15 percent of the aggregate of the holding company's pro rata interests in the tier 1 capital of its subsidiary banks. However, the adjusted carrying value of such investments must be included in determining the total amount of nonfinancial equity investments held by the banking organization in relation to its tier 1 capital, and thus the marginal capital charge that applies to the organization's covered equity investments. Investments made by a state bank under the authority in section 24(f) of the FDI Act are also exempt from additional regulatory capital charges. The rule does not apply the higher capital charges to equity securities acquired and held by a bank or BHC as a bona fide hedge of an equity derivatives transaction lawfully entered into by the institution.

The rule does not apply to investments made in community development corporations under 12 USC 24 (eleventh), or to equity securities that are acquired in satisfaction of a debt previously contracted (DPC) and that are held and divested in accordance with applicable law. The rule also does not apply to equity investments made under section 4(k)(4)(I) of the BHCA by an insurance underwriting affiliate of an FHC.

A grandfather provision exempts from the higher capital charges any individual investment made by a bank or BHC before March 13, 2000, or made after such date pursuant to a binding written commitment entered into before March 13, 2000. An investment qualifies for grandfather rights only if the banking organization has continuously held the investment since March 13, 2000. For example, if the banking organization sold 40 shares of a grandfathered investment in Company X on March 15, 2000, and purchased another 40 shares of Company X on December 31, 2000, the 40 shares would be ineligible for grandfathered status. Shares or other interests received by a banking organization through a stock split or stock dividend on a grandfathered investment are not considered new investments if the banking organization does not provide any consideration for the shares or interests and the transaction does not materially increase the organization's proportional interest in the portfolio company. The adjusted carrying value of grandfathered investments must be included in determining the total amount of nonfinancial equity investments held by the banking organization in relation to its tier 1 capital, and thus the marginal capital charge that applies to the organization's covered equity investments.

The marginal capital charges are applied by making a deduction from the banking organization's tier 1 capital. For investments with an aggregate adjusted carrying value equal to less than 15 percent of the banking organization's tier 1 capital, 8 percent of the aggregate adjusted carrying value is deducted from tier 1 capital. For investments with an aggregate adjusted carrying value equal to 15 to 24.99 percent of the banking organization's tier 1 capital, 12 percent of the aggregate adjusted carrying value is deducted from tier 1 capital. For investments with an aggregate adjusted carrying value in excess of 25 percent of the banking organization's tier 1 capital, 25 percent of the aggregate adjusted carrying value is deducted from tier 1 capital.

The adjusted carrying value of an investment is the value at which the investment is recorded on the balance sheet of the banking organization, reduced by (1) net unrealized gains that are included in carrying value but have not been included in tier 1 capital and (2) associated deferred tax liabilities. The total adjusted carrying value of a banking organization's nonfinancial equity investments that is subject to a deduction from tier 1 capital will be excluded from the organization's average total consolidated assets for purposes of computing the denominator of the organization's tier 1 leverage ratio.

The capital requirements established by the rule are minimum levels of capital required to adequately support a banking organization's equity investment activities. The rule requires banking organizations to maintain, at all times, capital that is commensurate with the level and nature of the risks to which they are exposed, including the risks of private equity and merchant banking investments. The Board may impose a higher capital charge on the nonfinancial equity investments of a banking organization if the facts and circumstances indicate that a higher capital level is appropriate in light of the risks associated with the organization's investment activities.

Internal Capital

Consistent with the guidelines identified in SR-99-18 (July 1, 1999), institutions conducting

material equity investment activities are expected to have internal methods for allocating capital based on the inherent risk and control environment of these activities. These methodologies should identify material risks and their potential impact on the safety and soundness of the consolidated entity. Internal capital-allocation methodologies for equity-investing activities consider both the risks posed by the broader market and those risks specific to the underlying portfolio companies. Other relevant risks may include country, business, and operational risk. More sophisticated banking organizations also identify the risks inherent in and allocate capital to equity-investing activities based on the investment stage (early-stage seed investments to later-stage buyouts) and type of investment (public versus private).

The level of capital dedicated to equity-investing activities should be appropriate to the size, complexity, and financial condition of the banking organization. Accordingly, it is generally appropriate for banking organizations to maintain capital in excess of minimum regulatory requirements to ensure that equity investment activities do not compromise the integrity of the institution's capital. Examiners should not only assess the institution's compliance with regulatory capital requirements and the quality of regulatory capital, but also review an institution's methodologies for internally allocating capital to this business line. As set forth in SR-99-18, the fundamental elements of a sound internal analysis of capital adequacy include (1) identifying and measuring all material risks, (2) relating capital to the level of risk, (3) stating explicit capital adequacy goals with respect to risk, and (4) assessing conformity to the institution's stated objectives. For equity-investing activities in particular, changes in the risk profile of the banking organization's equity portfolio, including the introduction of new instruments, increased investment volumes, changes in portfolio composition or concentrations, changes in the quality of the bank's portfolio, or changes in the overall economic environment, should be reflected in risk measurements and internal capital levels.

Risk-measurement methodologies for public securities generally reflect price declines based on standard stress scenarios. The selected stress-test benchmark should be appropriate to the characteristics of the portfolio holdings (for example, the sensitivity of small company–oriented portfolios may be more closely correlated to a Russell index rather than the S&P 500). A common approach to estimating industry-specific declines reflects the application of industry beta adjustments to each portfolio company.

Techniques can also be employed to measure the estimated exposure of the portfolio to unfavorable price moves over an extended holding period. The analysis is based on the historical volatility of each investment at a selected confidence interval. The process is based on the longest period for which historical volatility data are available.

Internal capital-allocation methodologies for private equity investments should consider both the market and credit risks inherent in this asset class. However, most methodologies employed to determine capital allocation for the market risk inherent in private equity investments are typically volatility-based approaches. Stress-test scenarios reflect conditions that prevailed during historically volatile equity markets with the results adjusted by industry betas. A number of banking organizations employ industry-adjusted, historical volatility–based measures to estimate the risk to private equity valuations from declines in earnings multiples. Some banking organizations base their stress scenarios on historical-volatility data provided by private equity vendors. While exposure to broader market risk is considered nondiversifiable, measurement of credit-specific risk should attempt to identify risk at the portfolio company–specific level, as well as identify other idiosyncratic factors that could result in impairments of value.

The amount of capital held should not only reflect measured levels of risk, but also consider potential uncertainties in risk measurement. A banking organization's internal capital should reflect an adequate cushion to take into account the perceived level of precision in the risk measures used, the potential volatility of exposures, and the relative importance to the institution of equity-investing activities.

Banking organizations should be able to demonstrate that their approach to relating capital to risk is conceptually sound and that results are reasonable. In assessing its approach, an institution may use sensitivity analysis of key inputs and compare its practices to peer practices.

Other Laws and Regulations

The conduct of equity investment activities is subject to different laws and regulations, depend-

ing on the authority under which the activities are conducted. Compliance with all laws and regulations applicable to the institution's investment activities should be a focus of the institution's system of internal controls. Regulatory compliance requirements should be incorporated into internal controls so that managers outside of the compliance or legal functions understand the parameters of permissible investment activities.

In particular, examiners should determine whether the institution has an effective program for compliance with federal and state securities laws and regulations. This is particularly important if the institution offers private equity fund investments to its private-banking customers. These investments generally represent a long-term and illiquid investment. Significant returns on investment may not be realized until the later stages of the funds' terms. Therefore, fund investments generally are suitable only for investors that can bear the risk of holding their investments for an indefinite time period and the risk of investment loss. Examiners should ensure that management has established a process to review to whom the funds are marketed and how the banking organization verifies that a customer's investment in the fund is suitable. As a general matter, fund investments are deemed to be suitable investments only after it is determined that—

- the client's investment in the fund is compatible with the size, condition, and nature of the client's investment objective, and
- the client has the capability (either personally or through independent professional advice) to understand the nature, material terms, conditions, and risks of the fund.

Examiners should encourage staff involved in marketing funds to private-banking clients to use an investor-suitability checklist. In addition, the Investment Company Act of 1940 and the Securities Act of 1933, as well as state securities laws, may impose restrictions on the sale of fund interests. Banking organizations involved in fund sales should consult with qualified securities counsel.

RISK MANAGEMENT

A banking organization engaged in equity investment activities must maintain policies, procedures, records, and systems reasonably designed to conduct, monitor, and manage such investment activities, as well as the risks associated with them, in a safe and sound manner. The banking organization should have a sound process for executing all elements of investment management, including initial due diligence, periodic reviews of holdings, investment valuation, and realization of returns. This process requires appropriate policies, procedures, and management information systems, the formality of which should be commensurate with the scope, complexity, and nature of an institution's equity investment activities. A sound investment process should be applied to all equity investment activities, regardless of the legal entity in which investments are booked. Supervisory reviews of equity investment activities should be risk-focused, taking into account the institution's stated tolerance for risk, the ability of senior management to govern these activities effectively, the materiality of activities in light of the institution's risk profile, and the capital position of the institution.

Policies, procedures, records, and systems should be reasonably designed to—

- delineate the types and amounts of investments that may be made;
- provide guidelines on appropriate holding periods for different types of investments;
- establish parameters for portfolio diversification;
- monitor and assess the carrying value, market value, and performance of each investment and the aggregate portfolio;
- identify and manage the market, credit, concentration, and other risks;
- identify, monitor, and assess the terms, amounts, and risks arising from transactions and relationships (including contingent fees or interests) with each company in which the FHC holds an interest;
- ensure the maintenance of corporate separateness between the FHC and each company in which the FHC holds an interest under merchant banking authority, and protect the FHC and its depository institution subsidiaries from legal liability for the operations conducted and financial obligations of each such company; and
- ensure compliance with laws and regulations governing transactions and relationships with companies in which the FHC holds an interest.

Portfolio-diversification policies should identify factors pertinent to the risk profile of the investments being made, such as industry, sector, geographic, and market factors. Policies establishing expected holding periods should specify the general criteria for liquidation of investments and guidelines for the divestiture of an underperforming investment. Decisions to liquidate underperforming investments are necessarily made on a case-by-case basis considering all relevant factors; however, policies and procedures stipulating more frequent review and analysis are generally used to address investments that are performing poorly or have been in portfolio for a considerable length of time. Policies should identify the aggregate exposure that the institution is willing to accept, by type and nature of investment. Adherence to these exposure limits should take into consideration unfunded, as well as funded, commitments.

Many institutions have different procedures for assessing, approving, and reviewing investments based on the size, nature, and risk profile of an investment. Often, procedures used for direct investments are different from those used for indirect investments made through private equity funds. For example, different levels of due diligence and senior-management approvals may be required. Accordingly, management should ensure that the infrastructure for conducting these activities contains operating procedures and internal controls that appropriately reflect the diversity of investments. Supervisors should recognize this potential diversity of practice when conducting reviews of the equity investment process. Their focus should be on (1) the appropriateness of the process employed relative to the risk of the investments made, (2) the materiality of the equity investment business line to the overall soundness of the banking organization, and (3) the potential impact on affiliated depository institutions.

Well-founded analytical assessments of investment opportunities and formal processes for approving investments are critical in conducting equity investment activities. While analyses and approval processes may differ by individual investments and across institutions, the methods and types of analyses conducted should be appropriately structured to assess adequately the specific risk profile, industry dynamics, management, and specific terms and conditions of the investment opportunity, as well as other relevant factors. All elements of the analytical and approval processes, from initial review through formal investment decision, should be documented and clearly understood by the staff conducting these activities.

An institution's evaluation of potential investments in private equity funds, as well as reviews of existing fund investments, should involve assessments of a fund's structure, with due consideration given to (1) management fees, (2) carried interest and its computation on an aggregate portfolio basis, (3) the sufficiency of general partners' capital commitments in providing management incentives, (4) contingent liabilities of the general partner, (5) distribution policies and wind-down provisions, and (6) performance-based return-calculation methodologies. A banking organization must make its policies, procedures, and records available to the Board or the appropriate Reserve Bank upon request. A banking organization must provide reports to the appropriate Reserve Bank in such format and at such times as the Board may prescribe.

Internal Controls

An adequate system of internal controls, with appropriate checks and balances and clear audit trails, is critical to conducting equity investment activities effectively. Appropriate internal controls should address all elements of the investment-management process, focusing on the appropriateness of existing policies and procedures; adherence to policies and procedures; and the integrity and adequacy of investment valuations, risk identification, regulatory compliance, and management reporting. Senior management should review and document departures from policies and procedures, and this documentation should be available for examiner review.

As with other financial activities, assessments of compliance with both written and implied policies and procedures should be independent of line decision-making functions to the fullest extent possible. Large complex banking organizations with material equity investment activities should have periodic independent reviews of their investment process and valuation methodologies by internal auditors or independent outside parties. In smaller, less complex institutions where limited resources may preclude independent review, alternative checks and bal-

ances should be established, such as random internal audits, senior management reviews of the function, or the use of outside third parties.

Management Information Systems and Reporting Mechanisms

The board of directors and senior management should ensure that the risks associated with private equity investments and merchant banking activities do not adversely affect the safety and soundness of the banking organization and its affiliated insured depository institutions. An adequate and detailed management information system (MIS) is essential for managing equity investments and allowing the board of directors to actively monitor the performance and risk profile of equity investment business lines in light of established objectives, strategies, and policies.

MIS should be commensurate with the scope, complexity, and nature of an institution's equity investment activities. The following MIS reports may be appropriate for a banking organization engaged in equity investment activities. Examples of annual reports include the—

- strategic plan, which should detail country and industry limits and concentrations, earnings goals based on IRRs, and investment plans;
- budget, which should show performance results versus projections and identify anticipated investments for the next annual period; and
- annual peformance review, which should clearly identify sources of revenue (such as unrealized gains or losses, dividend income, or realized gains or losses).

Examples of monthly and quarterly reports are—

- portfolio-valuation reports that provide, for each material investment, a brief overview of the investment, the unrealized gain or loss, any unfunded commitments or contingencies, and projected exit timetables;
- portfolio-wide performance and statistical data, including gains or losses on the portfolio for the period and the performance of any hedging strategies;
- the results of any stress tests;
- analyses of concentrations by sector, industry, geographic location, or type of investment;
- regulatory compliance reports;
- management and investment committee reports that make commitments for or approve new transactions or a redirection of corporate plans; and
- a semiannual investment-portfolio review, which is a full review of the equity investment portfolio that determines the quality (valuation) of the assets by reviewing and analyzing their financial condition, management assessment, future prospects, strengths and weaknesses, and exit strategies.

In addition to a review of the content of MIS reports, examiners should determine whether reports are prepared and disseminated to senior management and the board (or an appropriate committee of the board) on a timely basis. Reports provided to senior management and the board should be readily understandable by members who are not experts in the equity investment business line.

The sophistication of the software a banking organization employes to conduct equity-investing activities will depend on the complexity of those activities. Several software options are available to simplify portfolio management, monitoring, and reporting.

A quality portfolio database should be easy to use and logical, have general-ledger capabilities, access information readily, be network-ready and compatible with the operating system, and use a programming language based on industry-established sound practices. In general, a comprehensive software system should be able to produce the following reports:

- risk summary data for the investment portfolio, for example, by industry, investment stage, and geographic region;
- comprehensive data for each investment holding (its cost, market, IRR, net cash flows, and legal entity and authority); and
- the unfunded commitments schedule and stock distributions.

In addition, if the banking organization sponsors a fund of funds, additional features of a comprehensive software system could include the ability to provide information on—

- total commitments;
- individual-investor contributions;
- distributions to individual investors;

- IRRs and total returns by individual fund, vintage year, and portfolio; and
- exposures by stage, industry, geographic region, and company.

Hedging Activities

A limited number of banking organizations have engaged in hedging strategies in an effort to reduce the impact of volatility on their holdings. The expansion of international private equity investments in the increasingly global financial-products market has given rise to foreign-exchange risk exposure, as well as market-risk exposure. Hedging strategies have been developed to reduce these risks at some large complex banking organizations (LCBOs) that have material foreign equity investments.

The most basic hedging strategy is to capture a portion of an investment's unrealized increase in fair value through the purchase of a long put option. The cost of this strategy is the premium price of the option, which varies with the strike price and maturity. The closer the underlying instrument's market value is to the strike price, the more expensive the premium and vice versa.

To avoid the premium cost of the long put, the equity investor may instead purchase a ''costless'' collar, in which the premium paid for the put is offset by the premium received on the sale of the call. The collar limits both the upside potential and downside risk of the investment through the purchase of a put and the sale of a call. A collar strategy can be an effective hedging strategy if the value of the investment is expected to remain relatively stable or decline. However, if the value of the investment increases, the holder of the call option is likely to exercise, and the banking organization (the seller) will forego the appreciation in the value of the investment.

Another transaction used to hedge equity exposure is an equity swap. A specific price is established for the investment, and cash flows are paid to the purchaser or seller of the swap, depending on whether the underlying security value increases or decreases.

Most of the hedging instruments described above, particularly the option strategies, are European in nature, meaning that the option or embedded option may only be exercised on the stated maturity date. This feature may pose liquidity issues for the banking organization if it desires to sell its directly held investment, or if the general partner of a fund investment that holds marketable securities decides to liquidate a hedged investment before option maturity. In such cases, the banking company is effectively short the underlying investment until maturity date. To maintain their business relationships, counterparties offering the hedging products will allow banking organizations to unwind contracts for a fee when an unanticipated sale occurs. In selected cases, the banking organization may be required to post collateral to the counterparty for the hedging transaction. Most banking organization equity-investing units do not hold U.S. Treasury obligations in portfolio; therefore, the most common form of collateral provided is cash. In certain cases, the parent company will provide a guarantee on behalf of the equity-investing unit if it is a stand-alone subsidiary engaged in these activities. Common currency-hedging strategies for investments made in the international markets are currency forward sales or, to a lesser extent, option transactions.

If a banking organization uses hedging strategies to conduct equity investment activities, examiners should assess whether the organization has in place—

- formal and clearly articulated hedging policies and strategies, approved by the board of directors or an appropriate committee, that identify limits on hedged exposures and permissible hedging instruments;
- procedures for the review of hedging transactions for compliance with Statement of Financial Accouting Standards No. 133 (FAS 133); and
- appropriate management information systems and reporting systems for monitoring the hedge strategies. Systems should include mark-to-market valuation of the hedging instruments, premium amortization of purchased instruments, and an all-in performance evaluation that includes the current fair value of the underlying position.

COMPENSATION ARRANGEMENTS

The need to maintain a qualified staff is an extremely important aspect of risk management in equity investing. In many instances, the

compensation package for professional equity investment staff includes a co-investment arrangement under which the professional staff invests on a percentage basis in each of the portfolio companies or funds in which the banking organization invests during the year. Generally, a new co-investment partnership is formed annually so that each partnership reflects investments made in a particular calendar year. The duration of the partnership corresponds to the expected holding period of the investments in the partnership.

Each professional staff member's percentage of ownership within the partnership generally is based on that individual's tenure, experience, or rank. Staff members generally contribute a portion of the partnership's investment in cash; the remaining portion of the investment may be borrowed from the parent bank holding company or a nonbank subsidiary at a market rate, such as the applicable federal rate (AFR), which is published monthly by the IRS. While the holding company or a nonbank subsidiary may provide loans to the investing employees, it is recommended that the employees be required to furnish a portion of the investment with funds that have not been borrowed.

The borrowings should be serviced according to formal written agreements, and full payment of amounts borrowed, with interest, should be made before any partnership distributions to the employees. A private equity subsidiary should establish clear policies and procedures governing compensation arrangements, including co-investment structures, terms and conditions of employee loans, and sales of participants' interests, before the release of any liens.

If a partnership does not participate in every investment of the venture subsidiary, the examiner should consider this practice, known as "cherry picking," to be an exception worthy of criticism, as the intent of co-investment arrangement is for senior management responsible for the business line to share the investment risks with the banking organization. Moreover, if the investments in the portfolio are hedged, the investments in the co-investment plan should also be hedged, regardless of whether the hedge is in place to protect the upside profit potential or to minimize the downside risk. The important point is that co-investment plans consistently share in both the upside potential and downside risks of investment activities.

Other equity investment compensation plans base remuneration in whole or in part on the performance of the equity investment portfolios. This method is less accepted within the industry. If compensation is based on investment performance, a thorough understanding of the formula used and the underlying accounting treatments must be determined. Unrealized gains generally should not be included in determining compensation, as they do not reflect funds taken into income by the banking organization and may not ultimately be realized.

NONINVESTMENT BUSINESS TRANSACTIONS

Additional risk-management issues arise when a banking institution or an affiliate lends to or has other business relationships with (1) a company in which the banking institution or an affiliate has invested (that is, a portfolio company), (2) the general partner or manager of a private equity fund that has also invested in a portfolio company, or (3) a private-equity-financed company in which the banking institution does not hold a direct or indirect ownership interest but that is an investment or portfolio company of a general partner or fund manager with which the banking organization has other investments. Given their potentially higher than normal risk attributes, institutions should devote special attention to ensuring that the terms and conditions of such lending relationships are at arm's-length, in accordance with section 23B of the Federal Reserve Act, and are consistent with the lending policies and procedures of the institution. Similar issues may arise in the context of derivative transactions with or guaranteed by portfolio companies and general partners.

Lending and other business transactions between an insured depository institution and a portfolio company that meets the definition of an affiliate must comply with sections 23A and 23B of the Federal Reserve Act. The holding company should have systems and policies in place to monitor transactions between the holding company, or a nondepository institution subsidiary of the holding company, and a portfolio company, as these transactions are not typically governed by section 23B. A holding company should ensure that the risks of these transactions, including exposures of the holding company on a consolidated basis to a single portfolio company, are reasonably limited and that all transactions are on reasonable terms,

with special attention paid to transactions that are not on market terms.

When a banking organization lends to a private-equity-financed company in which it has no equity interest but in which the borrowing company is a portfolio investment of private equity fund managers or general partners with which the institution may have other private equity–related relationships, care must be taken to ensure that the extension of credit is granted on reasonable terms. In some cases, lenders may wrongly assume that the general partners or another third party implicitly guarantees or stands behind such credits. Reliance on implicit guarantees or comfort letters should not substitute for reliance on a sound borrower that is expected to service its debt with its own resources. As with any type of credit extension, absent a written contractual guarantee, the credit quality of a private equity fund manager, general partner, or other third party should not be used to prevent the classification or special mention of a loan. Any tendency to relax this restriction when the general partners or sponsors of private-equity-financed companies have significant business dealings with the banking organization should be strictly avoided. Banking organizations that extend credit to companies in which the institution has made an equity investment should also be aware of the potential for equitable subordination of the lending arrangements.

DISCLOSURE OF EQUITY INVESTMENT ACTIVITIES

Given the important role that market discipline plays in controlling risk, institutions should ensure that they adequately disclose the information necessary for markets to assess an institution's risk profiles and performance in the equity investment business line. Indeed, it is in the interests of the institution itself, as well as its creditors and shareholders, to disclose publicly information about earnings and risk profiles. Institutions are encouraged to disclose in public filings information on the type and nature of investments, portfolio concentrations, returns, and their contributions to reported earnings and capital. Supervisors should use such disclosures, as well as periodic regulatory reports filed by publicly held banking organizations, as part of the information that they review routinely. The following topics are relevant for public disclosure, though disclosures regarding each of these topics may not be appropriate, relevant, or sufficient in every case:

- the size of the portfolio
- the types and nature of investments (for example, direct/indirect, domestic/international, public/private, equity/debt with conversion rights)
- the initial cost, carrying value, and fair value of investments, and, when applicable, comparisons to publicly quoted share values of portfolio companies
- accounting techniques and valuation methodologies, including key assumptions and practices affecting valuation and changes in those practices
- realized gains or losses arising from sales and unrealized gains or losses
- insights regarding the potential performance of equity investments under alternative market conditions

Reviews of the equity investment and merchant banking activities should be risk-focused and rely on any findings of the primary or functional supervisors, where available and applicable. In selecting investments for review, a cross-section of investments should be targeted. The selection process should extend across specific sectors in which the banking organization has material investments. A mix of both recent and seasoned investments should be selected to determine whether changes have occurred in the underwriting, accounting, or valuation processes or in investment performance. When preparing to review equity-investing activities, the review team should collect any available background information from prior reviews, risk assessments, regulatory reports, or publicly available information.

1. Identify the extent to which the banking organization is engaged in equity investment and merchant banking activities, the types of investments made, and activities conducted, and determine the materiality of these activities to the institution's earnings and capital.
2. Identify and, to the extent possible, quantify the material risks posed by the banking organization's equity investment and merchant banking activities.
3. Determine whether the board of directors and senior management understand the risk profile of the banking organization's equity-investing activities.
4. Determine whether the accounting and valuation policies and practices for the equity investment business line are appropriate, clearly articulated, consistently applied in accordance with generally accepted accounting principles (GAAP), and properly disclosed.
5. Determine whether write-downs or adjustments to the valuation of investments are made in appropriate amounts and in a timely manner.
6. Evaluate the quality and timeliness of portfolio-valuation reviews.
7. Evaluate the adequacy and effectiveness of the policies, procedures, and processes designed to ensure compliance with applicable laws, regulations, and supervisory guidance governing equity investment and merchant banking activities.
8. Determine the adequacy of the institution's regulatory and internally allocated capital relative to the activities conducted and the inherent risks.
9. Evaluate the institution's framework of policies, procedures, systems, and internal controls designed to measure, monitor, and control investment risks.
10. Determine whether the banking organization's management information systems (MIS) and reporting mechanisms are commensurate with the scope, complexity, and nature of its equity investment and merchant banking activities.
11. Determine the adequacy of internal and external risk-management and audit reviews.
12. Determine the adequacy of policies and procedures governing any hedging activities authorized in connection with the banking organization's equity investment and merchant banking activities, and determine whether any of these activities are conducted in accordance with Statement of Financial Accounting Standards No. 133 (FAS 133).
13. Determine that personnel working in equity-investing activities are technically competent and well trained; ethical standards are established, communicated, and respected; and compensation arrangements are clearly documented and appropriate.
14. Assess any lending-based or noninvestment business relationships with portfolio companies, portfolio company managers, or general partners of equity investment ventures and funds, and determine whether such transactions are being conducted in accordance with applicable laws and supervisory guidance and in a manner that does not compromise the safety or soundness of insured depository institution subsidiaries.
15. Determine the adequacy of internal and public disclosures of equity investment activities, and recommend improvements when warranted.
16. Recommend corrective action when policies, procedures, practices, internal controls, or management information systems are found to be deficient or when violations of laws, rulings, or regulations have been noted.

TYPES OF EQUITY INVESTMENTS

1. Assess the composition of investments among direct investments, indirect investments through limited partnership funds, and indirect investments through funds of funds. Identify the types of equity instruments the banking organization holds (for example, common and preferred stock, convertible debt, warrants, and partnership interests) and the stage of development of portfolio companies (for example, start-up, growth, buyout, and recapitalization). Identify any issuer or industry-sector concentrations.
2. Determine if activities are managed along legal-entity or functional-business-unit lines. Identify the number of geographic offices through which investment activities are conducted, including any non-U.S. sites. Where applicable, determine how foreign organizations book and manage investments (that is, whether investments are booked in offshore vehicles rather than in U.S.-domiciled entities).
3. Determine whether and to what extent the banking organization serves as the general partner of private equity funds, and review any partnership agreements, fund-offering documents, or other pertinent information. Determine whether private equity funds are offered to the banking organization's private-banking clients, and, if so, review relevant documentation.

ACCOUNTING AND VALUATION

1. Evaluate the appropriateness of the banking organization's accounting treatment of various types of equity investments.
2. Determine whether the banking organization has established a valuation policy that establishes appropriate methodologies for each type of equity investment held (for example, private direct, funds, public security investments) or stage of investment. Determine if the valuation policy is applied consistently over time.
3. Assess the banking organization's current year-to-date write-offs, write-downs, write-ups, and recoveries in light of past trends and current market conditions.
4. Determine the appropriateness of the factors the banking organization considered in determining whether to make private-security valuation adjustments, and assess whether the banking organization's policies clearly articulate conditions and criteria for indicating other-than-temporary impairment of private equity investments.
5. If the banking organization discounts public securities, determine whether policies establish a rigid matrix of discounts or provide for a more subjective approach. If a subjective approach is used, determine how it is applied and documented.
6. Determine how the banking organization values fund investments. Are fund-investment valuation adjustments based on quarterly general-partner statements, or does the banking organization monitor the potential impact on its fund valuations based on an analysis of the underlying portfolio companies?
7. Determine whether acceptable levels of documentation support valuation decisions. Determine whether reviews of valuation methodologies are supported by robust documentation (especially where valuations reflect consideration of subjective factors).
8. Assess whether valuation reviews are comprehensive and timely, given the nature and complexity of the banking organization's investment activities.
9. Identify the level of unfunded commitments and the banking organization's ability to meet those commitments.

COMPLIANCE WITH LAWS AND REGULATIONS

1. Identify and verify the various legal authorities through which the banking organization engages in equity-investing activities. If applicable, has the BHC (or foreign bank) properly notified the appropriate Reserve Bank that it has elected to become a financial holding company (FHC) and that it has initiated merchant banking investment activities?
2. Verify that the firm's FR Y-12 accurately reflects the activities as conducted.
3. Identify and assess the regulatory-compliance process for the equity investment business

line, and assess how the process is coordinated with the consolidated compliance function.

4. Verify that board and senior management oversight of investing activities is commensurate with the complexity of the portfolio (or portfolios). Are reports provided on a timely basis, and do reports reflect the complexity and risk profile of the institution's activities?
5. Determine if the banking organization has established written policies and procedures for monitoring compliance with the applicable laws, regulations, and supervisory guidance, including but not limited to the rules in subpart J of Regulation Y (governing merchant banking activities), sections 23A and 23B of the Federal Reserve Act, and SR-00-9.
6. Determine the process for monitoring compliance with sections 23A and 23B of the Federal Reserve Act. Identify what system or process has been established at the holding company to monitor transactions between (1) any portfolio companies or fund managers that are considered affiliates and (2) its affiliate banks.
7. Request and review documentation on the banking organization's capital-allocation oversight infrastructure, and review how the process incorporates all consolidated nontrading equity holdings. Determine if management has effectively related the level of capital allocated for equity-investing activities to the level of inherent portfolio risks. Do internal capital allocations distinguish between different types of equity-related investments, including public, private, limited partnership funds, and mezzanine holdings? Are unfunded commitments to limited partnership funds included?
8. For those banking organizations employing value-at-risk (VaR) and volatility techniques to estimate portfolio risk for internal capital-allocation purposes, assess the following:
   a. What is the simulation time horizon (quarterly or annual)?
   b. How appropriate is the historical data sample to be used (source and length of time)?
   c. How does the banking organization map its investments to industry-specific market indices to determine volatilities and cross-industry correlations?
   d. How frequently are positions and volatilities reviewed?
   e. Are the methodology and assumptions periodically reviewed by an independent source or function?
   f. Has the banking organization considered the feasibility of using other types of internal modeling methodologies (including non-VaR methods), such as historical-scenario analyses or stress tests, for measuring the risk of equity investments and determining regulatory capital charges?
9. Discuss the impact of regulatory capital requirements on portfolio and risk-management activities with the banking organization's management team. Ensure that management has established an appropriate infrastructure to meet regulatory capital requirements.

RISK MANAGEMENT

1. Assess the adequacy of the banking organization's policies, procedures, systems, and internal controls in light of the complexity and risk profile of the institution's equity investment activities. Determine whether these policies, procedures, systems, and controls are reasonably designed to—
   a. delineate the types and amounts of investments that may be made;
   b. provide guidelines on appropriate holding periods for different types of investments;
   c. establish parameters for portfolio diversification;
   d. monitor and assess the carrying value, market value, and performance of each investment and the aggregate portfolio;
   e. identify and manage the market, credit, concentration, and other risks;
   f. identify, monitor, and assess the terms, amounts, and risks arising from transactions and relationships (including contingent fees or interests) with each company in which the banking organization holds an interest;
   g. ensure the maintenance of corporate separateness between the banking organization and each company in which the banking organization holds an interest under merchant banking authority, and

protect the banking organization and its depository institution subsidiaries from legal liability for the operations conducted by and financial obligations of each such company; and
   h. ensure compliance with laws and regulations governing transactions and relationships with companies in which the banking organization holds an interest.
2. Determine how risk exposures are aggregated on a consolidated basis at the bank holding company level. Determine how equity-ownership positions are aggregated if nontrading equity investments are made in other areas across the consolidated organization. Request a copy of any aggregation reports.
3. Review any internal audits, regulatory examinations, consultant reports, or other third-party reviews to identify significant supervisory issues.
4. Identify the investment strategy and whether it is consistent with the institution's risk profile and overall investment strategy.
5. Review and assess the adequacy and completeness of the investment process by reviewing investment memoranda, due-diligence reviews, and periodic portfolio reviews for information, including—
   a. an overall description of the investment, which generally includes the nature of the business and type of securities held;
   b. financial condition and trends; and
   c. the current valuation, exit strategies, the internal rate of return (IRR), and risk rating.
6. Assess the reasonableness of exit strategies for the investments reviewed.
7. If the banking organization is engaged in fund-management activities, assess the robustness of the following:
   a. the limited-partner due-diligence process, including suitability analyses
   b. the review of fund documentation by outside legal counsel with sufficient experience in such activities
   c. operational processing capabilities and limited-partner reporting capabilities
   d. the level of due diligence performed on third parties responsible for operational or reporting functions
8. If the banking organization acts as a general partner for private equity funds or sponsors funds of funds, determine the following:
   a. What is the business objective and strategy for launching limited partnerships or funds of funds?
   b. How is the fund (or funds) structured? Who is the general partner?
   c. What are the investment objectives (review a sample of private-placement memoranda)? Are the reviewed samples consistent with stated objectives?
   d. Does management understand the risks of launching limited partnerships or funds of funds?
   e. Does management use qualified internal counsel or retain outside counsel to ensure compliance with securities laws?
   f. Who is the client base for limited partnerships or funds of funds (that is, to whom are these funds marketed)? What is the process for determining investor suitability?
   g. Has the firm experienced any investor defaults on fund capital calls?
   h. Is the administration of funds of funds performed in-house or outsourced? If outsourced, has management established procedures for and does it perform a periodic review of the provider? How extensive is the provider's client base?
   i. How robust are the fund-of-funds selection and due-diligence processes? What is the valuation methodology for the funds?
   j. How are management fees generated on the banking organization's limited partnership or fund-of-funds activities?
9. Assess the robustness of the banking organization's risk-exposure measurement capabilities. Determine whether market scenarios employed for risk-exposure simulations of equity investments are consistent with those used in broader corporate market-risk modeling. Does the banking organization periodically stress-test the portfolio (or portfolios) to estimate the worst-case-scenario risk exposure in its portfolio?
10. Review the banking organization's investment-approval process to ensure that it is consistent with board-approved policies, procedures, limits, and supervisory guidance (such as in SR-00-9) and that it is appropriately documented.
11. Obtain and review formal hedging policies. The policies should include descriptions of approved hedging instruments for specific hedging strategies, definitive performance-related objectives, and appropriate risk

parameters, including both market- and credit-risk exposure.
12. Determine whether hedges comply with Statement of Financial Accouting Standards No. 133 (FAS 133), if applicable. Correlation between the derivative and the investment (or investments) to be hedged should be well documented and periodically validated by independent, external audits.
13. Assess the adequacy of management information systems (MIS), including systems for mark-to-market valuation of the hedging instruments, the premium amortization of purchased instruments, and performance evaluation.
14. If hedging strategies are developed and executed at the business unit, assess the background and experience level of staff who conduct these activities.
15. Obtain documentation summarizing the banking organization's MIS capabilities, including schematic diagrams, where available, to identify the level of automation and required manual processing. If MIS reports are generated manually, has the firm established a control process to ensure the integrity of the data in the reports?
16. Assess whether MIS is sufficiently robust for the size and complexity of the banking organization's investment activities. Does the management information system appropriately monitor and report on all material risks?
17. Determine whether the banking organization's MIS capabilities allow for tracking of ownership and risk exposures across entities in which equity investment activities are booked or conducted.
18. Identify and assess the level of MIS integration with corporate systems. Does the equity investment system feed into the corporate general-ledger system or is manual intervention required?
19. If applicable, request a demonstration of the MIS capabilities, including the various functions supporting a representative transaction.
20. Determine if management has established follow-up or escalation procedures to be implemented if management reports indicate emerging problems or abnormal conditions.
21. If the banking organization has launched a fund of funds, and if the reporting function for the fund is outsourced, review vendor reports for timeliness, accuracy, and completeness.

COMPENSATION ARRANGEMENTS

1. Assess whether clear policies and procedures are in place to govern compensation arrangements, including the co-investment structure and the terms and conditions of employee loans.
2. Determine if the co-investment partnership participates in every direct investment of the private equity subsidiary.
3. Determine the appropriateness of the repayment terms for any co-investment-plan borrowings. The loan should be serviced before any distributions are made to the co-investment partnership.
4. If the investments in the private equity portfolio are hedged, determine whether the co-investment-plan investments are similarly hedged.
5. If there are other forms of compensation besides a co-investment plan, determine if compensation is based on performance levels or operating results. Also determine if results are based on realized or unrealized gains and whether compensation incentives encourage the conduct of equity investment operations in a manner consistent with the institution's risk appetite. The income statement should be closely reviewed to determine what the firm represents are profits of these investments.

NONINVESTMENT TRANSACTIONS

1. Determine the extent to which the institution is engaged in lending or other noninvestment transactions with portfolio companies or with private equity fund managers or general partners of portfolio companies, including derivative transactions with or guaranteed by portfolio companies and general partners. Determine whether these transactions are conducted on terms and conditions that are appropriate and reasonable from the standpoint of the institution.
2. Determine whether lending and other business transactions between an insured deposi-

tory institution and a portfolio company that meets the definition of an affiliate comply with sections 23A and 23B of the Federal Reserve Act.

3. Determine whether the bank holding company has systems and policies in place to monitor transactions between the holding company, or a nondepository institution subsidiary of the holding company, and a portfolio company, including limits on exposures of the holding company on a consolidated basis to a single portfolio company.

DISCLOSURE OF EQUITY INVESTMENT ACTIVITIES

1. Determine the completeness and appropriateness of the institution's public disclosures of its equity investment activities, in light of the materiality and risk profile of these activities.
2. Advise management of any material concerns regarding the sufficiency of disclosure and encourage consultation with qualified securities counsel, as appropriate.

This section contains product profiles of financial instruments that examiners may encounter during the course of their review of capital-markets and trading activities. Knowledge of specific financial instruments is essential for examiners' successful review of these activities. These product profiles are intended as a general reference for examiners; they are not intended to be independently comprehensive but are structured to give a basic overview of the instruments.

Each product profile contains a general description of the product, its basic characteristics and features, a depiction of the marketplace, market transparency, and the product's uses. The profiles also discuss pricing conventions, hedging issues, risks, accounting, risk-based capital treatments, and legal limitations. Finally, each profile contains references for more information.

GENERAL DESCRIPTION

Federal funds (fed funds) are reserves held in a bank's Federal Reserve Bank account. If a bank holds more fed funds than is required to cover its Regulation D reserve requirement, those excess reserves may be lent to another financial institution with an account at a Federal Reserve Bank. To the borrowing institution, these funds are *fed funds purchased*. To the lending institution, they are *fed funds sold*.

CHARACTERISTICS AND FEATURES

Fed funds purchases are not government-insured and are not subject to Regulation D reserve requirements or insurance assessments. They can be borrowed only by those depository institutions that are required by the Monetary Control Act of 1980 to hold reserves with Federal Reserve Banks: commercial banks, savings banks, savings and loan associations, and credit unions. These transactions generally occur without a formal, written contract, which is a unique feature of fed funds.

Most fed funds transactions are conducted on an overnight-only basis because of the unpredictability of the amount of excess funds a bank may have from day to day. *Term fed funds* generally mature between two days to one year. *Continuing contracts* are overnight fed funds loans that are automatically renewed unless terminated by either the lender or the borrower—this type of arrangement is typically employed by correspondents who purchase overnight fed funds from respondent banks. Unless notified to the contrary by the respondent, the correspondent will continually roll the interbank deposit into fed funds, creating a longer-term instrument of open maturity. The interest payments on continuing contract fed funds loans are computed from a formula based on each day's average fed funds rate.

Fed funds transactions are usually unsecured. Nevertheless, an upstream correspondent bank that is selling funds may require collateralization if the credit quality of the purchaser is not strong.

All fed funds transactions involve only Federal Reserve Bank accounts. Two methods are commonly used to transfer funds between depository institutions:

- The selling institution authorizes its district Federal Reserve Bank to debit its reserve account and credit the reserve account of the buying institution. Fedwire, the Federal Reserve's electronic funds and securities transfer network, is used to complete the transfer with immediate settlement. On the maturity date, the buying institution uses Fedwire to return the funds purchased plus interest.
- A respondent bank tells its correspondent that it intends to sell funds. In response, the correspondent bank purchases funds from the respondent by reclassifying the respondent's demand deposits as *federal funds purchased*. The respondent does not have access to its deposited money as long as it is classified as federal funds on the books of the correspondents. Upon maturity of the loan, the respondent's demand deposit account is credited for the total value of the loan plus interest.

USES

Banks lend fed funds to other banks which need to meet Regulation D reserve requirements or need additional funding sources. Since reserve accounts do not earn interest, banks prefer to sell fed funds rather than keep higher than necessary reserve account balances. Community banks generally hold overnight fed funds sold as a source of primary liquidity.

DESCRIPTION OF MARKETPLACE

Transactions may be done directly between banks, often in a correspondent relationship, or through brokers. They may be initiated by either the buyer or the seller. Many regional banks stand ready to buy all excess funds available from their community bank correspondents or sell needed funds up to a predetermined limit. Consequently, there is a large amount of demand in the fed funds market, with selling banks easily able to dispose of all excess funds. Correspondent banks may also broker funds as agent as long as their role is fully disclosed. Fed

funds, including the term fed funds, are nonnegotiable products and, therefore, there is no secondary market.

Market Participants

Participants in the federal funds market include commercial banks, thrift institutions, agencies and branches of banks in the United States, federal agencies, and government securities dealers. The participants on the buy side and sell side are the same.

Market Transparency

Price transparency is high. Interbank brokers disseminate quotes on market news services. Prices of fed funds are active and visible.

PRICING

Fed fund yields are quoted on an add-on basis. All fed funds yields are quoted on an actual/360-day basis. The fed funds rate is a key rate for the money market because all other short-term rates relate to it. Bid/offer spreads may vary among institutions, although the differences are usually slight. The fed effective rate on overnight fed funds, the weighted average of all fed funds transactions done in the broker's market, is published in *The Wall Street Journal*. Thompson Bankwatch rates the general credit quality of banks, which is used by banks when determining credit risk for fed funds sold.

Rates on term fed funds are quoted in the broker's market or over the counter. In addition, money market brokers publish indicative quotes on the Telerate screen.

HEDGING

Due to the generally short-term nature of fed funds, hedging does not usually occur, although fed funds futures contracts may be used as hedging vehicles.

RISKS

Interest-Rate Risk

For nonterm fed funds, interest-rate risk is minimal due to the short maturity. For term fed funds, interest-rate risk may be greater, depending on the length of the term.

Credit Risk

Fed funds sold expose the lender to credit risk. Upstream correspondent banks may require collateral to compensate for their risks. All banks should evaluate the credit quality of any bank to whom they sell fed funds and set a maximum line for each potential counterparty.

Liquidity Risk

The overnight market is highly liquid. As there is no secondary market for term fed funds rates, their liquidity is directly related to their maturity.

Banks may purchase fed funds up to the maximum of the line established by selling financial institutions. Those lines are generally not disclosed to purchasing banks. Active users may need to test the availability of funds periodically to ensure that sufficient lines are available when needed.

ACCOUNTING TREATMENT

Fed funds sold should be recorded at cost. Term fed funds sold should be reported as a loan on the call report.

RISK-BASED CAPITAL WEIGHTING

A 20 percent risk weight is appropriate for fed funds. For specific risk weights for qualified trading accounts, see section 2110.1, ''Capital Adequacy.''

LEGAL LIMITATIONS FOR BANK INVESTMENT

A bank may sell overnight fed funds to any counterparty without limit. Sales of fed funds with maturities of one day or less or under continuing contract have been specifically

excluded from lending limit restrictions by 12 CFR 32. Term fed funds are subject to the 15 percent lending limit with any one counterparty and may be combined with all other credit extensions to that counterparty. Sales of fed funds to affiliates are subject to 12 USC 371c, ''Loans to Affiliates.''

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GENERAL DESCRIPTION

Commercial paper (CP) is a short-term, fixed-maturity, unsecured promissory note issued in the open markets as an obligation of the issuing entity. CP is usually issued with maturities of less than 270 days, with the most common having maturities of 30 to 50 days or less. CP is sold either directly by the issuer or through a securities broker. For entities with a sufficient credit rating, CP is generally backed by bank lines of credit or letters of credit. However, some entities with lesser-quality credit will issue CP without credit enhancements. These issues are typically through private placements and are generally not rated. Foreign corporations may also issue CP. Banks are active in the CP market as issuers, investors, dealers, and lenders on lines of credit used to back CP issuance.

In 1996, outstanding CP in the United States totaled approximately $803 billion: about 70 percent was issued by financial companies, 20 percent by domestic nonfinancial entities, and the remainder by foreign corporations and governments. The CP market grew 14 percent a year on average from 1970 to 1991. Between 1991 and 1996, the market grew by 50 percent.

CHARACTERISTICS AND FEATURES

CP is issued in maturities which range anywhere from a few days to 270 days (the Securities and Exchange Commission (SEC) does not generally require registration of securities due in less than 270 days), depending on the funding needs of the issuer. Most CP matures in less than 30 days. Issuers prefer to issue CP with a maturity of less than 90 days so that banks can use the CP as collateral at the Federal Reserve discount window. Most issuers need ongoing financing and roll the CP over at maturity, using the new proceeds to pay off the maturing CP. The minimum round-lot transaction is $100,000. Some issuers will sell CP in denominations of $25,000. CP is quoted on a 360-day discount basis. A small amount of CP is issued in interest-bearing form; the rate paid on this paper is the quoted discount rate converted to the equivalent simple interest rate. CP is typically issued in bearer form, but it may also be issued in registered form.

CP Credit Ratings

Credit ratings are crucial to the CP market because most investors restrict their CP investments to high-quality CP or will only buy rated CP. The CP ratings are assessments of the issuer's likelihood of timely payment. Table 1 summarizes CP ratings from the major rating agencies.

Superior-rated issues are considered to have a high likelihood of repayment, satisfactory-rated issues are considered to have satisfactory likelihood, and so on. Before they will assign a rating, the credit agencies require issuers to prove that they have adequate short-term liquidity. Some issuers raise their credit ratings by obtaining credit support to guarantee payment, such as a letter of credit (credit-supported commercial paper), or by collateralizing the issue with high-quality assets (asset-backed commercial paper).

Table 1—Commercial Paper Ratings

	Moody's	*S&P*	*Duff & Phelps*	*Fitch*
Superior	P-1	A-1+/A-1	Duff 1, Duff 1, Duff 1+	F-1
Satisfactory	P-2, P-3	A-2	Duff 2	F-2
Adequate	P-3	A-3	Duff 2	F-2
Speculative	NP	B, C	Duff 4	F-3
Defaulted	NP	D	Duff 5	F-5

USES

Investors

CP is generally purchased as a short-term, liquid, interest-bearing security. The short maturity structure, low credit risk, and large number of issuers make CP an attractive short-term investment alternative for short-term portfolio managers and for the liquid portion of longer-term portfolios. CP is particularly attractive when interest rates are volatile, as many investors are unwilling to buy long-term, fixed-rate debt in a volatile interest-rate environment.

Investors wishing to take a position in short-term rates denominated in a foreign currency without taking the risks of investing in an unfamiliar counterparty or facing country risk often invest in an instrument such as Goldman Sachs's Universal Commercial Paper (UCP) or Merrill Lynch's Multicurrency Commercial Paper (MCCP). With UCP or MCCP, the dealer creates synthetic foreign-currency-denominated paper by having a U.S. issuer issue CP in a foreign currency. The dealer then executes a currency swap with the issuer, which eliminates foreign-exchange risk for the issuer. The investor is therefore left with a short-term piece of paper denominated in a foreign currency which is issued by a U.S. counterparty, thus eliminating country risk.

Banks and Bank Holding Companies

Bank holding companies (BHCs) are active issuers of CP. The money raised is often used to fund nonbank activities in areas such as leasing and credit cards and to fund offshore branches.

BHCs use commercial paper in sweep programs. On a BHC level, the sweep programs are maintained with customers at the bank level, and the funds are upstreamed to the parent as part of the BHC's funding strategy. Sweep programs use an agreement with the bank's deposit customers (typically corporate accounts) that permits them to reinvest amounts in their deposit accounts above a designated level in overnight obligations of the parent bank holding company, another affiliate of the bank, or a third party. These obligations include instruments such as commercial paper, program notes, and master-note agreements.

DESCRIPTION OF MARKETPLACE

Investors

The short-term nature of commercial paper, together with its low credit risk and large number of issuers, makes it an attractive short-term investment for many investors. Investment companies, especially money funds, are the largest investors in the CP market. Other significant investors include the trust departments of banks, insurance companies, corporate liquidity portfolios, and state and local government bodies. If CP carries a rating of A-2, P-2, or better, thrifts may buy CP and count it as part of their liquidity reserves.

Issuers

Issuers of CP include industrial companies such as manufacturers, public utilities and retailers, and financial institutions such as banks and leasing companies. Financial issuers account for approximately 75 percent of CP outstanding, with industrial issuance making up the remainder. Approximately 75 percent of the CP outstanding carries the highest credit rating of A-1/P-1 or better, while only approximately 5 percent of CP outstanding carries a credit rating of A-3/P-3 or below. In the U.S. market for CP, domestic issuers account for approximately 80 percent of issuance, with foreign issuers making up the remainder.

Several large finance companies and bank holding companies place their paper directly with the investor without using a dealer. Approximately 40 percent of all CP outstanding is placed directly with the investor.

Primary Market

The primary market consists of CP sold directly by issuers (direct paper) or sold through a dealer acting as principal (dealer paper). Dealer paper accounts for most of the market. As principals, dealers buy and immediately sell the CP (with a small markup called the dealer spread). Sometimes the dealers hold CP as inventory for a short time as a service to issuers in need of immediate funds. Dealers are mostly large invest-

ment banks and commercial banks with section 20 subsidiaries.

Although dealers do not normally inventory positions in CP, at times they will agree to position any paper which the issuer posted but did not sell on a particular day. The amount unsold is usually small, and the positions assumed are usually on an overnight basis only. If the market moves, most issuers give dealers the discretion to sell CP within established bands set by the issuer.

Issuers of CP have their own dedicated sales force marketing their paper. Direct issuers also post their rates on services such as Telerate and Reuters, and often with bank money desks. Sometimes a company sells direct paper under a master-note agreement, under which the investor can buy and sell CP daily, up to a specific amount, for a specific interest rate that is set daily. The return on the master-note CP is slightly higher than that on an overnight repo.

Secondary Market

The CP market is larger than the market for other money market instruments, but secondary trading is only moderately active. Most investors have purchased CP tailored to their short-term investment needs and hold it to maturity. If an investor chooses to sell CP, he can usually sell it back to the original seller (dealer or issuer). Although CP is not traded on an organized exchange, price quotes for most of the significant issues can be obtained from security brokers. Average yields on newly issued CP are published in the *Wall Street Journal.*

PRICING

Each issue is priced based on the strength of the credit rating of the issuer. CP is a discount instrument, which means that it is sold at a price less than its maturity value (though occasionally, CP is issued as interest-bearing paper). The difference between the maturity value and the price paid is the interest earned by the investor. When calculating commercial paper, a year is assumed to have 360 days.

The yield on CP tracks that of other money market instruments. CP yields are higher than those offered on comparable T-bills—the higher credit risk is due to less liquidity and the state and local income tax exemption of T-bills. The rate on CP is also slightly higher than that offered on comparable certificates of deposit (CDs) due to the poorer liquidity of CP relative to CDs.

HEDGING

As mentioned above, dealers do not usually inventory positions in CP. When they do, these positions tend to be small and are usually held only overnight. Due to the short-term nature of CP, dealers often do not hedge these open positions. When these positions are hedged, dealers generally use instruments such as T-bill futures or Eurodollar futures to hedge their residual exposure. However, use of these products may subject the dealer to basis risk to the extent that the underlying instrument and the hedge instrument do not move in tandem.

RISKS

Credit Risk

Given that CP is an unsecured obligation of the issuer, the purchaser assumes the risk that the issuer will not be able to pay the debt at maturity. This credit risk is generally mitigated by the financial strength of most issuers and by some form of credit enhancement (unused bank lines of credit, letters of credit, corporate guaranty, or asset collateralization). Historically, the default rate on CP has been extremely low.

Liquidity Risk

As most investors hold CP until maturity, trading in the secondary market is relatively thin. As a result, only the highest-rated issues may be readily marketable in the secondary market. Privately placed CP is subject to further legally mandated restrictions on resale, which presents additional impediments to marketability.

Interest-Rate Risk

Like all fixed-income instruments, CP is subject to interest-rate risk. However, this risk is usually minimal given CP's short-term nature.

Foreign-Exchange Risk

CP denominated in foreign currency may expose the purchaser to foreign-exchange risk.

ACCOUNTING TREATMENT

The accounting treatment for investments in commercial paper is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

CP is generally weighted at 100 percent unless it is backed by a bank letter of credit, in which case the asset weight would be 20 percent. Tax-exempt CP may carry weights of 20 percent or 50 percent, depending on the issuer (that is, depending on whether the obligation is a general obligation or a revenue obligation). For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

CP is considered a loan to the issuer and is therefore subject to the applicable lending limit of the purchasing institution. One exception would be a general obligation tax-exempt CP, which can be held without limitation. Holdings of CP issued by an affiliate are subject to the limitations of section 23A of the Federal Reserve Act regarding loans to affiliates.

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GENERAL DESCRIPTION

A repurchase agreement (repo) involves the sale of a security to a counterparty with an agreement to repurchase it at a fixed price on an established future date. At initiation of the transaction, the buyer pays the principal amount to the seller, and the security is transferred to the possession of the buyer. At expiration of the repo, the principal amount is returned to the initial buyer (or lender) and possession of the security reverts to the initial seller (or borrower). Importantly, the security serves as collateral against the obligation of the borrower and does not actually become the property of the lender. Given the short tenor of a typical repo and the need to make proper custody arrangements for the securities involved, operational issues are important to proper management of repo activities. At times, in addition to being a counterparty in some transactions, a bank may serve as third-party custodian of securities collateral in other transactions as a service to the buyer and the seller.

In a repurchase agreement, a bank borrows funds when it ''sells'' the security and commits to ''repurchase'' it in the future. In a reverse repurchase agreement, the bank lends funds when it ''buys'' the security and commits to ''resell'' it in the future. A reverse repo is sometimes termed a resale agreement or a security purchased under agreement to resell (SPAR). The terms ''repo'' and ''reverse repo'' thus describe the same transaction, but from the perspective of each counterparty.

A closely related instrument is a dollar roll, which is identical to a repurchase agreement except that the ''repurchase'' leg of the transaction may involve a *similar* security rather than the specific security initially ''sold.'' In a dollar roll, the transaction contract explicitly allows for substitution of the collateral. The borrower of funds in this transaction thus runs the risk that at the closing of the transaction he or she will own a security that is generally comparable but inferior in some material way to the original security.

CHARACTERISTICS AND FEATURES

Most repos are conducted with U.S. Treasury or agency securities as collateral. Repos of mortgage pass-through securities and collateralized mortgage obligations (CMOs) issued or guaranteed by U.S. government agencies are less common but occur frequently. Repos of other securities or loans are not common, in part because the Federal Reserve System generally considers repos with other assets to be deposits of the selling institution and subject to Regulation D reserve requirements.

Repos can be conducted on an overnight basis, for a longer fixed term, or on an open-account basis. Overnight repos, or one-day transactions, represent approximately 80 percent of all repo transactions. Anything longer (called a ''term repo'') usually extends for less than 30 days. Repo agreements ''to maturity'' are those that mature on the same day as the underlying securities. ''Open'' repo agreements have no specific maturity, so either party has the right to close the transaction at any time.

USES

In general, repos are attractive to a variety of market participants as (1) a low-cost source of short-term funding for borrowers and (2) an asset with high credit quality regardless of the counterparty for suppliers of funds. Participation in this market requires proper operational and administrative arrangements as well as an inventory of eligible collateral.

Dealers

Repos can be used to finance long positions in dealers' portfolios by short-term borrowing. The repo market is a highly liquid and efficient market for funding dealers' bond inventory at a short-term rate of interest. Dealers may also use repos to speculate on future levels of interest rates. The difference between the coupon rate on the dealer's bond and the repo rate paid by the dealer is called ''carry,'' and it can be a source of dealer profit. Sometimes the borrowing rate will be below the bond's coupon rate (positive carry), and sometimes the borrowing rate will be above the bond's coupon rate (negative carry).

Dealers may use reverse repos to cover short positions or failed transactions. The advantage

of the reverse repo is that a dealer may borrow a security it has sold short with either positive or negative carry. A problem arises, however, when demand exceeds supply for a specific bond issue (collateral), and it goes on ''special.'' This means that those who own the security can earn a premium by lending it to those needing to deliver on short positions. These ''lenders'' are compensated by paying a below-market borrowing rate on the cash side of the transaction (the repo rate is lower on ''specials'' because the owner of the special security is the borrower of cash funds and is seeking the lowest lending rate possible).

Bank Nondealer Activity

Like dealers, a bank can use repos to fund long positions and profit from the carry. The market also gives a bank the means to use its securities portfolio to obtain additional liquidity—that is, funding—without liquidating its investments or recognizing a gain or loss on the transaction. For money market participants with excess funds to invest in the short term, reverse repos provide a collateralized lending vehicle offering a better yield than comparable time deposit instruments.

Commercial Depositors

Repos have proved to be popular temporary investment vehicles for individuals, firms, and governments with unpredictable cash flows. Repos (like other money market instruments) can also be used as a destination investment for commercial depositors with sweep accounts, that is, transaction accounts in which excess balances are ''swept'' into higher-yielding nonbank instruments overnight. Again, as collateral for the corporation's investment, the counterparty or bank will ''sell'' Treasury bills to the customer (that is, collateralize the loan).

DESCRIPTION OF MARKETPLACE

On any given day, the volume of repo transactions amounts to an estimated $1 trillion. Important lenders of funds in the market include large corporations (for example, General Motors) and mutual funds. Borrowers generally include large money-center or regional banks with a need for funding.

Repos are not traded on organized exchanges. There is no secondary market, and quoted market values are not available. The Public Securities Association has produced a standard master repo agreement and supplements that are used throughout the industry. Although the transactions themselves are not rated, the entities undertaking repos (such as larger banks and dealers) may be rated by Moody's, Standard & Poor's, or other rating agencies.

PRICING

Repo rates may vary somewhat with the type of collateral and the term of the transaction. Overnight repos with U.S. government collateral, however, generally take place at rates slightly below the federal funds rate. Interest may be paid explicitly, so that the ''sale'' price and ''repurchase'' price of the security are the same, or it may be embedded in a difference between the sale price and repurchase price.

The seller of a security under a repo agreement continues to receive all interest and principal payments on the security while the purchaser receives a fixed rate of interest on a short-term investment. In this respect, interest rates on overnight repo agreements usually are lower than the federal funds rate by as much as 25 basis points. The additional security provided by the loan collateral employed with repos lessens their risk relative to federal funds.

Interest is calculated on an actual/360 day-count add-on basis. When executed under a continuing contract (known as a demand or open-basis overnight repo), repo contracts usually contain a clause to adjust the interest rate on a day-to-day basis.

HEDGING

Since repo rates move closely with those of other short-term instruments, the hedge vehicles available for these other instruments offer an attractive hedge for positions in repos. If the portfolio of repos is not maintained as a matched book by the institution, the dealer or bank could be subject to a level of residual market risk.

RISKS

Market Risk

Repos and reverse repos, if used to fund longer or more sensitive positions, expose the institution to changes in the future levels of interest rates.

Credit Risk

The buyer is exposed to the risk that the seller will default on his or her obligation to repurchase the security when agreed. Of course, the buyer has access to the security as collateral and, in the event of default, the security could be sold to satisfy the debt. However, this could occur only through legal procedures and bankruptcy. Despite the conventional terminology, this type of transaction is a collateralized advance and not truly considered a sale and repurchase. If the value of the security has declined since the funds were disbursed, a loss may be incurred. Overcollateralization and margin arrangements are used to reduce this risk.

Operational Risk

If the buyer is to rely on its ability to sell a security in the open market upon the seller's default, it must exercise effective control over the securities collateralizing the transactions. The Government Securities Act was passed in 1986 to address abuses that had resulted in customer losses when the security was held by the seller. Its requirements include (1) written repurchase agreements must be in place, (2) the risks of the transactions must be disclosed to the customer, (3) specific repurchase securities must be allocated to and segregated for the customer, and (4) confirmations must be made and provided to the customer by the end of the day on which a transaction is initiated and on any day on which a substitution of securities occurs. Participants in repo transactions now will often require securities to be delivered or held by a third-party custodian. (See section 2020.1 of the *Commercial Bank Examination Manual*.)

ACCOUNTING TREATMENT

The accounting treatment for repurchase agreements is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

In general, assets collateralized by the current market value of securities issued or guaranteed by the U.S. government, its agencies, or government-sponsored agencies are given a 20 percent risk weight. If appropriate procedures to perfect a lien in the collateral are not taken, the asset should be assigned a 100 percent risk weight. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

Repos on securities that are eligible for bank investment under 12 USC 24(7th) and 12 CFR 1, and that meet guidelines set forth by the Federal Reserve System, may be held without limit. Repos that do not meet these guidelines should be treated as unsecured loans to the counterparty subject to 12 USC 84, and combined with other credit extensions to that counterparty. Repos with affiliates are subject to 12 USC 371c.

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GENERAL DESCRIPTION

U.S. Treasury bills, notes, and bonds (collectively known as ''Treasuries'') are issued by the Treasury Department and represent direct obligations of the U.S. government. Treasuries have very little credit risk and are backed by the full faith and credit of the U.S. government. Treasuries are issued in various maturities of up to 10 years.

CHARACTERISTICS AND FEATURES

Treasury Bills

Treasury bills, or T-bills, are negotiable, noninterest-bearing securities with original maturities of three months, six months, and one year. T-bills are offered by the Treasury in minimum denominations of $10,000, with multiples of $5,000 thereafter, and are offered only in book-entry form. T-bills are issued at a discount from face value and are redeemed at par value. The difference between the discounted purchase price and the face value of the T-bill is the interest income that the purchaser receives. The yield on a T-bill is a function of this interest income and the maturity of the T-bill. The returns are treated as ordinary income for federal tax purposes and are exempt from state and local taxes.

Treasury Notes and Bonds

Treasury notes are currently issued in maturities of 2, 3, 5, and 10 years on a regular schedule. Treasury notes are not callable. Notes and bonds pay interest semiannually, when coupon rates are set at the time of issuance based on market interest rates and demand for the issue. Notes and bonds are issued monthly or quarterly, depending on the maturity of the issue. Notes and bonds settle regular-way, which is one day after the trade date (T+1). Interest is calculated using an actual/365-day-count convention.

USES

Banks use Treasuries for investment, hedging, and speculative purposes. The lack of credit risk and deep liquidity encourages the use of Treasuries as investment vehicles, and they are often held in a bank's investment portfolio as a source of liquidity. Since it is the deepest and most efficient financial market available, many fixed-income and derivative instruments are priced relative to Treasuries. Speculators often use Treasuries to take positions on changes in the level and term structure of interest rates.

DESCRIPTION OF MARKETPLACE

Issuing Practices

T-bills are issued at regular intervals on a yield-auction basis. The three-month and six-month T-bills are auctioned every Monday. The one-year T-bills are auctioned in the third week of every month. The amount of T-bills to be auctioned is released on the preceding Tuesday, with settlement occurring on the Thursday following the auction. The auction of T-bills is done on a competitive-bid basis (the lowest-yield bids are chosen because they will cost the Treasury less money). Noncompetitive bids may also be placed on purchases of up to $1 million. The price paid by these bids (if allocated a portion of the issue) is an average of the price resulting from the competitive bids.

Two-year and 5-year notes are issued once a month. The notes are generally announced near the middle of each month and auctioned one week later. They are usually issued on the last day of each month. Auctions for 3-year and 10-year notes are usually announced on the first Wednesday of February, May, August, and November. The notes are generally auctioned during the second week of those months and issued on the 15th day of the month.

Primary Market

Treasury notes and bonds are issued through yield auctions of new issues for cash. Bids are separated into competitive bids and noncompetitive bids. Competitive bids are made by primary government dealers, while noncompetitive bids are made by individual investors and small institutions. Competitive bidders bid yields to

three decimal places for specific quantities of the new issue. Two types of auctions are currently used to sell securities:

- *Multiple-price auction.* Competitive bids are ranked by the yield bid, from lowest to highest. The lowest price (highest yield) needed to place the allotted securities auction is determined. Treasuries are then allocated to noncompetitive bidders at the average yield for the accepted competitive bids. After all Treasuries are allocated to noncompetitive bidders, the remaining securities are allocated to competitive bidders, with the bidder bidding the highest price (lowest yield) being awarded first. This procedure continues until the entire allocation of securities remaining to be sold is filled. Regional dealers who are not primary government dealers often get their allotment of Treasury notes and bonds through primary dealers, who may submit bids for the accounts of their customers as well as for their own accounts. This type of auction is used for 3-year and 10-year notes.

- *Single-price auction.* In this type of auction, each successful competitive bidder and each noncompetitive bidder is awarded securities at the price equivalent to the highest accepted rate or yield. This type of auction is used for 2-year and 5-year notes.

During the one- to two-week period between the time a new Treasury note or bond issue is auctioned and the time the securities sold are actually issued, securities that have been auctioned but not yet issued trade actively on a when-issued basis. They also trade when-issued during the announcement to the auction period.

Secondary Market

Secondary trading in Treasuries occurs in the over-the-counter (OTC) market. In the secondary market, the most recently auctioned Treasury issue is considered ''current,'' or ''on-the-run.'' Issues auctioned before current issues are typically referred to as ''off-the-run'' securities. In general, current issues are much more actively traded and have much more liquidity than off-the-run securities. This often results in off-the-run securities trading at a higher yield than similar-maturity current issues.

Market Participants

Sell Side

All U.S. government securities are traded OTC, with the primary government securities dealers being the largest and most important market participants. A small group of interdealer brokers disseminates quotes and broker trades on a blind basis between primary dealers and users of the Government Securities Clearing Corporation (GSCC), the private clearinghouse created in 1986 to settle trades for the market.

Buy Side

A wide range of investors use Treasuries for investing, hedging, and speculation. This includes commercial and investment banks, insurance companies, pension funds, and mutual fund and retail investors.

Market Transparency

Price transparency is relatively high for Treasury securities since several information vendors disseminate prices to the investing public. Govpx, an industry-sponsored corporation, disseminates price and trading information over interdealer broker screens. Prices of Treasuries are active and visible.

PRICING

Treasury Bills

Treasury bills are traded on a discount basis. The yield on a discount basis is computed using the following formula:

$$\text{Annualized Yield} = [(\text{Face Value} / \text{Price}) / \text{Face Value}] \times (360 / \text{Days Remaining to Maturity})$$

Treasury Notes and Bonds

Treasury note and bond prices are quoted on a percentage basis in 32nds. For instance, a price of 98:16 means that the price of the note or bond will be 98.5 percent of par (that is, 98 16/32). Notes and bonds can be refined to 64ths through the use of a plus tick. A 98:16+ bid means that the bid is 98 and 16½ 32nds (that is, 98 16.5/32), which is equivalent to 98.515625 percent of par. When the note or bond is traded, the buyer pays the dollar price plus accrued interest as of the settlement date. Yields are also quoted on an actual/365 day-count convention.

HEDGING

Treasuries are typically hedged in the futures or options markets or by taking a contra position in another Treasury security. Also, if a position in notes or bonds is hedged using an OTC option, the relative illiquidity of the option may diminish the effectiveness of the hedge.

RISKS

Market Risk

The risks of trading Treasury securities arise primarily from the interest-rate risk associated with holding positions and the type of trading conducted by the institution. Treasury securities are subject to price fluctuations because of changes in interest rates. Longer-term issues have more price volatility than shorter-term instruments. A large concentration of long-term maturities may subject a bank's investment portfolio to increased interest-rate risk. For instance, an institution which does arbitrage trading by buying an issue that is relatively cheap (that is, off-the-run securities) in comparison to historical relationships and selling one that is relatively expensive (that is, current securities) may expose itself to large losses if the spread between the two securities does not follow its historical alignments. In addition, dealers may take positions based on their expectations of interest-rate changes, which can be risky given the size of positions and the impact that small changes in rates have on the value of longer-duration instruments. If this type of trading is occurring, the institution's risk-management system should be sufficiently sophisticated to handle the magnitude of risk to which the dealer is exposed.

Liquidity Risk

Due to lower liquidity, off-the-run securities generally have a higher yield than current securities. Many institutions attempt to arbitrage these pricing anomalies between current and off-the-run securities.

ACCOUNTING TREATMENT

The accounting treatment for investments in Treasuries is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

U.S. Treasury bills, notes, and bonds have a 0 percent risk weighting. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

U.S. Treasury bills, notes, and bonds are type I securities with no legal limitations on a bank's investment.

REFERENCES

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Chicago: Irwin Professional Publishing, 1995.

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U.S. Department of the Treasury. *Buying Treasury Securities.* Washington, D.C.: The Bureau of the Public Debt, 1995.

GENERAL DESCRIPTION

STRIPS are zero-coupon securities (zeros) of the U.S. Treasury created by physically separating the principal and interest cash flows. This process of separating cash flows from standard fixed-rate Treasury securities is referred to as "coupon stripping." Similar trademark securities with such acronyms as CATS and TIGRs are created by investment banks.

CHARACTERISTICS AND FEATURES

STRIPS is the U.S. Treasury's acronym for "Separate Trading of Registered Interest and Principal Securities," the Treasury program developed in 1985 to facilitate the stripping of designated Treasury securities. All new Treasury bonds and notes with maturities of 10 years and longer are eligible to be stripped under this program and are direct obligations of the U.S. government. Under the STRIPS program, the holder of any eligible security can request that the U.S. Treasury create separate book-entry instruments for all of the principal and interest cash flows. The principal and interest portions of these instruments are assigned separate identification (CUSIP) numbers and may be owned and traded separately.

Trademark Products

Trademark products, which predate the STRIPS market, are stripped Treasury securities created by investment banks. In August 1982, Merrill Lynch marketed its Treasury Income Growth Receipts (TIGRs) and Salomon Brothers marketed its receipts as Certificates of Accrual on Treasury Securities (CATS). Other investment banks followed suit by issuing their own receipts. These products were created by purchasing Treasury securities and depositing them in a trust. The trusts then issued receipts representing ownership interests in the coupon and principal payments of the underlying Treasury securities.

Since the start of the STRIPS program in 1985, creation of trademark products such as TIGRs and CATS has ceased, and STRIPS now dominate the market. Trademark products are, however, still traded in the secondary market.

USES

STRIPS and other zero-coupon instruments can be tailored to meet a wide range of portfolio objectives because of their known cash-flow value at specific future dates. Specifically, they appeal to investors who want to lock in a terminal value without incurring the risk associated with reinvesting intervening cash flows. They also appeal to investors with definite opinions on interest rates, as prices of STRIPS are highly sensitive to changes in interest rates. Due to this high sensitivity to interest-rate changes, disproportionately large long-maturity holdings of Treasury derivatives such as STRIPS, CATS, or TIGRs in relation to the total investment portfolio or total capital of a depository institution would be considered an imprudent investment practice.

DESCRIPTION OF MARKETPLACE

The STRIPS program provides that all stripped securities be maintained in a book-entry format. For maintenance and transfer purposes, each marketable Treasury security has a unique identification (CUSIP) number. Under STRIPS, each principal and interest component is assigned a separate CUSIP number. All STRIPS are traded over the counter (OTC), with the primary government securities dealers being the largest and most important market participants. A small group of interdealer brokers disseminates quotes and broker trades on a blind basis between market participants. Arbitrageurs continually monitor the prices of STRIPS and underlying coupon-bearing bonds, looking for profitable opportunities to strip or reconstitute. Price transparency is relatively high for STRIPS since several information vendors disseminate prices to the investment public.

Market Participants

A wide range of investors use zeros for investing, hedging, and speculation. This includes commercial and investment banks, insurance companies, pension funds, and mutual fund and retail investors.

PRICING

The prices of STRIPS, CATS, and TIGRs are quoted on a discount basis, as a percentage of par. Eligible securities can be stripped at any time. For a book-entry security to be separated into its component parts, the par value must be an amount which, based on the stated interest rate, will produce a semiannual interest payment of $1,000 or a multiple of $1,000. Quotes for STRIPS are quoted in yields to maturity.

HEDGING

Zeros are typically hedged in the futures or options markets, or by taking a contra position in another Treasury security. The effectiveness of any hedge depends on yield-curve and basis risk. Also, if a position in zeros is hedged with an OTC option, the relative illiquidity of the derivative Treasury security and the option may diminish the effectiveness of the hedge.

RISKS

Many factors affect the value of zeros. These include the current level of interest rates and the shape of their term structure (interest-rate risk), bond maturities (rate sensitivity or duration), and the relative demand for zero-coupon bonds (liquidity).

Interest-Rate Risk

Increases in the level of interest rates increase the advantages of stripping. This is because the constant-yield method applied to premium bonds results in a lower price than linear amortization does. Zeros have higher sensitivity to changes in interest rates than bonds with the same maturity. Because they are zero-coupon bonds, their duration equals their maturity. Duration measures the percentage change in price for a given change in rates. The higher the duration, the higher the potential volatility.

Liquidity Risk

The STRIPS market is significantly less liquid than the U.S. Treasury bond market. Investors encounter wider bid/ask spreads and are subject to higher commissions. In addition, liquidity may fluctuate significantly in times of market instability. However, since a dealer can strip or reconstitute bonds in a fairly flexible manner, if zero-coupon prices diverge too far from their equilibrium levels, a new supply can be created or reduced through the stripping and reconstitution process.

Trademark products may have an uncertain marketability, as some may be eligible to be purchased only though the sponsoring dealer. CATS, however, are listed on the New York Stock Exchange, enhancing their liquidity. The market for zero-coupon Treasuries is more retail-oriented than the rest of the market. This often results in wider trading spreads, smaller transaction size, and less liquidity.

Credit Risk

As an obligation of the U.S. Treasury, STRIPS are considered to be free from default (credit) risk. Trademark products such as CATS and TIGRs are collateralized by the underlying U.S. Treasury, but whether they are considered ''obligations'' of the U.S. Treasury is uncertain. Proprietary products should be reviewed individually to determine the extent of credit risk.

ACCOUNTING TREATMENT

The accounting treatment for investments in U.S. Treasury STRIPS is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), ''Accounting for Certain Investments in Debt and Equity Securities,'' as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), ''Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities.'' Accounting

treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

U.S. Treasury STRIPS have a 0 percent risk weighting. Trademark products have a 20 percent risk weighting. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

U.S. Treasury STRIPS are a type I security with no limitations on a bank's investment. Trademark products are proprietary products, so legal limits vary. Appropriate supervisory personnel should be consulted on specific issues.

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GENERAL DESCRIPTION

Treasury inflation-indexed securities (TIIs) are issued by the Treasury Department and represent direct obligations of the U.S. government. The securities are designed to provide investors with a hedge against increases in inflation. The initial auction of these relatively new securities was held in January 1997, when a 10-year note was issued. Various longer-term maturities are planned for future auctions, which will be held quarterly. TIIs have very little credit risk, since they are backed by the full faith and credit of the U.S. government. Banks can be designated as primary dealers of Treasury securities, but they may sell them in the secondary markets and invest in TIIs for their own account.

CHARACTERISTICS AND FEATURES

TIIs were created to meet the needs of longer-term investors wanting to insulate their investment principal from erosion due to inflation. The initial par amount of each TII issue is indexed to the nonseasonally adjusted Consumer Price Index for All Urban Consumers (CPI-U). The index ratio is determined by dividing the current CPI-U level by the CPI-U level that applied at the time the security was issued or last re-indexed. If there is a period of deflation, the principal value can be reduced below par at any time between the date of issuance and maturity. However, if at maturity the inflation-adjusted principal amount is below par, the Treasury will redeem the security at par. Every six months, interest is paid based on a fixed rate determined at the initial auction; this rate will remain fixed throughout the term of the security. Semiannual interest payments are determined by multiplying the inflation-adjusted principal amount by one-half the stated rate of interest on each payment date. TIIs are eligible for stripping into their principal and interest components under the Treasury STRIPS program.

Similar to zero-coupon bonds, TIIs are tax disadvantaged in that investors must pay tax on the accretion to the principal amount of the security, even though they do not currently receive the increase in principal in cash. Paying tax on income not received reduces the effective yield on the security.

The following example illustrates how TIIs work: suppose an investor purchases a $1,000 note at the beginning of the year, in which the interest rate set at the time of the auction is 3 percent. Also suppose that inflation for the first year of the note is 3 percent. At the end of the first year, the $1,000 principal will be $1,030, reflecting the increase in inflation, although the investor will not receive this increase in principal until maturity. The investor will receive, however, the 3 percent interest payment. At the end of the first year, the notes will be paying 3 percent interest on the increased principal balance of $1,030. Principal will be adjusted each year, based on the increase or decrease in inflation.

USES

At present, the primary strategy behind the purchase of a TII would be to hedge against erosion in value due to inflation. However, banks also use TIIs for investment, hedging, and speculative purposes. As TIIs are tax disadvantaged, they are most likely to appeal to investors who are not subject to tax.

An investor in TIIs is taking a view that *real* interest rates will fall. Real interest rates are defined as the nominal rate of interest less the rate of inflation. If nominal rates fall, but inflation does not (that is, a decline in real interest rates), TIIs will appreciate because their fixed coupon will now represent a more attractive rate relative to the market. If inflation rises, but nominal rates rise more (that is, an increase in real interest rates), the security will decrease in value because it will only partially adjust to the new rate climate.

DESCRIPTION OF MARKETPLACE

Issuing Practices

The auction process will use a single pricing method identical to the one used for two-year and five-year fixed-principal Treasury notes. In this type of auction, each successful competitive

bidder and each noncompetitive bidder is awarded securities at the price equivalent to the highest accepted rate or yield.

Market Participants

Sell Side

Like all U.S. government securities, TIIs are traded over the counter, with the primary government securities dealers being the largest and most important market participants. A small group of interdealer brokers disseminate quotes and broker trades on a blind basis between primary dealers and users of the Government Securities Clearing Corporation (GSCC), the private clearinghouse created in 1986 to settle trades for the market.

Buy Side

A wide range of investors are expected to use TIIs for investing, hedging, and speculation, including commercial and investment banks, insurance companies, pension funds, mutual funds, and individual investors. As noted above, TIIs will most likely appeal to investors who are not subject to tax.

Market Transparency

Price transparency is relatively high for Treasury securities since several information vendors disseminate prices to the investing public. Govpx, an industry-sponsored corporation, disseminates price and trading information via interdealer broker screens. Prices of TIIs are active and visible.

RISKS

Interest-Rate Risk

TIIs are subject to price fluctuations because of changes in real interest rates. TIIs will decline in value if real interest rates increase. For instance, if nominal interest rates rise by more than the increase in inflation, the value of a TII will decrease because the inflation component will not fully adjust to the higher level of nominal rates in the market. As the coupon rate on TIIs is well below market for similar maturity instruments, the duration of TIIs will be higher, increasing the price sensitivity of the instrument for a given change in real interest rates. Also, the CPI-U index used in calculating the principal accretion on TIIs is lagged three months, which will hurt the investor when inflation is rising (and help the investor when inflation is falling).

Longer-term issues will have more price volatility than shorter-term instruments. A large concentration of long-term maturities may subject a bank's investment portfolio to unwarranted interest-rate risk.

Liquidity Risk

The Treasury securities market is the largest and most liquid in the world. While an active secondary market for TIIs is expected, that market initially may not be as active or liquid as the secondary market for Treasury fixed-principal securities. In addition, as a new product, TIIs may not be as widely traded or well understood as Treasury fixed-principal securities. Lesser liquidity and fewer market participants may result in larger spreads between bid and asked prices for TIIs relative to the bid/ask spreads for fixed-principal securities of the same maturity. Larger bid/ask spreads normally result in higher transaction costs and/or lower overall returns. The liquidity of the TII market is expected to improve over time as additional amounts are issued and more entities enter the market.

ACCOUNTING TREATMENT

The accounting treatment for investments in Treasury inflation-indexed securities is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for

Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

TIIs have a 0 percent risk weighting. For specific risk weights for qualified trading accounts, see section 2110.1, ''Capital Adequacy.''

LEGAL LIMITATIONS FOR BANK INVESTMENT

TIIs are a type I security so there are no legal limits on a bank's investment in them.

REFERENCES

U.S. Department of the Treasury. *Buying Treasury Inflation-Indexed Securities*. Washington, D.C.: The Bureau of the Public Debt, 1997.

GENERAL DESCRIPTION

Agency securities are debt obligations issued by federal agencies or federally sponsored agencies. Federal agencies are direct arms of the U.S. government; federally sponsored agencies are privately owned and publicly chartered organizations which were created by acts of Congress to support a specific public purpose (also referred to as government-sponsored entities or GSEs).

Federal agencies are arms of the federal government and generally do not issue securities directly in the marketplace. These agencies include the Government National Mortgage Association (GNMA or Ginnie Mae), Export-Import Bank, Farmers Home Administration (FmHA), General Services Administration (GSA), Maritime Administration, Small Business Administration (SBA), Tennessee Valley Authority, Commodity Credit Corporation, Rural Electrification Administration, Rural Telephone Bank, and Washington Metropolitan Area Transit Authority. All federally related institutions are exempt from registration with the Securities and Exchange Commission (SEC). Except for securities of the Private Export Funding Corporation and the Tennessee Valley Authority, the securities are backed by the full faith and credit of the U.S. government.

Government-sponsored entities include agencies in the following areas:

- housing (such as the Federal Home Loan Mortgage Corporation and Federal National Mortgage Association)
- farm credit (such as the Federal Farm Credit Bank System and Farm Credit System Financial Assistance Corporation)
- student loans (such as the Student Loan Marketing Association)
- small business (the Small Business Administration)
- export funding (the Export-Import Bank)

GSEs issue both discount and coupon notes and bonds. Discount notes are short-term obligations, with maturities ranging from overnight to 360 days. Coupon notes and bonds are sold with maturities greater than two years. The securities are not backed by the full faith and credit of the U.S. government. Consequently, investors purchasing GSEs are exposed to some potential credit risk. The yield spread between these securities and Treasury securities of comparable maturity reflects differences in perceived credit risk and liquidity.

GSEs issue direct debt obligations and guarantee various types of asset-backed securities. This section discusses only securities that represent direct obligations of federal and federally sponsored agencies. For a discussion of securities issued or guaranteed by some of these agencies, see ''Residential-Mortgage-Backed Securities,'' section 4110.1. Also, many GSEs are active in issuing structured notes. The role of the agency and particular risks involved in these securities are discussed in section 4040.1, ''Structured Notes.''

CHARACTERISTICS AND FEATURES

Federal-agency securities such as those issued by the Government National Mortgage Association are backed by the full faith and credit of the U.S. government. However, government-sponsored agency securities are not guaranteed by the U.S. government, although market participants widely believe that the government would provide financial support to an agency if the need arose. This view has gained some credence as a result of the federal government's operations to bolster the Farm Credit System in the mid-1980s. U.S. agency securities are also exempt from SEC registration.

USES

Agency securities are deemed suitable investments for banks. They are frequently purchased by banks and held in their investment portfolios.

DESCRIPTION OF MARKETPLACE

In the primary market, government agencies and GSEs sell their securities to a select group of commercial banks, section 20 subsidiaries of commercial banks, and investment banks known as ''selling groups.'' Members of a selling group advise the agencies on issuing debt, placing the

debt with end-users, and making markets in these securities.

Prices for the securities traded in the secondary market can be obtained from the ''Money and Investing'' section of *The Wall Street Journal* or the financial section of local newspapers. Other media, such as Internet financial sites and Bloomberg, provide over-the-counter quotes as well.

Federal Agencies

Federal agencies do not issue securities directly in the marketplace. Since 1973, most have raised funds through the Federal Financing Bank, although many of these institutions have outstanding obligations from previous debt issues. Federal agencies include the following: the Export-Import Bank of the United States, Commodity Credit Corporation, Farmers Home Administration, General Services Administration, Government National Mortgage Association, Maritime Administration, Private Export Funding Corporation, Rural Electrification Administration, Rural Telephone Bank, Small Business Administration, Tennessee Valley Authority, and Washington Metropolitan Area Transit Authority (neither the Tennessee Valley Authority nor the Private Export Funding Corporation is backed by the full faith and credit of the U.S. government).

Federally Sponsored Agencies

Following is a summary of the main federally sponsored agencies and the types of obligations that they typically issue to the public. The Federal Farm Credit Bank System issues discount notes; short-term bonds with maturities of three, six, and nine months; and long-term bonds with maturities of between one and 10 years. The Federal Farm Credit Bank also issues medium-term notes which have maturities of between one and 30 years. The Federal Farm Credit System Financial Assistance Corporation issues 15-year notes, guaranteed by the federal government, which were issued to support the Farm Credit System in the mid-1980s.

The Federal Home Loan Bank System issues discount notes that mature in one year or less and noncallable bonds with maturities ranging from one to 10 years. These debts are consolidated obligations of the 12 regional Federal Home Loan Banks whose mandate is to provide funds to savings and other home-financing member organizations.

The Federal National Mortgage Association (Fannie Mae) issues short-term discount notes and long-term bonds with maturities of up to 30 years. Fannie Mae has also issued indexed sinking-fund debentures which are callable and contain features of both mortgage-backed securities and callable corporate bonds. The Federal Home Loan Mortgage Corporation (Freddie Mac) issues discount notes and a limited number of bonds. The Student Loan Marketing Association (Sallie Mae) issues unsecured debt obligations in the form of discount notes to provide funds to support higher education.

PRICING

Agency notes and bonds are quoted in terms of 32nds (a percentage of par plus 32nds of a point). Thus, an investor will be willing to pay 101.5 percent of par for an agency security that is quoted at 101:16. Short-term discount notes are issued on a discount basis similar to the way that U.S. Treasury bills are priced.

Agency securities trade at yields offering a positive spread over Treasury security yields because of slightly greater credit risk (due to the lack of an explicit government guarantee for most obligations) and somewhat lower liquidity.

HEDGING

The price risk of most agency securities is hedged in the cash market for Treasury securities or by using Treasury futures or options. As with all hedges, yield curve and basis risk must be monitored closely. In addition, dealers who are actively conducting arbitrage trades and other strategies should have the capability to monitor their positions effectively.

RISKS

As with any security, much of the risk is a function of the type of trading strategy conducted by an institution.

Interest-Rate Risk

Agency securities are subject to price fluctuations due to changes in interest rates. As with other types of securities, the longer the term of the security, the greater the fluctuation and level of interest-rate risk. Moreover, some agency securities are subject to greater interest-rate risk than others. Agencies that issue structured notes that are direct obligations, such as step-up notes from a Federal Home Loan Bank, may have greater risk than other agency securities.

Credit Risk

The credit risk of agency securities is slightly higher than that of Treasury securities because they are not explicitly guaranteed by the U.S. government. However, their credit risk is still low due to the *implied* government guarantee.

Liquidity Risk

Agency securities as a whole are not as liquid as U.S. Treasury securities, but liquidity varies widely within the agency market, depending on the issuer and the specific debt obligation. In general, agency securities have large trading volumes on the secondary market that help to keep the liquidity risk low. However, various debt provisions and structured notes of different agency securities contribute to differing levels of liquidity risk within the agency market.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," determines the accounting treatment for investments in government agency securities. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Federal-agency securities have a 0 percent risk asset capital weight, as they are direct and unconditionally guaranteed obligations of federal agencies. Obligations of federally sponsored agencies (not explicitly guaranteed) have a 20 percent risk asset capital weight. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

General obligations of U.S. government agencies are type I securities, and are exempt from the limitations of 12 USC 24 (section 5136 of the U.S. Revised Statutes). Banks may purchase these securities for their own accounts without limitation, other than the exercise of prudent banking judgment. (One exception is an obligation of the Tennessee Valley Authority (TVA), which is a type II security. Investments in the TVA are limited to 10 percent of a bank's capital stock and unimpaired surplus.)

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Stigum, Marcia L. *The Money Market.* 3d ed. Homewood, Ill.: Dow Jones-Irwin, 1990.

GENERAL DESCRIPTION

Structured notes are hybrid securities, possessing characteristics of straight debt instruments and derivative instruments. Rather than paying a straight fixed or floating coupon, the interest payments of these instruments are tailored to a myriad of possible indexes or rates. The Federal Home Loan Bank (FHLB), one of the largest issuers of such products in the United States, has more than 175 indexes or index combinations against which cash flows are calculated. In addition to the interest payments, the redemption value and final maturity of the securities can also be affected by the derivatives embedded in structured notes. Most structured notes contain embedded options, generally sold by the investor to the issuer. These options are primarily in the form of caps, floors, or call features. The identification, pricing, and analysis of these options give structured notes their complexity.

Structured notes are primarily issued by *government-sponsored enterprises (GSEs)*, such as the Federal Home Loan Bank (FHLB), Federal National Mortgage Association (FNMA), Student Loan Marketing Association (SLMA), and Federal Home Loan Mortgage Corporation (FHLMC). Although the credit risk of these securities is minimal, other risks such as interest-rate risk, market (price) risk, and liquidity risk can be material.

CHARACTERISTICS AND FEATURES

There are many different types of structured notes; typically, a structure is created specifically to meet one investor's needs. Thus, an exhaustive description of all the types of structures in which an institution may invest is impossible. However, certain structures are fairly common and are briefly described below.

In many cases, very complex probability and pricing models are required to accurately evaluate and price structured notes. As mentioned earlier, most structures have embedded options, implicitly sold by the investor to the note's issuer. The proper valuation of these options poses unique challenges to investors considering structured notes. Many popular structures include embedded, path-dependent options for which pricing involves complex models and systems.

Inverse Floating-Rate Notes

An inverse floating-rate note (FRN) has a coupon that fluctuates inversely with changes in the reference rate. The coupon is structured as a base rate minus the reference rate, for example, a three-year note with a semiannual coupon that pays 13 percent minus six-month LIBOR, and an interest-rate floor of 0 percent, which ensures that rates can never be negative. The return on an inverse FRN increases in a decreasing-rate environment, and decreases in an increasing-rate environment. An investor in an inverse FRN is taking a view that rates will decrease. An inverse FRN has the risk characteristics of a leveraged fixed-rate instrument: inverse FRNs will outperform nonleveraged fixed-rate instruments when rates decrease and underperform when rates increase. If rates increase significantly, the investor may receive no coupon payments on the note.

The leverage inherent in an inverse FRN varies with each structure. The leverage amount of a particular structure will be equal to the underlying index plus one (that is, 13 percent minus 6-month LIBOR has a leverage factor of 2; 20 percent – (2 × 6-month LIBOR) has a leverage factor of 3). The degree of leverage incorporated in an FRN will increase the volatility and, hence, the interest-rate and price risk of the note.

Step-Ups/Multi-Steps

Step-up notes or bonds are generally callable by the issuer; pay an initial yield higher than a comparable fixed-rate, fixed-maturity security; and have coupons which rise or ''step up'' at predetermined points in time if the issue is not called. If the coupon has more than one adjustment period, it is referred to as a multi-step. Step-up notes have final maturities ranging from one year to as long as 20 years. Typical *lock-out periods* (periods for which the note cannot be called) range from three months to five years.

An example of a step-up note is a five-year note which has an initial coupon of 6 percent; the coupon increases 50 basis points every six months. The note is callable by the issuer on any six-month interest-payment date.

Step-up notes contain embedded call options "sold" to the issuer by the investor. Any time an issue is callable, *the purchaser of the security has sold a call option to the issuer.* In the above example, the investor has sold a series of call options, called a *Bermuda option,* to the issuer. The note is callable on *any* interest-payment date after a specified lock-out period. Unlike callable issues which pay a *flat* rate until maturity or call, the step-up feature of these securities increases the value of the call options to the issuer and likewise increases the prospect of early redemption. Multi-steps can also be thought of as one-way floaters since the coupon can adjust higher, but never lower. As such, they can be viewed as securities in which the investor has bought a series of periodic floors and has sold a series of periodic caps in return for above-market initial yield.

As the investor has sold a series of call options to the issuer, a step-up note will outperform a straight bond issue when rates are relatively stable and underperform in a volatile rate environment. In a decreasing-rate environment, the note is likely to be called and the investor will be forced to invest the proceeds of the redemption in a low-interest-rate environment. Conversely, in a rising-rate environment, an investor will be in a below-market instrument when rates are high. Step-up notes with very long maturities (beyond 10 years) may have greater liquidity and price risk than other securities because of their long tenor.

Index-Amortizing Notes

An index-amortizing note (IAN) is a form of structured note for which the outstanding principal or note amortizes according to a predetermined schedule. The predetermined amortization schedule is linked to the level of a designated index (such as LIBOR, CMT, or the prepayment rate of a specified pass-through pool). Thus, the timing of future cash flows and, hence, the average life and yield to maturity of the note become uncertain. The IAN does have a stated maximum maturity date, however, at which time all remaining principal balance is retired.

An embedded option feature, called a *path-dependent option,* is present in this type of security. The option is termed path-dependent because the payoff structure of the option will depend not only on the future path of the underlying index but on where that index has been in the past. The investor, in return for an above-market initial yield, effectively sells this option to the issuer. The issuer has the option to alter the principal amortization as the interest-rate environment changes. Caps and floors may also be present if the issue has a floating-rate coupon.

A typical IAN is structured so that as the designated index (for example, LIBOR) rises above a trigger level, the average life extends. Conversely, if the designated index is at or below the trigger level, the IAN's principal will quickly amortize, leading to a shorter average life. The outstanding principal balance will vary according to the schedule at each redemption date. One may equate the amortization of the note to the retirement (call) of some portion of the principal. As the amortization quickens, more and more of the note is "called."

IANs generally appeal to investors who want an investment with a CMO-like risk-return profile, but with reduced uncertainty as to the average life. As the amortization schedule of an IAN depends only on the level of the underlying index, an IAN eliminates the noneconomic prepayment factors of a CMO. However, like a CMO, an IAN will outperform a straight bond issue in a stable rate environment and underperform it in a volatile rate environment. In a decreasing-rate environment, the IAN is likely to be called, and the investor will be forced to invest the proceeds of the redemption in a low interest-rate environment. Conversely, in a rising-rate environment, the maturity of the IAN will extend, and an investor will be in a below-market instrument when rates are high.

De-Leveraged and Leveraged Floaters

De-leveraged and leveraged floating-rate notes give investors the opportunity to receive an above-market initial yield and tie subsequent coupon adjustments to a specific point on the yield curve. A leveraged note's coupon will adjust by a multiple of a change in the relevant interest rate, for example, 1.25 × LIBOR + 100 basis points. Conversely, a de-leveraged securi-

ty's coupon adjusts by a fraction of the change in rates, for example, .60 × 10-year CMT + 100 basis points.

De-leveraged floaters are combinations of fixed- and floating-rate instruments. For example, a $10 million de-leveraged floater with a coupon of 60 percent of the 10-year CMT + 100 basis points is equivalent to the investor holding a $6 million note with a coupon equal to a 10-year CMT/LIBOR basis swap and a $4 million fixed-rate instrument. If rates rise, an investor in a de-leveraged floater participates in the rise, but only by a fraction. The leverage factor (for example, 60 percent) causes the coupons to lag the actual market. Thus, de-leveraged floaters will outperform straight bond issuances in a declining or stable interest-rate environment.

Conversely, a leveraged floater such as the example above should be purchased by investors with an expectation of rising rates in which they would receive better than one one-to-one participation. The degree of leverage amplifies the risks as well as the rewards of this type of security. The greater the leverage, the greater the interest-rate and price risk of the security.

Other alternatives in this category include floaters which do not permit the coupon to decrease, so-called one-way de-leveraged floaters which can effectively lock in higher coupons in an environment where the index rises then falls.

Ratchet Notes

Ratchet notes typically pay a floating-rate coupon that can never go down. The notes generally have periodic caps that limit the amount of the increases (ratchets) or that set a predetermined increase for each quarter. These periodic caps are akin to those found in adjustable-rate mortgage products.

An investor in a ratchet note has purchased from the issuer a series of periodic floors and has sold a series of periodic caps. As such, a ratchet note will outperform a straight floating-rate note in a stable or declining interest-rate environment, and it will underperform in a rapidly rising interest-rate environment. In a rapidly rising interest-rate environment, a ratchet note will perform similarly to a fixed-rate instrument with a low coupon which gradually steps up. The price volatility of the instrument will therefore depend on the frequency of resets, the amount of coupon increase at each reset, and the final maturity of the note. Longer maturity notes, which have limited reset dates and limited coupon increases, will be more volatile in rising- rate environments and will therefore have a greater degree of interest-rate and price risk.

Dual-Index Notes

A dual-index note (sometimes called a yield curve anticipation note (YCAN)) is a security whose coupon is tied to the spread between two market indexes. An example is a three-year security which pays a semiannual coupon equal to (prime + 250 basis points – 6-month LIBOR). Typical indexes used to structure payoffs to these notes are the prime rate, LIBOR, COFI, and CMT yields of different maturities. Yield-curve notes allow the investor to lock in a very specific view about forward rates. Such a play, while constructable in the cash market, is often difficult and costly to an investor. A purchaser of this type of security is typically making an assumption about the *future shape* of the yield curve. These notes can be structured to reward the investors in either steepening or flattening yield-curve environments. However, these notes can also be tied to indexes other than interest rates, such as foreign-exchange rates, stock indexes, or commodity prices.

An example of a note which would appeal to investors with expectations of a flattening yield curve (in a currently steep yield-curve environment) would be one with a coupon that floats at

[the 5-year CMT – the 10-year CMT + a designated spread].

Based on this formula, the coupon will increase if the yield curve flattens between the 5-year and the 10-year maturities. Alternatively, a yield-curve-steepening play would be an issue that floats at—

[the 10-year CMT – the 5-year CMT + a designated spread].

In this case, coupons would increase as the spread between the long- and medium-term indexes widens.

A dual-index note is equivalent to being a long basis swap (in the example above, the investor receives prime and pays LIBOR) and to being long a fixed-rate instrument. As such, the note has the risk-return elements of both a basis swap and a comparable fixed-rate instrument. The note will underperform comparable fixed-rate instruments in an environment when the basis relationship (between prime and LIBOR in the above example) narrows. These instruments are subject to incremental price risk in a rising-rate environment in which the basis spread is narrowing.

Principal-Linked Notes

An example of a principal-linked note is a one-year security which pays a fixed semi-annual coupon of 8 percent, and the principal received at maturity is determined by the following formula using market yields two days before maturity:

P = 100 + 5 (((2-year swap rate – 3-month LIBOR) – 1.40))

The resulting principal-redemption amount under varying rate scenarios would be as follows in table 1.

Table 1—Examples of Possible Principal-Redemption Schemes

	Rate			
Par	2-Year Swap Rate – 3-Month LIBOR	Rate – 1.40	5*(Rate – 140)	*Redemption Percentage*
100	180	.4	2.00	102
100	160	.2	1.00	101
100	140	.00	0.00	100
100	120	–0.20	–1.00	99
100	100	–0.40	–2.00	98

Under a principal-linked structured note, the maturity and the fixed coupon payments are unchanged from the terms established at issuance. The issuer's redemption obligation at maturity, however, is *not* the face value of the note. Redemption amounts are established by a formula whose components reflect historical or prevailing market levels. Principal-linked notes have been issued when the principal redemption is a function of underlying currency, commodity, equity, and interest-rate indexes. As the return of principal at maturity in many types of principal-linked notes is not ensured, these structures are subject to a great degree of price risk.

Range Notes

Range notes (also called accrual notes) *accrue* interest daily at a set coupon which is tied to an index. Most range notes have two coupon levels; the higher accrual rate is for the period that the index remains *within* a designated range, the lower rate is used during periods that the index falls outside the range. *This lower level may be zero.* Range notes have been issued which reference underlying indexes linked to interest rates, currencies, commodities, and equities. Most range notes reference the index daily such that interest may accrue at 7 percent on one day and at 2 percent on the following day, if the underlying index crosses in and out of the range. However, they can also reference the index monthly, quarterly, or only once over the note's life. If the note only references quarterly, then the index's relationship to the range matters only on the quarterly reset date. With the purchase of one of these notes, the investor has sold a series of digital (or binary) options:[1] a call

1. A digital option has a fixed, predetermined payoff if the underlying instrument or index is at or beyond the strike at expiration. The value of the payoff is not affected by the magnitude of the difference between the underlying and the strike price.

struck at the high end of the range and a put struck at the low end of the range. This means that the accrual rate is strictly defined, and the magnitude of movement outside the range is inconsequential. The narrower the range, the greater the coupon enhancement over a like instrument. In some cases, the range varies each year that the security is outstanding.

However, range notes also exist which require that the investor sell two barrier options:[2] a down-and-out put struck at the low level of the range and an up-and-out call struck at the high level of the range. For these range notes, the index must remain within the target band for the entire accrual period, and sometimes for the entire life of the instrument. If it crosses either barrier on even one day, the investor's coupon will drop to zero for the whole period.[3] This type of range note is quite rare, but investors should pay careful attention to the payment provisions attached to movements outside the range.

As the investor has sold leveraged call and put options to the issuer of these securities, a range note will outperform other floating-rate instruments in stable environments when the index remains within the specified range, and it will underperform in volatile environments in which the underlying index is outside of the specified range. Given the degree of leverage inherent in these types of structures, the securities can be very volatile and often exhibit a significant degree of price risk.

USES

Structured notes are used for a variety of purposes by investors, issuers, and underwriters or traders. Banks are often involved in all three of these capacities.

Uses by Investors

Structured notes are investment vehicles that allow investors to alter the risk profile of their portfolios and/or to express a viewpoint about the course of interest rates or other financial variables. The basic appeal of structured notes lies in their attendant *customized* risk parameters. Attributes that typically are *not* available (or not *easily* available) to an investor are assembled in a prepackaged format. Additionally, investors find the notes attractive for other distinct reasons. In a sustained period of low interest rates (such as the United States experienced for the five years leading up to February 1994), receiving an ''acceptable'' return on an investment became increasingly difficult. Structured notes, whose cash flows and market values are linked to one or more benchmarks, offered the *potential* for greater returns than prevailing market rates. The desire for higher yield led investors to make a risk-return tradeoff which reflected their market view.

The fact that most structured notes are issued by government-sponsored enterprises (GSEs) means that credit risk—the risk that the issuer will default—is minimal. GSEs are not, however, backed by the full faith and credit of the U.S. government, though most have explicit lines of credit from the Treasury. As a result, investors were attracted by the potential returns of structured notes and by their high credit quality (implied government guarantee). As noted above, however, the credit risk of these notes may be minimal, but their price risk may be significant.

Uses by Issuers

Issuers often issue structured notes to achieve all-in funding rates, which are more advantageous than what is achievable through a straight debt issue. To induce issuers to issue complex and often very specialized debt instruments, investors often will sacrifice some return, which lowers the issuer's all-in cost of funding. Generally, only highly rated (single-A or better) banks, corporations, agencies, and finance companies will be able to issue in the structured-note market. A detailed discussion of issuing practices is included in the ''Description of Marketplace'' subsection below.

Uses by Underwriters or Traders

Investment banks and the section 20 subsidiaries of banks often act to underwrite structured-note

2. Path-dependent options with both their payoff pattern and their survival to the nominal expiration date are dependent not only on the final price of the underlying but on whether the underlying sells at or through a barrier (instrike, outstrike) price during the life of the option.

3. McNeil, Rod. ''The Revival of the Structured Note Market.'' *International Bond Investor.* Summer 1994, pp. 34–37.

issuances. They are often actively involved in making a market in secondary structured notes. A detailed discussion of these activities is included in the ''Description of Marketplace'' subsection below.

DESCRIPTION OF MARKETPLACE

Background

In its heyday, the structured-note market was a by-product of a unique period in financial history. In 1992 and 1993, Wall Street firms engineered debt that allowed borrowers to attain highly attractive below-market funding and that rewarded investors (in large part) *as long as interest rates remained low.* The incredible and at times implausible array of structure types came into being in response to the investment community's desire for higher returns during a sustained period of low interest rates. Issuers and investment dealer firms were more than willing to address this need, introducing investors to more attractive (and by definition riskier) securities whose cash flows were linked to, for example, the performance of the yen; the yen's relationship to the lira; and a host of other indexes, currencies, or benchmarks.[4] Investors' quest for enhanced yield caused them to adopt, in many cases, very tenuous risk-reward measures with respect to potential investment choices.

Structured notes received heightened attention from both regulators and investors in the spring and summer of 1994. Many of these structured securities, created to satisfy a perceived need at the time, deteriorated in value as a result of the rate increases of 1994. In many cases, the leverage inherent in the security worked against the investor, obliterating once attractive coupon payments. Market values of many of these instruments fell below par as their coupons became vastly inferior to comparable maturity investments and as maturities were extended beyond investors' original expectations.

4. As more exotic structured-note issues came into being (and especially in light of the Orange County debacle), much of the bad press centered on the (quasi-government) agencies who issued the paper. As discussed later, the impetus for the vast majority of deals in fact emanated from Wall Street.

Primary Market

Structured notes are primarily issued by GSEs such as the FHLB, FNMA, SLMA, and FHLMC, which carry an implicit government guarantee and are rated triple-A. Many large corporations, banks, and finance companies, generally rated single-A or better, also issue structured notes.

Most structured-note issuances originate with investors on a *reverse inquiry basis*, through the *medium-term note (MTN)* market. The process originates when an investor has a demand for a security with specific risk characteristics. Through a reverse inquiry, an investor will use MTN agents such as the underwriting desk of an investment bank or section 20 subsidiary of a bank to communicate its desires to the issuer. If the issuer agrees to the inquiry, the issuer will issue the security which is sold through the MTN agent to the investor.

Although structured notes in the MTN market often originate with the investor, investment banks and section 20 subsidiaries of banks also put together such transactions. Most investment banks and section 20 subsidiaries have derivative-product specialists who design structured notes to take advantage of specific market opportunities. When an opportunity is identified, the investment bank or section 20 subsidiary will inform investors and propose that they buy the structured note. If an investor tentatively agrees to purchase the security, the MTN agents in the investment bank or section 20 subsidiary will contact an issuer with the proposed transaction. If the structure meets the funding needs of the issuer, the structured note will be issued to the investors.

Secondary Market

Structured notes are traded in the secondary market through market makers such as investment banks or section 20 subsidiaries of banks or through brokers. Market makers will buy or sell structured notes, at a predetermined bid and offer. Market makers will usually trade GSE structured notes through their secondary agency trader and trade corporate-issued structured notes through their corporate bond trader. Some market makers trade secondary structured notes through their structured-note desk, a specialized group who will buy and trade all types of structured notes.

Investors in secondary structured notes may buy the notes at a discount or premium to issuance and receive the performance characteristics of the note as shown in the prospectus. Investors may also purchase structured notes on an *asset-swap basis*, which strips the optionality out of a note and leaves the investor with a synthetically created ''plain vanilla' return such as LIBOR. Asset-swap pricing is discussed in the ''Pricing'' subsection below.

Secondary structured notes are also used to create special-purpose vehicles such as Merrill Lynch's STEERS program. In these types of programs, secondary structured notes are placed in a special-purpose vehicle, the receipts of which are then sold to investors. A series of swap transactions is then entered into between a swap counterparty and the special-purpose vehicle, which strips the optionality out of the structures. The investor therefore receives a trust receipt which pays a plain vanilla return such as LIBOR.

Structured notes often possess greater liquidity risk than many other types of securities. The most important factor affecting the liquidity of the note in the secondary market is the size of the secondary note being traded. Generally, the larger the size of the note, the more liquid the note will be in the secondary market. Most investors will not buy a structured note of limited size unless they receive a significant premium to cover the administrative costs of booking the note. Similarly, most market makers will not inventory small pieces of paper unless they charge a significant liquidity premium.

Another factor which may affect the liquidity of a structured note in the secondary market is the one-way ''bullishness'' or ''bearishness'' of a note. For example, in a rising-rate environment, leveraged bullish instruments such as inverse floaters may not be in demand by investors and may therefore have less liquidity in the secondary market. As many structured notes are sold on an asset-swap basis, the characteristics of the structured note can be ''engineered'' out of the note, leaving the investor with a plain vanilla return. The asset-swap market, therefore, helps to increase the liquidity of these types of notes.

PRICING

The two primary methods by which structured notes are priced in the secondary market are (1) on an asset-swap basis or (2) on a straight-pricing basis.

Asset-Swap Pricing

Structured notes are typically constructed by embedding some form of optionality in the coupon, principal, or maturity component of a debt issue. Once these embedded derivatives are quantified, a swap or series of swaps can be undertaken to strip out those options and effectively create a synthetic instrument with either fixed or variable cash-flow streams. This process is known as asset-swap pricing.[5]

Asset-swap pricing initially involves decomposing and valuing the components of the note, including contingent cash flows. It conveys where those components can be cashed out in the market, often referred to as the *break-up value* of the note. After the note is decomposed, an alternate cash-flow stream is created through the asset-swap market.

When structured notes are priced on an asset-swap basis, the issue is analyzed based on its *salvage value*.[6] The salvage value on most agency structured issues varies based on the current market and the size, type, and maturity of the note.

Liquidity in the structured-notes market exists because every note has a salvage value. If demand for the note as a whole is weak, its cash flows can be reconstructed via the asset-swap market to create a synthetic security. In many cases, the re-engineered security has broader investor appeal, thereby generating needed liquidity for the holder of the original issue.

Straight Pricing

Contrasted with an asset-swapped issue, a note trading on a straight-pricing basis is purchased and sold as is.[7] Traders who price structured notes on this basis compare the note with similar types of instruments trading in the market and derive a price accordingly.

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5. See the Federal Reserve product summary *Asset Swaps—Creating Synthetic Instruments* by Joseph Cilia for a detailed treatment on the topic.

6. Goodman, Laurie. ''Anatomy of the Secondary Structured Note Market.'' *Derivatives Quarterly,* Fall 1995.

7. Peng, Scott Y., and Ravi E. Dattatreya. *The Structured Note Market.* Chicago: Probus, 1995.

HEDGING

Structured notes are, from a cash-flow perspective, a combination of traditional debt instruments and derivative contracts. As a result, the value (or performance) of a structured note can be replicated by combining components consisting of appropriate zero-coupon debt plus appropriate futures or options positions that reflect the optionality embedded in the issue. Similar to the decomposition process employed in an asset-wap transaction, the fair value of this replicated portfolio should be equivalent to the fair value of the structured note.

Theoretically, one should be indifferent about investing in a structured note or in its equivalently constructed portfolio as long as the price of the note equals the present value of its replication components.[8] Price discrepancy should govern the selection process between these alternatives.

A hedge of a structured-note position involves engaging in the opposite of the replication trades noted above. To be fully protected in a hedge, the sum of the present values of each component of the hedge should be less than or equal to the market value of the note. If, for some reason, the note was priced *higher* than the cost of the worst-case replication components, the hedging firm stands to lock in a positive spread if that worst-case scenario fails to materialize.[9]

A structured-note position itself can serve to hedge unique risks faced by the investor. For example, a company which is long (owns) Japanese yen (¥) is exposed to the risk of yen depreciation. The FHLB issued a one-year structured range note which accrued interest daily at 7 percent if the ¥/U.S.$ is greater than 108.50 or at 0 percent if the ¥/U.S.$ is less than 108.50. If the yen depreciates, the note accrues interest at an above-market rate. Meanwhile, the company's yen holdings will decline in value. This note could serve as a perfectly tailored hedge for the company's business-risk profile. In fact, the design of many of the most complicated structured notes is driven not by the innovations of note issuers and underwriters, but rather by investors seeking to hedge their own unique risk profiles.

8. Kawaller, Ira G. "Understanding Structured Notes." *Derivatives Quarterly,* Spring 1995.
9. Ibid., p. 32.

RISKS

Market Risk

The embedded options and other leverage factors inherent in structured notes result in a great deal of uncertainty about future cash flows. Thus, price volatility is generally high in these types of securities. An institution should have—or should have ready access to—a model which is able to quantify the risks. The model should be able to forecast the change in market price at various points in time (for example, one year later or the first call date) for a given shift in interest rates. For the many variants of these products which are tied to the shape of the yield curve, the ability to model price effects from nonparallel interest-rate shifts is also crucial. In most cases (except for some principal-linked notes), full principal will be returned at maturity. However, between issuance and redemption, changes in fundamental factors can give rise to significant reductions in the "market" price.

As with other types of instruments in which an investor has sold an option, structured notes will underperform similar straight debt issuances in a volatile rate environment. For notes such as callable step-ups and IANs, the investor may be exposed to reinvestment risk (investing the proceeds of the note in a low-interest-rate environment) when rates decrease and to extension risk (not being able to invest in a high-interest-rate environment) when rates increase.

Liquidity Risk

Due to the complex nature of structured notes, the number of firms that are able and willing to competitively price and bid for these securities is quite small; however, an active secondary market has developed over the past few years. When the structure is complex, however, bidders may be few. Consequently, an institution hoping to liquidate a structured-note holding before maturity may find that their only option is to sell at a significant loss. In certain cases, the issue's original underwriter is the only source for a bid (and even that is not always guaranteed).

Some factors influencing the liquidity of the note include the type, size, and maturity of the note. In general, the more complex the structure or the more a note exhibits one-way bullishness or bearishness, the less liquidity a note will have. Although the asset-swap market allows

the derivative components to be engineered out of these complex structures, liquidity may be impaired because many institutions have investment guidelines which prohibit the purchase of certain types of complex notes. Thus, the size of the potential market is diminished, and liquidity decreases. Also, notes with a smaller size (generally under $10 million) and a longer maturity (generally greater than five years) will tend to be less liquid.

Volatility Risk

For each of these structures with embedded options, assumptions about the volatility of interest-rate moves are also inherent. For any of these options which are purchased by investors (for example, interest-rate floors), the risk that expectations for market-rate volatility will decrease over time exists. If this happens, market valuation of these securities will also decrease, and the investor will have "purchased" an overvalued option for which he or she will not be compensated if the instrument is sold before maturity. For options which are sold by investors (for example, interest-rate caps), the risk that volatility increases after the note is purchased exists. If this occurs, the market valuation of the structured note will decrease, and the investor will have "sold" an undervalued option for which he or she will have to pay a higher price if the instrument is sold before maturity.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," determines the accounting treatment for investments in structured notes. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Structured notes issued by GSEs should be given a 20 percent risk weighting. Structured notes issued by investment-grade corporations should be given a 100 percent risk weighting. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENTS

The limitations of 12 CFR 1 apply to structured notes. Structured notes issued by GSEs are type I securities, and there is no limitation on the amount which a bank can purchase or sell. Structured notes issued by investment-grade-rated corporations are type III securities. A bank's purchases and sales of type III securities are limited to 10 percent of its capital and surplus.

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GENERAL DESCRIPTION

Corporate bonds are debt obligations issued by corporations. Corporate bonds may be either secured or unsecured. Collateral used for secured debt includes but is not limited to real property, machinery, equipment, accounts receivable, stocks, bonds, or notes. If the debt is unsecured, the bonds are known as debentures. Bondholders, as creditors, have a prior legal claim over common and preferred stockholders as to both income and assets of the corporation for the principal and interest due them and may have a prior claim over other creditors if liens or mortgages are involved.

Corporate bonds contain elements of both interest-rate risk and credit risk. Corporate bonds usually yield more than government or agency bonds due to the presence of credit risk. Corporate bonds are issued as *registered bonds* and are usually sold in *book-entry form*. Interest may be fixed, floating, or the bonds may be zero coupons. Interest on corporate bonds is typically paid semiannually and is fully taxable to the bondholder.

CHARACTERISTICS AND FEATURES

Security for Bonds

Various types of security may be pledged to offer security beyond that of the general standing of the issuer. Secured bonds, such as first-mortgage bonds, collateral trust bonds, and equipment trust certificates, yield a lower rate of interest than comparable unsecured bonds because of the greater security they provide to the bondholder.

First-Mortgage Bonds

First-mortgage bonds normally grant the bondholder a first-mortgage lien on the property of the issuer. Often first-mortgage bonds are issued in series with bonds of each series secured equally by the same first mortgage.

Collateral Trust Bonds

Collateral trust bonds are secured by pledges of stocks, notes, bonds, or other collateral. Generally, the market or appraised value of the collateral must be maintained at some percentage of the amount of the bonds outstanding, and a provision for withdrawal of some collateral is often included, provided other acceptable collateral is provided. Collateral trust bonds may be issued in series.

Equipment Trust Certificates

Equipment trust certificates are usually issued by railroads or airlines. The issuer, such as a railroad company or airline, buys a piece of equipment from a manufacturer, who transfers the title to the equipment to a trustee. The trustee then leases the equipment to the issuer and at the same time sells equipment trust certificates (ETCs) to investors. The manufacturer is paid off through the sale of the certificates, and interest and principal are paid to the bondholders through the proceeds of lease payments from the issuer to the trustee. At the end of some specified period of time, the certificates are paid off, the trustee sells the equipment to the issuer for a nominal price, and the lease is terminated. As the issuer does not own the equipment, foreclosing a lien in event of default is facilitated. These bonds are often issued in serial form.

Debenture Bonds

Debenture bonds are not secured by a specific pledge of designated property. Debenture bondholders have the claim of general creditors on all assets of the issuer not pledged specifically to secure other debt. They also have a claim on pledged assets to the extent that these assets have value greater than necessary to satisfy secured creditors. Debentures often contain a variety of provisions designed to afford some degree of protection to bondholders, including limitation on the amount of additional debt issuance, minimum maintenance requirements on net working capital, and limits on the payment of cash dividends by the issuer. If an issuer

has no secured debt, it is customary to provide a *negative pledge clause*—a provision that debentures will be secured equally with any secured bonds that may be issued in the future.

Subordinated and Convertible Debentures

Subordinated debenture bonds stand behind secured debt, debenture bonds, and often some general creditors in their claim on assets and earnings. Because these bonds are weaker in their claim on assets, they yield a higher rate of interest than comparable secured bonds. Often, subordinated debenture bonds offer conversion privileges to convert bonds into shares of an issuer's own common stock or the common stock of a corporation other than an issuer—referred to as *exchangeable bonds.*

Guaranteed Bonds

Guaranteed bonds are guaranteed by a corporation other than the issuer. The safety of a guaranteed bond depends on the financial capability of the guarantor, as well as the financial capability of the issuer. The terms of the guarantee may call for the guarantor to guarantee the payment of interest and/or repayment of principal. A guaranteed bond may have more than one corporate guarantor, who may be responsible for not only its pro rata share but also the entire amount guaranteed by other guarantors.

Maturity

Corporate bonds are issued in a broad maturity spectrum, ranging from less than one year to perpetual issues. Issues maturing within one year are usually viewed as the equivalent of cash items. Debt maturing between one and five years is generally thought of as short-term. Intermediate-term debt is usually considered to mature between 5 and 12 years, whereas long-term debt matures in more than 12 years.

Interest-Payment Characteristics

Fixed-Rate Bonds

Most fixed-rate corporate bonds pay interest semiannually and at maturity. Interest payments once a year are the norm for bonds sold overseas. Interest on corporate bonds is based on a 360-day year, made up of twelve 30-day months.

Zero-Coupon Bonds

Zero-coupon bonds are bonds without coupons or a stated interest rate. These securities are issued at discounts to par; the difference between the face amount and the offering price when first issued is called the *original-issue discount* (OID). The rate of return depends on the amount of the discount and the period over which it accretes. In bankruptcy, a zero-coupon bond creditor can claim the original offering price plus accrued and unpaid interest to the date of bankruptcy filing, but not the principal amount of $1,000.

Floating-Rate Notes

The coupon rates for floating-rate notes are based on various benchmarks ranging from short-term rates, such as prime and 30-day commercial paper, to one-year and longer *constant maturity Treasury rates* (CMTs). Coupons are usually quoted as spread above or below the base rate (that is, three-month LIBOR + 15 bp). The interest rate paid on floating-rate notes adjusts based on changes in the base rate. For example, a note linked to three-month U.S. LIBOR would adjust every three months, based on the then-prevailing yield on three-month U.S. LIBOR. Floating-rate notes are often subject to a maximum (cap) or minimum (floor) rate of interest.

Features

A significant portion of corporate notes and bonds has various features. These include call provisions, in which the issuer has the right to redeem the bond before maturity; put options, in which the holder has the right to redeem the bond before maturity; sinking funds, used to retire the bonds at maturity; and convertibility features that allow the holder to exchange debt for equity in the issuing company.

Callable Bonds

Callable bonds are bonds in which the investor has sold a call option to the issuer. This increases the coupon rate paid by the issuer but exposes the investor to prepayment risk. If market interest rates fall below the coupon rate of the bond on the call date, the issuer will call the bond and the investor will be forced to invest the proceeds in a low-interest-rate environment. As a rule, corporate bonds are callable at a premium above par, which declines gradually as the bond approaches maturity.

Put Bonds

Put bonds are bonds in which the investor has purchased a put option from the issuer. The cost of this put option decreases the coupon rate paid by the issuer, but decreases the risk to an investor in a rising interest-rate environment. If market rates are above the coupon rate of the bond at the put date, the investor can ''put'' the bond back to the issuer and reinvest the proceeds of the bond in a high-interest-rate environment.

Sinking-Fund Provisions

Bonds with sinking-fund provisions require the issuer to retire a specified portion on a bond issue each year. This type of provision reduces the default risk on the bond because of the orderly retirement of the issue before maturity. The investor assumes the risk, however, that the bonds may be called at a special sinking-fund call price at a time when interest rates are lower than rates prevailing at the time the bond was issued. In that case, the bonds will be selling above par but may be retired by the issuer at the special call price that may be equal to par value.

Convertible Bonds

Convertible securities are fixed income securities that permit the holder the right to acquire, at the investor's option, the common stock of the issuing corporation under terms set forth in the bond indenture. New convertible issues typically have a maturity of 25 to 30 years and carry a coupon rate below that of a nonconvertible bond of comparable quality. An investor in a convertible security receives the upside potential of the common stock of the issuer, combined with the safety of principal in terms of a prior claim to assets over equity security holders. The investor, however, pays for this conversion privilege by accepting a significantly lower yield-to-maturity than that offered on comparable nonconvertible bonds. Also, if anticipated corporate growth is not realized, the investor sacrifices current yield and risks having the price of the bond fall below the price paid to acquire it. Commercial banks may purchase eligible convertible issues if the yield obtained is reasonably similar to nonconvertible issues of similar quality and maturity, and the issues are not selling at a significant conversion premium.

USES

Corporate bonds can be used for hedging, investment, or speculative purposes. In some instances, the presence of credit risk and lack of liquidity in various issues may discourage their use. Speculators can use corporate bonds to take positions on the level and term structure of both interest rates and corporate spreads over government securities.

Banks often purchase corporate bonds for their investment portfolios. In return for increased credit risk, corporate bonds provide an enhanced spread relative to Treasury securities. Banks may purchase investment-grade corporate securities subject to a 10 percent limitation of its capital and surplus for one obligor. Banks are prohibited from underwriting or dealing in these securities. A bank's section 20 subsidiary may, however, be able to underwrite and deal in corporate bonds.

Banks often act as corporate trustees for bond issues. A corporate trustee is responsible for authenticating the bonds issued and ensuring that the issuer complies with all of the covenants specified in the indenture. Corporate trustees are subject to the Trust Indenture Act, which specifies that adequate requirements for the performance of the trustee's duties on behalf of the bondholders be developed. Furthermore, the trustee's interest as a trustee must not conflict with other interest it may have, and the trustee must provide reports to bondholders.

DESCRIPTION OF MARKETPLACE

The size of the total corporate bond market was $2.2 trillion dollars at the end of 1993. Nonfinancial corporate business comprised approximately 56 percent of total issuance in 1993.

Market Participants

Buy Side

The largest holder of corporate debt in the United States is the insurance industry, accounting for more than 33 percent of ownership at the end of 1993. Private pension funds are the second-largest holders with 13.7 percent of ownership. Commercial banks account for approximately 4.5 percent of ownership of outstanding corporate bonds.

Sell Side

Corporate bonds are underwritten in the primary market by investment banks and section 20 subsidiaries of banks. In the secondary market, corporate bonds are traded in the listed and unlisted markets. Listed markets include the New York Stock Exchange and the American Stock Exchange. These markets primarily service retail investors who trade in small lots. The over-the-counter market is the primary market for professional investors. In the secondary market, investment banks and section 20 subsidiaries of banks may act as either a broker or dealer. Brokers execute orders for the accounts of customers; they are agents and get a commission for their services. Dealers buy and sell for their own accounts, thus taking the risk of reselling at a loss.

Sources of Information

For a primary offering, the primary source of information is contained in a *prospectus* filed by the issuer with the Securities and Exchange Commission. For seasoned issues, major contractual provisions are provided in Moody's manuals or Standard & Poor's corporation records.

Bond ratings are published by several organizations that analyze bonds and express their conclusions by a ratings system. The four major nationally recognized statistical rating organizations (NRSROs) in the United States are Duff & Phelps Credit Rating Co. (D&P); Fitch Investor Service, Inc. (Fitch); Moody's Investor Service, Inc. (Moody's); and Standard & Poor's Corporation (S&P).

PRICING

The major factors influencing the value of a corporate bond are—

- its coupon rate relative to prevailing market interest rates (typical of all bonds, bond prices will decline when market interest rates rise above the coupon rate, and prices will rise when interest rates decline below the coupon rate) and
- the issuer's credit standing (a change in an issuer's financial condition or ability to finance the debt can cause a change in the risk premium and price of the security).

Other factors that influence corporate bond prices are the existence of call options, put features, sinking funds, convertibility features, and guarantees or insurance. These factors can significantly alter the risk/return profile of a bond issue. (These factors and their effect on pricing are discussed in the ''Characteristics and Features'' subsection above.)

The majority of corporate bonds are traded on the over-the-counter market and are priced as a spread over U.S. Treasuries. Most often the benchmark U.S. Treasury is the on-the-run (current coupon) issue. However, pricing ''abnormalities'' can occur where the benchmark U.S. Treasury is different from the on-the-run security.

HEDGING

Interest-rate risk for corporate debt can be hedged either with cash, exchange-traded, or over-the-counter instruments. Typically, long corporate bond or note positions are hedged by selling a U.S. Treasury issue of similar maturity or by shorting an exchange-traded futures contract. The effectiveness of the hedge depends, in part, on basis risk and the degree to which the hedge

has neutralized interest-rate risk. Hedging strategies may incorporate assumptions about the correlation between the credit spread and government rates. The effectiveness of these strategies may be affected if these assumptions prove inaccurate. Hedges can be constructed with securities from the identical issuer but with varying maturities. Alternatively, hedges can be constructed with issuers within an industry group. The relative illiquidity of various corporate instruments may diminish hedging effectiveness.

RISKS

Interest-Rate Risk

For fixed-income bonds, prices fluctuate with changes in interest rates. The degree of interest-rate sensitivity depends on the maturity and coupon of the bond. Floating-rate issues lessen the bank's interest-rate risk to the extent that the rate adjustments are responsive to market rate movements. For this reason, these issues generally have lower yields to compensate for their benefit to the holder.

Prepayment or Reinvestment Risk

Call provisions will also affect a bank's interest-rate exposure. If the issuer has the right to redeem the bond before maturity, the action has the potential to adversely alter the investor's exposure. The issue is most likely to be called when market rates have moved in the issuer's favor, leaving the investor with funds to invest in a lower-interest-rate environment.

Credit Risk

Credit risk is a function of the financial condition of the issuer or the degree of support provided by a credit enhancement. The bond rating may be a quick indicator of credit quality. However, changes in bond ratings may lag behind changes in financial condition. Banks holding corporate bonds should perform a periodic financial analysis to determine the credit quality of the issuer.

Some bonds will include a credit enhancement in the form of insurance or a guarantee by another corporation. The safety of the bond may depend on the financial condition of the guarantor, since the guarantor will make principal and interest payments if the obligor cannot. Credit enhancements often are used to improve the credit rating of a bond issue, thereby reducing the rate of interest that the issuer must pay.

Zero-coupon bonds may pose greater credit-risk problems. When a zero-coupon bond has been sold at a deep discount, the issuer must have the funds to make a large payment at maturity. This potentially large balloon repayment may significantly increase the credit risk of the issue.

Liquidity Risk

Major issues are actively traded in large amounts, and liquidity concerns may be small. Trading for many issues, however, may be inactive and significant liquidity problems may affect pricing. The trading volume of a security determines the size of the bid/ask spread of a bond. This provides an indication of the bond's marketability and, hence its, liquidity. A narrow spread of between one-quarter to one-half of 1 percent may indicate a liquid market, while a spread of 2 or 3 percent may indicate poor liquidity for a bond. Even for major issues, news of credit problems may cause temporary liquidity problems.

Event Risk

Event risk can be large for corporate bonds. This is the risk of an unpredictable event that immediately affects the ability of an issuer to service the obligations of a bond. Examples of event risk include leveraged buyouts, corporate restructurings, or court rulings that affect the credit rating of a company. To mitigate event risk, some indentures include a maintenance of net worth clause, which requires the issuer to maintain its net worth above a stipulated level. If the requirement is not met, the issuer must begin to retire its debt at par.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards

No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," determines the accounting treatment for investments in corporate notes and bonds. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Corporate notes and bonds should be weighted at 100 percent. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

Corporate notes and bonds are type III securities. A bank may purchase or sell for its own account corporate debt subject to the limitation that the corporate debt of a single obligor may not exceed 10 percent of the bank's capital and surplus. To be eligible for purchase, a corporate security must be "investment grade" (that is, rated BBB or higher) and must be marketable. Banks may not deal in or underwrite corporate bonds.

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GENERAL DESCRIPTION

Municipal securities are interest-bearing obligations issued by local governments or their political subdivisions (such as cities, towns, villages, counties, or special districts) or by state governments, agencies, or political subdivisions. These governmental entities can borrow at favorable rates because the interest income from most municipal securities generally receives advantageous treatment under federal income tax rules. There are important restrictions on these tax advantages, however, and banks are subject to different tax treatment than other investors.

The two principal classifications of municipal securities are general obligation bonds and revenue bonds. *General obligation bonds* are secured by the full faith and credit of an issuer with taxing power. General obligation bonds issued by local governments are generally secured by a pledge of the issuer's specific taxing power, while general obligation bonds issued by states are generally based on appropriations made by the state's legislature. In the event of default, the holders of general obligation bonds have the right to compel a tax levy or legislative appropriation to satisfy the issuer's obligation on the defaulted bonds.

Revenue bonds are payable from a specific source of revenue, so that the full faith and credit of an issuer with taxing power is not pledged. Revenue bonds are payable only from specifically identified sources of revenue. Pledged revenues may be derived from operation of the financed project, grants, and excise or other taxes. *Industrial development bonds* are a common example of revenue bonds. These bonds are municipal debt obligations issued by a state or local government (or a development agency) to finance private projects that generate tax revenues. The debt service on these bonds is dependent on the lease income generated by the project or facility. In certain instances, industrial development bonds may be categorized as loans (see the instructions to the call report).

In addition to municipal and industrial development bonds, state and local governmental entities issue short-term obligations in the form of notes. These debt obligations are generally issued to bridge the gap between when expenses are paid and tax revenues are collected. The types of notes issued include *tax anticipation notes (TANs), revenue anticipation notes (RANs), tax and revenue anticipation notes (TRANs), grant anticipation notes (GANs),* and *bond anticipation notes (BANs).*

CHARACTERISTICS AND FEATURES

Municipal bonds are typically issued in denominations of $5,000, known as the par value or face value amount of the bond. Municipal bonds are generally issued in serial maturities. A typical offering is made up of different maturities which allow the issuer to spread out debt service and stay within financial requirements. In recent years, however, term bonds have become increasingly popular. Term bonds are bonds comprising a large part or all of a particular issue which comes due in a single maturity. The issuer usually agrees to make periodic payments into a sinking fund for mandatory redemption of term bonds before maturity or for payment at maturity. Most municipal bonds are issued with call provisions which give the issuer flexibility in controlling its borrowing costs through the early retirement of debt.

A prime feature of municipal securities had been the exemption of their interest from federal income taxation. However, two significant restrictions have been imposed on the tax benefits of owning municipal securities. First, beginning in 1986, all taxpayers became subject to the alternative minimum tax (AMT), which was intended to provide an upper limit on the degree to which individuals and corporations can protect their income from taxation. Interest income from private-activity securities issued since then is potentially subject to the AMT. Second, investors became unable to deduct interest expense incurred in funding tax-advantaged securities, a measure that was intended to remove the benefit of borrowing funds from others to invest in municipal securities. In this regard, special federal tax rules apply to bank holdings of municipal securities, including the manner in which the amount of nondeductible interest expense is calculated. Exceptions to these various limitations apply only to tax-exempt obligations issued after August 1986 that are issued by small entities and are not private-activity bonds.

The state and local income taxation treatment of municipal securities varies greatly from state to state. Many states and local governments exempt interest income only on those bonds and notes issued by government entities located within their own boundaries.

USES

Municipal securities have traditionally been held primarily for investment purposes by investors who would benefit from income that is advantaged under federal income tax statutes and regulations. This group includes institutional investors such as insurance companies, mutual funds, commercial banks, and retail investors. The value of the tax advantage and, therefore, the attractiveness of the security increase when the income earned is also advantaged under state and local tax laws. Wealthy individuals and corporations face the highest marginal tax rates and, therefore, stand to receive the highest tax-equivalent yields on these securities. Private individuals are the largest holders of municipal securities, accounting for three-fourths of these securities outstanding.

DESCRIPTION OF MARKETPLACE

Issuing Practices

State and local government entities can market their new bond issues by offering them publicly or placing them privately with a small group of investors. When a public offering is selected, the issue is usually underwritten by investment bankers and municipal bond departments of banks. The underwriter may acquire the securities either by negotiation with the issuer or by award on the basis of competitive bidding. The underwriter is responsible for the distribution of the issue and accepts the risk that investors might fail to purchase the issues at the expected prices. For most sizable issues, underwriters join together in a syndicate to spread the risk of the sale and gain wider access to potential investors.

Standards and practices for the municipal securities activities of banks and other market participants are set by the Municipal Securities Rulemaking Board (MSRB), a congressionally chartered self-regulatory body that is overseen by the SEC. Examination and enforcement of MSRB standards is delegated to the NASD for securities firms and to the appropriate federal banking agency (Federal Reserve, OCC, or FDIC) for banking organizations.

Secondary Market

Municipal securities are not listed on or traded in exchanges; however, there are strong and active secondary markets for municipal securities that are supported by municipal bond dealers. These traders buy and sell to other dealers and investors and for their own inventories. The bond broker's broker also serves a significant role in the market for municipal bonds. These brokers are a small number of interdealer brokers who act as agents for registered dealers and dealer banks. In addition to using these brokers, many dealers advertise municipal offerings for the retail market through the *Blue List*. The *Blue List* is published by Standard & Poor's Corporation and lists securities and yields or prices of bonds and notes being offered by dealers.

Market Participants

Market participants in the municipal securities industry include underwriters, broker-dealers, brokers' brokers, the rating agencies, bond insurers, and investors. Financial advisors, who advise state and local governments for both competitive and negotiated offerings, and bond counsel, who provide opinions on the legality of specific obligations, are also important participants in the industry. The underwriting business primarily consists of a small number of large broker-dealers, typically with retail branch systems, and a large number of regional underwriters and broker-dealers with ties to local governments and who specialize in placing debt in their individual regions.

Market Transparency

Price transparency in the municipal securities industry varies depending on the type of security and the issuer. Prices for public issues are more readily available than prices for private placements. Two publications quote prices for municipal securities: *The Bond Buyer* and the *Blue List.*

PRICING

Municipal securities are priced either on a yield or dollar basis depending on the issue. Securities that are priced on a dollar basis are quoted as a percentage of the par value. A bond that is traded and quoted as a percentage of its par value is called a "dollar bond." Municipal securities, however, are generally traded and quoted in terms of yields because there are so many issues of different maturities. A bond quoted at 6.751-6.50 percent means that a dealer is willing to purchase the bond to yield 6.75 percent and will sell it to yield 6.50 percent.

To compare the yield of a municipal security with that of a taxable bond, the yield of the maturity must be adjusted to account for a number of factors that may be unique to the individual investor. For example, a fully taxable equivalent (FTE) yield would consider the relevant federal, state, and local marginal tax rates of the investor; specific characteristics of the security; the applicability of the alternative minimum tax (AMT); the ability to deduct interest expense associated with funding the acquisition; and other elements of the institution's tax status. (These factors are discussed more fully in the "Characteristics and Features" subsection.)

HEDGING

Generally, the special features and unique potential tax advantages of municipal securities make it difficult to construct an ideal hedge. The municipal bond futures contract from the Chicago Board of Trade (and corresponding options) is frequently used to hedge positions in municipal bonds. These contracts are cash settled to the value of the Bond Buyer Index, an index of actively traded municipal bonds, whose composition changes frequently. The market for these exchange contracts is not very liquid, however, and the possibility of basis risk may be large.

Municipal securities also can be hedged using more liquid Treasury securities, futures, and options. Treasury securities can be used to mitigate exposure to yield-curve risk; however, the significant basis risk present in the municipal/Treasury securities price relationship would remain unhedged. Some dealers use over-the-counter municipal swaps to hedge interest-rate risk. This would reduce basis risk to the relationship between the security being hedged and the municipal index employed in the swap transaction. Municipal swaps are relatively new and are not widespread in the industry. As a result, their use as hedging vehicles is limited.

RISKS

Credit Risk

Municipal securities activities involve differing degrees of credit risk depending on the financial capacity of the issuer or economic obligor. Noteworthy cases in which municipal securities have been unable to perform as agreed range from New York City in the 1970s and WPPSS (a Washington state power utility) in the 1980s to more recent examples. For revenue bonds, the ability to perform depends primarily on the success of the project or venture funded by the bond. Trends in real estate values, fiscal management, and the size of the tax base bear directly on the issuer's ability to service general obligation bonds.

An important starting point in performing a credit review of a potential issuer is to obtain a legal opinion that the issuing entity has the legal authority to undertake the obligation. The entity must also have the capacity to repay as well as the willingness to perform, both influenced not only by financial factors but by political factors. Since some issuers depend on legislatures or voters to approve bond issues or new funding, credit analysis can become problematic; issuers could default on their bond obligations despite having the funds to service debt. These political issues may reach beyond the direct jurisdiction of the issuing entity, including decisions made by state legislatures or Congress. Therefore, to fully evaluate market risk, market participants must monitor how political and legislative factors may affect a security's default risk.

The lack of standardized financial statements and the large number of different issuers (as many as 50,000 entities issue municipal bonds) also make credit analysis of municipal securities more difficult. This heightens the importance of the role of the rating agencies and bond insurers in comparison to other markets. Larger issuers of municipal securities are rated by nationally recognized rating agencies. Other issuers achieve an investment-grade rating through the use of credit enhancements such as insurance from a municipal bond insurance company or a letter of credit issued by a financial institution. Credit

enhancements are often used to improve the credit rating of a security, thereby lowering the interest that the issuer must pay.

Liquidity Risk

One of the problems in the municipal market is the lack of ready marketability for many municipal issues. Many municipal bonds are relatively small issues, and most general obligation issues are sold on a serial basis, which in effect breaks the issues up into smaller components. Furthermore, a large percentage of municipal securities are purchased by retail investors and small institutions that tend to hold securities to maturity. Overall, smaller issues and those with thin secondary markets often experience liquidity difficulties and are therefore subject to higher risk.

Interest-Rate Risk and Market Risk

Like other fixed-income securities, fixed-income municipal securities are subject to price fluctuations based on changes in interest rates. The degree of fluctuation depends on the maturity and coupon of the security. Variable-rate issues are typically tied to a money market rate, so their interest-rate risk will be significantly less. Nonetheless, since bond prices and interest rates are inextricably linked, all municipal securities involve some degree of interest-rate risk.

Holders of municipal securities are also affected by changes in marginal tax rates. For instance, a reduction in marginal tax rates would lower the tax-equivalent yield on the security, causing the security to depreciate in price.

Prepayment or Reinvestment Risk

Call provisions will affect a bank's interest-rate exposure. If the issuer has the right to redeem the bond before maturity, the risk of an adverse effect on the bank's exposure is greater. The security is most likely to be called when rates have moved in the issuer's favor, leaving the investor with funds to invest in a lower-interest-rate environment.

ACCOUNTING TREATMENT

The accounting treatment for investments in municipal securities is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

General obligations, BANs, and TANs have a 20 percent risk weight. Municipal revenue bonds and RANs have a 50 percent risk weight. Industrial development bonds are rated at 100 percent. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

The limitations of 12 USC 24 (section 5136 of the Revised Statutes) apply to municipal securities. Municipal securities that are general obligations are type I securities and may be purchased by banks in unlimited amounts. Municipal revenue securities, however, are either type II or type III securities. The purchase of type II and type III securities is limited to 10 percent of equity capital and reserves for each obligor. That limitation is reduced to 5 percent of equity capital and reserves for all obligors in the aggregate when the judgment of the obligor's ability to perform is based predominantly on reliable estimates versus adequate evidence.

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GENERAL DESCRIPTION

A Eurodollar certificate of deposit (Eurodollar CD) is a negotiable dollar-denominated time deposit issued by a U.S. bank located outside the United States or by a foreign bank located abroad. Dollars deposited in international banking facilities (IBFs) in the United States are also considered Eurodollars.

CHARACTERISTICS AND FEATURES

Eurodollar CDs are not FDIC-insured. Eurodollar deposits are generally free from domestic (U.S.) regulation and reserve requirements, and are not subject to other fees imposed by the FDIC. Most Eurodollar CDs are issued in denominations over $1 million. Although their maturities must be at least seven days, and most CDs are issued for three to six months, there is no upward limit on the term. Issuing banks cannot purchase their own CDs.

USES

The primary reason for issuing in the Eurodollar market (besides the basic reason to issue a CD—to provide a source of funds) is the lower cost of funds available as a result of the elimination of regulatory costs and reserve requirements. Buyers, on the other hand, can take advantage of the slightly higher yields while maintaining reasonable liquidity. Eurodollar CD issuers subsequently take the funds received from the issuance and redeposit them with other foreign banks; invest them; retain them to improve reserves or overall liquidity; or lend them to companies, individuals, or governments outside the United States.

DESCRIPTION OF MARKETPLACE

The Eurodollar CD market is centered in London. Activity also takes place in offshore branches, including those in Nassau and the Cayman Islands. Issuers include the overseas branches of money-center U.S. banks, large British banks, and branches of major Canadian and Japanese banks. Only the largest banks with strong international reputations usually sell Eurodollar CDs. Since the advent of the medium-term note market, the Eurodollar CD market has been on a decline and is now a relatively illiquid market.

Eurodollar CDs are sold by the issuing bank at face value either directly to investors or depositors or through CD dealers and brokers. Settlement is on a two-day basis and occurs at the New York correspondents of the issuers' and investors' banks.

PRICING

Eurodollar CDs are priced off the London Interbank Offered Rate (LIBOR). Their yields are generally slightly higher than yields for domestic CDs to compensate the investor for the slightly higher risk.

Eurodollar CDs are quoted and sold on an interest-bearing basis on an actual 360-day basis. The bid/offer quotes are in 16ths (for example, 12 7/16). The quotes directly translate to rates on the given Eurodollar CD. Thus, bid/offer rates of 12 7/16 and 12 3/16 would roughly translate to a bid interest rate of 12.4375 percent and an offer rate of 12.1875 percent, respectively, giving the dealer a spread of .25 percent.

HEDGING

Eurodollar futures may be used to hedge Eurodollar time deposits. Eurodollar futures are one of the most actively traded futures contracts in the world.

RISKS

The risks associated with purchasing Eurodollar CDs include credit risk, sovereign risk, and liquidity risk. To reduce credit risk, a detailed analysis should be performed on all Eurodollar CD issuers in which the investor has invested. Although the instruments themselves are not rated, most issuers are rated by either Thompson

Bankwatch (for domestic banks) or IBCA, Ltd. (for foreign banks).

The secondary market for Eurodollar CDs is less developed than the domestic CD market. The current perception of the issuer's name, as well as the size and maturity of the issue, may affect marketability.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statment of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," determines the accounting treatment for investments in Eurodollar CDs. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statment of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

In general, a 20 percent risk weighting is appropriate for depository institutions based in OECD countries. For specific risk weights for qualified trading accounts, see section 2110.1, "Capital Adequacy."

LEGAL LIMITATIONS FOR BANK INVESTMENT

Owning Eurodollar CDs is authorized under the "incidental powers" provisions of 12 USC 24 (7th). Banks may legally hold these instruments without limit.

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GENERAL DESCRIPTION

Asset-backed securities (ABS) are debt instruments that represent an interest in a pool of assets. Technically, mortgage-backed securities (MBS) can be viewed as a subset of ABS, but the term ''ABS'' is generally used to refer to securities in which underlying collateral consists of assets other than residential first mortgages such as credit card and home equity loans, leases, or commercial mortgage loans. Issuers are primarily banks and finance companies, captive finance subsidiaries of nonfinancial corporations (for example, GMAC), or specialized originators such as credit card lenders (for example, Discover). Credit risk is an important issue in asset-backed securities because of the significant credit risks inherent in the underlying collateral and because issuers are primarily private entities. Accordingly, asset-backed securities generally include one or more credit enhancements, which are designed to raise the overall credit quality of the security above that of the underlying loans.

Another important type of asset-backed security is commercial paper issued by special-purpose entities. Asset-backed commercial paper is usually backed by trade receivables, though such conduits may also fund commercial and industrial loans. Banks are typically more active as issuers of these instruments than as investors in them.

CHARACTERISTICS AND FEATURES

An asset-backed security is created by the sale of assets or collateral to a conduit, which becomes the legal issuer of the ABS. The securitization conduit or issuer is generally a bankruptcy-remote vehicle such as a grantor trust or, in the case of an asset-backed commercial paper program, a special-purpose entity (SPE). The sponsor or originator of the collateral usually establishes the issuer. Interests in the trust, which embody the right to certain cash flows arising from the underlying assets, are then sold in the form of securities to investors through an investment bank or other securities underwriter. Each ABS has a servicer (often the originator of the collateral) that is responsible for collecting the cash flows generated by the securitized assets—principal, interest, and fees net of losses and any servicing costs as well as other expenses—and for passing them along to the investors in accord with the terms of the securities. The servicer processes the payments and administers the borrower accounts in the pool.

The structure of an asset-backed security and the terms of the investors' interest in the collateral can vary widely depending on the type of collateral, the desires of investors, and the use of credit enhancements. Often ABS are structured to reallocate the risks entailed in the underlying collateral (particularly credit risk) into security tranches that match the desires of investors. For example, senior subordinated security structures give holders of senior tranches greater credit risk protection (albeit at lower yields) than holders of subordinated tranches. Under this structure, at least two classes of asset-backed securities are issued, with the senior class having a priority claim on the cash flows from the underlying pool of assets. The subordinated class must absorb credit losses on the collateral before losses can be charged to the senior portion. Because the senior class has this priority claim, cash flows from the underlying pool of assets must first satisfy the requirements of the senior class. Only after these requirements have been met will the cash flows be directed to service the subordinated class.

ABS also use various forms of credit enhancements to transform the risk-return profile of underlying collateral, including third-party credit enhancements, recourse provisions, overcollateralization, and various covenants. Third-party credit enhancements include standby letters of credit, collateral or pool insurance, or surety bonds from third parties. Recourse provisions are guarantees that require the originator to cover any losses up to a contractually agreed-upon amount. One type of recourse provision, usually seen in securities backed by credit card receivables, is the ''spread account.'' This account is actually an escrow account whose funds are derived from a portion of the spread between the interest earned on the assets in the underlying pool of collateral and the lower interest paid on securities issued by the trust. The amounts that accumulate in this escrow account are used to cover credit losses in the

underlying asset pool, up to several multiples of historical losses on the particular asset collateralizing the securities.

Overcollateralization is another form of credit enhancement that covers a predetermined amount of potential credit losses. It occurs when the value of the underlying assets exceeds the face value of the securities. A similar form of credit enhancement is the cash-collateral account, which is established when a third party deposits cash into a pledged account. The use of cash-collateral accounts, which are considered by enhancers to be loans, grew as the number of highly rated banks and other credit enhancers declined in the early 1990s. Cash-collateral accounts provide credit protection to investors of a securitization by eliminating "event risk," or the risk that the credit enhancer will have its credit rating downgraded or that it will not be able to fulfill its financial obligation to absorb losses.

An investment banking firm or other organization generally serves as an underwriter for ABS. In addition, for asset-backed issues that are publicly offered, a credit-rating agency will analyze the policies and operations of the originator and servicer, as well as the structure, underlying pool of assets, expected cash flows, and other attributes of the securities. Before assigning a rating to the issue, the rating agency will also assess the extent of loss protection provided to investors by the credit enhancements associated with the issue.

Although the basic elements of all asset-backed securities are similar, individual transactions can differ markedly in both structure and execution. Important determinants of the risk associated with issuing or holding the securities include the process by which principal and interest payments are allocated and downstreamed to investors, how credit losses affect the trust and the return to investors, whether collateral represents a fixed set of specific assets or accounts, whether the underlying loans are revolving or closed-end, under what terms (including maturity of the asset-backed instrument) any remaining balance in the accounts may revert to the issuing company, and the extent to which the issuing company (the actual source of the collateral assets) is obligated to provide support to the trust/conduit or to the investors. Further issues may arise based on discretionary behavior of the issuer within the terms of the securitization agreement, such as voluntary buybacks from, or contributions to, the underlying pool of loans when credit losses rise.

A bank or other issuer may play more than one role in the securitization process. An issuer can simultaneously serve as originator of loans, servicer, administrator of the trust, underwriter, provider of liquidity, and credit enhancer. Issuers typically receive a fee for each element of the transaction.

Institutions acquiring ABS should recognize that the multiplicity of roles that may be played by a single firm—within a single securitization or across a number of them—means that credit and operational risk can accumulate into significant concentrations with respect to one or a small number of firms.

TYPES OF SECURITIZED ASSETS

There are many different varieties of asset-backed securities, often customized to the terms and characteristics of the underlying collateral. The most common types are securities collateralized by revolving credit-card receivables, but instruments backed by home equity loans, other second mortgages, and automobile-finance receivables are also common.

Installment Loans

Securities backed by closed-end installment loans are typically the least complex form of asset-backed instruments. Collateral for these ABS typically includes leases, automobile loans, and student loans. The loans that form the pool of collateral for the asset-backed security may have varying contractual maturities and may or may not represent a heterogeneous pool of borrowers. Unlike a mortgage pass-through instrument, the trustee does not need to take physical possession of any account documents to perfect security interest in the receivables under the Uniform Commercial Code. The repayment stream on installment loans is fairly predictable, since it is primarily determined by a contractual amortization schedule. Early repayment on these instruments can occur for a number of reasons, with most tied to the disposition of the underlying collateral (for example, in the case of an ABS backed by an automobile loan, the sale of the vehicle). Interest is typically passed through to bondholders at a fixed rate that is slightly

below the weighted average coupon of the loan pool, allowing for servicing and other expenses as well as credit losses.

Revolving Credit

Unlike closed-end installment loans, revolving credit receivables involve greater uncertainty about future cash flows. Therefore, ABS structures using this type of collateral must be more complex to afford investors more comfort in predicting their repayment. Accounts included in the securitization pool may have balances that grow or decline over the life of the ABS. Accordingly, at maturity of the ABS, any remaining balances revert to the originator. During the term of the ABS, the originator may be required to sell additional accounts to the pool to maintain a minimum dollar amount of collateral if accountholders pay down their balances in advance of predetermined rates.

Credit card securitizations are the most prevalent form of revolving-credit ABS, although home equity lines of credit are a growing source of ABS collateral. Credit card ABS are typically structured to incorporate two phases in the life cycle of the collateral: an initial phase during which the principal amount of the securities remains constant, and an amortization phase during which investors are paid off. A specific period of time is assigned to each phase. Typically, a specific pool of accounts is identified in the securitization documents, and these specifications may include not only the initial pool of loans but a portfolio from which new accounts may be contributed.

The dominant vehicle for issuing securities backed by credit cards is a master-trust structure with a ''spread account,'' which is funded up to a predetermined amount through ''excess yield''—that is, interest and fee income less credit losses, servicing, and other fees. With credit card receivables, the income from the pool of loans—even after credit losses—is generally much higher than the return paid to investors. After the spread account accumulates to its predetermined level, the excess yield reverts to the issuer. Under GAAP, issuers are required to recognize on their balance sheet an excess yield asset that is based on the fair value of the expected future excess yield; in principle, this value would be based on the net present value of the expected earnings stream from the transaction. Issuers are further required to revalue the asset periodically to take account of changes in fair value that may occur due to interest rates, actual credit losses, and other factors relevant to the future stream of excess yield. The accounting and capital implications of these transactions are discussed further below.

Asset-Backed Commercial Paper

A number of larger banks have started using a new structure, a ''special-purpose entity (SPE),'' which is designed to acquire trade receivables and commercial loans from high-quality (often investment-grade) obligors and to fund those loans by issuing (asset-backed) commercial paper that is to be repaid from the cash flow of the receivables. Capital is contributed to the SPE by the originating bank which, together with the high quality of the underlying borrowers, is sufficient to allow the SPE to receive a high credit rating. The net result is that the SPE's cost of funding can be at or below that of the originating bank itself. The SPE is ''owned'' by individuals who are not formally affiliated with the bank, although the degree of separation is typically minimal.

These securitization programs enable banks to arrange short-term financing support for their customers without having to extend credit directly. This structure provides borrowers with an alternative source of funding and allows banks to earn fee income for managing the programs. As the asset-backed commercial paper structure has developed, it has been used to finance a variety of underlying loans—in some cases, loans purchased from other firms rather than originated by the bank itself—and as a remote-origination vehicle from which loans can be made directly. Like other securitization techniques, this structure allows banks to meet their customers' credit needs while incurring lower capital requirements and a smaller balance sheet than if it made the loans directly.

USES

Issuers obtain a number of advantages from securitizing assets, including improving their capital ratios and return on assets, monetizing gains in loan value, generating fee income by providing services to the securitization conduit,

closing a potential source of interest-rate risk, and increasing institutional liquidity by providing access to a new source of funds. Investors are attracted by the high credit quality of ABS, as well as their attractive returns.

DESCRIPTION OF MARKETPLACE

The primary buyers for ABS have been insurance companies and pension funds looking for attractive returns with superior credit quality. New issues often sell out very quickly. Banks typically are not active buyers of these securities. The secondary market is active, but new issues currently trade at a premium to more seasoned products.

Market transparency can be less than perfect, especially when banks and other issuers retain most of the economic risk despite the securitization transaction. This is particularly true when excess yield is a significant part of the transaction and when recourse (explicit or implicit) is a material consideration. The early-amortization features of some ABS also may not be fully understood by potential buyers.

PRICING

ABS carry coupons that can be fixed (generally yielding between 50 and 300 basis points over the Treasury curve) or floating (for example, 15 basis points over one-month LIBOR). Pricing is typically designed to mirror the coupon characteristics of the loans being securitized. The spread will vary depending on the credit quality of the underlying collateral, the degree and nature of credit enhancement, and the degree of variability in the cash flows emanating from the securitized loans.

HEDGING

Given the high degree of predictability in their cash flows, the hedging of installment loans and revolving-credit ABS holdings is relatively straightforward and can be accomplished either through cash-flow matching or duration hedging. Most market risk arises from the perceived credit quality of the collateral and the nature and degree of credit enhancement, a risk that may be difficult to hedge. One source of potential unpredictability, however, is the risk that acceleration or wind-down provisions would be triggered by poor credit quality in the asset pool—essentially, a complex credit-quality option that pays off bondholders early if credit losses exceed some threshold level.

For issuers, variability in excess yield (in terms of carrying value) or in the spread account (in terms of income) can represent a material interest-rate risk, particularly if the bonds pay interest on a variable-rate basis while the underlying loans are fixed-rate instruments. While the risk can be significant, the hedging solutions are not complex (that is, dollar-for-dollar in notional terms). Potential hedging strategies include the use of futures or forwards, forward rate agreements (FRAs), swaps, or more complex options or swaptions. In the case of home equity loans or other revolving credits for which the pool earnings rate is linked to prime while the ABS interest rate is not, prime LIBOR swaps or similar instruments could be used to mitigate basis risk. Note that the presence of interest-rate risk may have credit-quality ramifications for the securities, since tighter excess yield and spread accounts would reduce the ability of the structure to absorb credit losses.

An asset-backed commercial paper (ABCP) program can lead to maturity mismatches for the issuer depending on the pricing characteristics of the commercial loan assets. Similarly, the presence of embedded options—such as prepayment options, caps, or floors—can expose the ABCP entity to options risk. These risks can be hedged through use of options, swaptions, or other derivative instruments. As with home equity ABS, prime-based commercial loans could lead to basis-risk exposure, which can be hedged using basis swaps.

RISKS

Credit Risk

Credit risk arises from (1) losses due to defaults by the borrowers in the underlying collateral and (2) the issuer's or servicer's failure to perform. These two elements can blur together as, for example, in the case of a servicer who does not provide adequate credit-review scrutiny to the serviced portfolio, leading to a higher incidence

of defaults. ABS are rated by major rating agencies.

Market Risk

Market risk arises from the cash-flow characteristics of the security, which for most ABS tend to be predictable. Rate-motivated prepayments are a relatively minor phenomenon due to the small principal amounts on each loan and the relatively short maturity. The greatest variability in cash flows comes from credit performance, including the presence of wind-down or acceleration features designed to protect the investor in the event that credit losses in the portfolio rise well above expected levels.

Interest-Rate Risk

Interest-rate risk arises for the issuer from the relationship between the pricing terms on the underlying loans and the terms of the rate paid to bondholders, and from the need to mark to market the excess servicing or spread-account proceeds carried on the balance sheet. For the holder of the security, interest-rate risk depends on the expected life or repricing of the ABS, with relatively minor risk arising from embedded options. The notable exception is valuation of the wind-down option.

Liquidity Risk

Liquidity risk can arise from increased perceived credit risk, like that which occurred in 1996 and 1997 with the rise in reported delinquencies and losses on securitized pools of credit cards. Liquidity can also become a major concern for asset-backed commercial paper programs if concerns about credit quality, for example, lead investors to avoid the commercial paper issued by the special-purpose entity. For these cases, the securitization transaction may include a ''liquidity facility,'' which requires the facility provider to advance funds to the SPE if liquidity problems arise. To the extent that the bank originating the loans is also the provider of the liquidity facility, and that the bank is likely to experience similar market concerns if the loans it originates deteriorate, the ultimate practical value of the liquidity facility to the transaction may be questionable.

Operations Risk

Operations risk arises through the potential for misrepresentation of loan quality or terms by the originating institution, misrepresentation of the nature and current value of the assets by the servicer, and inadequate controls over disbursements and receipts by the servicer.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), ''Accounting for Certain Investments in Debt and Equity Securities,'' as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), ''Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities,'' determines the accounting treatment for investments in government agency securities. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

For the holder of ABS, a 100 percent risk weighting is assigned for corporate issues and a 20 percent rating for state or municipal issues. Under risk-based capital regulations, a transfer of assets is a ''true sale'' as long as the banking organization (1) retains no risk of loss and (2) has no obligation to any party for the payment of principal or interest on the assets transferred. Unless these conditions are met, the banking organization is deemed to have sold the assets with recourse; thus, capital generally must be held against the entire risk-weighted amount of the assets sold unless (1) the transaction is subject to the low-level capital rule or (2) the loans securitized are small-business loans and receive preferential treatments. Assets sold in which an interest-only receivable is recognized under FAS 140, or in which the spread account is recognized on the balance sheet and provides credit enhancement to the assets sold, are deemed to have

been sold with recourse. In the case of asset-backed commercial paper, capital generally must be held against the entire risk-weighted amount of any guarantee, other credit enhancement, or liquidity facility provided by the bank to the special-purpose entity.

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Asset-backed securities can be either type IV or type V securities. Type IV securities were added as bank-eligible securities in 1996 primarily in response to provisions of the Riegle Community Development and Regulatory Improvement Act of 1994 (RCDRIA), which removed quantitative limits on a bank's ability to buy commercial mortgage and small-business-loan securities. In summary, type IV securities include the following asset-backed securities that are fully secured by interests in a pool (or pools) of loans made to numerous obligors:

- investment-grade residential-mortgage-related securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- residential-mortgage-related securities, as described in section 3(a)(41) of the Securities Exchange Act of 1934, (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade commercial mortgage securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- commercial mortgage securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade, small-business-loan securities as described in section 3(a)(53)(A) of the Securities Exchange Act of 1934 (15 USC 78c(a)(53)(A))

For all type IV commercial and residential mortgage securities and for type IV small-business-loan securities rated in the top two rating categories, there is no limitation on the amount a bank can purchase or sell for its own account. Type IV investment-grade small-business-loan securities that are not rated in the top two rating categories are subject to a limit of 25 percent of a bank's capital and surplus for any one issuer. In addition to being able to purchase and sell type IV securities, subject to the above limitations, a bank may deal in those type IV securities which are fully secured by type I securities.

Type V securities consist of all ABS that are not type IV securities. Specifically, they are defined as marketable, investment-grade-rated securities that are not type IV and are "fully secured by interests in a pool of loans to numerous obligors and in which a national bank could invest directly." They include securities backed by auto loans, credit card loans, home equity loans, and other assets. Also included are residential and commercial mortgage securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) which are not rated in one of the two highest investment-grade rating categories, but are still investment-grade. A bank may purchase or sell type V securities for its own account provided the aggregate par value of type V securities issued by any one issuer held by the bank does not exceed 25 percent of the bank's capital and surplus.

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GENERAL DESCRIPTION

A mortgage loan is a loan which is secured by the collateral of a specified real estate property. The real estate pledged with a mortgage can be divided into two categories: residential and nonresidential. Residential properties include houses, condominiums, cooperatives, and apartments. Residential real estate can be further subdivided into single-family (one- to four-family) and multifamily (apartment buildings in which more than four families reside). Nonresidential property includes commercial and farm properties. Common types of mortgages which have been securitized include traditional fixed-rate level-payment mortgages, graduated-payment mortgages, adjustable-rate mortgages (ARMs), and balloon mortgages.

Mortgage-backed securities (MBS) are products that use pools of mortgages as collateral for the issuance of securities. Although these securities have been collateralized using many types of mortgages, most are collateralized by one- to four-family residential properties. MBS can be broadly classified into four basic categories:

1. mortgage-backed bonds
2. pass-through securities
3. collateralized mortgage obligations and real estate mortgage investment conduits
4. stripped mortgage-backed securities

Mortgage-Backed Bonds

Mortgage-backed bonds are corporate bonds which are general obligations of the issuer. These bonds are credit enhanced through the pledging of specific mortgages as collateral. Mortgage-backed bonds involve no sale or conveyance of ownership of the mortgages acting as collateral.

Pass-Through Securities

A mortgage-backed pass-through security provides its owner with a pro rata share in underlying mortgages. The mortgages are typically placed in a trust, and certificates of ownership are sold to investors. Issuers of pass-through instruments primarily act as a conduit for the investors by collecting and proportionally distributing monthly cash flows generated by homeowners making payments on their home mortgage loans. The pass-through certificate represents a sale of assets to the investor, thus removing the assets from the balance sheet of the issuer.

Collateralized Mortgage Obligations and Real Estate Mortgage Investment Conduits

Collateralized mortgage obligations (CMOs) and real estate mortgage investment conduit (REMICs) securities represent ownership interests in specified cash flows arising from underlying pools of mortgages or mortgage securities. CMOs and REMICs involve the creation, by the issuer, of a single-purpose entity designed to hold mortgage collateral and funnel payments of principal and interest from borrowers to investors. Unlike pass-through securities, however, which entail a pro rata share of ownership of all underlying mortgage cash flows, CMOs and REMICs convey ownership only of cash flows assigned to specific classes based on established principal distribution rules.

Stripped Mortgage-Backed Securities

Stripped mortgage-backed securities (SMBS) entail the ownership of either the principal or interest cash flows arising from specified mortgages or mortgage pass-through securities. Rights to the principal are labeled POs (principal only), and rights to the interest cash flows are labeled IOs (interest only).

CHARACTERISTICS AND FEATURES

Products Offered under Agency Programs

The Government National Mortgage Association (GNMA or Ginnie Mae), Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac), and the Federal National Mortgage Association (FNMA or Fannie Mae) are the three

main government-related institutions which securitize like groups of mortgages for sale to investors. Major mortgage-purchasing programs sponsored by these three agencies are listed below.

Abbreviation	*Description*
GNMA	
30-YR	30-year single-family programs
15-YR	15-year single-family programs
GPMs	Graduated-payment programs
PROJ Loans	Project-loan programs
ARMs	Single-family adjustable-rate programs
FNMA	
30-YR SF	30-year single-family programs
30-YR MF	30-year multifamily programs
30-YR FHA/VA	FHA/VA 30-year single- and multifamily programs
15-YR	15-year single-family programs
SF ARMs	Single-family adjustable-rate programs
MF ARMs	Multifamily adjustable-rate programs
Balloons	Balloon-payment seven-year programs
Two-step	Five- and seven-year two-step programs
FHLMC	
30-YR	30-year single-family programs
15-YR	15-year single-family programs
TPMs	Tiered-payment single-family programs
ARMs	Single-family adjustable-rate programs
MF	Multifamily programs
5- & 7-year balloons	Balloon-payment, five- to seven-year programs

While the majority of outstanding mortgage loans are structured as 30-year fixed-rate loans, in recent years the size of the 15-year, fixed-rate sector has grown. Declining interest rates and a steep yield curve have led many borrowers to refinance or prepay existing 30-year, higher-coupon loans and replace them with a shorter maturity. This experience also has demonstrated the prepayment risk inherent in all mortgages.

Public Securities Association Prepayment Rates

Mortgagors have the option to prepay the principal balance of their mortgages at any time. The value of the prepayment option to investors and mortgagors depends on the level of interest rates and the volatility of mortgage prepayments. Prepayment rates depend on many variables, and their response to these variables can be unpredictable. The single biggest influence on prepayment rates is the level of long-term mortgage rates; mortgage prepayments generally increase as long-term rates decrease. While future long-term rates are not known, higher volatility in long-term interest rates means lower rates are more likely, making the prepayment option more valuable to the mortgagor. This higher value of the prepayment option is reflected in lower mortgage security prices, as mortgage investors require higher yields to compensate for increased prepayment risk.

The importance of principal prepayment to the valuation of mortgage securities has resulted in several standardized forms of communicating the rate of prepayments of a mortgage security. One standard form is that developed by the Public Securities Association (PSA). The PSA standard is more accurately viewed as a benchmark or reference for communicating prepayment patterns. It may be helpful to think of the PSA measurement as a kind of speedometer, used only as a unit for measuring the speed of prepayments.

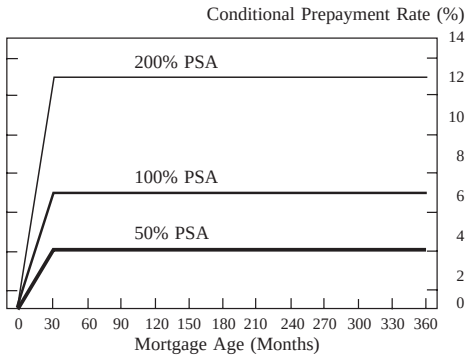
For a pool of mortgage loans, the PSA standard assumes that the mortgage prepayment rate increases at a linear rate over the first 30 months following origination, then levels off at a constant rate for the remaining life of the pool. Under the PSA convention, prepayments are assumed to occur at a 0.2 percent annual rate in the first month, 0.4 percent annual rate in the second month, escalating to a 6.0 percent annual rate by month 30. The PSA's annualized prepayment rate then remains at 6.0 percent over the remaining life of the mortgage pool (see chart 1). Using this convention, mortgage prepayment rates are often communicated in multiples of the PSA standard of 100 percent. For example, 200 percent PSA equals two times the PSA standard, whereas 50 percent PSA equals one-half of the PSA standard.

Mortgage Pass-Through Securities

Mortgage pass-through securities are created when mortgages are pooled together and sold as undivided interests to investors. Usually, the mortgages in the pool have the same loan type and similar maturities and loan interest rates. The originator (for instance, a bank) may continue to service the mortgage and will ''pass through'' the principal and interest, less a servicing fee, to an agency or private issuer of mortgage-backed securities. Mortgages are then packaged by the agency or private issuer and sold to investors. The principal and interest, less guaranty and other fees are then ''passed through'' to the investor, who receives a pro rata share of the resulting cash flows.

Every agency pass-through pool is unique, distinguished by features such as size, prepayment characteristics, and geographic concentration or dispersion. Most agency pass-through securities, however, trade on a generic or to-be-announced (TBA) basis. In a TBA trade, the seller and buyer agree to the type of security, coupon, face value, price, and settlement date at the time of the trade, but do not specify the actual pools to be traded. Two days before settlement, the seller identifies the specific pools to be delivered to satisfy the commitment. Trading in agency pass-throughs may take place on any business day, but TBA securities usually settle on one specific date each month. The Public Securities Association releases a monthly schedule that divides all agency pass-throughs into six groups, each settling on a different day. Agency pass-throughs generally clear through electronic book-entry systems.

Chart 1—PSA Model



Nonagency pass-throughs are composed of specific pools and do not trade on a TBA basis. New issues settle on the date provided in the prospectus. In the secondary market, these securities trade on an issue-specific basis and generally settle on a corporate basis (three business days after the trade).

Collateralized Mortgage Obligations

Since 1983, mortgage pass-through securities and mortgages have been securitized as collateralized mortgage obligations (CMOs).[1] While pass-through securities share prepayment risk on a pro rata basis among all bondholders, CMOs redistribute prepayment risk among different classes or tranches. The CMO securitization process recasts prepayment risk into classes or tranches. These tranches have risk profiles ranging from extremely low to significantly high risk. Some tranches can be relatively immune to prepayment risk, while others bear a disproportionate share of the risk associated with the underlying collateral.

CMO issuance has grown dramatically throughout the 1980s and currently dominates the market for FNMA and FHLMC pass-throughs or agency collateral. Given the dramatic growth of the CMO market and its complex risks, this subsection discusses the structures and risks associated with CMOs.

In 1984, the Treasury ruled that multiple-class pass-throughs required active management; this resulted in the pass-through entities' being considered corporations for tax purposes rather than trusts. Consequently, the issuer was no longer considered a grantor trust, and the income was taxed twice: once at the issuer level and again at the investor level. This ruling ultimately had complex and unintended ramifications for the CMO market.

The issue was ultimately addressed in the Tax Reform Act of 1986 through the creation of real estate mortgage investment conduits (REMICs). These instruments are essentially tax-free vehicles for issuing multiple-class mortgage-backed securities. REMIC is a tax designation; a REMIC may be originated as a trust, partnership, or other entity.

1. Today almost all CMOs are structured as real estate mortgage investment conduits (REMICs) to qualify for desirable tax treatment.

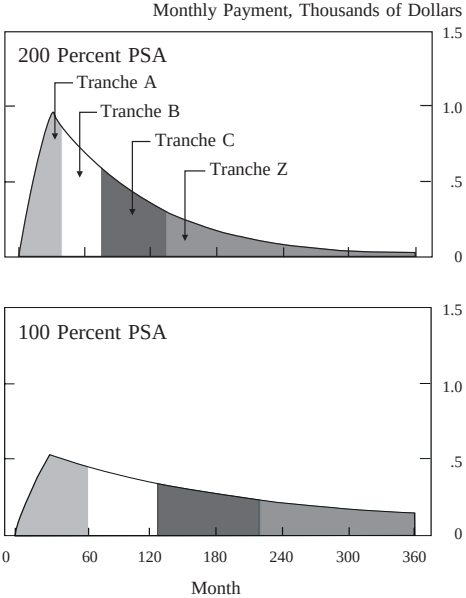
The Tax Reform Act of 1986 allowed for a five-year transition during which mortgage-backed securities could be issued pursuant to existing Treasury regulations. However, as of January 1, 1992, REMICs became the sole means of issuing multiple-class mortgage-backed securities exempt from double taxation. As a practical matter, the vast majority of CMOs carry the REMIC designation. Indeed, many market participants use the terms ''CMO'' and ''REMIC'' interchangeably.

CMOs do not trade on a TBA basis. New-issue CMOs settle on the date provided in the prospectus and trade on a corporate basis (three business days after the trade) in the secondary market. Common CMO structures include sequential pay, PACs, TACs, and floaters and inverse floaters as described below.

Sequential pay structure. The initial form of CMO structure was designed to provide more precisely targeted maturities than the pass-through securities. Now considered a relatively simple design for CMOs, the sequential pay structure dominated CMO issuance from 1983 (when the first CMO was created) until the late 1980s. In the typical sequential pay deal of the 1980s (see chart 2), mortgage cash flows were divided into four tranches, labeled A, B, C, and Z. Tranche A might receive the first 25 percent of principal payments and have an average maturity, or average life, of one to three years.[2] Tranche B, with an average life of between three and seven years, would receive the next 25 percent of principal. Tranche C, receiving the following 25 percent of principal, would have an average life of 5 to 10 years. The Z tranche, receiving the final 25 percent, would be an ''accrual'' bond with an average life of 15 to 20 years.[3]

The sequential pay structure was the first step in creating a mortgage yield curve, allowing mortgage investors to target short, intermediate, or long maturities. Nevertheless, sequential pay structure maturities remained highly sensitive to prepayment risks, as prepayments of the underlying collateral change the cash flows for each tranche, affecting the longer-dated tranches most, especially the Z tranche. If interest rates declined and prepayment speeds doubled (from 100 percent PSA to 200 percent PSA as shown on chart 2), the average life of the A tranche would change from 35 months to 25 months, but the average life of the Z bond would shift from 280 months to 180 months. Hence, the change in the value of the Z bond would be similarly greater than the price change of the A tranche.

Chart 2—Four-Tranche Sequential Pay CMO



Planned amortization class (PAC) structure. The PAC structure, which now dominates CMO issuance, creates tranches, called planned amortization classes, with cash flows that are protected from prepayment changes within certain limits. However, creating this ''safer'' set of tranches necessarily means that there must be other tranches, called ''support'' bonds, that are by definition more volatile than the underlying pass-throughs. While the PAC tranches are relatively easy to sell, finding investors for higher-yielding, less predictable support bonds has been crucial for the success of the expanding CMO market.

Chart 3 illustrates how PACs are created. In the example, the estimated prepayment rate for the mortgages is 145 percent of the PSA standard, and the desired PAC is structured to

2. Average life, or weighted average life (WAL), is defined as the weighted average number of years that each principal dollar of the mortgage security remains outstanding.

3. Unlike the Z tranche, the A, B, and C tranches receive regular interest payments in the early years before the principal is paid off.

be protected if prepayments slow to 80 percent PSA or rise to 250 percent PSA. The PACs therefore have some protection against both ''extension risk'' (slower than expected prepayments) and ''call risk'' (faster than expected prepayments). In order to create this 80 to 250 percent ''PAC range,'' principal payments are calculated for 80 percent PSA and 250 percent PSA.

The area underneath both curves indicates that amount of estimated principal that can be used to create the desired PAC tranche or tranches. That is, as long as the prepayment rates are greater than 80 percent PSA or less than 250 percent PSA, the four PACs will receive their scheduled cash flows (represented by the shaded areas).

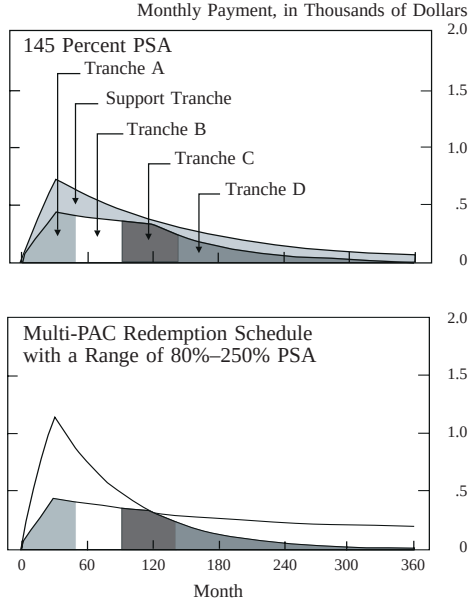
This PAC analysis assumes a constant prepayment rate of between 80 and 250 percent of the PSA standard over the life of the underlying mortgages. Since PSA speeds can change every month, this assumption of a constant PSA speed for months 1 to 360 is never realized. If prepayment speeds are volatile, even within the PAC range, the PAC range itself may narrow over time. This phenomenon, termed ''effective PAC band,'' affects longer-dated PACs more than short-maturity PACs. Thus, PAC prepayment protection can break down from extremely high, extremely low, or extremely volatile prepayment rates.

A PAC bond classified as PAC 1 in a CMO structure has the highest cash-flow priority and the best protection from both extension and prepayment risk. In the past, deals have also included super PACs, another high-protection, lower-risk-type tranche distinguished by extremely wide bands. The mechanisms that protect a PAC tranche within a deal may diminish, and its status may shift more toward the support end of the spectrum. The extent of a support-type role that a PAC might play depends in part on its original cash-flow priority status and the principal balances of the other support tranches embedded within the deal. Indeed, as prepayments accelerated in 1993, support tranches were asked to bear the brunt, and many disappeared. A PAC III, for example, became a pure support tranche, foregoing any PAC-like characteristics in that case.

A variation on the PAC theme has emerged in the scheduled tranche (SCH). Like a PAC, an SCH has a predetermined cash-flow collar, but it is too narrow even to be called a PAC III. An SCH tranche is also prioritized within a deal using the above format, but understand that its initial priority status is usually below even that of a PAC III. These narrower band PAC-type bonds were designed to perform well in low-volatility environments and were popular in late 1992 and early 1993. At that time, many investors failed to realize what would happen to the tranche when prepayments violated the band.

In chart 3, the four grey shaded areas represent the PAC structure, which has been divided into four tranches to provide investors with an instrument more akin to the bullet maturity of Treasury and corporate bonds.[4] The two support tranches are structured to absorb the full amount of prepayment risk to the extent the prepayment rate for the PAC tranches is within the specified range of 80 to 250 percent PSA. The second panel of chart 3 shows principal cash flows at the original estimated speed of 145 percent PSA, which are divided between the PAC and support bonds throughout the life of the underlying mortgages.

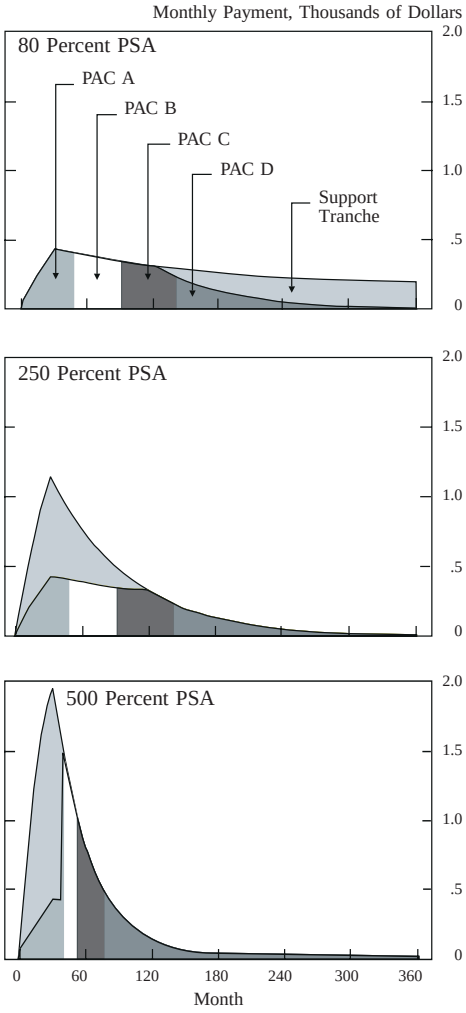
Chart 3—Principal Payments



4. Treasury and corporate bonds usually return principal to investors at stated maturity; the PAC structure narrows the time interval over which principal is returned to the investors.

Chart 4 shows how both PACs and the support tranches react to different prepayment speeds. The average lives of the support bonds in this example could fluctuate from 1½ to 25 years depending on prepayment speeds. Simply put, support-bond returns are diminished whether prepayment rates increase or decrease (a lose-lose proposition). To compensate holders of support bonds for this characteristic (sometimes referred to as ''negative convexity''), support bonds carry substantially higher yields than PAC bonds.[5] Conversely, PAC bond investors are willing to give up yield in order to reduce their exposure to prepayment risk or negative convexity. Nevertheless, PAC bond holders are exposed to prepayment risk outside the protected range and correspondingly receive yields above those available on comparable Treasury securities. In extreme cases, even PAC tranches are subject to prepayment risk. For example, at 500 percent PSA (see the third panel of chart 4), the PAC range is broken. The support bonds fail to fully protect even the first PAC tranche; principal repayment accelerates sharply at the end of the scheduled maturity of PAC A.

Chart 4—Principal Payments



Targeted amortization tranche structure. A targeted amortization tranche (TAC) typically offers protection from prepayment risk but not extension risk. Similar to the cash-flow schedule of a PAC that is built around a collar, a TAC's schedule is built around a single pricing speed, and the average life of the tranche is ''targeted'' to that speed. Any excess principal paid typically has little effect on the TAC; its targeted speed acts as a line of defense. Investors in TACs, however, pay the price for this defense with their lack of protection when rates increase, subjecting the tranche to potential extension risk.

Floaters and inverse floaters. CMOs and REMICs can include several floating-rate classes. Floating-rate tranches have coupon rates that float with movements in an underlying index. The most widely used indexes for floating-rate tranches are the London Interbank Offered Rate (LIBOR) and the Eleventh District Cost of Funds Index (COFI). While LIBOR correlates closely with interest-rate movements in the domestic federal funds market, COFI has a built-in lag feature and is slower to respond to changes in interest rates. Thus, the holders of COFI-indexed floaters generally experience a delay in the effects of changing interest-rate movements.

5. Price/yield curves for most fixed-income securities have a slightly convex shape, hence the securities are said to possess convexity. An important and desirable attribute of the convex shape of the price/yield curve for Treasury securities is that prices rise at a faster rate than they decline. Mortgage price/yield curves tend to be concave, especially in the range of premium prices, and are said to possess negative convexity. Securities with negative convexity rise in price at a slower rate than they fall in price.

Since most floating-rate tranches are backed by fixed-rate mortgages or pass-through securities, floating-rate tranches must be issued in combination with some kind of ''support.'' The designed support mechanism on floaters is an interest-rate cap, generally coupled with a support bond or inverse floater. If interest rates rise, where does the extra money come from to pay higher rates on the floating CMO tranches? The solution is in the form of an inverse floating-rate tranche. The coupon rate on the inverse tranche moves opposite of the accompanying floater tranche, thus allowing the floater to pay high interest rates. The floater and the inverse tranches ''share'' interest payments from a pool of fixed-rate mortgage securities. If rates rise, the coupon on the floater moves up; the floater takes more of the shared interest, leaving less for the inverse, whose coupon rate must fall. If rates fall, the rate on the floater falls, and more money is available to pay the inverse floater investor and the corresponding rate on the inverse rises.

Effectively, the interest-payment characteristics of the underlying home mortgages have not changed; another tranche is created where risk is shifted. This shifting of risk from the floater doubles up the interest-rate risk in the inverse floater, with enhanced yield and price ramifications as rates fluctuate. If rates fall, the inverse floater receives the benefit of a higher-rate-bearing security in a low-rate environment. Conversely, if rates rise, that same investor pays the price of holding a lower-rate security in a high-rate environment. As with other tranche types, prepayments determine the floating cash flows and the weighted average life of the instrument (WAL).

With respect to floaters, the two most important risks are the risk that the coupon rate will adjust to its maximum level (cap risk) and the risk that the index will not correlate tightly with the underlying mortgage product. Additionally, floaters that have ''capped out'' and that have WALs that extend as prepayments slow may experience considerable price depreciation.

Stripped Mortgage-Backed Securities: Interest-Only and Principal-Only

Interest-only (IO) and principal-only (PO) securities are another modification of the mortgage pass-through product. This market is referred to as the stripped mortgage-backed securities (SMBS) market. Both IOs and POs are more sensitive to prepayment rates than the underlying pass-throughs.[6] Despite the increased exposure to prepayment risk, these instruments have proved popular with several groups of investors. For example, mortgage servicers may purchase POs to offset the loss of servicing income from rising prepayments. IOs are often used as a hedging vehicle by fixed-income portfolio managers because the value of IOs rises when prepayments slow—usually in rising interest-rate environments when most fixed-income security prices decline.

Two techniques have been used to create IOs and POs. The first, which dominates outstandings in IOs and POs, strips pass-throughs into their interest and principal components, which are then sold as separate securities. As of October 1993, approximately $65 billion of the supply of outstanding pass-throughs had been stripped into IOs and POs.[7] The second technique, which has become increasingly popular over the past few years, simply slices off an interest or principal portion of any CMO tranche to be sold independently. In practice, IO slices, called ''IOettes,''[8] far outnumber PO slices.

Since IOs and IOettes produce cash flows in proportion to the mortgage principal outstanding, IO investors are hurt by fast prepayments and aided by slower prepayments. The value of POs rises when prepayments quicken and falls when prepayments slow because of the increases in principal cash flows coupled with the deep discount price of the PO.

IOs and IOettes are relatively high-yielding tranches that are generally subject to considerable prepayment volatility. For example, falling interest rates and rising prepayment speeds in late 1991 caused some IOs (such as those backed by FNMA 10 percent collateral) to fall up to 40 percent in value between July and December. IOs also declined sharply on several occasions in 1992 and 1993 as mortgage rates moved to 20- and 25-year lows, resulting in very high levels of prepayment. CMO dealers use IOettes to reduce coupons on numerous tranches, allowing these tranches to be sold at a discount

6. This counterintuitive result arises because IO and PO prices are negatively correlated.

7. Of this amount, FNMA has issued $26 billion, FHLMC $2.3 billion, and private issuers $6.5 billion.

8. Securities and Exchange Commission regulations forbid pure IO slices within CMOs. IO slices therefore include nominal amounts of principal and are termed ''IOettes.'' As a practical matter, IOettes have the price performance characteristics of IOs.

(as preferred by investors). In effect, much of the call risk is transferred from these tranches to the IOette.

The fact that IO prices generally move inversely to most fixed-income securities makes them theoretically attractive hedging vehicles in a portfolio context. Nevertheless, IOs represent one of the riskiest fixed-income assets available and may be used in a highly leveraged way to speculate about either future interest rates or prepayment rates. Given that their value rises (falls) when interest rates increase (decrease), many financial institutions, including banks, thrifts, and insurance companies, have purchased IOs and IOettes as hedges for their fixed-income portfolios, but such hedges might prove problematic as they expose the hedger to considerable basis risk.

USES

Both pass-through securities and CMOs are purchased by a broad array of institutional customers, including banks, thrifts, insurance companies, pension funds, mortgage ''boutiques,''[9] and retail investors. CMO underwriters customize the majority of CMO tranches for specific end-users, and customization is especially common for low-risk tranches. Since this customization results from investors' desire to either hedge an existing exposure or to assume a specific risk, many end-users perceive less need for hedging. For the most part, end-users generally adopt a buy-and-hold strategy, perhaps in part because the customization makes resale more difficult.

Uses by Banks

Within the mortgage securities market, banks are predominately investors or end-users rather than underwriters or market makers. Furthermore, banks tend to invest in short to intermediate maturities. Indeed, banks aggressively purchase short-dated CMO tranches, such as planned amortization classes, floating-rate tranches, and adjustable-rate mortgage securities.

To the extent that banks do operate as market makers, the risks are more diverse and challenging. The key areas of focus for market makers are risk-management practices associated with trading, hedging, and funding their inventories. The operations and analytic support staff required for a bank's underwriting operation are much greater than those needed for its more traditional role of investor.

Regulatory restrictions limit banks' ownership of high-risk tranches. These tranches are so complex that the most common approaches and techniques for hedging interest-rate risks could be ineffective. High-risk tranches are so elaborately structured and highly volatile that it is unlikely that a reliable hedge offset exists. Hedging these instruments is largely subjective, and assessing hedge effectiveness becomes extremely difficult. Examiners must carefully assess whether owning such high-risk tranches reduces a bank's overall interest-rate risk.

DESCRIPTION OF MARKETPLACE

Primary Market

The original lender is called the mortgage originator. Mortgage originators include commercial banks, thrifts, and mortgage bankers. Originators generate income in several ways. First, they typically charge an origination fee, which is expressed in terms of basis points of the loan amount. The second source of revenue is the profit that might be generated from selling a mortgage in the secondary market, and the profit is called secondary-marketing profit. The mortgage originator may also hold the mortgage in its investment portfolio.

Secondary Market

The process of creating mortgage securities starts with mortgage originators which offer consumers many different types of mortgage loans. Mortgages that meet certain well-defined criteria are sold by mortgage originators to conduits, which link originators and investors. These conduits will pool like groups of mortgages and either securitize the mortgages and sell them to an investor or retain the mortgages as investments in their own portfolios. Both

9. Mortgage boutiques are highly specialized investment firms which typically invest in residuals and other high-risk tranches.

government-related and private institutions act in this capacity. Ginnie Mae; Freddie Mac, and Fannie Mae are the three main government-related conduit institutions; all of them purchase *conforming* mortgages which meet the underwriting standards established by the agencies for being in a pool of mortgages underlying a security that they guarantee.

Ginne Mae is a government agency, and the securities it guarantees carry the full faith and credit of the U.S. government. Fannie Mae and Freddie Mac are government-sponsored agencies; securities issued by these institutions are guaranteed by the agencies themselves and are generally assigned an AAA credit rating partly due to the implicit government guarantee.

Mortgage-backed securities have also been issued by private entities such as commercial banks, thrifts, homebuilders, and private conduits. These issues are often referred to as private label securities. These securities are not guaranteed by a government agency or GSE. Instead, their credit is usually enhanced by pool insurance, letters of credit, guarantees, or over-collateralization. These securities usually receive a rating of AA or better.

Private issuers of pass-throughs and CMOs provide a secondary market for conventional loans which do not qualify for Freddie Mac and Fannie Mae programs. There are several reasons why conventional loans may not qualify, but the major reason is that the principal balance exceeds the maximum allowed by the government (these are called ''jumbo'' loans in the market).

Servicers of mortgages include banks, thrifts, and mortgage bankers. If a mortgage is sold to a conduit, it can be sold in total, or servicing rights may be maintained. The major source of income related to servicing is derived from the servicing fee. This fee is a fixed percentage of the outstanding mortgage balance. Consequently, if the mortgage is prepaid, the servicing fee will no longer accrue to the servicer. Other sources of revenue include interest on escrow, float earned on the monthly payment, and late fees. Also, servicers who are lenders often use their portfolios of borrowers as potential sources to cross-sell other bank products.

PRICING

Mortgage valuations are highly subjective because of the unpredictable nature of mortgage prepayment rates. Despite the application of highly sophisticated interest-rate simulation techniques, results from diverse proprietary prepayment models and assumptions about future interest-rate volatility still drive valuations. The subjective nature of mortgage valuations makes marking to market difficult due to the dynamic nature of prepayment rates, especially as one moves farther out along the price-risk continuum toward high-risk tranches. Historical price information for various CMO tranche types is not widely available and, moreover, might have limited value given the generally different methodologies used in deriving mortgage valuation.

Decomposition of MBS

A popular approach to analyzing and valuing a callable bond involves breaking it down into its component parts—a long position in a noncallable bond and a short position in a call option written to the issuer by the investor. An MBS investor owns a callable bond, but decomposing it is not as easy as breaking down more traditional callables. The MBS investor has written a series of put and call options to each homeowner or mortgagor. The analytical challenge facing an examiner is to determine the value and risk profile of these options and their contribution to the overall risk profile of the portfolio. Compounding the problem is the fact that mortgagors do not exercise these prepayment options at the same time when presented with identical situations. Most prepayment options are exercised at the least opportune time from the standpoint of the MBS investor. In a falling-rate environment, a homeowner will have a greater propensity to refinance (or exercise the option) as prevailing mortgage rates fall below the homeowner's original note (as the option moves deeper into the money). Under this scenario, the MBS investor receives a cash windfall (principal payment) which must be reinvested in a lower-rate environment. Conversely, in a high- or rising-rate environment, when the prevailing mortgage rate is higher than the mortgagor's original term rate, the homeowner is less apt to exercise the option to refinance. Of course, the MBS investor would like nothing more than to receive his or her principal and be able to reinvest that principal at the prevailing higher rates. Under this scenario, the MBS investor holds an instrument

with a stated coupon that is below prevailing market rates and relatively unattractive to potential buyers.

Market prices of mortgages reflect an expected rate of prepayments. If prepayments are faster than the expected rate, the mortgage security is exposed to call risk. If prepayments are slower than expected, the mortgage securities are exposed to extension risk (similar to having written a put option). Thus, in practice, mortgage security ownership is comparable to owning a portfolio of cash bonds and writing a combination of put and call options on that portfolio of bonds. Call risk is manifested in a shortening of the bond's effective maturity or duration, and extension risk manifests itself in the lengthening of the bond's effective maturity or duration.

Option-Adjusted Spread Analysis

For a further discussion of option-adjusted spread (OAS) analysis or optionality in general, see section 4330.1, ''Options.''

HEDGING

Hedging mortgage-backed securities ultimately comes down to an assessment of one's expectation of forward rates (an implied forward curve). A forward-rate expectation can be thought of as a no-arbitrage perspective on the market, serving as a pricing mechanism for fixed-income securities and derivatives, including MBS. Investors who wish to hedge their forward-rate expectations can employ strategies which involve purchasing the underlying security and the use of swaps, options, futures, caps, or combinations thereof to hedge duration and convexity risk.[10]

With respect to intra-portfolio techniques, one can employ IOs and POs as hedge vehicles. Although exercise of the prepayment option generally takes value away from the IO class and adds value to the PO class, IOs and POs derived from the same pool of underlying mortgages *do not* have a correlation coefficient of negative one.[11] If that were the case, the value of a pass-through security would *always* be hedged with respect to interest rates. However, IOs and POs do represent extremities in MBS theory and, properly applied, can be used as effective risk-reduction tools. Because the value of the prepayment option and the duration of an IO and PO are not constant, hedges must be continually managed and adjusted.

In general, a decline in prepayment speeds arises largely from rising mortgage rates, with fixed-rate mortgage securities losing value. At the same time, IO securities are rising in yield and price. Thus, within the context of an overall portfolio, the inclusion of IOs serves to increase yields and reduce losses in a rising-rate environment. More specifically, IOs can be used to hedge the interest-rate risk of Treasury strip securities. As rates increase, an IO's value increases. The duration of zero-coupon strips equals their maturity, while IOs have a negative duration.[12] Combining IOs with strips creates a portfolio with a lower duration than a position in strips alone.[13]

POs are a means to synthetically add discount (and positive convexity) to a portfolio, allowing it to more fully participate in bull markets. For example, a bank funding MBS with certificates of deposit (CDs) is exposed to prepayment risk. If rates fall faster than expected, mortgage holders (in general) will exercise their prepayment option while depositors will hold their higher-than-market CDs as long as possible. The bank could purchase POs as a hedge against its exposure to prepayment and interest-rate risk. As a hedging vehicle, POs offer preferable alternatives to traditional futures or options; the performance of a PO is directly tied to actual prepayments, thus the hedge should experience potentially less basis risk than other cross-market hedging instruments.

RISKS

Prepayment Risk

All investors in the mortgage sector share a common concern: the mortgage prepayment

10. Davidson, Andrew S., and Michael D. Herskovitz. *Mortgage Backed Securities—Investment Analysis and Advanced Valuation Techniques*. Chicago: Probus Publishing, 1994.

11. Zissu, Anne, and Charles Austin Stone. ''The Risks of MBS and Their Derivatives.'' *Journal of Applied Corporate Finance*, Fall 1994.

12. Ibid., p. 102.

13. Ibid., p. 104.

option. This option is the homeowner's right to prepay a mortgage any time, at par. The prepayment option makes mortgage securities different from other fixed-income securities, as the timing of mortgage principal repayments is uncertain. The cash-flow uncertainty that derives from prepayment risk means that the maturity and duration of a mortgage security are uncertain. For investors, the prepayment option creates an exposure similar to that of having written a call option. That is, if mortgage rates move lower, causing mortgage bond prices to move higher, the mortgagor has the right to call the mortgage away from the investor at par.

While lower mortgage interest rates are the dominant economic incentive for prepayment, idiosyncratic, noneconomic factors to prepay a mortgage further complicate the forecasting of prepayment rates. These factors are sometimes summarized as the ''five D's'': death, divorce, destruction, default, and departure (relocation). Prepayments arising from these causes may lead to a mortgage's being called away from the investor at par when it is worth more or less than par (that is, trading at a premium or discount).

Funding and Reinvestment Risk

The uncertainty of the maturities of underlying mortgages also presents both funding and reinvestment risks for investors. The uncertainty of a mortgage security's duration makes it difficult to obtain liabilities for matched funding of these assets. This asset/liability gap presents itself whether the mortgage asset's life shortens or lengthens, and it may vary dramatically.

Reinvestment risk is normally associated with duration shortening or call risk. Investors receive principal earlier than anticipated, usually as a result of declines in mortgage interest rates; the funds can then be reinvested only at the new lower rates. Reinvestment risk is also the opportunity cost associated with lengthening durations. Mortgage asset durations typically extend as rates rise. This results in lower investor returns as they are unable to reinvest at the now higher rates.

Credit Risk

While prepayments expose pass-throughs and CMOs to considerable price risk, most MBS pass-throughs have little credit risk.[14] Approximately 90 percent of all outstanding pass-through securities have been guaranteed by Ginnie Mae, Fannie Mae, and Freddie Mac.[15] This credit guarantee gives ''agency'' pass-through securities and CMOs a decisive advantage over nonagency pass-throughs and CMOs, which comprise less than 10 percent of the market.

In general, nonagency pass-through securities and CMOs use mortgages that are ineligible for agency guarantees. Issuers can also obtain credit enhancements, such as senior subordinated structures, insurance, corporate guarantees, or letters of credit from insurance companies or banks. The rating of the nonagency issue then partially depends upon the rating of the insurer and its credit enhancement.

Settlement and Operational Risk

The most noteworthy risk issues associated with the trading of pass-through securities is the forward settlement and operational risk associated with the allocation of pass-through trades. Most pass-through trading occurs on a forward basis of two to three months, often referred to as ''TBA'' or ''to be announced'' trading.[16] During this interval, participants are exposed to counterparty credit risk.

Operating risk grows out of the pass-through seller's allocation option that occurs at settlement. Sellers in the TBA market are allowed a 2.0 percent delivery option variance when meeting their forward commitments. That is, between 98 and 102 percent of the committed par amount may be delivered. This variance is provided to ease the operational burden of recombining various pool sizes into round trading lots.[17] This delivery convention requires significant operational expertise and, if mismanaged, can be a

14. Credit risk in a pass-through stems from the possibility that the homeowner will default on the mortgage *and* that the foreclosure proceeds from the resale of the property will fall short of the balance of the mortgage.

15. For a full explanation of the minor differences between these agencies, see chapter 5 in Fabozzi, *The Handbook of Mortgage-Backed Securities*, 1995.

16. In the forward mortgage pass-through trading, or TBA trading, the seller announces the exact pool mix to be delivered the second business day before settlement day.

17. ''Good delivery'' guidelines are promulgated by the Public Securities Association in its *Uniform Practices* publication.

source of significant risk in the form of failed settlements and unforeseen carrying costs.

Price Volatility in High-Risk CMOs

When the cash flow from pass-through securities is allocated among CMO tranches, prepayment risk is concentrated within a few volatile classes, most notably residuals, inverse floaters, IOs and POs, Z bonds, and long-term support bonds. These tranches are subject to sharp price fluctuations in response to changes in short- and long-term interest rates, interest-rate volatility, prepayment rates, and other macroeconomic conditions. Some of these tranches—especially residuals and inverse floaters—are frequently placed with a targeted set of investors willing to accept the extra risk. These classes are also among the most illiquid bonds traded in the CMO market.

These high-risk tranches, whether held by dealers or investors, have the potential to incur sizable losses (and sometimes gains) within a short period of time.[18] Compounding this price risk is the difficulty of finding effective hedging strategies for these instruments. Using different CMOs to hedge each other can present problems. Although pass-through securities from different pools tend to move in the same direction based on the same event, the magnitude of these moves can vary considerably, especially if the underlying mortgage pools have different average coupons.[19]

Risks in ''Safe'' Tranches

Investors may also be underestimating risks in some ''safe'' tranches, such as long-maturity PACs, PAC 2s, and 3s, and floaters, because these tranches can experience abrupt changes in their average lives once their prepayment ranges are exceeded. Even floating-rate tranches face risks, especially when short-term rates rise significantly and floaters reach their interest-rate caps. At the same time, long rates may rise and prepayments slow, causing the floaters' maturities to extend significantly since the floater is usually based on a support bond. Under such circumstances, floater investors could face significant losses.

In addition to possible loss of market value, these safe tranches may lose significant liquidity under extreme interest-rate movements. These tranches are currently among the most liquid CMOs. Investors who rely on this liquidity when interest-rate volatility is low may find it difficult to sell these instruments to raise cash in times of financial stress. Nevertheless, investors in these tranches face lower prepayment risk than investors in either mortgage pass-throughs or the underlying mortgages themselves.

Cap Risk

The caps in many floating-rate CMOs and ARMs are an embedded option. The value of floating-rate CMOs or ARMs is equal to the value of an uncapped floating-rate security less the value of the cap. As the coupon rate of the security approaches the cap rate, the value of the option increases and the value of the security falls. The rate of change is non-linear and increases as the coupon approaches the cap. As the coupon rate equals or exceeds the cap rate, the security will exhibit characteristics similar to those of a fixed-rate security, and price volatility will increase. All else being equal, securities with coupon rates close to their cap rates will tend to exhibit greater price volatility than securities with coupon rates farther away from their cap rates. Also, the tighter the ''band'' of caps and floors on the periodic caps embedded in ARMs, the greater the price sensitivity of the security will be. The value of embedded caps also increases with an increase in volatility. Thus, all else being equal, higher levels of interest-rate volatility will reduce the value of the floating-rate CMO or ARM.

FFIEC Regulations Concerning Unsuitable Investments

The Federal Financial Institutions Examination Council (FFIEC) issued a revised policy state-

18. Examples of single-firm losses include a $300 million to $400 million loss by one firm on POs in the spring of 1987; more recently, several firms have lost between $50 million and $200 million on IO positions in 1992 and 1993.

19. For a discussion of the idiosyncratic prepayment behavior of pass-throughs, see Sean Becketti and Charles S. Morris, *The Prepayment Experience of FNMA Mortgage-Backed Securities*. New York University Salomon Center, 1990, pp. 24–41.

ment concerning securities activities for member banks. These rules became effective February 10, 1992, for member banks and bank holding companies under the Board's jurisdiction. A bank's CMO investments are deemed unsuitable if—

- the present weighted average life (WAL) is greater than 10 years,
- the WAL extends more than four years or shortens more than six years for a parallel interest-rate shift of up and down 300 basis points, or
- the price changes by more than 17 percent from the asking price for a parallel interest-rate shift of up and down 300 basis points.

An affirmation of any of these three parameters means that the bond in question (1) may be considered high risk and (2) may not be a suitable investment for banks or bank holding companies. An institution holding high-risk securities must demonstrate that they reduce overall interest-rate risk for the bank.

Floating-rate CMOs with coupons tied to indexes other than LIBOR (sometimes called "mismatched floaters") are generally exempt from the average-life and average-life-sensitivity tests. Given the degree of price sensitivity associated with these securities, however, institutions that purchase non-LIBOR-indexed floaters must maintain documentation showing that they understand and are able to monitor the risks of these instruments. The documentation should include a prepurchase analysis and at least an annual analysis of the price sensitivity of the security under both parallel and nonparallel shifts of the yield curve. See the *Commercial Bank Examination Manual* for more information on the FFIEC testing parameters detailed above.

ACCOUNTING TREATMENT

The accounting treatment for investments in mortgage-backed securities is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Pass-through securities are assigned the following weights:

GNMA (Ginnie Mae)	0
FNMA (Fannie Mae)	20 percent
FHLMC (Freddie Mac)	20 percent
Private label	50–100 percent

Collaterialized mortgage obligations are assigned the following weights:

Backed by Ginnie Mae, Fannie Mae, or Freddie Mac securities	20–100 percent
Backed by whole loans or private-label pass-throughs	50–100 percent

Stripped MBS are assigned a 100 percent risk weighting.

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Pass-Through Securities

Ginnie Mae, Fannie Mae, and Freddie Mac pass-through securities are type I securities. Banks can deal in, underwrite, purchase, and sell these securities for their own accounts without limitation.

CMOs and Stripped MBS

CMOs and stripped MBS securitized by small business–related securities and certain residential- and commercial-related securities rated Aaa and Aa are type IV securities. As such, a bank may

purchase and sell these securities for its own account without limitation. CMOs and stripped MBS securitized by small business–related securities rated A or Baa are also type IV securities and are subject to an investment limitation of 25 percent of a bank's capital and surplus. Banks may deal in type IV securities which are fully secured by type I transactions without limitations.

CMOs and stripped MBS securitized by certain residential- and commercial-mortgage-related securities rated A or Baa are type V securities. For type V securities, the aggregate par value of a bank's purchase and sales of the securities of any one obligor may not exceed 25 percent of its capital and surplus.

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GENERAL DESCRIPTION

The Australian Treasury issues Australian Commonwealth Government Bonds (CGBs) to finance the government's budget deficit and to refinance maturing debt. Since 1982, bonds have been issued in registered form only, although some outstanding issues may be in bearer form. The principal and interest on CGBs are guaranteed by the Commonwealth Government of Australia.

CHARACTERISTICS AND FEATURES

CGBs, with maturities ranging from one to 20 years, are issued every six to eight weeks in an average tender size totaling A$800 million. Most CGBs are noncallable, fixed-coupon securities with bullet maturities. The Australian Treasury has issued some indexed-linked bonds with either interest payments or capital linked to the Australian consumer price index. However, there are few of these issues and they tend to be very illiquid. CGBs can be issued with current market coupons, but in many cases the Australian Treasury will reopen existing issues.

Interest for government bonds is paid semiannually on the 15th day of the month, and it is calculated on an actual/365 day-count basis. Coupon payments that fall on weekends or public holidays are paid on the next business day. Semiannual coupon payments are precisely half the coupon rate. Bonds that have more than six months left to maturity settle three business days after the trade date (T+3). Bonds with less than six months left to maturity may settle on the same day, provided they are dealt before noon; otherwise, they settle the next day.

USES

Australian banks are the largest single group of investors in outstanding CGB issues. They use these securities to meet regulatory capital requirements. The Australian pension industry holds CGBs mainly as investment vehicles. In addition, CGBs are viewed as attractive investment vehicles by many foreign investors because (1) they offer high yields relative to those available on other sovereign debt instruments and (2) the Australian bond market is regarded as stable. Although the bond market has a substantial foreign participation, due to its attractive yield and a much shorter period of time required for the bonds to mature, the majority of CGB investors are domestic. U.S. banks purchase CGBs to diversify their portfolios, speculate on currency and Australian interest rates, and to hedge Australian-denominated currency positions and positions along the Australian yield curve.

DESCRIPTION OF MARKETPLACE

Issuing Practices

CGBs are issued periodically on an as-needed basis, typically every six to eight weeks. Generally, issuance is through a competitive tender whereby subscribers are invited to submit bids as they would in an auction. Issue size is announced one day before the tender day. Bids, which are sent to the Reserve Bank of Australia through the Reserve Bank Information Transfer System (RBITS), are submitted to the Reserve Bank of Australia on a semiannual, yield-to-maturity basis. Specific information on the issue is announced later on the tender day, such as the amounts tendered and issued, the average and range of accepted bids, and the percentage of bids allotted at the highest yield.

Secondary Market

While CGBs are listed on the Australian Stock Exchange, nearly all trading takes place over the counter (OTC), by screen or direct trading. The primary participants in the secondary market are authorized dealers and share brokers. OTC transactions must be in amounts of A$250,000 or more. Stock-exchange transactions are essentially limited to retail transactions under A$1 million. Usually, authorized dealers trade bonds which are within five years of maturing.

Market Participants

Sell Side

Authorized dealers are the primary participants in the sell side of the CGB market.

Buy Side

Australian banks and other financial institutions are the largest single group of investors in CGBs. These entities usually hold large quantities of shorter-term government bonds for regulatory purposes, as these securities may be included in the prime asset ratios of banks. In addition, a variety of other domestic investors participate in the CGB market.

The Australian bond market has been known to attract substantial foreign participation over the years, primarily because it is regarded as a stable market which offers relatively high yields. In general, foreign market participants are institutional investors, such as securities firms, life insurance companies, banks, and fund managers.

Market Transparency

Prices tend to be active and liquid. Price transparency is enhanced by the dissemination of prices by several information vendors including Reuters and Telerate.

PRICING

CGBs are quoted in terms of yield and rounded to three decimal places to determine gross price for settlement purposes. While tick size is equivalent to one basis point, yields are often quoted to the half basis point.

HEDGING

Interest-rate risk may be hedged by taking an offsetting position in other government bonds or by using interest-rate forward, futures, options, or swap contracts. Foreign-exchange risk may be hedged by using foreign-currency derivatives and swaps.

RISKS

Liquidity Risk

The CGB market is considered fairly active and liquid. Trading volume among the benchmark bonds is about equal, although the three-year and 10-year benchmark issues tend to have the most turnover.

Interest-Rate Risk

CGBs are subject to price fluctuation resulting from interest-rate volatility. Generally, longer-term bonds have more price volatility than shorter-term instruments. If an institution has a large concentration of long-term maturities, it may be subject to unwarranted interest-rate risk.

Foreign-Exchange Risk

Currency fluctuations may affect the bond's yield as well as the value of coupons and principal paid in U.S. dollars. A number of factors may influence a country's foreign-exchange rate, including its balance of payments and prospective changes in that balance; inflation and interest-rate differentials between that country and the United States; the social and political environment, particularly with regard to the impact on foreign investment; and central bank intervention in the currency markets.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in

Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Australian CGBs are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Australian CGBs are a type III security. As such, a bank's investment is limited to 10 percent of its equity capital and reserves.

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J.P. Morgan Securities. *Government Bond Outlines.* 9th ed. April 1996.

GENERAL DESCRIPTION

The federal government of Canada issues bonds, known as ''Canadas,'' to finance its public debt. The Canadian government bond market is the sixth largest in the world, with about C$270 billion (U.S.$195 billion) in bonds outstanding as of April 1996. Overall, this market is structurally similar to the U.S. bond market, particularly with regard to the types of securities issued. Canadas come in a wide variety of maturities ranging from 2 to 30 years. Recently, the longer maturity bonds have increased in popularity.

CHARACTERISTICS AND FEATURES

Canadas are issued at a price close to par value and are denominated in C$1,000, C$25,000, C$100,000, and C$1 million allotments. Canadas are available in bearer form with coupons attached or in registered form. All new Canadian bonds are issued with bullet maturities and are not callable; there is one callable issue outstanding that matures in 1998. All Canadas have fixed coupons ranging from 3 percent to 18 percent. Real return bonds, inflation-indexed bonds, were introduced in December 1991 and are currently issued once per quarter. Principal and coupon payments for these bonds are linked to the Canadian consumer price index.

Interest on Canadas is paid semiannually and is accrued from the previous coupon date (exclusive) to the settlement date (inclusive) up to a maximum value of 181.5 days. As a result, the value date is always the same as the settlement date. New issues may offer short first coupons, but not long first coupons. Interest on short first coupons is accrued from the dated date to the first coupon date. Any ''reopened'' bonds include the accrued interest in the issue price to ensure that the new tranches carry the same coupons as the existing bond and trade indistinguishably. Canadas with remaining maturities of less than three years settle two market days after the trade date (T+2), while Canadas with maturities over three years settle three market days after the trade date (T+3).

USES

Canadas are held for investment, hedging, and speculative purposes by both domestic (Canadian) and foreign investors. U.S. banks purchase Canadas to diversify their portfolios, speculate on currency and Canadian interest rates, and hedge Canadian-denominated currency positions and positions along the Canadian yield curve.

DESCRIPTION OF MARKETPLACE

Issuing Practices

Canadas are issued by two methods: by allotment and auction. With the allotment system, the amount, coupon, and issue price for each of the maturity tranches is announced after consultation with the primary distributors. The Bank of Canada pays a commission to all primary distributors who are responsible for placing the issue.

The auction system is very similar to the U.S. system. On the Thursday before the regular Wednesday auction, the Bank of Canada announces details, including the size, maturity, and delivery date for the upcoming auction, and active open market trading begins on a yield basis. The coupon for new issues is not known until auction results are released, and it is set at the nearest ¼ percent increment below the auction average. The Bank of Canada accepts both competitive and noncompetitive bids from primary distributors. However, it will only accept one noncompetitive bid, which may have a maximum value of C$2 million.

On the auction date, bids are submitted to the Bank of Canada and primary distributors receive bonds up to 20 percent of the total amount issued based on the competitiveness of their bids. The delivery date and dated date are usually ten days to two weeks after the auction. Issues typically range from C$100 million to C$8.8 billion, and any issue may be reopened by the Department of Finance based on market conditions.

Secondary Market

Canadas are not listed on any stock exchanges

but trade in over-the-counter (OTC) markets 24 hours a day. Settlement occurs through a book-entry system between market participants and the Canadian Depository for Securities (CDS). Therefore, Canadas may trade *when-issued* without an exchange of cash.

Market Participants

Sell Side

Primary distributors include investment dealers and Canadian chartered banks.

Buy Side

A wide range of investors use Canadas for investing, hedging, and speculation, including domestic banks, trust and insurance companies, and pension funds. The largest Canadian holders of Canadas are trust pension funds, insurance companies, chartered banks, and the Bank of Canada.

Foreign investors are also active participants in the Canadian government bond market. In general, foreign market participants are institutional investors such as banks, securities firms, life insurance companies, and fund managers.

Market Transparency

Price transparency is relatively high for Canadas and several information vendors disseminate prices to the investing public. Trading of Canadas, both domestically and internationally, is active and prices are visible.

PRICING

Bonds trade on a clean-price basis (net of accrued interest) and are quoted in terms of a percentage of par value, with the fraction of a percent expressed in decimals. Canadas typically trade with a ⅛- to ¼-point spread between bid and offer prices. Canadas do not trade ex-dividend. If a settlement date occurs in the two weeks preceding a coupon payment date, the seller retains the upcoming coupon but must compensate the buyer by postdating a check payable to the buyer for the amount of the coupon payment.

HEDGING

Interest-rate risk on Canadas may be hedged using interest-rate swaps, forwards, futures (such as futures on 10-year and 5-year Canadas, which are traded on the Montreal Stock Exchange), and options (such as options on all Canadas issues, which are traded on the MSE). Hedging may also be effected by taking a contra position in another Canadian government bond. Foreign-exchange risk may be hedged through the use of currency forwards, futures, swaps, and options. The effectiveness of a particular hedge depends on the yield curve and basis risk. For example, hedging a position in a 10-year Canadas future with an overhedged position in a 5-year bond may expose the dealer to yield-curve risk. Hedging a 30-year bond with a Canadas future exposes the dealer to basis risk if the historical price relationships between futures and cash markets are not stable. Also, if a position in notes or bonds is hedged using an over-the-counter option, the relative illiquidity of the option may diminish the effectiveness of the hedge.

RISKS

Liquidity Risk

The Canadian bond market is considered to be one of the most liquid bond markets in the world, with Canadas traded actively in both domestic and international capital markets. Most investment dealers in Canadas will make markets on all outstanding issues. The most liquid issues are the short-term issues of less than 10 years, but several 15-year and 30-year Canadas are actively traded and very liquid. All government bond issues are reasonably liquid when their outstanding size, net of stripping, is over C$1 billion. ''Orphaned'' issues, small issues that are not reopened, are the only Canadas that are very illiquid because they are not actively traded.

Interest-Rate Risk

Canadas are subject to price fluctuations due to changes in interest rates. Longer-term issues tend to have more price volatility than shorter-term issues and, therefore, a large concentration

of longer-term maturities in a bank's portfolio may subject the bank to a high degree of interest-rate risk.

Foreign-Exchange Risk

Due to the low volatility of the Canadian dollar exchange rate, there has been a low level of foreign-exchange risk associated with Canadian bonds. To the extent that this risk exists, it can be easily reduced by using foreign-currency derivatives instruments as described above.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statment of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Canadas are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Canadas are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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J.P. Morgan Securities. *Government Bond Outlines.* 9th ed. April 1996.

GENERAL DESCRIPTION

The French Treasury is an active issuer of three types of government debt securities, which cover all maturities. Obligation Assimilable du Tresor (OATs), issued since 1985, are the French government's long-term debt instruments with maturities of up to 30 years. Bons du Tresor a Taux Fixe et Interest Annuel (BTANs) are medium-term, fixed-rate notes with maturities of up to five years. The French Treasury also issues discount Treasury bills, Bons du Tresor a Taux Fixe et Interest Precomptes (BTFs), with maturities of up to one year. In addition, an active market for stripped OATs has developed since May 1991. Stripping involves separating a bond's interest and principal payments into several zero-coupon bonds.

French government securities are mainly denominated in French francs (FFr). However, the Treasury has also been issuing OATs and BTANs in European Currency Units (ECUs) since 1989 and 1993, respectively. Until 1985, the French Treasury issued bonds known as Emprunts d'Etats. However, these bonds are approaching the end of their trading life and are illiquid. The following discussion will focus on OATs, BTANs, BTFs, and stripped securities.

CHARACTERISTICS AND FEATURES

The French Treasury issues OATs in units of FFr 2,000 (ECU 500), with maturities of up to 30 years. Most OATs carry a fixed interest rate and have bullet maturities. However, some OATs are issued with floating rates that are referenced to various short-term or long-term indexes. OATs generally pay interest annually. OATs are settled three days after the trade date (T+3), both domestically and internationally. OATs are cleared through the SICOVAMs Relit system domestically, while OATs that settle internationally are cleared through Euroclear or Cedel.

BTANs and BTFs are issued in units of FFr 1 million (ECU 1,000). All BTANs are fixed-rate, bullet maturity notes with maturities of up to five years. Interest on BTANs is paid annually on the 12th of the month. Domestic settlement for BTANs and BTFs usually occurs one day after the trade date (T+1) through the Bank of France's Saturne system. Internationally, BTANs and BTFs settle three days after the trade date. Like OATS, BTANs and BTFs may also be cleared through Euroclear or Cedel. Interest on all government bonds and notes is calculated using a 30/360-day count convention in which each month is assumed to have 30 days.

Since May 1991, French government securities primary dealers, Specialistes en Valuers du Tresor (SVTs), have been allowed to strip most long-term OATs. Primary dealers may strip OATs denominated in either FFr or ECUs and subsequently reconstitute them. All stripped coupons carry a face value of FFr 5 (ECU 1.25). This is done to ensure the fungibility of receipts that have the same maturities but are derived from OATs of different maturities.

USES

French government securities are used for investment, hedging, and speculative purposes. They are considered attractive for investment purposes by foreign and domestic investors because of the market's liquidity, lack of credit risk, and wide range of maturities and structures (for example, fixed vs. floating rate). Foreign investors often choose to invest internationally to enhance the diversification of their investment portfolios or derive higher returns. Stripped OATs can be used as tools for hedging or asset liability management purposes, for example, to immunize a portfolio in terms of interest-rate risk. Speculators also use OATs, BTANs, and stripped OATs to take positions on the direction of interest-rate changes and yield curve shifts. Finally, there is an active market for futures and options on French government securities traded on the Marche a terme international de France (Matif), the Paris financial futures exchange.

DESCRIPTION OF MARKETPLACE

Issuing Practices

The French Treasury issues OATs, BTANs, and BTFs through Dutch Auction. The Treasury usually issues tranches of securities that are part of a single borrowing line. The auction schedule

is generally announced several months in advance. Securities are supplied at the price or effective rate tendered by the bidder rather than the marginal price or rate. The highest bids are filled first, followed by lower bids. Although bidding is open to any institution that has an account with the SICOVAM, Saturne, or Bank of France, SVTs account for 90 percent of the securities bought in the primary market. SVTs also quote two-way prices on a *when-issued* basis several business days before an auction.

Secondary Market

There is an active secondary market for most issues of French government securities. OATs, BTANs, and BTFs are listed on the Paris Stock Exchange, but are principally traded over the counter. SVTs are responsible for making markets in these securities and account for most of the trading activity. However, other broker-dealers, banks, and specialized financial institutions are also active participants in the secondary market. Since 1994, the repo market in French government securities has grown considerably. The repo market, also managed by the SVTs, allows investors to finance short-term positions.

Market Participants

Sell Side

Since 1987, a network of primary government securities dealers, known as Specialistes en Valuers de Tresor (SVTs), has managed the market for French government securities. The SVTs work closely with the French Treasury in determining issuance policy, market conditions, and prices. SVTs are required to quote prices for clients and other primary dealers in tradeable securities and are responsible for the maintenance of liquid primary and secondary markets. In exchange, the French Treasury permits SVTs to strip and reconstitute OATs and participate in noncompetitive bidding.

Buy Side

French government securities are used for investment, hedging, and speculative purposes by a wide range of institutional investors, both international and domestic. This includes insurance companies, pension funds, mutual funds, and commercial and investment banks.

Market Transparency

The market of French government bonds is active and market transparency is relatively high for most issues. The French Treasury regularly publishes the debt issuance schedule and other information on the management of its debt. Auction results, trading information, and prices for most issues are available on interdealer broker screens such as Reuters, Telerate, and Bloomberg.

PRICING

OATs are quoted as a percentage of par to two decimal places. For example, the price quote of 106.85 refers to an OAT that is trading at 106.85 percent of its par value. Strips are quoted on the basis of their yield. BTANs and BTFs are quoted on an annual-yield basis to two decimal places.

HEDGING

The interest-rate risk of French government securities can be hedged in the futures or options market at the Matif or by taking a contra position in another French government security. Swaps and options can also be used to hedge interest-rate risk. The effectiveness of a particular hedge is dependent on yield curve and basis risk. For example, hedging a position in a five-year note with an overhedged position in a three-year note may expose the dealer to yield curve risk. Hedging a 30-year bond with a treasury bond future exposes the dealer to basis risk if historical price relationships between futures and cash markets are not stable. Also, if a position in notes or bonds is hedged using an OTC option, the relative illiquidity of the option may diminish the effectiveness of the hedge.

International investors are also exposed to foreign-exchange risk. Foreign-exchange risk can be hedged using currency forwards, futures, swaps, or options. An international investor can

use a series of forward foreign-exchange contracts corresponding to each of the coupon payments and the final principal payment to hedge this risk. Swaps, futures contracts, or currency options, traded either on the Matif or OTC, can also be used to hedge currency risk.

RISKS

Liquidity Risk

French bonds are among the most liquid in Europe. Because the French Treasury issues OATs and BTANs as tranches of existing bonds, most bond issues have sizable reserves and liquidity. SVTs make a market in French government bonds, a practice that enhances liquidity of the market. The most recently issued 10-year OAT generally serves as the benchmark, and is thus the most liquid of these issues. For the medium-term market, the most recent issues of two- and five-year BTANs serve as the benchmark. Next to the U.S. Treasury strip market, French strips are the most liquid in the world. As stated above, the face value of all stripped OATs is FFr 5 ensuring the fungibility of coupons of different maturities. Because primary dealers may reconstitute strips at any time, their liquidity is comparable to the reference OAT.

Interest-Rate Risk

From the perspective of an international investor, the market risk of French government bonds consists primarily of interest-rate risk and foreign-exchange risk. The interest-rate risk of a French government bond depends on its duration and the volatility of French interest rates. Bonds with longer durations are more price sensitive to changes in interest rates than bonds with shorter durations. Because they are zero-coupon instruments, French strips have longer durations than OATs of comparable maturity, and they are more volatile.

Foreign-Exchange Risk

From the perspective of an international investor, the total return from investing in French government securities is partly dependent on the exchange rate between the U.S. dollar and the French franc. Several factors affect the volatility of a foreign-exchange rate, including the country's balance of payments and prospective changes in that balance, inflation and interest-rate differentials between countries, the social and political environment, relative changes in the money supply, and central bank intervention in the currency markets. Traditionally, the French foreign-exchange rate has been relatively stable.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Acounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

French government bonds and notes are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

French government bonds and notes are type III

securities. A bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

The federal government of Germany issues several types of securities: bonds (Bunds), notes (Bobls and Schätze) and Treasury discount paper (U-Schätze). Government agencies such as the Federal Post Office and the Federal Railway have also issued bonds (Posts and Bahns) and notes (Schätze). In addition, with the unification of West and East Germany in October 1990, the German Unity Fund began to issue Unity Fund bonds (Unities) and notes (Schätze). The outstanding debt issues of the Post Office, Railway, and Unity Fund have since been folded into the so-called Debt Inheritance Fund, which has led to an explicit debt service of these issues through the federal government. Hence, these issues are guaranteed by the full faith and credit of the federal government. All government-guaranteed securities are available in book-entry form only.

The government also issues U-Schätze, zero-coupon Treasury notes with maturities of one to two years which may not be purchased by foreigners, and short-term Treasury bills, with one-half- to one-year maturities, which may be purchased by foreigners. However, the secondary market for these instruments is small and does not attract substantial foreign investment. Therefore, the following discussion will focus on bonds and notes.

CHARACTERISTICS AND FEATURES

Bunds are issued regularly, usually in deutschemarks (DM) 20 billion to DM 30 billion blocks, with maturities ranging from 8 to 30 years. Bunds are issued in a minimum denomination of DM 1,000, and a typical issue carries a maturity of 10 years. Bunds are redeemable in a lump sum at maturity at face value (bullet structure) with interest paid annually. Until 1990, all bonds issued by the federal government and other public authorities were noncallable and bore a fixed coupon. However, since February 1990, some callable floating-rate bonds have been issued.

Special five-year federal notes (Bobls) have been issued by the federal government since 1979, but foreign investment in these securities has been permitted only since 1988. In the past, medium-term notes with four- to six-year maturities (Schätze) were issued irregularly by the federal government, the Unity Fund, and the Federal Post Office and Railway. However, in 1995, the Ministry of Finance decided to discontinue the issuance of these securities to create more transparency in the market. All Bobls and existing Schätze issues are fixed-coupon securities with bullet maturities.

Stock-exchange settlement takes place two market days after trade date (T+2). International settlement takes place three business days after trade date (T+3). As of January 1, 1994, German federal government notes and bonds no longer trade ex-coupon. They trade on a cum-coupon basis; the purchaser of the bond pays the seller accrued interest from the last coupon date to settlement. Interest is accrued on a 30/360-day-count basis in which each month is assumed to have 30 days and a year is assumed to have 360 days.

USES

German government bonds and notes are used for investment, hedging, and speculative purposes. Foreign investors, including U.S. banks, often purchase German government securities as a means of diversifying their securities portfolios. In particular, the low credit risk and deep liquidity of German government bonds and notes encourages the use of these instruments as non-U.S. investment vehicles. German government securities may also be used to hedge German interest-rate risk or foreign-currency risk related to positions in deutschemarks. Speculators may use German government bonds to take positions on changes in the level and term structure of German interest rates or on changes in the foreign-exchange rates between Germany and the United States. Because it is a deep and efficient market, some German futures contracts and options are priced relative to Bund issues.

DESCRIPTION OF MARKETPLACE

Issuing Practices

Bunds are issued using a combination of syndi-

cation and bidding procedures. Part of the issue is offered at fixed terms to the members of the Federal Bond Consortium, which consists of German banks, foreign banks in Germany, and the Deutsche Bundesbank (German Central Bank). The Bundesbank is the lead bank in the syndicate and determines the allocation of the offerings among the syndicate members. These allocations are changed infrequently. During the syndicate meeting, the coupon rate, maturity, and issue price are determined by the government and syndicate, although the total size of the issue is unknown. Syndicate members receive a fee from the government for selling bonds received through syndicate negotiations.

A further tranche is issued to the syndicate by means of an American-style auction. The terms—coupon rate, maturity, and settlement date—are the same as those determined in the syndicate meeting, although the overall size of the issue is not specified. The German Central Bank accepts bids starting with the highest price and accepts lower bids until the supply of securities it wishes to sell is depleted. Noncompetitive bids may also be submitted, which are filled at the average accepted price of the auction. The size of the issue is announced after the auction. The difference between the issue size and the amount that has been issued through the underwriting syndicate plus the auction is retained by the Bundesbank for its bond market operations.

Bobls are issued on a standing-issue basis (similar to a tap form in which a fixed amount of securities at a fixed price is issued when market conditions are considered favorable) with stated coupon and price. During the initial selling period, which may last a few months, the price is periodically adjusted by the Ministry of Finance to reflect changes in market conditions. The sales of a given series are terminated when either the issuing volume has been exhausted or the nominal interest rate has moved too far away from the going market rate. The new series is launched within a short period of time. Only domestic private individuals and domestic nonprofit institutions are permitted to purchase the issues in the primary market. German banks (which cannot purchase these securities for their own account) receive a commission for selling the bonds to qualified investors. After the selling period is over and an issue is officially listed on the German stock exchange, the securities may be purchased by any investor.

Secondary Market

German bonds are listed and traded on all eight German stock exchanges seven days after they are issued. Bobl issues are officially listed on the stock exchanges after the initial selling period of one to three months. In addition to the stock-exchange transactions, substantial (OTC) over-the-counter trading occurs. In Germany, the secondary market for both stocks and bonds is primarily an interbank market.

For some issues, prices are fixed once during stock-exchange hours (stock-exchange fixing takes place from 11:00 a.m. to 1:30 p.m. Greenwich mean time +1). However as of October 3, 1988, variable trading was introduced at the German stock exchanges for Bunds, Bobls, Bahns, and Posts issued after January 2, 1987, with a minimum size of DM 2 billion. The Unity Fund issues also participate. After the fixing of the prices on the stock exchanges, the securities are traded on the OTC market (OTC hours are from 8:30 a.m. to 5:30 p.m.). Bunds are typically quoted in the OTC market on the basis of a difference from the fixing price, for example, a price quote of –10 means a price of 10 pfennigs (1/100 of a DM) less than the fixing price.

Seventy to 80 percent of the secondary-market trading of Bunds, Bahns, and Posts takes place in the OTC market. About 75 percent of Bobl trading takes place in the OTC market, as does most Schätze trading. However, the stock markets are important because the prices determined there provide standard, publicly available benchmarks.

Market Participants

Sell Side

The underwriting of public authority bonds is done by the Federal Bond Syndicate, which consists of German banks, foreign banks in Germany, and the Deutsche Bundesbank (German Central Bank). German banks are responsible for placing Bobls with qualified investors.

Buy Side

Domestic banks are the largest holders of German bonds, and private German individuals are the second largest investment group due in

part to the propensity of German households to save and invest their savings. German insurance companies are also major holders of German bonds, as are German investment funds. Foreign investors, such as U.S. commercial and investment banks, insurance companies, and money managers also hold German government securities.

Market Transparency

The market for German government bonds and notes is active and liquid, and price transparency is considered to be relatively high for these securities. Several vendors, including Reuters and Telerate, disseminate price information to the investing public.

PRICING

Bonds and notes are quoted as a percentage of par to two decimal places. For example, a price of 98.25 means that the price of the bond or note is 98.25 percent of par. Bonds are traded on a price basis, net of accrued interest (clean). Prices generally move in increments of five pfennigs. The bid/offer spread is usually eight pfennigs for liquid issues and 15 pfennigs for less-liquid issues. For notes, bid/offer spreads are five to 10 pfennigs for liquid issues.

HEDGING

Interest-rate risk can be hedged using swaps, forwards, futures, or options, or by taking a contra position in another German government security. The effectiveness of a particular hedge is dependent on yield-curve and basis risk. For example, hedging a position in a five-year note with an overhedged position in a three-year note may expose the dealer to yield-curve risk. Hedging a 30-year bond with a bond future exposes the dealer to basis risk if the historical price relationships between futures and cash markets are not stable. Also, if a position in notes and bonds is hedged using an OTC option, the relative illiquidity of the option may diminish the effectiveness of the hedge. Foreign-exchange risk may be hedged with currency swaps, forwards, futures, and options.

RISKS

Liquidity Risk

The German government bond market is the third largest bond market in the world and is considered the most liquid government bond market after the U.S. government bond market. Bunds are the most liquid and actively traded bond issues in Germany. Unities issued by the German Unity Fund are generally as liquid as Bunds, but Bahn and Post issues of government agencies are fairly limited compared with the federal government's bonds. Therefore, these agency securities tend to be less liquid and generally trade at a higher yield than Bunds.

The on-the-run (most recent) Bund issue is the most liquid of its category and serves as the benchmark. The most liquid area of the Bund yield curve is in the eight- to-10-year maturity range, as most Bund issues carry a 10-year maturity. Similar to Bunds, on-the-run Bobls are the most liquid type of note. Off-the-run prices are not as transparent as current coupon securities, which makes these issues less liquid and trading more uncertain. Of course, larger issues of bonds and notes are generally more liquid than smaller ones.

At the stock exchange, the German Central Bank makes a market in Bunds, Bobls, Unities, and Post issues. The German Central Bank is responsible for maintaining an orderly secondary market in these securities and regularly intervenes to support or regulate their prices. This tends to increase the liquidity in the market for these issues. However, the Bundesbank is not responsible for stabilizing Schätze prices. For this reason, these securities tend to be much less liquid than Bunds or Bobls; their issue sizes are also normally much smaller. The Railway Bank makes a market in Bahn issues, which enhances the liquidity of these issues.

Interest-Rate Risk

German bonds and notes are subject to price fluctuations due to changes in German interest rates. The variation in the term structure of interest rates accounts for the greatest amount of local market risk related to foreign bonds. Longer-term issues have more price volatility due to interest-rate fluctuations than do shorter-term instruments. Therefore, a large concentration of long-term maturities may subject a bank's

investment portfolio to unwarranted interest-rate risk.

Foreign-Exchange Risk

Currency fluctuations can account for up to two-thirds of the return and risk of an unhedged international fixed-income portfolio. There are two types of currency risk related to foreign bonds: (1) the coupons and face value are paid in the foreign currency, which means that any change in the exchange rate affects the bond's value to the U.S. investor, and (2) the bond's yield may be affected by currency movements.

A number of factors exert a direct influence on foreign-exchange rates, including the balance of payments and prospective changes in that balance; inflation and interest-rate differentials between Germany and the United States; the social and political environment in Germany, particularly with regard to the impact on foreign investment; and central bank intervention in the currency markets. Historically, German exchange rates have been very stable.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Finanical Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

German government bonds and notes are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

German government bonds and notes are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

Irish government bonds (IGBs) are issued by the National Treasury Management Agency (NTMA), which is responsible for the management of Ireland's national debt. Bonds are issued to fund the government's borrowing requirements and to fund maturing bond issues.

CHARACTERISTICS AND FEATURES

Bonds are issued in maturities of 5, 10, and 20 years. Issues are transferable in any amount and are listed and traded on the Irish stock exchange. Fixed-rate bonds issued before 1993 pay interest semiannually, while bonds issued since then pay interest annually. Coupons on variable-rate bonds are paid quarterly. Interest is accrued from the coupon payment date to the settlement date, and bonds go ex-dividend on the Wednesday nearest to three weeks before the coupon is paid. Interest is computed using the actual/365 day-count convention on semiannual coupon bonds and using the 30/365 day-count convention on annual coupon bonds. Settlement is done the day after the trade date (T+1) domestically and three days after the trade date (T+3) internationally. IGBs are available in registered form and are cleared through the Central Bank of Ireland Securities Settlement System (CBISS).

USES

Irish government bonds and notes are used for investment, hedging, and speculative purposes, by both domestic (Irish) and foreign investors and traders. U.S. banks purchase Irish government bonds to diversify their portfolios, speculate on currency and Irish interest rates, and hedge Irish-denominated currency positions and positions along the Irish yield curve.

DESCRIPTION OF MARKETPLACE

Issuing Practices

About 80 percent of issuance is by the tap system, and the rest of the bonds are issued by regular auctions. Taps are sales of a fixed amount of securities at a fixed price when market conditions are considered favorable. The type of bond and size of the tap issue are communicated to the market, but the price is only communicated to the primary dealers who bid by telephone. The auction system has both a competitive and noncompetitive element. The competitive auction is open to all investors who may bid directly or via a primary dealer or stockbroker. Following the auction, noncompetitive bids are filled at the average auction price. Only primary dealers may submit noncompetitive bids.

Secondary Market

IGBs are listed on the Dublin, Cork, and London Stock Exchanges. They are also traded in the over-the-counter (OTC) market.

Market Participants

Sell Side

Six primary dealers quote firm bid and offer prices in each of a specified list of eight bonds. In return for their market-making services, the NTMA provides these dealers with exclusive access to the supply of bonds issued in tap form. The designated brokers are CS First Boston, UBS Ltd., Davy, Goodbody, NCB, and Riada.

Buy Side

The principal holders of IGBs are domestic (Irish) and foreign institutional investors, such as banks, securities firms, insurance companies, pension funds, and money managers.

Market Transparency

Price transparency is relatively high for Irish government securities as a result of the structure of the primary dealer system, which enhances liquidity. Several information vendors disseminate prices to the investing public.

PRICING

Bonds are quoted as a percent of par to two decimal places. The price paid by the buyer does not include accrued interest. The bid/offer spread ranges from .05 to .20 basis points, depending on the liquidity of the issue.

HEDGING

Interest-rate risk may be hedged by taking contra positions in government securities or by using swaps or futures. Foreign-exchange risk can be hedged by using currency swaps, futures, or forward rate agreements.

RISKS

Liquidity Risk

Active portfolio management, the wide range of coupons and maturities available, and the development of a trading, rather than a purely investment outlook, among Irish investors has increased the liquidity of the Irish government bond market. The large issues tend to be very liquid throughout the yield curve, particularly the eight bonds in which the primary dealers are obliged to make markets.

Interest-Rate Risk

IGBs are exposed to interest-rate risk as a result of the inverse relationship between bond prices and interest rates. Longer-term issues have more price volatility than short-term instruments.

Foreign-Exchange Risk

Currency fluctuations may affect the bond's yield as well as the value of coupons and principal paid in U.S. dollars.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Finanical Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Irish government bonds are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Irish government bonds are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

The Italian Treasury issues bonds, notes, and bills, which are guaranteed by the Italian government. These securities are issued with maturities ranging from three months to 30 years in a wide variety of structures. These structures include Treasury bonds, Treasury floating-rate notes, Treasury notes with a put option, and short-term Treasury bills. The Treasury also issues notes and bills denominated in European Currency Units (ECUs). Government securities are issued in book-entry form but may be converted to bearer form following issuance.

CHARACTERISTICS AND FEATURES

Treasury bonds, or Buoni del Tesero Poliennali (BTPs), are fixed-coupon medium- to long-term government bonds with semiannual dividend payments. These bonds have played an important role in financing the Treasury, especially after the establishment of the Telematic Market for government bonds, which provides the liquidity necessary for these instruments. These bonds are issued with 5-, 10-, and 30-year maturities in denominations of lire 5, 10, 50, 100, 500, and 1,000 million. Interest on these bonds is paid through deferred semiannual coupons.

Treasury floating-rate notes, or Certificati di Credito del Tesoro (CCTs), are floating-rate notes indexed to T-bill rates. CCTs are generally issued in denominations of lire 5, 10, 50, 100, 500, and 1,000 million, with 7-year maturities, although 5- and 10-year notes have also become popular. Interest on these bonds is paid through deferred semiannual or annual dividend coupons, with rates indexed to Italian Treasury Bill (BOT) yields. For BOTs issued after December 1994, the coupon is calculated by adding a spread of 30 basis points to the six-month T-bill recorded in the last auction. For issues before December 1994, the coupon is calculated by adding a spread of 30 basis points to the average gross semiannual yields of one-year BOTs auctioned in the second and third months preceding the coupon period.

Treasury notes with options, or Certificati del Tesoro con Opzione (CTOs), are fixed-coupon securities with an embedded put. The embedded option in the CTO permits investors to redeem the bond halfway through nominal maturity, and it is designed to encourage investors to extend their investment horizons. Any request for refunding must be forwarded within an 11-day period beginning precisely one month before the scheduled date for anticipated redemption. The bonds are issued in maturities similar to BTPs. The Treasury has not issued any CTOs since May 1992.

Treasury notes denominated in ECUs, or Certificati del Tesoro in ECU (CTEs), were introduced by the Italian government in 1982 as part of an effort to diversify the instruments issued for financing public deficits. They are fixed-coupon ECU-denominated bonds issued in denominations of ECU 5,000, 10,000, 100,000, 500,000, and 1 million, generally with a five-year maturity. The foreign-currency weighting of the CTEs is attractive to investors who fear devaluation of Italian exchange rates. Interest on these bonds is paid in the form of deferred annual coupons in ECUs or, at the holder's request, in an ECU-equivalent lira amount.

Domestic and international settlement of Italian government bonds takes place three business dates after the trade date (T+3). The only exception is BOTs, which settle two business dates after the trade date (T+2). Italian government bonds with a coupon can be settled via Euroclear or Cedel. Settlement through Euroclear and Cedel takes five days. Interest is calculated using a 30/360-day count in which each month is assumed to have 30 days.

USES

Italian government securities are used for investment, hedging, and speculative purposes. While investors may buy Italian bonds as part of diversifying their investment portfolios, the bonds may also be used to hedge positions that are sensitive to movements in interest rates. Speculators, on the other hand, may use long-term bonds to take positions on changes in the level and term structure of interest rates.

DESCRIPTION OF MARKETPLACE

Issuing Practices

Italian government bonds are issued via a marginal auction, in which there is no base price. Each allotment is made at the marginal accepted bid which represents the stop-out price, below which no bids are considered. Partial allotments may be given at the stop-out price if the amount bid at that price exceeds the amount not covered by the higher-priced bids. Each participant is limited to three bids. The exclusion price, or the price below which no bids will be accepted, is calculated by listing the bids in decreasing order and proceeding as follows:

If the amount of competitive bids is greater than or equal to the amount offered—

- take the amount of bids (in a decreasing price order) needed to cover half the offered amount,
- calculate the weighted average of the above set of bids, and
- subtract 200 basis points from the weighted average to obtain the exclusion price.

If the amount of competitive bids is less than the amount offered—

- take half of the bids in a decreasing price order,
- calculate the weighted average of the above set of bids, and
- subtract 200 basis points from the weighted average to obtain the exclusion price.

Once the exclusion yield is calculated, bids are accepted in decreasing order of price. Bids are accepted to the point that covers the amount to be offered up to the stop-out price. Partial allotments may be given at the stop-out price if the amount bid at that price exceeds the amount not covered by the higher-priced bids. Noncompetitive bids may also be accepted and awarded at the average of accepted competitive bids plus a Treasury spread.

The Treasury makes an announcement of auction dates annually and also makes a quarterly announcement of the types of bonds and minimum issue sizes to be offered in the following three months. The auctions are held at the beginning and middle of the month. Generally, 3- and 5-year bills are sold on the same day, 10- and 30-year bonds are sold together, and CCTs are sold on the third day of the auctions.

The Bank of Italy may reopen issues, that is, sell new tranches of existing bonds, until the level outstanding reaches a certain volume, generally over lire 10 trillion. After that threshold volume is reached, a new bond must be issued. If an issue is reopened, the Bank of Italy issues new tranches of securities with the same maturities, coupons, and repayment characteristics as existing debt. The ability to reopen issues improves liquidity and avoids the potential poor pricing of securities that often occurs when a market is flooded with one very large issue.

Secondary Market

Italian government bonds can be traded on any of the following: the Milan Stock Exchange, the telematic government bond spot market (Mercato Telematico dei Titoli di Stato or MTS), and the over-the-counter (OTC) market. Bonds may be traded on the Milan Stock Exchange if they are transformed into bearer bonds (at least six months after being issued). The stock exchange is the reference market for the small saver as only small dealings are transacted there. At the end of the day, the exchange publishes an official list of the prices and volumes of trading. The MTS is the reference market for professional dealers.

MARKET PARTICIPANTS

Sell Side

Only banks authorized by the government of Italy may act as primary dealers of Italian government bonds. Branches of foreign banks and nonfinancial institutions can also act as dealers, provided they are residents in the European Union and subject to comparable financial regulations.

Buy Side

A wide range of investors use Italian government bonds for investing, hedging, and speculation. This includes domestic banks, nonfinancial corporate and quasi-corporate public and private enterprises, insurance companies, and

private investors. Foreign investors, including U.S. commercial banks, securities firms, insurance companies, and money managers, are also active in the Italian government bond market.

Market Transparency

The Italian government bond market is an active one. Price transparency is relatively high for Italian government securities as several information vendors, including Reuters, disseminate prices to the investing public.

PRICING

Prices and yields of Italian government securities are stated as a percentage of par to two decimal places. For instance, a price of 97.50 means that the price of the bond is 97.50 percent of par. The price spread is generally narrow due to the efficiency of the market.

Bonds trade on a clean-price basis, quoted net of accrued interest. Italian government bonds do not trade ex-dividend. Interest on Italian bonds is accrued from the previous coupon date to the settlement date (inclusive). In this regard, Italian bonds pay an extra day of interest compared with other bond markets.

HEDGING

Italian government bonds can be hedged for interest-rate risk in the Italian futures market (*Mercato Italiano Futures* or MIF) as well as the London International Financial Futures Exchange (LIFFE). The MIF and LIFFE offer futures on 10-year Italian government securities, and the MIF offers futures on five-year Italian government securities. The LIFFE also offers OTC options on individual bonds as well as options on futures contracts. OTC forwards and swaps can also be used to hedge interest-rate risk.

The effectiveness of a hedge depends on the yield-curve and basis risk. For example, hedging a position in a five-year note with an overhedged position in a two-year note may expose the dealer to yield-curve risk. Hedging a 30-year bond with an Italian bond future exposes the dealer to basis risk if the historical price relationships between futures and cash markets are not stable. Additionally, if a position in notes or bonds is hedged using an OTC option, the relative illiquidity of the option may diminish the effectiveness of the hedge.

RISKS

Liquidity Risk

The Italian bond market is one of the most liquid markets in the world. Liquidity is maintained by 40 market makers, which include 16 specialists, top-tier market makers (Morgan Guaranty, Milan), and 24 other market makers who are obligated to quote two-way prices. Ten market makers have privileged access to the Bank of Italy on the afternoon of an auction to buy extra bonds at the auction price. The purchases are subject to a limit set by the Bank. For instance, if a particular issue were oversubscribed and prices were likely to shoot up, the selected market makers would be able to buy more of the same bond and maintain or increase market liquidity.

As discussed above, the Bank of Italy may reopen issues until they reach a certain volume before selling a new bond. The ability to reopen issues improves liquidity and avoids the unfavorable pricing which may occur if the market is flooded with one very large issue. Liquidity is also maintained by limiting the number of government entities that issue debt. In the case of Italy, only the central government may issue debt securities.

Interest-Rate Risk

Italian government bonds are subject to price fluctuations due to changes in interest rates. Longer-term issues have more price volatility than shorter-term instruments. Therefore, a large concentration of longer-term maturities in an investment portfolio may increase interest-rate risk.

Foreign-Exchange Risk

From a U.S. investor's perspective, there are two types of risk related to foreign bonds: (1) the coupons and face value are paid in the foreign currency, which means that any change in the exchange rate affects the bond's value to the

U.S. investor, and (2) the bond's yield may be affected by currency movements. A number of factors exert a direct influence on foreign-exchange rates, including the balance of payments and prospective changes in that balance; inflation and interest-rate differentials between Italy and the United States; the social and political environment in Italy, particularly with regard to the impact on foreign investment; and central bank intervention in the currency markets.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Italian government bonds and notes are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Italian government notes and bonds are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

Japanese government bonds (JGBs) are issued by the Japanese national government. The Ministry of Finance (MOF) authorizes the issuance of coupon and non-coupon-bearing JGBs in a variety of maturities: long-term (10 and 20 years) and medium-term (two through five years). The MOF also issues short-term Treasury bills, which are issued at a discount with a maturity of 180 days. JGBs are guaranteed by the Japanese national government and, therefore, are considered to have very little credit risk.

CHARACTERISTICS AND FEATURES

The two types of long-term bonds are ''long-term'' and ''super long-term.'' The long-term bond, the most common, has a maturity of 10 years, and the super long-term bond has a 20-year maturity. Both long-term and super long-term bonds are numbered serially. They are referred to by number and issue month (for example, #182 August) rather than by maturity and coupon. JGB issues are categorized as construction bonds, deficit financing bonds, or refunding bonds, although there is no difference among these bonds from an investment perspective.

JGBs are typically issued in registered form but they may be converted to bearer form within two market days of issue. Exchange transactions of registered bonds must be issued in blocks of 1,000. There are no such restrictions for bearer bonds. JGBs have bullet maturities and are callable at any time, although call provisions are rarely exercised. Ten-year JGBs maturing after mid-1997 pay interest on the standard March/September or June/December semiannual coupon cycle. Twenty-year JGBs, however, pay interest only in March and September. Since new issues can appear monthly, the practice of using quarterly coupon dates leads to odd first coupons for both 10- and 20-year JGBs.

The two types of medium-term bonds are coupon bonds and five-year discount, or zero-coupon, bonds. Medium-term coupon bonds are issued with maturities of two, three, and four years. Issue sizes of both types of bonds vary considerably from month to month. However, the most common issue sizes are yen (¥) 50,000, ¥ 100,000, ¥ 1 million, ¥ 10 million, and ¥ 100 million. Medium-term coupon bonds make interest payments semiannually, and redemption is on the 20th day of the month in which the bond matures.

Previously, trades in JGBs were settled on the 5th, 10th, 15th, 20th, 25th and 30th of each month, based on trade date. This convention has been replaced by a T+7 (trade date plus seven Japanese business days) settlement method as of September 19, 1996.

USES

Domestic and foreign investors use JGBs for investment, hedging, and speculative purposes. U.S. investors, including commercial banks, may purchase JGBs to speculate on interest rates or foreign-exchange rates, to diversify portfolios, to profit from spreads between U.S. and Japanese interest rates, and to hedge various positions.

DESCRIPTION OF MARKETPLACE

Issuing Practices

The Bank of Japan (BOJ) is responsible for issuing JGBs in an aggregate amount not to exceed the limit set by the MOF. JGBs are issued monthly by the BOJ by competitive auction and syndicate. A syndicate comprising banks, life insurance companies, and securities firms underwrite 40 percent of each 10-year issue. The remaining 60 percent are issued via competitive auction. The coupon size and issue size are announced on the day of the auction after consultation with the syndicate. The average auction price determines the price of the syndicated portion. No firm may bid for more than 30 percent of the tranche issued via competitive auction. All 20-year bonds are issued via fully competitive auction. Medium-term coupon bonds are issued primarily through public subscriptions, but a certain portion are issued through fixed-rate private placements.

Secondary Market

Most JGBs are listed on the Japanese stock exchanges, although the majority of JGB trading occurs in the over-the-counter (OTC) market. While the OTC market is characterized by very large trading volume, stock-exchange trading is important in that it enhances transparency in pricing—the Tokyo Stock Exchange closing prices serve as a public pricing source for JGBs. Long-term government bonds account for the largest share of secondary-market trading of government securities, partly because they have higher credit ratings and greater marketability than shorter maturity JGBs. In the secondary market, the broker and investor negotiate the ''invoice price,'' which includes commissions for the agent.

The secondary market for JGBs has some unusual features. The first relates to the benchmark or bellwether bond issue. In the U.S. Treasury market, the on-the-run issue (that is, the most recently auctioned issue for a given maturity) is the benchmark issue for each maturity. However, the Japanese benchmark issue is determined through an informal process that occurs over a few weeks. Benchmark issue characteristics are as follows: (1) a coupon that is near the prevailing rate, (2) a large outstanding amount (approximately ¥ 1.5 trillion or more), (3) a wide distribution or placement after its issue, and (4) remaining maturity that is very close to 10 years.

Another unusual feature of the JGB market is the so-called reverse coupon effect. In most bond markets, high-coupon bonds trade at a higher yield than low-coupon bonds of the same duration. This ''coupon effect,'' which varies with the duration of the bond as well as over time, is often attributed to such institutional factors as different taxation of capital gains and ordinary income. In Japan, however, there is a strong preference for high-coupon bonds. As a result, high-coupon bonds trade at lower yields than low-coupon bonds for the same duration (the ''reverse coupon effect''). This effect occurs in spite of the Japanese tax code that requires income tax to be paid on coupon income but generally not on capital gains on Japanese government bonds. Banks prefer coupon interest because banks' current income ratios are closely monitored by Japanese bank regulators.

Market Participants

Sell Side

JGBs are issued through a syndicate consisting of domestic (Japanese) banks, life insurance companies, other domestic financial institutions, and some foreign securities firms.

Buy Side

A wide range of domestic and foreign investors use JGBs for investing, hedging, and speculation. Japanese financial institutions, particularly city, long-term credit, regional banks and insurance companies, tend to be the largest investors in yen-denominated bonds, although corporate and individual investors are very active investors in the medium-term government bond market. Foreign investors, such as U.S. commercial banks, securities firms, insurance companies, and money managers, are also active in the Japanese government bond market.

MARKET TRANSPARENCY

Price transparency is relatively high for JGBs. JGBs are actively traded and pricing information is available from a variety of price information services, including Reuters and Telerate.

PRICING

JGB prices are quoted in yield, specifically on the basis of simple yield, in basis points. Market price is calculated from simple yield. The following formulas are used to calculate price and yield:

$$Y_S = [C + (100 - P / T] / P, \text{ or}$$
$$P = [(C * T) + 100] / [1 + (T * Y_S)],$$

where

Y_S = simple yield
C = coupon stated in decimal form
P = price
T = time to maturity = number of days to maturity/365

Discount Bonds

Discount bonds are quoted on a simple-yield basis, which is different from the simple yield used on coupon bonds. Simple yield is used for discount bonds with a maturity of less than one year, but the formula is adjusted to reflect the fact that discount bonds do not pay interest. Annually compounded yield is used for discount bonds with a maturity greater than one year.

The yield on a discount bond with less than one year remaining to maturity is the value of Y_s that solves—

$$P = 100 / (1 + T + Y_s).$$

The yield on a discount bond with more than one year remaining to maturity is the value of Y_m that solves—

$$P = 100 / (1 + Y_m)t,$$

where t is the number of days to maturity (excluding leap days) divided by 365.

HEDGING

Because of the multiple risks associated with positions in foreign government bonds, investors may need to hedge one position in several markets using various instruments. Interest-rate risk related to JGBs is typically hedged by taking contra positions in other government bonds or by investing in interest-rate forwards, futures, options, or swaps. Similarly, foreign-exchange risk can be reduced by using currency forwards, futures, options, or swaps.

RISKS

Liquidity Risk

The market for longer-term JGBs tends to be more liquid than for the shorter-term issues, although liquidity has improved for the shorter-term issues in the past few years. The benchmark 10-year JGB still accounts for the majority of trading volume in the secondary market and therefore enjoys the best liquidity. JGBs issued more recently also tend to be more liquid than older issues. The market for medium-term bonds is less liquid because such bonds are typically purchased by individuals and investment trust funds, which tend to be buy-and-hold investors. The existence of a large and active JGB futures market enhances the liquidity of these issues.

Interest-Rate Risk

Like all bonds, the price of JGBs will change in the opposite direction from a change in interest rates. If an investor has to sell a bond before the maturity date, an increase in interest rates will mean the realization of a capital loss (selling the bond below the purchase price). This risk is by far the major risk faced by an investor in the bond market. Interest-rate risk tends to be greater for longer-term issues than for shorter-term issues. Therefore, a large concentration of long-term maturities may subject a bank's investment portfolio to unwarranted interest-rate risk.

Foreign-Exchange Risk

A non-dollar-denominated bond (a bond whose payments are made in a foreign currency) has unknown U.S. dollar cash flows. The dollar-equivalent cash flows depend on the exchange rate at the time the payments are received. For example, a U.S. bank that purchases a 10-year JGB receives interest payments in Japanese yen. If the yen depreciates relative to the U.S. dollar, fewer dollars will be received than would have been received if there had been no depreciation. Alternatively, if the yen appreciates relative to the U.S. dollar, the investor will benefit by receiving more dollars than otherwise. Over the last few years, volatility in the U.S.-Japanese exchange rate has been particularly high, primarily due to the Japanese banking crisis.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Japanese government bonds and yields are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Japanese government bonds and notes are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

The Spanish Treasury issues medium- and long-term bonds, Bonos del Estado (Bonos) and Obligaciones del Estado (Obligaciones), which are guaranteed by the Spanish government. Since 1987, these bonds have been issued in book-entry form only.

CHARACTERISTICS AND FEATURES

Bonos are issued with maturities of three or five years, while Obligaciones are issued with maturities of 10 or 15 years. Both types of bonds are issued in denominations of 10,000 pesetas (pta). Bonos and Obligaciones are noncallable with bullet maturities and can be issued with either annual or semi-annual coupons. All Spanish government bonds bear a fixed coupon. Domestic settlement takes place the market date after the trade date (T+1), while international settlement takes place seven calendar days following the trade date (T+7). Settlement is done on a delivery-against-payment basis for all transactions between interbank market participants. Bonos and Obligaciones are also eligible for settlement through Euroclear and Cedel. Interest is calculated using an actual/365-day count.

USES

Historically, Bonos and Obligaciones have been used as medium- and long-term investments. However, in the early 1990s, the trading volume of these bonds doubled as banks and corporations began to use Bonos and Obligaciones for cash-management purposes. These securities can also be used for hedging and speculative purposes.

DESCRIPTION OF MARKETPLACE

Issuing Practices

Currently, all Bonos and Obligaciones are issued through monthly competitive auctions. The Spanish Treasury publishes the auction calendar at the beginning of the year. On the first Tuesday of the month, the 3- and 10-year bonds are issued. The 5- and 15-year bonds are issued on the following Wednesday. Each issue is sold in at least three competitive tenders. Bids are submitted before 10:30 a.m. on the auction date. Auction results are announced at 11:30 a.m. on the same day on Reuters page BANCN. Payments generally occur on the 15th of the same month.

At the beginning of each issue, the Treasury fixes the coupon to be paid for at least the next three auctions. After all bids are made, the Treasury fixes the total issue amount and allocates bids from the highest price to a cut-off price. The total issue amount is not disclosed. The lowest bid submitted is referred to as the marginal price of the issue. Bids between the average and the marginal price are filled at the price the bidders submitted. Bids above the average are filled at the average price bid.

If the Treasury announces a target issuance level and the volume awarded during the initial bidding stage is equal to or higher than 70 percent of the target level—but does not reach the target issuance level—the Treasury has the right, but not the obligation, to hold a second auction exclusively with the primary dealers. In this case, every primary dealer must submit bids for an amount at least equal to—

(target issuance level – the volume awarded) / the number of primary dealers.

If the target issuance level is met with the first bidding stage or if the Treasury does not announce a target issuance level, primary dealers may submit up to three additional bids. These bids cannot have yields higher than the average yield during the first bidding stage. In this scenario, the Treasury must accept bids equal to at least 10 percent of the volume awarded during the first bidding stage if it had accepted more than 50 percent of the bids. If it had accepted less than 50 percent of the bids, the Treasury must accept bids equal to at least 20 percent of the volume awarded during the first bidding stage.

Interest begins to accrue from a date nominated by the Treasury. Historically, the date has been set so that the first coupon period will

be exactly one year. Thus, tranches issued before the nominated date have an irregular period during which they trade at a discount without accrued interest.

Secondary Market

About 40 percent of all transactions are executed through a system of interdealer brokers (blind brokers) instituted by the Bank of Spain. In the secondary market, only entities designated as ''primary dealers'' can deal directly with the Bank of Spain. For example, if a customer wants to buy a bond that a dealer does not have in inventory, a primary dealer can go to the Bank of Spain to obtain the bond. Nonprimary dealers would have to obtain the bonds through interdealer trading. Interdealer trading is executed through information screens. Amounts and prices are quoted, but counterparties are not disclosed.

Competitive tenders must be at least pta 50 million in the interbank market and pta 100 million in the blind-broker system. Trading volume in the secondary market varies between pta 500 million and pta 1 billion. Trading hours are between 9:00 a.m. to 5:00 p.m. local time through blind brokers, and at any hour through regular brokers.

Market Participants

Sell Side

As noted above, the dealers of government securities are classified as either primary dealers or nonprimary dealers. The Bank of Spain designates primary dealers with whom they will conduct business. Other dealers obtain government securities through interdealer trading.

Buy Side

The primary holders of Bonos and Obligaciones are private and savings banks. The Bank of Spain, corporations, and foreign investors, including U.S. commercial banks, securities firms, insurance companies, and money managers also hold outstanding bonds.

MARKET TRANSPARENCY

Several information vendors disseminate price information on Spanish government bonds. Reuters and Telerate provide pricing information for Bonos and Obligaciones. A Telerate service called ''38494'' provides the latest auction information. Reuters carries bond prices, dealer prices, the latest auction results, and Spanish Treasury pages.

PRICING

Bonos and Obligaciones are quoted on a percentage of par basis in eighths. Bid/offer spreads are typically 5 to 10 basis points for actively traded issues and about 20 basis points for illiquid issues. Bonos and Obligaciones do not trade ex-dividend, but they do trade before the Treasury nominates a date to begin coupon accruals. The period before the nomination date is referred to as the *irregular period.* Because there is no accrued interest until a coupon payment date is nominated by the Treasury, issues outstanding before the nomination are priced at a discount and adjustments to yield must be made accordingly. The following price/yield relationship holds during the irregular period:

$$PV_0 = PV_1 / (1 + y)^{(n/365)},$$

where

PV_1 = standard price/yield on the nominated date

y = annual internal rate of return

n = the number of days until the end of the irregular period

HEDGING

Foreign-currency and interest-rate risk may be hedged by using derivative instruments such as forwards, futures, swaps, or options. Interest-rate risk may also be hedged by taking an offsetting position in another Spanish fixed-income security.

RISKS

Liquidity Risk

Liquidity risk is increased when market volumes of a security are low. In the case of Bonos and Obligaciones, market volumes have been volatile as investor objectives and strategies change, for example, when banks and corporations began to use Bonos and Obligaciones as cash-management instruments rather than as medium-term investments. Therefore, these bonds may experience varying levels of liquidity. Liquidity may also be a function of how close to maturity a bond issue is. In other words, more recently issued bonds tend to be more liquid than bonds that have been traded in the market for a longer period of time.

Interest-Rate Risk

Interest-rate risk is derived from price fluctuations caused by changes in interest rates. Longer-term issues have more price volatility than shorter-term issues. A large concentration of long-term maturities may subject a bank's investment portfolio to greater interest-rate risk.

Foreign-Currency Risk

From the perspective of an international investor, the total return from investing in Spanish government securities is partly dependent on the exchange rate between the U.S. dollar and the Spanish peseta. Several factors affect the volatility of a foreign-exchange rate including the following: the country's balance of payments and prospective changes in that balance; inflation and interest-rate differentials between countries; the social and political environment; relative changes in the money supply; and central bank intervention in the currency.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Spanish government bonds are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Spanish government bonds are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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J.P. Morgan Securities. *Government Bond Outlines.* 9th ed. April 1996.

GENERAL DESCRIPTION

Swiss government notes (SGNs) and bonds (SGBs), also known as confederation notes and bonds, are fully guaranteed debt obligations of the Swiss government. The Swiss government debt market has historically been relatively small as a result of the country's low level of debt and its balanced-budget policy. The Swiss government does not engage in open market operations because of the high degree of liquidity in the banking system. However, budget deficits in recent years have resulted in an increase in the volume of activity. Bonds and notes are issued through the Swiss National Bank in bearer form only.

CHARACTERISTICS AND FEATURES

Bonds have average maturity ranges of seven to 20 years and are issued in denominations of Swiss franc (SFr) 1,000, SFr 5,000, and SFr 100,000. Notes have average maturities of three to seven years and are issued in denominations of SFr 50,000 and SFr 100,000. Both bonds and notes are fixed-coupon securities redeemable at par (bullets). Interest is paid annually and there are no odd first coupons. Most issues are callable, but many recent issues do not have a call feature. Settlement is based on Euroclear (an international clearing organization) conventions, three days after the trade date (T+3). Interest is calculated using the 30E+/360 day-count convention. If a starting date is the 31st, it is changed to the 30th, and an end date that falls on the 31st is changed to the 1st.

USES

Swiss government bonds and notes are used for investment, hedging, and speculative purposes. Foreign investors, including U.S. banks, often purchase Swiss government securities as a means of diversifying their securities portfolios. The low credit risk and liquidity of Swiss government bonds encourage their use. Swiss government securities may also be used to hedge an investor's exposure to Swiss interest rates or currency risk that is related to its positions in Swiss francs. Speculators may use Swiss government bonds to take positions on changes in the level and term structure of Swiss interest rates or on changes in the foreign-exchange rates between Switzerland and the United States.

DESCRIPTION OF MARKETPLACE

Issuing Practices

The Swiss Treasury issues debt through a Dutch auction, and allocations are made to the highest bidders in descending order until the supply of securities the Treasury wishes to sell is depleted. The lowest accepted tender price is considered the clearing price. The debt-issuance calendar is announced at the beginning of each year. Currently, issuance takes place on the fourth Thursday of every second month.

Secondary Market

SGBs are listed on the Swiss stock exchanges in Zurich, Geneva, and Basel, as well as on the over-the-counter (OTC) market. SGNs are traded over the counter only.

Market Participants

Sell Side

The main dealers of SGBs are the Union Bank of Switzerland, Credit Suisse, and the Swiss Bank Corporation. The Swiss National Bank does not allow non-Swiss banks to underwrite or manage issues.

Buy Side

Many investors, foreign and domestic, are attracted to the Swiss bond market because of the strength of the Swiss economy, the country's low inflation rates, and the stability of its political environment and currency, all of which contribute to a stable and low-risk

government bond market. Investors include banks, securities firms, insurance companies, and money managers.

Market Transparency

The market of SGBs and SGNs is fairly active. Price transparency is relatively high for Swiss government securities since several information vendors, including Reuters and Telerate, disseminate prices to the investing public.

PRICING

Notes and bonds are quoted as a percentage of par to two decimals. For example, a quote of 98.16 would mean a price that is 98.16 percent of par value. The price quoted does not include accrued interest. Notes and bonds do not trade ex-dividend.

HEDGING

Interest-rate risk may be hedged by taking contra positions in other government securities or by using interest-rate swaps, forwards, options, or futures. Foreign-exchange risk can be hedged by using currency swaps, forwards, futures, or options.

RISKS

Liquidity Risk

The market for SGBs is more liquid than SGNs due to a lower number of SGN issues. Bonds typically trade in a liquid market for the first few months after they are issued. However, after a few months on the secondary market, liquidity tends to decrease as a result of the fact that issue size is relatively small. In addition, liquidity is hampered by buy-and-hold investment practices and by federal and cantonal taxes levied on secondary transactions.

Interest-Rate Risk

SGBs and SGNs are subject to interest-rate risk as a result of the inverse relationship between bond prices and interest rates. Longer-term issues have more price volatility than short-term instruments. However, the Swiss capital market is characterized by relatively low and stable interest rates.

Foreign-Exchange Risk

Currency fluctuations may affect the bond's yield as well as the value of coupons and principal paid in U.S. dollars. The Swiss franc is one of the strongest currencies in the world as a result of the strength of the Swiss economy and the excess liquidity in the banking system. Volatility of Swiss foreign-exchange rates has historically been low.

Political Risk

A change in the political environment, withholding tax laws, or market regulations can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The accounting treatment for investments in foreign debt is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Swiss government notes and bonds are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Swiss government notes and bonds are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

United Kingdom government bonds, known as ''gilts'' or ''gilt-edged stocks,'' are Sterling-denominated bonds issued by the Bank of England (BOE) on behalf of the Treasury. The bonds are unconditionally guaranteed by the U.K. government and, therefore, are considered to have very low credit risk. Shorts are those gilts having 0 to 5 years remaining to maturity; mediums, 5 to 15 years; and longs, over 15 years. The securities are generally held in registered form in the domestic settlement system. The securities can also be held via Euroclear and Cedel.

CHARACTERISTICS AND FEATURES

Gilts come in a variety of structures. Conventional gilts or ''straights'' are noncallable bullet issues that pay interest semiannually. These bonds comprise around 80 percent of the outstanding gilt-edged securities. The government also issues callable gilts, so called ''double-dated'' gilts, which may be called at the government's discretion anytime after the designated call date. In addition to these bonds, a number of nonconventional gilt issues are considered to be of minor importance because of their insignificant issue sizes and lack of liquidity. Such nonconventional issues include convertible gilts (in which short-dated bonds may be converted to longer-dated bonds), index-linked gilts, and irredeemable gilts (consols). Most gilt issues pay a fixed coupon. Floating-rate gilts, first issued in March 1994, have coupon payments linked to the London Interbank Bid Rate (LIBID). Unlike fixed-rate gilts, interest on floating-rate gilts is paid quarterly to investors.

Settlement in the gilt market is usually done on the market date following the trade date (T+1), although two-day and seven-day settlements are also fairly common. Deals are normally cleared through the Bank of England's Central Gilt Office (CGO). The CGO is linked to Euroclear and Cedel. Interest is calculated using an actual/365-day count.

USES

Gilts are used for investment, hedging, and speculative purposes by domestic and foreign entities. While foreign investors may buy gilts as a means of diversifying their investment portfolios, gilts may also be used to hedge positions that are sensitive to movements in U.K. interest rates or foreign-exchange rates. Speculators, on the other hand, may use long-term bonds to take positions on changes in the level and term structure of interest rates.

DESCRIPTION OF MARKETPLACE

Issuing Practices

The BOE issues a debt management report in March of each year, which lays out gilt-issuance plans for the fiscal year running from April to March. The report represents the Treasury's forecast of the gilts that need to be sold and also details the percentage of issuance expected to fall into each area of the maturity spectrum. Complete details of the auction, including the amount and terms of gilt to be auctioned and other information, are announced eight days before the auction. Gilt-edged market makers (GEMMs) quote prices on a when-issued basis. Deals cannot be settled until the business day after the auction when trading in the newly issued bonds officially begins. The existence of a shadow market, however, ensures that the market can trade to a level where new bonds will be easily absorbed, limiting the chances of a surplus inventory of bonds.

During the auction process, bids are accepted on a competitive and a noncompetitive basis. Competitive bids are for a minimum of £500,000 and can be made at any price. Bids are accepted going from the highest price to the lowest price until the bank exhausts the amount of securities it wants to sell. If the issue size is not large enough to satisfy demand at the lowest accepted price, bidders get a proportion of their requests. In such a bid, the BOE cannot give more than 25 percent of the amount offered to any one bidder. Noncompetitive bids vary between £1,000 and £500,000 per bidder. Bonds are allocated to noncompetitive bidders at a price

equal to that of the weighted average of bids filled in the competitive auction.

The BOE also sells a fixed amount of securities at a fixed price (tap form). This form of issuance allows the BOE to respond to market demand and add liquidity to the market. More specifically, tap issues are normally done from the supply of bonds that have not been sold at an auction. Typically, bonds are held back with the intent to sell them when demand has improved or when there is an increased need for funds. In a tap issuance, stock is issued to GEMMs in the form of ''tranchettes,'' typically up to £500 million.

Payment for gilts may be made in full or in part. In a partly paid auction, competitive bidders are required to deposit a portion of the amount bid, with the rest due after issue as specified in the prospectus. In a partly paid auction, the first coupon payment and the market price reflect the partly paid status of the gilt. After the installments are cleared as per the prospectus, the partly paid distinction disappears.

Secondary Market

U.K. gilts are traded on the London Stock Exchange, International Stock Exchange, and London International Financial Futures Exchange (LIFFE). Gilts can be traded 24 hours a day. Generally, gilts are traded on the International Stock Exchange between the hours of 9 a.m. and 5 p.m. and on the LIFFE between the hours of 8:30 a.m. and 4:15 p.m. and between 4:30 p.m. and 6:00 p.m. The typical transaction size in the secondary market varies between £5 to £100 million.

Market Participants

Sell Side

The primary dealers of U.K. government bonds are known as gilt-edged market makers or GEMMs. GEMMs quote the exact size, amount, and terms of the issuance beginning eight days before an auction, thereby creating a ''shadow market.'' At this time, they quote prices on a when-issued basis.

Buy Side

A wide range of investors use U.K. government bonds for investing, hedging and speculation. This includes banks, nonfinancial corporate and quasi-corporate public and private enterprises, pension funds, charities, pension arms of life insurance companies, and private investors. The largest holders of gilts are domestic entities, but foreign investors, including U.S. banks, are also active participants in the market.

Market Transparency

The gilt market is active and price transparency is relatively high for these securities. Several information vendors disseminate prices to the investing public, including Reuters.

PRICING

Prices are quoted as a percent of par in 32nds. For example, a price of 98:16 means that the price of the bond is 98.5 percent of par value (98 16/32). Prices are quoted on a clean-price basis, net of accrued interest. The settlement price takes accrued interest into account so that the total price equals the clean price plus or minus the accrued interest. The bid/offer spreads tend to be extremely thin. For liquid issues with a maturity of up to seven years, the spread is normally 1/16 or less; for liquid issues with longer maturities, the spread is normally 1/16 to 1/8.

HEDGING

U.K. gilts may be hedged for foreign-exchange risk using foreign-exchange options, forwards, and futures. These securities can be hedged for interest-rate risk by taking a contra position in another gilt or by using derivative instruments such as forwards, swaps, futures, or options. Currently, the LIFFE gilt futures contract is the most heavily traded hedging instrument. The effectiveness of a particular hedge depends on the yield curve and basis risk. For example, hedging a position in a six-year note with an over-hedged position in a two-year bill may expose the dealer to yield curve risk. Hedging a 30-year bond with a bond future exposes the

dealer to basis risk if the historical price relationships between futures and cash markets are not stable.

RISKS

Liquidity Risk

Gilts trade in an active and liquid market. Liquidity in the market is ensured by the BOE, which is responsible for maintaining the liquidity and efficiency of the market and, in turn, supervises the primary dealers of gilts. GEMMs, who act as primary dealers, are required to quote two-way prices at all times. An increase in foreign investment activity in the gilt market has led to a substantial increase in competition and enhanced liquidity.

Liquidity is also enhanced through the BOE's ability to reopen auctions and tap issues. The ability to reopen issues improves liquidity and avoids the unfavorable pricing that may occur when the market is flooded with one very large issue. A tap issue, as explained above, allows the BOE to relieve market shortage of a particular bond. An active repo market allows market makers (GEMMs) to fund their short positions, and it improves turnover in the cash market, attracting international players familiar with the instrument, which further improves liquidity.

Foreign-Exchange Risk

Currency movements have the potential to affect returns of fixed-income investments whose interest and principal are paid in foreign currencies. The devaluation of a foreign currency relative to the U.S. dollar would not only affect a bond's yield, but would affect bond pay-offs in U.S. dollar terms. Some factors that may affect the U.K. foreign-exchange rate include—

- wider exchange-rate mechanism bands, which increase the risk of holding high-yielding currencies;
- central bank intervention in the currency markets;
- speculation about the European economic and monetary union and its potential membership, which puts European currencies under pressure vis-à-vis the deutsche mark; and
- endemic inflation in the United Kingdom.

Political Risk

A change in the political environment, withholding tax laws, or market regulation can have an adverse impact on the value and liquidity of an investment in foreign bonds. Investors should be familiar with the local laws and regulations governing foreign bond issuance, trading, transactions, and authorized counterparties.

ACCOUNTING TREATMENT

The Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," determines the accounting treatment for investments in foreign debt. Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

United Kingdom government bonds are assigned to the 0 percent risk-weight category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

United Kingdom government bonds are type III securities. As such, a bank's investment in them is limited to 10 percent of its equity capital and reserves.

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GENERAL DESCRIPTION

In 1989, the Brady plan, named after then-U.S. Treasury Secretary Nicholas Brady, was announced to restructure much of the debt of developing countries that was not being fully serviced due to economic constraints. The plan provided debt relief to troubled countries and, in theory, opened access to further international financing. It also provided the legal framework to securitize and restructure the existing bank debt of developing countries into bearer bonds. Linking collateral to some bonds gave banks the incentive to cooperate with the debt reduction plan.

Brady bonds are restructured bank loans. They comprise the most liquid market for below-investment-grade debt (though a few Brady countries have received investment-grade debt ratings) and are one of the largest debt markets of any kind. Banks are active participants in the Brady bond market. Once strictly an interbank market, the Brady market has evolved into one with active participation from a broad investor base.

CHARACTERISTICS AND FEATURES

Brady bonds have long-term maturities, and many have special features attached. Callable bonds or step-up coupons are among the most common features. Others pay additional sources of income based on various economic factors or the price of oil. Listed below are the individual characteristics of several types of Brady bonds:

- *Par bonds* have fixed coupons or coupon schedules and bullet maturities of 25 to 30 years. Typically, these bonds have principal-payment and rolling interest-rate guarantees. Because pars are loans exchanged at face value for bonds, debt relief is provided by a lower interest payment.
- *Discount bonds* have floating-rate coupons typically linked to LIBOR. These bonds have principal and rolling interest-rate guarantees. Bond holders receive a reduced face amount of discount bonds, thereby providing debt relief.
- *Front-loaded interest-reduction bonds* provide a temporary interest-rate reduction. These bonds have a low fixed-interest rate for a few years and then step up to market rates until maturity.
- *Debt conversion bonds (DCBs)* and *new money bonds* are exchanged for bonds at par and yield a market rate. Typically, DCBs and new money bonds pay LIBOR + ⅞. These bonds are amortized and have an average life of between 10 and 15 years. DCBs and new money bonds are structured to give banks an incentive to inject additional capital. For each dollar of new money bond purchased, an investor converts existing debt into a new money bond at a fixed proportion determined by the Brady agreement. DCBs and new money bonds are normally uncollateralized.

The terms of local debt market instruments also vary widely, and issues are denominated in either local or foreign currency such as U.S. dollars. Brief descriptions of instruments in Argentina, Brazil, and Mexico follow.

Argentina

Letes are Argentine Treasury bills. They are offered on a discount basis and have maturities of 3, 6, and 12 months. Auctions are held on a monthly basis.

Brazil

Currently, the primary internal debt instruments issued in Brazil are so-called BBC bonds, which are issued by the central bank. As of mid-1996, BBC bonds were being issued in 56-day denominations, up from 35-, 42-, and 49-day denominations. Total outstandings as of June 30, 1996, were U.S.$49.9 billion, and these instruments are highly liquid. The central bank also issues bills and notes known as LTNs and NTNs that have maturities up to one year (though one NTN has been issued as of this writing with a two-year maturity). LTNs and NTNs are less liquid and have smaller outstandings (U.S.$34.4 and U.S.$18.2 billion, respectively) than BBC bonds.

Mexico

Ajustabonos

Though issuance of these bonds has been halted, ajustabonos are peso-denominated Treasury bonds. They are indexed to inflation and pay a real return over the Mexican consumer price index (CPI). These bonds are longer-term instruments with maturities of 1,092 days (three years) and 1,820 days (five years). Ajustabonos pay a quarterly real rate coupon over the CPI and are tax exempt to foreign investors. As of May 1996, U.S.$5.6 billion ajustabonos remained outstanding.

Bondes

Bondes are floating-rate, peso-denominated government development bonds. They have maturities of 364 and 728 days. Bondes pay interest every 28 days at the higher of the 28-day cetes rate or the retail pagares rate, calculated by the central bank. They are auctioned weekly and are tax exempt to foreign investors. The total amount outstanding as of mid-1996 was approximately U.S.$5 billion.

Cetes

Cetes are government securities and are the equivalent of Mexican T-bills. They are denominated in pesos and are sold at a discount. Cetes have maturities of 28, 91, 182, 364, and 728 days (though this maturity is presently discontinued). Cetes are highly liquid instruments and have an active repo market.

The capital gain for these instruments is determined by the difference between the amortized value and the purchase price; the day-count convention is actual/360-day. Auctions are held weekly by the central bank for the 28- through 364-day maturities. Foreign investors are exempted from paying taxes on these instruments.

Tesobonos

Though these instruments are not currently being issued, they comprised the majority of debt offerings in the time leading up to the 1994 peso crisis. Tesobonos are dollar-indexed government securities with a face value of U.S.$1,000. At the investors' option, they are payable in dollars, and they are issued at a discount. Maturities include 28, 91, 182, and 364 days.

UDIbonos

During the week of May 27, 1996, the Mexican central bank sold three-year UDIbonos for the first time. They are inflation-adjusted bonds denominated in accounting units or UDIs (a daily inflation index), which change in value every day. These instruments replaced the ajustabonos. UDIbonos pays interest semiannually and offer holders a rate of return above the inflation rate. They are auctioned biweekly and may have limited liquidity.

USES

Brady bonds and local debt market instruments can be used for investment, hedging, and speculation. Speculators will often take positions on the level and term structure of sovereign interest rates. Arbitragers will take positions based on their determination of mispricing.

DESCRIPTION OF MARKETPLACE

Issuing Practices

A Brady deal exchanges dollar-denominated loans for an agreed-upon financial instrument. These instruments include various debt instruments, debt equity swaps, and asset swaps. At the close of a collateralized Brady deal (not all Brady bonds are collateralized), collateral is primarily posted in the form of U.S. Treasury zero-coupon bonds and U.S. Treasury bills. The market value of this collateral depends on the yield of 30-year U.S. Treasury strips and tends to increase as the bond ages. Developing countries have also used their own resources for collateral as well as funds from international donors, the World Bank, and the International Monetary Fund (IMF) to support their Brady deals. Local debt instruments are subject to the issuing practices of each individual country.

Market Participants

The number of market participants in each emerging market differs with the characteristics of each market, such as regulatory barriers, liquidity constraints, and risk exposures. However, there are many participants in the Brady bond market. Securitization of Brady bonds enables banks to diversify and transfer some of their country exposures to other banks. New market participants in the Brady market include investment banks as well as traditional commercial banks, mutual funds, pension funds, hedge funds, insurance companies, and some retail investors.

Market Transparency

For many instruments, prices are available on standard quote systems such as Bloomberg, Reuters, and Telerate. In addition, many brokers can quote prices on less developed country (LDC) debt instruments. For all but the most liquid Brady bonds and internal debt instruments, however, transparency can be very limited.

PRICING

Pricing for the various LDC issues differs across instruments and countries. The price of a Brady bond is quoted on its spread over U.S. Treasuries. Standard bond pricing models are often used to price the uncollateralized bond and unsecuritized traded bank loans, with emphasis on the credit risk of the issuers (sovereign risk) in determining whether a sufficient risk premium is being paid. Most of the volatility in Brady bonds comes from movement in the spread over U.S. Treasuries.

HEDGING

Over-the-counter (OTC) options are the primary vehicles to hedge Brady bonds. Because the volume of the OTC options market is approximately one-tenth that of the cash Brady bond market, liquidity is relatively poor.

Cash instruments from the identical sovereign issuer can be used to hedge positions. However, as in other hedging situations, mismatch of terms can lead to basis risk.

Hedging strategies for Brady bonds are often focused on decomposing the sovereign risk from the U.S. rate risk and on neutralizing the latter. For example, a long fixed-coupon Brady bond position is exposed to the risk that U.S. rates will rise and Brady prices will fall. A hedge aimed at immunizing U.S. rate risk can be established with a short U.S. Treasury, Treasury futures, or forward position.

RISKS

Sovereign Risk

One of the most significant risks related to trading of LDC debt is sovereign risk. This includes political, regulatory, economic stability, tax, legal, convertibility, and other forms of risks associated with the country of issuance. Real risk is that of potential controls or taxes on foreign investment. While there is no way to predict policy shifts, it can help to be familiar with any current controls and to closely follow the trend of inflation.

Liquidity Risk

Liquidity risk is the risk that a party may not be able to unwind its position. In emerging markets, liquidity risk can be significant. During the Mexican peso crisis, bids on various instruments were nonexistent. Portfolio values of Latin American instruments plunged. In the OTC market, options are far less liquid than cash bonds. As a result, option positions are often held to expiry rather than traded.

Interest-Rate Risk

Debt issues of various countries are subject to price fluctuations because of changes in sovereign-risk premium in addition to changes in market interest rates and changes in the shape of the yield curve. Spreads between U.S. rates and sovereign rates capture this sovereign-risk premium. In general, the greater the uncertainty of future payoffs, the greater the spread between country rates and U.S. rates. This spread will not necessarily be stable, however, making interest-rate risk *at least* equivalent to that found in U.S. Treasury instruments.

ACCOUNTING TREATMENT

LDC debt that remains in the form of a loan and does not meet the definition of a security in the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," should be reported and accounted for as a loan. If the loan was restructured in a troubled-debt restructuring involving a modification of terms, and the restructured loan meets the definition of a security in FAS 115, then the instrument should be accounted for according to the provisions of FAS 115.

The accounting treatment for investments in foreign debt is determined by FAS 115, as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." Accounting treatment for derivatives used as investments or for hedging purposes is determined by Statement of Financial Accounting Standards No. 133 (FAS 133), "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

Claims that are directly and unconditionally guaranteed by an OECD-based central government or a U.S. government agency are assigned to the zero percent risk category. Claims that are not unconditionally guaranteed are assigned to the 20 percent risk category. A claim is not considered to be unconditionally guaranteed by a central government if the validity of the guarantee depends on some affirmative action by the holder or a third party. Generally, securities guaranteed by the U.S. government or its agencies and securities that are actively traded in financial markets are considered to be unconditionally guaranteed.

Claims on, or guaranteed by, non-OECD central governments which do *not* represent local currency claims that are unconditionally or conditionally guaranteed by non-OECD central governments to the extent that the bank has liabilities booked in that currency are assigned a 100 percent risk weight. Also, all claims on non-OECD state or local governments are assigned to the 100 percent risk category.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Obligations which are guaranteed by a department or an agency of the U.S. government, if the obligation commits the full faith and credit of the United States for the repayment of the obligation, are type I securities and are not subject to investment limitations. Also, obligations guaranteed by the Canadian government are classified as type I securities.

Obligations guaranteed by other OECD countries which are classified as investment-grade are type III securities. A bank's investment is limited to 10 percent of its capital and surplus.

Non-investment-grade LDC debt may be purchased under a bank's "reliable estimates" bucket. If a bank concludes, on the basis of reliable estimates, that an obligor will be able to perform, and the security is marketable, it can purchase the security notwithstanding its investment-grade rating. Such securities are subject to a 5 percent limit of a bank's capital and surplus for all securities purchased under this authority.

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GENERAL DESCRIPTION

Foreign exchange (FX) refers to the various businesses involved in the purchase and sale of currencies. This market is among the largest in the world and business is conducted 24 hours a day in most of the financial centers. The major participants are financial institutions, corporations, and investment and speculative entities such as hedge funds. Any financial institution which maintains *due from* bank balances, commonly known as ''nostro'' accounts, in foreign countries in the local currency can engage in foreign exchange. The volume in this market has been estimated to be the equivalent of $1 trillion a day.

CHARACTERISTICS AND FEATURES

The FX market is divided into spot, forward, swap, and options segments. Each of these segments is discussed in the following subsections.

Spot

Buying and selling FX at market rates for immediate delivery represents spot trading. Generally, spot trades in foreign currency have a ''value date'' (maturity or delivery date) of two to five business days (one day for Canada). Foreign-exchange rates that represent the current market value for the currency are known as spot rates. The risk of spot trading results from exchange-rate movements that occur while the financial institution's position in foreign currency is not balanced with regard to the currency it has bought and sold. Such unbalanced positions are referred to as net open positions.

Net Open Positions

A financial institution has a net open position in a foreign currency when its assets, including spot and forward/futures contracts to purchase, and its liabilities, including spot and forward/futures contracts to sell, in that currency are not equal. An excess of assets over liabilities is called a net ''long'' position, and liabilities in excess of assets are called a net ''short'' position. A long position in a foreign currency which is depreciating will result in an exchange loss relative to book value because, with each day, that position (asset) is convertible into fewer units of local currency. Similarly, a short position in a foreign currency which is appreciating represents an exchange loss relative to book value because, with each day, satisfaction of that position (liability) will cost more units of local currency.

The net open position consists of both balance-sheet accounts and contingent liabilities. For most financial institutions, the nostro accounts represent the principal assets; however, foreign-currency loans as well as any other assets or liabilities that are denominated in foreign currency, which are sizeable in certain financial institutions, must be included. All forward/futures foreign-exchange contracts outstanding are contingents. When a contract matures, the entries are posted to a nostro account in the appropriate currency.

Each time a financial institution enters into a spot foreign-exchange contract, its net open position is changed. For example, assume that Bank A opens its business day with a balanced net open position in pound sterling (assets plus purchased contracts equal liabilities plus sold contracts). This is often referred to as a ''flat'' position. Bank A then receives a telephone call from Bank B requesting a ''market'' in sterling. Because it is a participant in the interbank foreign-exchange trading market, Bank A is a ''market maker.'' This means it will provide Bank B with a two-sided quote consisting of its bid and offer for sterling. If a different currency was requested, European terms would be the opposite since the bid and offer would be for dollars instead of the foreign currency. In determining the market given, Bank A's trader of sterling will determine where the market is presently (from brokers and/or other financial institutions), attempt to anticipate where it is headed, and determine whether Bank B is planning to buy or sell sterling.

Forward Transactions

A forward transaction differs from a spot transaction in that the value date is more than two to

five business days in the future. The maturity of a forward foreign-exchange contract can be a few days, months, or even years in some instances. In practice, dates that are two years or more in the future are usually referred to as the long-dated forward market or the long-term FX (LTFX) market. The exchange rate is fixed at the time the transaction is agreed on. However, nostro accounts are not debited or credited, that is, no money actually changes hands, until the maturity date of the contract. There will be a specific exchange rate for each forward maturity, and each of those rates will generally differ from today's spot exchange rate. If the forward exchange rate for a currency is higher than the current spot rate, the currency is trading at a premium for that forward maturity. If the forward rate is below the spot rate, then the currency is trading at a discount. For instance, sterling with a value date of three months is at a discount if the spot rate is $1.75 and the three-month forward rate is $1.72.

Foreign-Exchange Swaps

Financial institutions that are active in the foreign-exchange market find that interbank outright forward currency trading is inefficient and engage in it infrequently. Instead, for future maturities, financial institutions trade among themselves as well as with some corporate customers on the basis of a transaction known as a *foreign-exchange swap*. A swap transaction is a simultaneous purchase and sale of a certain amount of foreign currency for two different value dates. The key aspect is that the financial institution arranges the swap as a single transaction with a single counterparty, either another financial institution or a nonbank customer. This means that, unlike outright spot or forward transactions, a trader does not incur a net open position since the financial institution contracts both to pay and to receive the same amount of currency at specified rates. Note that a foreign-*exchange* swap is different from a foreign-*currency* swap, because the currency swap involves the periodic exchange of interest payments. See the discussion in section 4335.1, "Currency Swaps."

A foreign-exchange swap allows each party to use a currency for a period in exchange for another currency that is not needed during that time. Thus, the swap offers a useful investment facility for temporary idle currency balances of a corporation or a financial institution. Swaps also provide a mechanism for a financial institution to accommodate the outright forward transactions executed with customers or to bridge gaps in the maturity structure of outstanding spot and forward contracts.

The two value dates in a swap transaction can be any two dates. But, in practice, markets exist only for a limited number of standard maturities. One of these standard types is called a *spot-against-forward swap*. In a spot-against-forward swap transaction, a trader buys or sells a currency for the spot value date and simultaneously sells or buys it back for a value date a week, a month, or three months later.

Another type of transaction of particular interest to professional market-making financial institutions is called a *tomorrow-next* swap or a *rollover*. These are transactions in which the dealer buys or sells a currency for value the next business day and simultaneously sells or buys it back for value the day after. A more sophisticated type of swap is called a *forward-forward* in which the dealer buys or sells currency for one future date and sells or buys it back for another future date. Primarily, multinational banks specialize in transactions of this type.

Options

The foreign-exchange options market includes both plain vanilla and exotic transactions. See section 4330.1, "Options," for a general discussion. Most options activity is plain vanilla.

USES

Foreign exchange is used for investment, hedging, and speculative purposes. Most banks use it to service customers and also to trade for their own account. Corporations use the FX market mainly to hedge their foreign-exchange exposure.

DESCRIPTION OF MARKETPLACE

Market Participants

Sell Side

The majority of U.S. banks restrict their foreign-exchange activities to serving their customers'

foreign-currency needs. The banks will simply sell the currency at a rate slightly above the market and subsequently offset the amount and maturity of the transaction through a purchase from another correspondent bank at market rates. This level of activity involves virtually no risk exposure as currency positions are covered within minutes. For these banks, a small profit is usually generated from the rate differential, but the activity is clearly designated as a service center rather than a profit center.

Usually, the larger the financial institution, the greater the emphasis placed on foreign-exchange activity. For instance, while serving the needs of corporate customers is still a priority, most regional banks also participate in the interbank market. These banks may look at the trading function as a profit center as well as a service. Such banks usually employ several experienced traders and may take positions in foreign currencies based on anticipated rate movements. These banks use their involvement in the interbank market to get information about the various markets. For most of these participants, the trading volume in the interbank market constitutes the bulk of the volume. (In some cases, the interbank volume is about 80 to 90 percent of total volume). Multinational banks assume by far the most significant role in the foreign-exchange marketplace. While still serving customer needs, these banks engage heavily in the interbank market and look to their foreign-exchange trading operation for sizeable profits. These banks trade foreign exchange on a global basis through their international branch networks.

One of the major changes in the structure of the foreign-exchange market over the past few years has been the increase in the use of electronic market-making and execution systems. In the past, most interbank dealing was done through the interbank brokers' system; however, advances in technology have made it more efficient for market participants to use electronic systems. (Among the more popular systems are Reuters and EBS (Electronic Brokering Systems).) These developments have decreased the number of errors that are common in the use of the brokers' market (for example, the use of points and error checks) and have also cut down on the costs of doing business.

Buy Side

The buy side consists of corporate hedgers, investors, and speculators. Corporations use this market to hedge their assets and liabilities incurred as a result of their overseas operations. Investors (for example, international mutual funds) use this market to gain exposure to markets and sometimes to hedge away the currency risk of their equity portfolios.

Market Transparency

Price transparency is very high. The prices for most of the markets are disseminated through various vendors such as Reuters and Telerate.

PRICING

Two methods are used to quote foreign-exchange rates. The method used depends on the currency.

- *American quote*. Number of foreign-currency units per U.S. dollar (for example, 105 yen per dollar). Most currencies are quoted using this convention.
- *European quote*. Number of U.S. dollars per foreign-currency unit (for example, $1.60 per British pound sterling). British and Irish pounds and Australian and New Zealand dollars are the most common currencies using this convention.

Spot FX

Most institutions will quote both a bid and an offer. When, for example, Bank A quotes sterling at $1.7115-25, it is saying that it will buy (bid) sterling at $1.7115 or sell (offer) sterling at $1.7125. If Bank B's interest is to buy sterling and the given quote is appealing, it will buy sterling from Bank A at $1.7125 (Bank A's offer price). Note that while Bank B may choose to buy, sell, or pass as it wishes, it must do business on the terms established by Bank A. These terms will be in Bank A's favor. As soon as Bank B announces it will purchase sterling at $1.7125, Bank A acquires a net open position (short) in sterling. Bank A must then decide whether to hold its short position (in anticipation of a decline in sterling) or cover its position. If it wishes to cover, it may call another bank and purchase the amount it sold to Bank B. However, as the calling bank, Bank A would buy its

sterling from the offered side of the quote it receives and must buy it at $1.7125 or less to avoid a loss.

Foreign-Exchange Swaps

In foreign-exchange swap transactions, the trader is only interested in the difference between spot and forward rates—the premium or discount—rather than the outright spot and forward rates themselves. Premiums and discounts expressed in points ($0.0001 per pound sterling or DM 0.0001 per dollar) are called swap rates. If the pound spot rate is $1.8450 and the six-month forward rate is $1.8200, the dollar's six-month premium is 250 points ($0.0250). If the pound spot rate is $1.8450 and the six-month forward rate is $1.8625, the dollar's six-month discount is 175 points ($0.0175).

Since, in a swap transaction, a trader is effectively borrowing one currency and lending the other for the period between the two value dates, the premium or discount is often evaluated in terms of percent per annum. For the examples above, the premium of 250 points is equivalent to 2.71 percent per annum, while the discount of 175 points is equivalent to 1.90 percent per annum. To calculate the percentage premium for the first case—

- take the swap rate ($0.0250),
- multiply by 12 months and divide by six months (a per annum basis),
- divide by the spot rate ($1.8450), and
- multiply by 100 (to get a percent basis).

This formula can be expressed as—

$$\%\ per\ annum = \frac{Premium\ or\ Discount * 12}{Spot\ rate * no.\ of\ months\ of\ forward\ contract} * 100$$

Forward rates (premiums or discounts) are solely influenced by the interest-rate differentials between the two countries involved. As a result, when the differential changes, forward contracts previously booked could now be covered at either a profit or loss. For example, assume an interest-rate differential between sterling and dollars of 3 percent (with the sterling rate lower). Using this formula, with a spot rate of $1.80, the swap rate on a three-month contract would be a premium of 135 points. If that interest-rate differential increases to 4 percent (by a drop in the sterling rate or an increase in the dollar rate), the premium would increase to 180 points. Therefore, a trader who bought sterling three months forward at 135 points premium could now sell it at 180 points premium, or at a profit of 45 points (expressed as .0045).

Thus, the dealer responsible for forward trading must be able to analyze and project dollar interest rates as well as interest rates for the currency traded. Additionally, because forward premiums or discounts are based on interest-rate differentials, they do not reflect anticipated movements in spot rates.

HEDGING

Spot FX

Banks engaged in trading in the spot market will acquire net open positions in the course of dealing with customers or other market makers. The bank must then decide whether to hold its open position (in anticipation of a move in the currency) or cover its position. If it wishes to cover, the bank may call another bank and either buy or sell the currency needed to close its open position.

Financial institutions engaging in interbank spot trading will often have sizeable net open positions, though many for just brief periods of time. No matter how skilled the trader, each institution will have occasional losses. Knowing when to close a position and take a small loss before it becomes large is a necessary trait for a competent trader. Many financial institutions employ a "stop-loss policy," whereby a net open position must be covered if losses from it reach a certain level. While a trader's forecast may ultimately prove correct within a day or week, rapid rate movements often cause a loss within an hour or even minutes. Also, access to up-to-the-minute information is vital for involvement in spot trading. Financial institutions that lack the vast informational resources of the largest multinationals may be particularly vulnerable to sudden spot rate movements. As a result, examiners should closely review financial institutions in which foreign-exchange activities consist primarily of interbank spot trading.

Forwards

Active trading financial institutions will generally have a large number of forward contracts outstanding. The portfolio of forward contracts is often called a *forward book*. Trading forward foreign exchange involves projecting interest-rate differentials and managing the forward book to be compatible with these projections.

Forward positions are generally managed on a gap basis. Normally, financial institutions will segment their forward books into 15-day periods and show the net (purchased forward contracts less sold ones) balance for each period. Volumes and net positions are usually segregated into 15-day periods for only the first three months, with the remainder grouped monthly. The trader will use the forward book to manage his or her overall forward positions.

A forward book in an actively traded currency may consist of numerous large contracts but, because of the risks in a net open position, total forward purchases will normally be approximately equal to total forward sales. What matters in reviewing a forward book is the distribution of the positions among periods. For example, if a forward book in sterling has a long net position of 3,200,000 for the first three months and is short a net 3,000,000 for the next four months, the forward book is structured anticipating a decline in dollar interest rates as compared with sterling interest rates since these sold positions could be offset (by purchase of a forward contract to negate the sold forward position) at a lower price—either through reduced premium or increased discount. See the subsection below for a discussion of the risks encountered in hedging foreign-exchange exposure.

RISKS

Exchange-Rate Risk

Exchange-rate (market) risk is an inevitable consequence of trading in a world in which foreign-currency values move up and down in response to shifting market supply and demand. When a financial institution's dealer buys or sells a foreign currency from another financial institution or a nonbank customer, exposure from a net open position is created. Until the time that the position can be covered by selling or buying an equivalent amount of the same currency, the institution is exposed to the risk that the exchange rate might move against it. That risk exists even if the dealer immediately seeks to cover the position because, in a market in which exchange rates are constantly changing, a gap of just a few minutes can be long enough to transform a potentially profitable transaction into a loss. Since exchange-rate movements can consistently run in one direction, a position carried overnight or over a number of days entails greater risk than one carried a few minutes or hours.

At any time, the trading function of a financial institution may have long positions in some currencies and short positions in others. These positions do not offset each other, even though, in practice, the price changes of some currencies do tend to be correlated. Traders in institutions recognize the possibility that the currencies in which they have long positions may fall in value and the currencies in which they have short positions may rise. Consequently, gross trading exposure is measured by adding the absolute value of each currency position expressed in dollars. The individual currency positions and the gross dealing exposure must be controlled to avoid unacceptable risks.

To accomplish this, management limits the open positions dealers may take in each currency. Practices vary among financial institutions, but, at a minimum, limits are established on the magnitude of open positions which can be carried from one day to the next (overnight limits). Several institutions set separate limits on open positions dealers may take during the day. These are called ''daylight limits.'' Formal limits on gross dealing exposure also are established by some institutions, while others review gross exposure more informally. The various limits may be administered flexibly, but the authority to approve a temporary departure from a limit is typically reserved for a senior officer.

For management and control purposes, most financial institutions distinguish between positions arising from actual foreign-exchange transactions (trading exposure) and the overall foreign-currency-translation exposure of the institution. The former includes the positions recorded by the institution's trading operations at the head office and at offices abroad. In addition to trading exposure, overall exposure incorporates all the institution's assets and liabilities denominated in foreign currencies,

including loans, investments, deposits, and the capital of foreign branches.

Maturity Gaps and Interest-Rate Risk

Interest-rate risk arises whenever mismatches or gaps occur in the maturity structure of a financial institution's foreign-exchange forward book. Managing maturity mismatches is an exacting task for a foreign-exchange trader.

In practice, the problem of handling mismatches is complex. Eliminating maturity gaps on a contract-by-contract basis is impossible for an active trading institution. Its foreign-exchange book may include hundreds of outstanding contracts, with some maturing each business day. Since the book is changing continually as new transactions are made, the maturity gap structure also changes constantly.

While remaining alert to unusually large mismatches in maturities that call for special action, traders generally balance the net daily payments and receipts for each currency through the use of rollovers. Rollovers simplify the handling of the flow of maturing contracts and reduce the number of transactions needed to balance the book. Reliance on day-to-day swaps is a relatively sound procedure as long as interest-rate changes are gradual and the size and length of maturity gaps are controlled. However, it does leave the financial institution exposed to sudden changes in relative interest rates between the United States and other countries. These sudden changes influence market quotations for swap transactions and, consequently, the cost of bridging the maturity gaps in the foreign-exchange book.

The problem of containing interest-rate risk is familiar to major money market banks. Their business often involves borrowing short-term and lending longer-term to benefit from the normal tendency of interest rates to be higher for longer maturities. But in foreign-exchange trading, it is not just the maturity pattern of interest rates for one currency that counts. In handling maturity gaps, the differential between interest rates for two currencies is decisive, making the problem more complex.

To control interest-rate risk, senior management generally imposes limits on the magnitude of mismatches in the foreign-exchange book. Procedures vary, but separate limits are often set on a day-to-day basis for contracts maturing during the following week or two and for each consecutive half-monthly period for contracts maturing later. At the same time, management relies on officers abroad, domestic money market experts, and its economic research department to provide ongoing analysis of interest-rate trends.

Credit and Settlement Risk

When a financial institution books a foreign-exchange contract, it faces a risk, however small, that the counterparty will not perform according to the terms of the contract. To limit credit risk, a careful evaluation of the creditworthiness of the customer is essential. Just as no financial institution can lend unlimited amounts to a single customer, no institution would want to trade unlimited amounts of foreign exchange with one counterparty.

Credit risk arises whenever an institution's counterparty is unable or unwilling to fulfill its contractual obligations—most blatantly when a corporate customer enters bankruptcy or an institution's counterparty is declared insolvent. In any foreign-exchange transaction, each counterparty agrees to deliver a certain amount of currency to the other on a particular date. Every contract is immediately entered into the financial institution's foreign-exchange book. In balancing its trading position, a financial institution counts on that contract being carried out in accordance with the agreed-upon terms. If the contract is not liquidated, then the institution's position is unbalanced and the institution is exposed to the risk of changes in the exchange rates. To put itself in the same position it would have been in if the contract had been performed, an institution must arrange for a new transaction. The new transaction may have to be arranged at an adverse exchange rate. The trustee for a bankrupt company may perform only on contracts which are advantageous to the company and disclaim those contracts which are disadvantageous. Some dealers have attempted to forestall such arbitrary treatment through the execution of legally recognized bilateral netting agreements. Examiners should determine whether dealers have such agreements in place and whether they have a favorable legal opinion as to their effectiveness, particularly in cross-border situations.

Another form of credit and settlement risk stems from the time-zone differences between the United States and foreign nations. Inevitably, an institution selling sterling, for instance,

must pay pounds to a counterparty before it will be credited with dollars in New York. In the intervening hours, a company can go into bankruptcy or an institution can be declared insolvent. Thus, the dollars may never be credited. Settlement risk has become a major source of concern to various supervisory authorities because many institutions are not aware of the extent of the risks involved. The Bank for International Settlements (BIS) has laid out the various risks in a paper that was published in July 1996.

Managing credit risk is the joint responsibility of the financial institution's trading department and its credit officers. A financial institution normally deals with corporations and other institutions with which it has an established relationship. Dealing limits are set for each counterparty and are adjusted in response to changes in its financial condition. In addition, most institutions set separate limits on the value of contracts that can mature on a single day with a particular customer. Some institutions, recognizing that credit risk increases as maturities lengthen, restrict dealings with certain customers to spot transactions or require compensating balances on forward transactions. An institution's procedures for evaluating credit risk and minimizing exposure are reviewed by supervisory authorities as part of the regular examination process.

ACCOUNTING TREATMENT

The accounting treatment for foreign-exchange contracts is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a foreign-exchange contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are as follows.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	1.00%
Five years or less	5.00%
Greater than five years	7.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, "Capital Adequacy.") For institutions that apply market-risk capital standards, all foreign-exchange transactions are included in value-at-risk (VAR) calculations for market risk.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Foreign-exchange contracts are not considered investment securities under 12 USC 24(7th). However, the use of these instruments is considered to be an activity incidental to banking, within safe and sound banking practices.

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GENERAL DESCRIPTION

Forwards are financial contracts in which two counterparties agree to exchange a specified amount of a designated product for a specified price on a specified future date or dates. Banks are active participants in the forward market. Forwards differ from futures (discussed separately in this manual) in that their terms are not standardized and they are not traded on organized exchanges. Because they are individually negotiated between counterparties, forwards can be customized to meet the specific needs of the contracting parties.

CHARACTERISTICS AND FEATURES

Forwards are over-the-counter (OTC) contracts in which a buyer agrees to purchase from a seller a specified product at a specified price for delivery at a specified future time. While forward contracts can be arranged for almost any product, they are most commonly used with currencies, securities, commodities, and short-term debt instruments. (Forwards on short-term debt instruments, or ''forward rate agreements,'' are discussed separately in this manual.) Commitments to purchase a product are called long positions, and commitments to sell a product are called short positions.

Foreign-exchange forward contracts constitute the largest portion of the forward market. They are available daily in the major currencies in 30-, 90-, and 180-day maturities, as well as other maturities depending on customer needs. Contract terms specify a forward exchange rate, a term, an amount, the ''value date'' (the day the forward contract expires), and locations for payment and delivery. The date on which the currency is actually exchanged, the ''settlement date,'' is generally two days after the value date of the contract.

In most instances, foreign-exchange forwards settle at maturity with cash payments by each counterparty. Payments between financial institutions arising from contracts that mature on the same day are often settled with one net payment.

USES

Market participants use forwards to (1) hedge market risks, (2) arbitrage price discrepancies within and between markets, (3) take positions on future market movements, and (4) profit by acting as market makers. Financial institutions, money managers, corporations, and traders use these instruments for managing interest-rate, currency, commodity, and equity risks. While most large financial institutions are active in the interest-rate and foreign-exchange markets, only a handful of financial institutions have exposures in commodities or equities.

Hedging Interest-Rate Exposure

Financial institutions use forwards to manage the risk of their assets and liabilities, as well as off-balance-sheet exposures. Asset-liability management may involve the use of financial forwards to lock in spreads between borrowing and lending rates. For example, a financial institution may sell an interest-rate forward contract in advance of an anticipated funding to lock in the cost of funds. If LIBOR subsequently increases, the short position will increase in value, offsetting the higher spot interest cost that the financial institution will have to pay on its funding.

Forward contracts may be used to hedge investment portfolios against yield curve shifts. Financial institutions can hedge mortgage portfolios by selling GNMA forwards, and government bond dealers may sell forwards to hedge their inventory. Pension and other types of benefits managers may hedge a fixed future liability by selling forwards or may hedge an expected receipt by buying forwards. When offsetting swaps with the necessary terms cannot be found, interest-rate swap dealers may also use forwards, as well as Eurodollar futures and Treasury futures, to hedge their unmatched commitments.

Hedging Foreign-Exchange Exposure

Corporations engaged in international trade may use foreign-currency contracts to hedge payments and receipts denominated in foreign currencies. For example, a U.S. corporation that

exports to Germany and expects payment in deutschemarks (DM) could sell DM forwards to eliminate the risk of a depreciation of the DM at the time that the payment arrives. A corporation may also use foreign-exchange contracts to hedge the translation of its foreign earnings for presentation in its financial statements.

Financial institutions use foreign-exchange forwards to hedge positions arising from their foreign-exchange dealing businesses. An institution that incurs foreign-exchange exposure from assisting its customers with currency risk management can use offsetting contracts to reduce its own exposure. A financial institution can also use forwards to cover unmatched currency swaps. For example, a dealer obligated to make a series of DM payments could buy a series of DM forwards to reduce its exposure to changes in the DM/$ exchange rate.

Arbitrage

Risk-free arbitrage opportunities in which a trader can exploit mispricing across related markets to lock in a profit are rare. However, for brief periods of time, pricing in the forward market may not be consistent with pricing in the cash market. For example, if DM forwards are overpriced relative to the rates implied by interest-rate parity relationships, a trader could borrow dollars, sell them against spot DM, purchase a DM deposit, and sell the DM forward. This arrangement would lock in a risk-free return.

DESCRIPTION OF MARKETPLACE

Primary Market

Forward contracts are not standardized. Market makers such as banks, investment banks, and some insurance companies arrange forward contracts in various amounts, including odd lots, to suit the needs of a particular counterparty. Brokers, who arrange forward contracts between two counterparties for a fee, are also active in the forward market. End-users, including banks, corporations, money managers, and sovereign institutions, use forwards for hedging and speculative purposes.

Secondary Market

Once opened, forwards tend not to trade because of their lack of standardization, the presence of counterparty credit risk, and their limited transferability.

Market Transparency

The depth of the interest-rate and foreign-exchange markets and the interest-rate parity relationships help ensure transparency of forward prices. Market makers quote bid/ask spreads, and brokers bring together buyers and sellers, who may be either dealers or end-users. Brokers distribute price information over the phone and via electronic information systems.

PRICING

In general, the value of a long forward contract position equals the spot price minus the contract price. For example, forward (and spot) foreign-exchange rates are quoted in the number of units of the foreign currency per unit of the domestic currency. Forward foreign-exchange rates depend on interest-rate parity among currencies. Interest-rate parity requires the forward rate to be that rate which makes a domestic investor indifferent to investing in the home currency versus buying foreign currency at the spot rate, investing it in a foreign time deposit, and subsequently converting it back to domestic currency at the forward rate. The interest-rate parity relationship can be expressed as—

$$F = S \times [1 + r(F)] / [1 + r(D)],$$

where F is the forward rate, S is the spot rate, $r(D)$ is the domestic interest rate, and $r(F)$ is the foreign interest rate. Currency rates are foreign currency per unit of domestic currency. For example, assume the 180-day dollar ($) interest rate is 5 percent, the 180-day DM interest rate is 10 percent, and the DM/$ spot rate is 1.3514 (DM per dollar). A dollar-based investor can borrow dollars at 5 percent, sell them against DM at the DM/$ spot rate of 1.3514, and invest the DM at a 10 percent rate of return. When the investment matures, the DM proceeds can be reconverted to dollars at the forward rate of 1.4156 DM for each dollar, giving the investor a total dollar return of 5 percent, which is the

same return available in dollar deposits. In this instance, the forward rate is higher than the spot rate to compensate for the difference between DM- and dollar-based interest rates. The difference between the domestic and foreign interest rates is referred to as the ''cost of carry.''

HEDGING

Positions in forwards can be offset by cash-market positions as well as other forward or futures position. A financial institution's exposure from a foreign-exchange forward contract can be split into a spot-currency component and an interest-rate differential between the two currencies. For the spot foreign-exchange component, consider a three-month long forward position that receives sterling (£) and pays dollars (in three months, the institution receives sterling and pays dollars). This position is comparable to the combination of receiving a three-month dollar deposit and making a three-month sterling loan. The forward position implicitly locks in a spread between the lending and borrowing rates while exposing the institution to future £/$ spot rates.

To eliminate the currency and interest-rate exposure, the financial institution can either enter into an offsetting forward or take a short position in sterling. By entering into a three-month forward contract to deliver sterling against dollars, the financial institution could virtually eliminate its currency exposure. Alternatively, the institution could borrow three-month sterling, sell it, and invest the dollar proceeds in a three-month deposit. When the long £/$ forward comes due, the institution can use the maturing dollar deposit to make its payment and apply the sterling proceeds to the repayment of the sterling loan.

RISKS

Users and providers of forwards face various risks, which must be well understood and carefully managed. The risk-management methods applied to forwards and futures may be similar to those used for other derivative products.

Credit Risk

Generally, a party to a forward contract faces credit risk to the degree that its side of the contract has positive market value. In other words, credit risk in forwards arises from the possibility that a contract has positive replacement cost and the counterparty to the contract fails to perform its obligations. The value of a contract is generally zero at inception, but it changes as the market price of the product underlying the forward changes. If the institution holds a contract that has positive market value (positive replacement cost) that the counterparty defaults on, the institution would forfeit this value. To counter this risk, weak counterparties may be required to collateralize their commitments. Counterparties dealing with financial institutions may be required to maintain compensating balances or collateral. Because of their credit risk and the lack of standardization, forwards generally cannot be terminated or transferred without the consent of each party.

As part of their risk management, financial institutions generally establish credit lines for each trading counterparty. For foreign exchange (spot and forward), the lines are most often expressed in notional terms. These credit lines include global counterparty limits, daily counterparty settlement limits, and maturity limits. Some sophisticated financial institutions use credit-equivalent risk limits rather than notional amounts for their foreign-exchange exposure. For interest-rate risk, financial institutions usually express their exposure in credit equivalents of notional exposure. Financial institutions may require a less creditworthy counterparty to pledge collateral and supplement it if the position moves against the counterparty.

Market Risk

The risk of forward contracts should be evaluated by their effect on the market risk of the overall portfolio. Institutions that leave positions in the portfolio unhedged may be more exposed to market risk than institutions that ''run a matched book.'' A financial institution may choose to leave a portion of its exposure uncovered to benefit from expected price changes in the market. However, if the market moves against the institution's prediction, the institution would incur losses.

Basis Risk

Basis risk is the potential for loss from changes

in the price or yield differential between instruments in two markets. Although risk from changes in the basis tends to be less than that arising from absolute price movements, it can sometimes represent a substantial source of risk. Investors may set up hedges, which leave them vulnerable to changes in basis between the hedge and the hedged instrument.

Yield-curve risk may also arise by holding long and short positions with equal durations but different maturities. Although such arrangements may protect against a parallel yield-curve shift, they may leave investors exposed to the risk of a nonparallel shift causing uneven price changes. In foreign currency, basis risk arises from changes in the differential between interest rates of two currencies.

Liquidity Risk

Forwards are usually not transferable without the consent of the counterparty and may be harder to liquidate than futures. To eliminate the exposure of a contract, a customer may have to buy an offsetting position if the initial dealer does not want to unwind or allow the transfer of the contract.

Clearing and Settlement Risk

In OTC markets, clearing and settlement occur on a bilateral basis thereby exposing counterparties to intraday and overnight credit risks. To reduce these risks as well as transactions costs, many financial institutions have bilateral netting arrangements with their major counterparties. Position netting allows counterparties to net their payments on a given day, but does not discharge their original legal obligations for the gross amounts. Netting by novation replaces obligations under individual contracts with a single new obligation.

ACCOUNTING TREATMENT

The accounting treatment for foreign-exchange forward contracts is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a forward contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are below.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	0.00%
Five years or less	0.50%
Greater than five years	1.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, "Capital Adequacy.") For institutions that apply market-risk capital standards, all foreign-exchange transactions are included in value-at-risk (VAR) calculations for market risk.

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Forwards are not considered investments under 12 USC 24 (seventh). The use of these instruments is considered to be an activity incidental to banking, within safe and sound banking practices.

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GENERAL DESCRIPTION

A forward rate agreement (FRA) is an over-the-counter (OTC) contract for a cash payment at maturity based on a *market (spot) rate* and a prespecified *forward rate*. The contract specifies how the spot rate is to be determined (this is sometimes called the *reference rate*). If the spot rate is higher than the contracted rate, the seller agrees to pay the buyer the difference between the prespecified forward rate and the spot rate prevailing at maturity, multiplied by a *notional principal amount*. If the spot rate is lower than the forward rate, the buyer pays the seller. The notional principal, which is not exchanged, represents a Eurocurrency deposit of a specified *maturity* or *tenor*, which starts on the day the FRA matures. The cash payment is the present value of the difference between the forward rate and the spot rate prevailing at the settlement date times the notional amount. This payment is due at the settlement date. Buying and selling FRAs is sometimes called *taking* and *placing* FRAs, respectively. FRAs with maturities longer than a year are called *long-dated* FRAs.

FRAs are usually *settled* at the start of the agreed-upon period in the future. At this time, payment is made of the discounted present value of the interest payment corresponding to the difference between the contracted fixed rate (the forward rate at origination) and the prevailing reference rate (the spot rate at maturity). For example, in a six-against-nine-month (6x9) FRA, the parties agree to a three-month rate that is to be netted in six months' time against the prevailing three-month reference rate, typically LIBOR. At settlement (after six months), the present value of the net interest rate (the difference between the spot and the contracted rate) is multiplied by the notional principal amount to determine the amount of the cash exchanged between the parties. The basis used in discounting is actual/360-day for all currencies except pounds sterling, which uses an actual/365-day count convention.

CHARACTERISTICS AND FEATURES

An FRA can be entered into either orally or in writing. Each party is, however, required to confirm the FRA in writing. FRAs are customized to meet the specific needs of both parties. They are denominated in a variety of currencies and can have customized notional principal amounts, maturities, and interest periods. The British Bankers' Association (BBA) has developed standards for FRAs, called *Forward Rate Agreements of the BBA (FRABBA) terms*, which are widely used by brokers and dealers. The standards include definitions, payment and confirmation practices, and various rights and remedies in case of default. Under these standards, counterparties execute a master agreement, under which they agree to execute their FRA transactions.

USES

Hedging

FRAs are often used as a hedge against future movement in interest rates. Like financial futures, they offer a means of managing interest-rate risk that is not reflected on the balance sheet and, therefore, generally requires less capital.

FRAs allow a borrower or lender to ''lock in'' an interest rate for a period that begins in the future (assuming no change in the basis), thus effectively extending the maturity of its liabilities or assets. For example, a financial institution that has limited access to funds with maturities greater than six months and has relatively longer-term assets can contract for a six-against-twelve-month FRA, and thus increase the extent to which it can match asset and liability maturities from an interest-rate risk perspective. By using this strategy, the financial institution determines today the cost of six-month funds it will receive in six months' time. Similarly, a seller of an FRA can lengthen the maturity profile of its assets by determining in advance the return on a future investment.

Trading

Banks and other large financial institutions employ FRAs as a trading instrument. Market makers seek to earn the bid/ask spread through buying and selling FRAs. Trading may also take the form of arbitrage between FRAs and interest-rate futures or short-term interest-rate swaps.

DESCRIPTION OF MARKETPLACE

Primary Market

Commercial banks are the dominant player in the FRA market, both as market makers and end-users. Nonfinancial corporations have also become significant users of FRAs for hedging purposes. Most contracts are originated in London and New York, but all major European financial centers have a significant share of volume. Market transparency is high in the FRA market, and quotes for standard FRA maturities in most currencies can be obtained from sources such as Telerate and Bloomberg.

A significant amount of trading in FRAs is done through brokers who operate worldwide. The brokers in FRAs usually deal in Euros and swaps. The principal brokers are Tullet & Tokyo Foreign Exchange; Garvin Guy Butler; Godsell, Astley & Pearce; Fulton Prebon; and Eurobrokers.

Secondary Market

The selling of an existing FRA consists of entering into an equal and opposite FRA at a forward rate offered by a dealer or other party at the time of the sale. The secondary market in FRAs is very active and is characterized by a significant amount of liquidity and market transparency.

PRICING

Initial Cost

When an FRA is initiated, the FRA *rate* is set such that the value of the contract is zero, since no money is exchanged, except perhaps a small arrangement fee (which may not be payable until settlement). Forward rates are directly determined from spot rates. For example, the rate on a 6-against-12-month FRA will be derived directly from rates on 6- and 12-month deposits. (This rate derived from the yield curve is termed an *implied forward rate*.) As an example, suppose the 6-month Eurodollar deposit rate is 6.00 percent and the 12-month Eurodollar deposit rate is 7.00 percent. The rate on a 6-against-12-month FRA would be derived by finding the 6-month forward rate, 6 months hence ($_6R_{12}$):

$$(1.07) = (1.06)^{.5}(1 + {}_6R_{12})^{.5}$$

$$_6R_{12} = 8.00\%$$

There is little evidence that arbitrage opportunities exist between the FRA and deposit markets after taking into account bid/offer spread and transactions costs.

Valuation at Settlement

Settlement on an FRA contract is made in advance, that is at the settlement date of the contract. The settlement sum is calculated by discounting the interest differential due from the maturity date to the settlement date using the relevant market rate.

Let f = the FRA rate (as a decimal), s = the spot rate at maturity (as a decimal), t = the tenor of the notional principal in number of days, P = the notional principal, and V = the sum due at settlement. Assume that the basis is actual/360-day. The interest due the buyer before discounting is $(s - f)P(t/360)$. The discount factor is $1 - s(t/360)$. V is the sum due at settlement:

$$V = [(s - f)P(t/360)][1 - s(t/360)]$$

For example, consider a \$10 million three-against-six-month FRA with a forward rate of 6.00 percent and a spot rate at maturity of 6.50 percent.

$$V = [\$10\text{mm}(.065 - .06)(91/360)]$$
$$[1 - ((.065)(91/360))]$$

$$V = \$12{,}431.22$$

A payment of \$12,431.22 would be made by the seller to the buyer of the FRA at settlement.

HEDGING

Market Risk

Eurodollar futures are usually used to hedge the market risk of FRA positions. However, the only perfect economic hedge for an FRA is an offsetting FRA with the same terms.

Credit Risk

Letters of credit, collateral, and other credit

enhancements can be required to mitigate the credit risks of FRAs. In practice, however, this is rarely done because the credit risk of FRAs is very low.

RISKS

Interest-Rate Risk

The interest-rate risk (or market risk) of an FRA is very similar to a short-term debt instrument with maturity equal to the interest period of the FRA. For example, a six-against-nine-month FRA has a price sensitivity similar to that of a three-month debt instrument (approximate duration of one-fourth of a year).

Liquidity Risk

Liquidity risk (the likelihood that one cannot close out a position) is low. The FRA markets are very liquid, although generally not as liquid as the futures markets.

Credit Risk

The credit risk of FRAs is small but greater than the credit risk of futures contracts. The credit risk of futures is minimal because of daily margining and the risk management of the futures clearing organizations. If an FRA counterparty fails, a financial institution faces a loss equal to the contract's replacement cost. The risk of loss depends on both the likelihood of an adverse movement of interest rates and the likelihood of default by the counterparty. For example, suppose a financial institution buys an FRA at 10 percent to protect itself against a rise in LIBOR. By the settlement date, LIBOR has risen to 12 percent, but the counterparty defaults. The financial institution therefore fails to receive anticipated compensation of 2 percent per annum of the agreed notional principal amount for the period covered by the FRA. Note that the financial institution is not at risk for the entire notional principal amount, but only for the net interest-rate differential.

FRAs raise the same issues about measuring credit-risk exposure as interest-rate swaps. Because the periods covered by FRAs are typically much shorter, many institutions calculate the credit exposure on FRAs as a flat rate against the counterparty's credit limit, for example, 5 percent (sometimes 10 percent) of the notional principal amount. The 5 percent credit exposure is a rule of thumb adopted for administrative ease, and it represents the approximate potential loss from counterparty default if the reference interest rate for a three-month future period moves against the financial institution by 20 percentage points before the settlement date. For an agreement covering a six-month future interval, the 5 percent charge to a counterparty's credit limit represents exposure against approximately a 10 percentage point movement in the reference interest rate.

ACCOUNTING TREATMENT

The accounting treatment of single-currency forward interest-rate contracts, such as forward rate agreements, is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of an FRA contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are below.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	0.00%
Five years or less	0.50%
Greater than five years	1.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'') For institutions that apply market-risk capital standards, all foreign-exchange trans-

actions are included in value-at-risk (VAR) calculations for market risk.

LEGAL LIMITATIONS FOR BANK INVESTMENTS

FRAs are not considered investments under 12 USC 24 (seventh). The use of these instruments is considered to be an activity incidental to banking, within safe and sound banking practices.

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GENERAL DESCRIPTION

Futures contracts are exchange-traded agreements for delivery of a specified amount and quality of a particular product at a specified price on a specified date. Futures contracts are essentially exchange-traded forward contracts with standardized terms. Futures exchanges establish standardized terms for futures contracts so that buyers and sellers only have to agree on price.

Unlike the over-the-counter (OTC) derivative markets, futures contracts are required by U.S. law to trade on federally licensed contract markets that are regulated by the Commodity Futures Trading Commission (CFTC). Banks may invest in futures for their own account or act as a futures broker through a futures commission merchant (FCM) subsidiary. The two generic types of futures contracts are commodity futures (such as coffee, cocoa, grain, or rubber) and financial futures (that is, currencies, interest rates, and stock indexes). This section focuses on financial futures.

CHARACTERISTICS AND FEATURES

Terms

All futures contracts have the following standardized terms: specific product, quality (or grade), contract size, pricing convention, and delivery date. The following is an example of the terms on a futures contract for U.S. Treasury notes traded on an exchange such as the Chicago Board of Trade (CBOT).

Product:	10-year Treasury notes
Contract size:	$100,000
Price quoted:	32nds of 100 percent
Delivery date:	Any business day of delivery month (March, June, September, or December, depending on the particular contract)
Deliverable grade:	Any U.S. Treasury notes with maturity of 6½ to 10 years

Margin

In addition, all exchanges require a *good faith* deposit or *margin* in order to buy or sell a futures contract. The amount of margin will vary from contract to contract and from exchange to exchange. The required margin deposit may also vary depending on the type of position held. The margin requirement is meant to ensure that adequate funds are available to cover losses in the event of adverse price changes. Margin requirements are determined and administered by the exchange's clearinghouse.

As an example of how margin requirements operate, consider a deutschemark (DM) 125,000 futures contract against the dollar with a price of $.68/DM. One trader takes a long DM position, meaning that it will receive DM 125,000 and pay $85,000 in December. Another trader takes a short DM position, such that it will pay the DM 125,000 in return for $85,000. Each trader puts up an initial margin of $4,250, which is invested in U.S. Treasuries in margin accounts held at each trader's broker. Time passes and the $/DM rate increases (the DM decreases in value) so that the trader with the long DM position must post additional margin. When the spot rate subsequently reaches $.61/DM, the long trader decides to cut his losses and close out his position. Ignoring the limited effect of prior fluctuations in margin, the long trader's cumulative loss measures $8,750 ($.68/DM – $.61/DM) × DM 125,000).

Exchanges

Futures contracts are traded on organized exchanges around the world. Exchanges for the major futures contracts in currencies, interest rates, and stock indexes are discussed below.

Currency Futures

In the United States, futures contracts trade in the International Monetary Market (IMM) of the Chicago Mercantile Exchange (CME) in the major currencies, including the deutschemark, Japanese yen, British pound, Canadian dollar, and Swiss franc. Overseas, the most active currency futures exchanges are the London

International Financial Futures Exchange (LIFFE) and the Singapore International Monetary Exchange (SIMEX).

Interest-Rate Futures

The IMM and the CBOT list most of the fixed-income futures in the United States. Contracts on longer-term instruments, such as Treasury notes (2-, 5-, and 10-year) and Treasury bonds (30-year), are listed on the CBOT. Futures on short-term instruments such as Eurodollar deposits and Treasury bills trade on the IMM. There are also futures on bond indexes such as those for municipal bonds, corporate bonds, Japanese government bonds, and British gilts. As with currencies, the most active overseas exchanges are in London and Singapore.

Stock-Index Futures

In the United States, stock-index futures are available for the S&P 500 (CME), Major Market Index (CME), New York Stock Exchange Composite Index (New York Futures Exchange), and Nikkei 225 Index (CME). Overseas, there are futures on many of the major equity markets, including the Nikkei (Osaka and Singapore Futures Exchanges), DAX (LIFFE), and FTSE 100 (LIFFE).

Clearinghouses

Clearinghouses provide centralized, multilateral netting of an exchange's futures contracts. Centralized clearing, margin requirements, and daily settlement of futures contracts substantially reduce counterparty credit risk. A futures exchange operates in tandem with a clearinghouse that interposes itself between a contract's counterparties and, thus, guarantees payment to each.

In addition, customers in futures markets post collateral, known as initial margin, to guarantee their performance on the obligation. At the end of each day, the futures position is marked to market with gains paid to or losses deducted from (variation margin payments) the margin account. The balance in a margin account cannot fall below a minimum level (known as maintenance margin). If the position falls below the maintenance margin, the counterparty must put up additional collateral.

Under some circumstances, traders that have positions in a variety of futures and options on futures can have their margin determined on a portfolio basis. This process takes into account the natural offsets from combinations of positions which may reduce the total margin required of a market participant. The industry has developed a scenario-based portfolio margining system called $SPAR_{TM}$ which stands for the Standard Portfolio Analysis of Risk.

Many futures contracts specify settlement in cash, rather than by physical delivery, upon expiration of the contract. Cash settlement has the advantage of eliminating the transaction costs of purchasing and delivering the underlying instruments. Examples of cash-settled contracts are futures on Eurodollars, municipal bond indexes, and equity indexes.

USES

Market participants use futures to (1) hedge market risks, (2) arbitrage price discrepancies within and between markets, (3) take positions on future market movements, and (4) profit by acting as market makers (forwards) or brokers (futures). Financial institutions, money managers, corporations, and traders use these instruments for managing interest-rate, currency, commodity, and equity risks. While most large financial institutions are active in the interest-rate and foreign-exchange markets, only a handful of financial institutions have exposures in commodities or equities.

Hedging

Futures are used to hedge the market risk of an underlying instrument. For example, financial institutions often face interest-rate risk from borrowing short-term and lending long-term. If rates rise, the institution's spread will decrease or even become negative. The institution can hedge this risk by shorting a futures contract on a fixed-income instrument (such as a Treasury security) maturing at the same time as the asset. If rates rise, the futures position will increase in value, providing profit to offset the decrease in net interest spread on the cash position. If rates fall, however, the value of the futures contract

will fall, offsetting the increase in the institution's interest-rate spread.

Arbitrage

Risk-free arbitrage opportunities in which a trader can exploit mispricing across related markets to lock in a profit are rare. For brief periods of time, pricing in the futures market may be inconsistent with pricing in the cash market. For example, if DM futures are overpriced relative to the rates implied by interest-rate parity relationships, a trader could borrow dollars, sell them against spot DM, purchase a DM deposit, and sell the DM future. This arrangement would lock in a risk-free return.

Positioning

Traders and investors can use futures for speculating on price movements in various markets. Futures have the advantage of lower transactions costs and greater leverage than many cash-market positions. Speculators may make bets on changes in futures prices by having uncovered long or short positions, combinations of long and short positions, combinations of various maturities, or cash and futures positions. Speculators may profit from uneven shifts in the yield curve, fluctuations in exchange rates, or changes in interest-rate differentials.

For example, a speculator expecting stock prices to increase buys 10 contracts on the S&P 500 index for March delivery at a price of $420. Each contract covers 500 times the price of the index, thereby giving the speculator immediate control of over $2.1 million (420 × 500 × 10) of stock. By February, the index increases to 440, giving the speculator an unrealized profit of $100,000 ((440 – 420) × 500 × 10). The market is still bullish, so the speculator decides to hold the contract for several more weeks, anticipating more profits. Instead, negative economic news drives the index down to 405 and induces the speculator to close out his position, leaving a loss of $75,000.

Money managers use financial futures as an asset-allocation tool. Futures allow managers to shift the fixed-income, currency, and equity portions of their portfolios without having to incur the costs of transacting in the cash market. A fixed-income manager may use bond futures to readjust the composition of a fixed-income portfolio in response to a particular outlook on interest rates. For example, a manager anticipating an increase in interest rates can shorten portfolio duration to reduce the risk of loss by selling Treasury bond or bill futures. Currency futures could be used to reduce or increase currency risk in an international portfolio. Equity index futures can be used to adjust a portfolio's exposure to the stock market.

Market Making or Brokering

A financial institution can also attempt to profit by holding itself out as a market maker or broker, providing two-way prices (bid and offer) to the market. While earning the bid offer spread, the institution will either hedge the resulting positions or choose to hold the position to speculate on expected price movements.

DESCRIPTION OF MARKETPLACE

The combination of contract standardization, centralized clearing, and limited credit risk promotes trading of futures on exchanges such as the CBOT, CME, and LIFFE. In the United States, futures exchanges traditionally use the "open outcry" method of trading, whereby traders and floor brokers, standing in pits on the trading floor, shout out or use hand signals to indicate their buy and sell orders and prices. Technological innovation and the desire for after-hours trading have fostered the development of electronic trading systems. These systems have become quite popular overseas, especially on newer exchanges. For example, GLOBEX is an electronic trading system that currently provides after-hours trading of contracts listed on the CME and the MATIF (Marche a Terme International de France) in Paris. The LIFFE after-hours trade-matching system is called APT, and the CBOT system is called Project A. In addition to these electronic trading systems, several exchanges have extended trading hours through exchange linkages. The oldest and most well-known linkage is the mutual offset system between the CME and the SIMEX for Eurodollar futures contracts. SIMEX has similar arrangements with the International Petroleum Exchange (IPE). LIFFE has announced

plans for futures linkages with the CBOT and the CME.

Customers submit their buy or sell orders through registered commodity brokers known as FCMs. Several large domestic and foreign banks and bank holding companies have established their own FCM subsidiaries. Most of these subsidiaries are also clearing members of the major commodity exchange clearinghouses and have an established floor staff working on the clearinghouse's associated futures exchange. Institutional customers often place their orders directly with the FCM's phone clerks on the exchange floor. The clerk signals the order to a pit broker (usually an independent contractor of the FCM). The pit broker completes the transaction with another member of the exchange and then signals a confirmation back to the phone clerk who verbally relates the trade information back to the customer. The trade is then processed by the FCM for trade matching, clearing, and settlement. An FCM's back-office clerks usually recap the customer's transactions at the end of day with the customer's back-office staff. Paper confirmation is mailed out the following day; however, on-line confirmation capability is becoming increasingly common.

PRICING

As with forward rates, futures prices are derived from arbitrage-free relationships with spot prices, taking into account carrying costs for corresponding cash-market goods. With commodities, carrying costs include storage, insurance, transportation, and financing costs. The cost-of-carry for financial instruments consists mostly of financing costs, though it may also include some fixed costs such as custody fees. The cost-of-carry concept when referred to in the context of futures contracts is known as the *basis* (that is, the difference between the cash price for a commodity or instrument and its corresponding futures price).

In the case of fixed-income, interest-rate futures, the cost-of-carry represents the difference between the risk-free, short-term interest rate and the yield on the underlying instrument. The price of a fixed-income future can be expressed by the formula:

$$F = P + [P \times (r - y)],$$

where F is the futures price, P is the cash price of the deliverable security, r is the short-term collateralized borrowing rate (or repo rate), and y is any coupon interest paid on the security divided by P. To understand the relationship between spot and futures prices, imagine an investor who borrows at the repo rate, takes a long position in the underlying bond, and sells a bond future. At the maturity of the futures contract, the investor can deliver the bond to satisfy the futures contact and use the cash proceeds from the short futures position to repay the borrowing. In competitive markets, the futures price will be such that the transaction does not produce arbitrage profits.

For foreign-exchange futures, the cost-of-carry can be derived from the differential between the interest rates of the domestic and foreign currencies. When foreign interest rates exceed domestic rates, the cost-of-carry is negative. The spread that could be earned on the difference between a short domestic position and a long foreign position would subsidize the combined positions. For the no-arbitrage condition to hold, therefore, a comparable futures position (domestic per foreign) must cost less than the cash (spot) position.

HEDGING

Hedge Ratio

The hedge ratio is used to calculate the number of contracts required to offset the interest-rate risk of an underlying instrument. The hedge ratio is normally constructed by determining the price sensitivity of the hedged item and the price sensitivity of the futures contract. A ratio of these price sensitivities is then formulated to determine the number of futures contracts needed to match the price sensitivity of the underlying instrument.

Interest-Rate Exposure

Financial institutions use futures to manage the risk of their assets and liabilities, as well as off-balance-sheet exposures. Asset/liability management may involve the use of futures to lock in spreads between borrowing and lending rates. For example, a financial institution may sell Eurodollar futures in advance of an anticipated

funding to lock in the cost of funds. If LIBOR subsequently increases, the short futures position will increase in value, offsetting the higher spot interest cost that the financial institution will have to pay on its funding.

These contracts may be used to hedge investment portfolios against yield-curve shifts. Financial institutions can hedge mortgage portfolios by selling futures contracts (or GNMA forwards), and government bond dealers may sell Treasury futures to hedge their inventory. Pension and other types of benefits managers may hedge a fixed future liability by selling futures, or they may hedge an expected receipt by buying futures.

Interest-rate swap dealers use futures (or forwards) to hedge their exposures because directly offsetting swaps with the necessary terms cannot be found easily. The dealers rely on Eurodollar futures, Treasury futures, and floating-rate agreements (a type of interest-rate forward) to hedge their unmatched commitments. For example, a dealer obligated to pay LIBOR may sell Eurodollar futures to protect itself against an increase in interest rates.

Foreign-Exchange Exposure

Corporations engaged in international trade may use foreign-currency contracts to hedge payments and receipts denominated in foreign currencies. For example, a U.S. corporation that exports to Germany and expects payment in DM could sell DM futures (or forwards) to eliminate the risk of lower DM spot rates at the time that the payment arrives. A corporation may also use foreign-exchange contracts to hedge the translation of its foreign earnings for presentation in its financial statements.

Financial institutions use foreign-exchange futures (or forwards) to hedge positions arising from their businesses dealing in foreign exchange. An institution that incurs foreign-exchange exposure from assisting its customers with currency risk management can use offsetting contracts to reduce its own exposure. A financial institution can also use futures (or forwards) to cover unmatched currency swaps. For example, a dealer obligated to make a series of DM payments could buy a series of DM futures (or forwards) to reduce its exposure to changes in the DM/$ exchange rate.

RISKS

Users and brokers of futures face various risks, which must be well understood and carefully managed. The risk-management methods applied to futures (or forwards) may be similar to those used for other derivative products.

Credit Risk

Unlike OTC derivative contracts, the credit risk associated with a futures contract is minimal. The credit risk in futures is less because the clearinghouse acts as the counterparty to all transactions on a given exchange. An exchange's clearinghouse may be a division of the exchange, as in the case of the CME, or may be a separately owned and operated entity, such as the Chicago Board of Trade Clearing Corporation (BOTCC) or the London Clearing House (LCH). In addition to the credit protection a futures clearinghouse receives from prospective (initial) margin and the daily contract revaluations and settlement (marking to market), a clearinghouse is usually supported by loss-sharing arrangements with its clearing member firms. These loss-sharing provisions may take the form of limited liability guarantees (''pass-the-hat rules'' (BOTCC, LCH)) or unlimited liability guarantees (''good-to-the-last-drop rules'' (CME, NYMEX, SIMEX)). Because of these safeguards, no customer has lost money due to default on a U.S. futures exchange.

In addition, customer-account segregation significantly reduces the risk a customer faces with regard to excess margin funds on deposit with its FCM. Segregation is required for U.S. futures brokers but is less common overseas. However, even with customer-account segregation, FCM customers are exposed to the performance of the FCM's other customers. Unlike a U.S. broker-dealer securities account, the futures industry does not have a customer insurance scheme such as the Securities Investor Protection Corporation (SIPC). The exchanges and their clearinghouses often maintain small customer-guarantee funds, but disbursement from these funds is discretionary.

Finally, clearinghouses maintain their margin funds in their accounts at their respective settlement banks. These accounts are not unique and carry the same credit risks as other demand deposit accounts at the bank. For this reason, the

European Capital Adequacy Directive assigns futures and options margins a 20 percent risk-based capital treatment.

Market Risk

Because futures are often used to offset the market risk of other positions, the risk of these contracts should be evaluated by their effect on the market risk of the overall portfolio. Institutions that leave positions in the portfolio unhedged may be more exposed to market risk than institutions that "run a matched book." A financial institution may choose to leave a portion of its exposure uncovered to benefit from expected price changes in the market. If the market moves against the institution's prediction, the institution would incur losses.

Basis Risk

Basis risk is the potential for loss from changes in the price or yield differential between instruments in two markets. Although risk from changes in the basis tends to be less than that arising from absolute price movements, it can sometimes represent a substantial source of risk.

With futures, basis may be defined as the price difference between the cash market and a futures contract. As a contract matures, the basis fluctuates and gradually decreases until the delivery date, when it equals zero as the futures price and the cash price converge. Basis on interest-rate futures can vary due to changes in the shape of the yield curve, which affects the financing rate for holding the deliverable security before delivery. In foreign currency, basis risk arises from changes in the differential between interest rates of two currencies.

Investors may set up hedges with futures, which leave them vulnerable to changes in basis between the hedge and the hedged instrument. For example, Treasury note futures could be sold short to hedge the value of a medium-term fixed-rate corporate loan. If market forces cause credit spreads to increase, the change in value of the hedge may not fully offset the change in value of the corporate bond.

Yield-curve risk may also arise by holding long and short positions with equal durations but different maturities. Although such arrangements may protect against a parallel yield-curve shift, they may leave investors exposed to the risk of a nonparallel shift causing uneven price changes.

Liquidity Risk

Because of the multilateral netting ability of a futures clearinghouse, futures markets are generally more liquid than their equivalent OTC derivative contracts. However, experience varies with each product and market. In the futures markets, most liquidity is found in near-term contracts and can be rather thin in the more distant contracts.

Clearing and Settlement Risk

In OTC markets, clearing and settlement occurs on a bilateral basis, exposing counterparties to intraday and overnight credit risks. To reduce these risks as well as transactions costs, many financial institutions have bilateral netting arrangements with their major counterparties. Position netting allows counterparties to net their payments on a given day, but does not discharge their original legal obligations for the gross amounts. Netting by novation replaces obligations under individual contracts with a single new obligation.

ACCOUNTING TREATMENT

The accounting treatment for foreign-currency futures contracts is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a financial futures contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are below.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	0.00%
Five years or less	0.50%
Greater than five years	1.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'')

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Banks may invest in any futures contract. However, in taking delivery of nonfinancial products, the bank may need to place the physical commodity in other real estate owned (OREO). In addition, the bank may not engage in the buying and selling of physical commodities or hold itself out as a dealer or merchant in physical commodities.

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GENERAL DESCRIPTION

Interest-rate swaps are over-the-counter (OTC) derivative contracts in which two parties agree to exchange interest cash flows or one or more notional principal amounts at certain times in the future according to an agreed-on formula. The cash flows may be in the same currency or a different currency. The formula defines the cash flows using one or more interest rates and one or more hypothetical principal amounts called *notional principal amounts.*

As an example, suppose that Company A and Bank B enter into a three-year interest-rate swap, in which Bank B agrees to pay a 6 percent fixed rate (quoted on a 30/360-day count basis) on a notional principal of $100 million, every six months, on January 1 and July 1. In return, Company A agrees to pay U.S. dollar six-month LIBOR on the same dates, on the same notional principal. Thus, the cash flows on the swap will have semiannual fixed-rate payments of $300,000 going to Company A on each January 1 and July 1, and floating payments based on the prevailing level of U.S. dollar six-month LIBOR on each January 1 and July 1 going to Bank B. These semiannual cash flows will be exchanged for the three-year life of the swap.

Banks, corporations, sovereigns, and other institutions use swaps to manage their interest-rate risks, reduce funding costs (fixed or floating), or speculate on interest-rate movements. Banks (commercial, investment, and merchant) also act as *swaps dealers* or *brokers* in their role as financial intermediaries. As a dealer, a bank offers itself as a counterparty to its customers. As a broker, a bank finds counterparties for its customers, in return for a fee.

The interest-rate swaps market has grown rapidly since its inception in the early 1980s. As of March 1995, interest-rate swaps accounted for 69 percent of the market in interest-rate derivatives, in terms of notional principal outstanding. The notional principal outstanding in swaps at this date was $18.3 trillion. The gross market value of these swaps was $562 billion, or 87 percent of all interest-rate derivative contracts.

CHARACTERISTICS AND FEATURES

Swap Terminology and Conventions

An interest-rate swap is an off-balance-sheet, OTC contractual agreement in which two counterparties agree to make interest payments to each other, based on an amount called the notional principal. In an interest-rate swap, only the interest payments are exchanged; the notional principal is not exchanged, it is used only to calculate the interest payments. Each counterparty's set of payments is called a *leg* or *side* of the swap. The fixed-rate payer has *bought the swap*, or is *long the swap*. Conversely, the floating-rate payer has *sold the swap*, or is *short the swap*. The counterparties make *service payments* at agreed-on periods during the swap's tenor. The payer of a fixed leg makes service payments at a fixed price (or rate). The payer of a floating leg makes payments at a floating price that is periodically *reset* using a *reference rate*, which is noted on specific reset dates. The actual dates on which payments are made are payment dates.

The reference floating rate in many interest-rate swap agreements is the *London Interbank Offered Rate (LIBOR)*. LIBOR is the rate of interest offered on short-term interbank deposits in Eurocurrency markets. These rates are determined by trading between banks, and they change continuously as economic conditions change. One-month, three-month, six-month, and one-year maturities are the most common for LIBOR quoted in the swaps market. Other floating-rate indexes common to the swaps market include prime, commercial paper, T-bills, and the 11th District Cost of Funds Index (COFI).

A day count convention for the fixed-rate and floating-rate payments is specified at the beginning of the contract. The standard convention is to quote the fixed leg on a semiannual 30/360-day basis, and to quote LIBOR on an actual/360-day basis. The fixed and floating legs, however, can be quoted on any basis agreed to by the counterparties.

The date that the swap is entered into is called the *trade date*. The calculation for the swap starts on its *settlement date* (effective or value date). Unless otherwise specified in the agree-

ment, the settlement date on U.S. dollar interest-rate swaps is two days after the trade date. The swap ends on its *termination* or *maturity* date. The period of time between the effective and termination dates is the swap's *tenor* or *maturity*.

Swap Agreement

Swaps are typically initiated through telephone conversations and confirmed by fax, telex, or letter (a *confirmation*). Both parties are legally bound by the initial agreement and complete documentation is not exchanged until later. Swap contracts are usually executed according to the standards of the International Swaps and Derivatives Association (ISDA) or the British Bankers Association's Interest-Rate Swaps (BBAIRS). The complete documentation of a particular swap consists of the confirmation; a payment schedule (in a format standardized by ISDA or BBAIRS); and a *master swap agreement* that uses standard language, assumptions, and provisions. As a rule, counterparties execute one master agreement to cover all their swaps. Thus, two different swaps may have different confirmations and payment schedules but may use the same master agreement. The master agreements cover many issues, such as (1) termination events; (2) methods of determining and assessing damages in case of default or early termination; (3) netting of payments; (4) payment locations; (5) collateral requirements; (6) tax and legal issues; and (7) timely notification of changes in address, telex numbers, or other information.

Types of Swaps

This general swap structure permits a wide variety of generic swaps. Common types of interest-rate swaps are outlined below.

- The *generic* (or *plain vanilla*) *swap* has a fixed and a floating leg; the notional amount and payments are all in the same currency.
- The *basis* (or *floating-for-floating*) *swap* has two floating legs, each tied to a different reference rate. These instruments are often used to reduce basis risk for a balance sheet that has assets and liabilities based on different indexes.
- The *forward swap* has a settlement at some agreed-on future date. A forward swap allows counterparties to lock in a fixed rate (as a payer or receiver) at the time of contract origination, but to postpone the setting of the floating rate and the calculation of cash flows until some time in the future. These swaps are often used to hedge future debt refinancings or anticipated issuances of debt.
- The *amortizing swap* has a notional principal which is reduced at one or more points in time before the termination date. These swaps are often used to hedge the interest-rate exposure on amortizing loans, such as project-finance loans.
- The *accreting swap* has a notional principal which is increased at one or more points in time before the termination date. These swaps are often used to hedge the interest-rate exposure on accreting loans, such as the drawdown period on project-finance loans.
- The *zero-coupon swap* is a fixed-for-floating swap in which no payments are made on the fixed leg until maturity. These swaps are often used to hedge the exposure on a zero-coupon instrument.
- *Callable*, *putable*, and *extendible swaps* are swaps with embedded options in which one party has the right, but not the obligation, to extend or shorten the tenor of the swap. As the counterparty has sold an option to the swap dealer in these transactions, the swaps will have a lower fixed rate in the case of a fixed-rate payer and a higher fixed rate in the case of a fixed-rate receiver. The counterparty is, however, subject to call or extension risk.
- The *seasonal swap* has different payment dates for the two legs (which may both be fixed), usually tied to the counterparties' cash-flow needs. These swaps are often used to create synthetic cash flows when actual cash flows change over time. This technique is called *deseasoning*. For example, suppose Firm A expects to make $120 million a year, or on average $10 million a month, but also expects to earn on average $15 million a month in June, July, and August; $5 million a month in May, September, and October; and $10 million a month in the remaining months. It can enter into a seasonal swap in which it pays $5 million a month in June, July, and August, when its revenues are high, and receives $5 million a month in May, September, and October, when its revenues are low.

USES

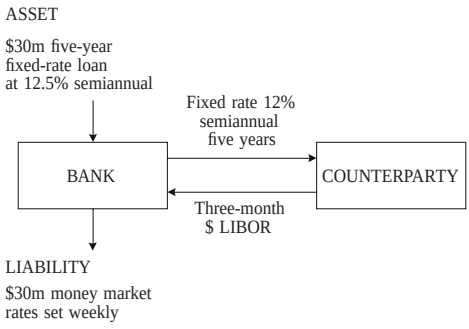
Interest-rate swaps are used for hedging, investment, and speculative purposes. Interest-rate swaps are also used to reduce funding costs and arbitrage purposes. Examples of how banks use interest-rate swaps for asset/liability management, investment purposes, and speculation are shown below.

Asset/Liability Management: Closing the Balance-Sheet Gap

Suppose a bank has a $30 million, five-year, fixed-rate loan asset with a semiannual coupon of 12.5 percent which it has funded with $30 million of money market deposits. The bank is faced with a balance-sheet gap—the asset has a fixed rate of interest, but the cost of the underlying liability resets every week. The risk faced by the bank is that a rise in short-term interest rates will cause the cost of its liabilities to rise above the yield on the loan, causing a negative spread. The bank can use a fixed-for-floating interest-rate swap to achieve a closer match between its interest income and interest expense, thereby reducing its interest-rate risk (see figure 1).

As shown in figure 1, the bank has entered into a five-year interest-rate swap in which it pays a dealer 12 percent and receives three-month U.S. dollar LIBOR. In effect, the bank has locked in a positive spread of 50 basis points.

Figure 1



Cash Flows on Transaction

Assumed cost of money market deposits (pays)	–3-month LIBOR
Swap inflow (receives)	+3-month LIBOR
Swap outflow (pays)	–12.00%
Loan interest inflow (receives)	+12.50%
Net position with hedge	+50 basis points

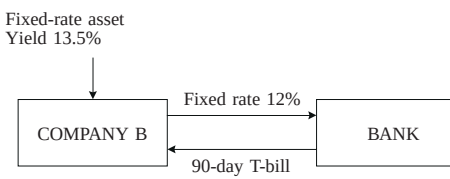
While the bank has effectively locked in a positive 50 basis point spread, it remains subject to basis risk between the three-month U.S. dollar LIBOR rate which it is receiving in the swap and the weekly money market rates which it pays to its depositors.

Investment Uses: Transforming a Fixed-Rate Asset into a Floating-Rate Basis

Interest-rate swaps are often used by investment managers to create synthetic assets, often in response to temporary arbitrage opportunities between the cash and derivative markets. A plain vanilla interest-rate swap can be used to transform the yield on a fixed- (floating-) rate asset such as a corporate bond into a floating- (fixed-) rate asset.

As an example, suppose that the investment manager of Company B has a five-year fixed-rate bond which yields 13.5 percent. Also, suppose that the investment manager has a strong view that interest rates will rise, but does not want to sell the bond because its credit quality could improve substantially in the future. To position the portfolio for a rise in rates without selling the bond, the investment manager can enter into an interest-rate swap in which Company B pays a fixed rate of 12 per-

Figure 2



cent and receives a floating rate based on the 90-day T-bill rate, effectively creating a synthetic floating-rate security yielding the 90-day T-bill rate plus 150 basis points (see figure 2).

Cash Flows on Transaction

Fixed rate on bond (receives)	+13.50%
Fixed rate on swap (pays)	−12.00%
Floating-rate 90-day T-bill (receives)	+90-day T-bill
Net Rate Received by Company B	90-day T-bill + 1.50%

Speculation: Positioning for the Expectation of Rate Movements

Interest-rate swaps can be used to take a position on interest-rate movements. In this example, an end-user establishes positions with swaps, believing that interest rates will fall in a six-month period. The end-user believes that short-term interest rates will decrease, but does not want to sell its floating-rate asset. The end-user can therefore enter into an interest-rate swap to receive a fixed rate of interest and pay a floating rate of interest, thereby converting the floating-rate asset to a fixed-rate basis.

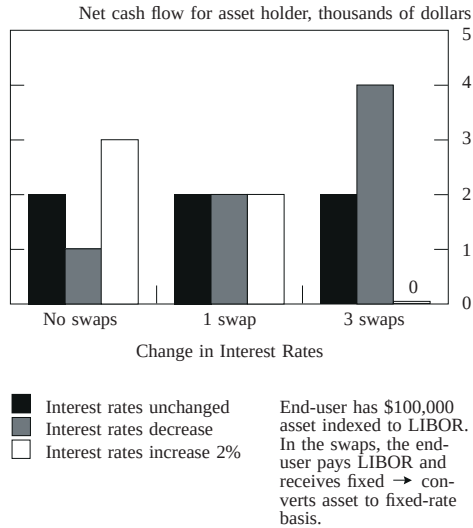
Figure 3 shows the cash flow to an end-user who has a $100,000 asset indexed to LIBOR, under various interest-rate scenarios for a period of six months. The vertical axis shows the end-user's net cash flow after six months, and the horizontal axis shows different interest-rate exposure strategies, ranging from holding the asset without entering into interest-rate swaps to entering into swaps to pay LIBOR and receive a fixed rate.

In each of the three clusters of bars on the horizontal axis, the return to the end-user under different interest-rate scenarios is displayed (from left to right) for no change in interest rates, a 2.00 percent decrease in interest rates, and a 2.00 percent increase in interest rates. As can be seen from the middle bar in the first cluster (the ''no swaps'' scenario), if the investor is correct and short-term interest rates decrease, the return on the asset will fall dramatically.

The second cluster of bars on the horizontal axis (the ''1 swap'' scenario) shows the asset return after the investor has entered into one swap based on a notional principal amount of $100,000 (equal to the amount invested in the asset), in which the investor pays a floating rate and receives a fixed rate. This swap is effectively a hedge which transforms the floating-rate asset return to a fixed-rate basis so that the asset return remains constant under all interest-rate scenarios.

The third cluster of bars on the horizontal axis (the ''3 swaps'' scenario) demonstrates the return from the investor's ''leveraged'' speculation that short-term interest rates will decrease. Here, the investor enters into three interest-rate swaps based on a notional principal of $100,000 (which is equivalent to one swap based on a notional principal of $300,000), in which the investor pays a floating rate and receives a fixed rate. Again, the first swap effectively transforms the floating-rate asset to a fixed-rate basis; in the second and third swaps, the investor receives (pays) the differential between the fixed and floating rates in the swap. Hence, if interest rates decrease 2.00 percent and the investor has entered into three interest-rate swaps (the middle bar in the third cluster), the asset return is increased substantially compared to just holding onto the asset (the middle bar in the first cluster). However, if the investor is wrong, and interest rates increase 2.00 percent after three interest rates have been entered into, the return on the asset will be zero.

Figure 3—Using Plain Vanilla Swaps to Leverage Interest-Rate Exposure



DESCRIPTION OF MARKETPLACE

Primary Market

The primary market for interest-rate swaps consists of swap dealers, swap brokers, and end-users.

Brokers and Dealers

Financial institutions, such as commercial banks, investment banks, and insurance companies, act as *dealers* in interest-rate swaps. Banks are a natural intermediary in the swaps market because of their exposure to interest-rate movements and their expertise in analyzing customer credit risk.

Swap brokers are paid a fee for arranging a swap transaction between two counterparties. Swap brokers do not take positions and do not act as a counterparty to a swap transaction.

End-Users

End-users of interest-rate swaps include financial institutions, corporations, sovereigns, government-sponsored enterprises (GSEs), and money managers. Banks who are dealers often also use swaps in an end-user capacity for asset/liability management, funding, and investment purposes. End-users use interest-rate swaps for hedging, investment, and speculative purposes. They also often use interest-rate swaps to reduce funding costs.

The nature of an end-user's business often determines whether he or she will wish to be a fixed-rate receiver or a fixed-rate payer. Fixed-rate payers are often firms whose minimum cash flows are reasonably predictable regardless of the level of interest rates. This class includes manufacturing and distribution firms in the developed countries, financial institutions with large portfolios of fixed-rate assets, and national agencies of certain developed countries that have difficulty accessing fixed-rate funds.

Fixed-rate receivers are often highly sensitive to changes in short-term market rates of interest. This class includes large money-center or regional banks that have large portfolios of floating-rate assets. The interest rates on the assets held in their loan portfolios may be indexed to U.S. prime rates, LIBOR, or other short-term market rates. The class also includes borrowers who have fixed-rate debt outstanding and prefer to convert it to floating-rate debt. Institutions such as life insurance companies, pension funds, wealthy investors, and managed trust accounts are notable examples of natural fixed-rate receivers.

Secondary Market

If a counterparty wishes to terminate, or *unwind*, an existing swap position in the secondary market, it must do so by one of three methods: *swap reversal*, *swap assignment*, or *swap buyback* (also called *close-out* or *cancellation*).

In a swap reversal, a counterparty of a swap enters into an offsetting swap with the same terms as the original swap. For example, if Firm A is in a fixed-for-floating swap, paying 10 percent on $10 million notional for U.S. dollar three-month LIBOR, with one year to maturity, the offsetting swap would be a one-year floating-for-fixed swap, paying U.S. dollar three-month LIBOR for 10 percent on $10 million notional. If market rates have changed since the position was initiated, which is likely, a *mirror offsetting position* cannot be established unless a fee is paid to establish the off-market mirror transaction. For instance, in the example above, if one-year rates at the time that the mirror swap is traded are 8 percent, the counterparty will have to pay a fee of approximately $185,000 to enter into the mirror trade ((10 percent – 8 percent) × $10 million discounted at 8 percent). The counterparty does not cancel the first swap; it adds a second swap to its books at the cost of increasing default risk.

In a swap assignment, a counterparty finds a new counterparty who is willing to assume its position in the swap. Swap assignments require the acquiescence of the other counterparty to the swap. At the time of the assignment, a payment representing the net present value of the swap is made either to or from the new assigned counterparty. For example, using the example above in which Firm A is in a 10 percent one-year fixed-for-floating swap, Firm A can assign its position in the swap to a new counterparty—Counterparty B (usually a dealer). In this case, as the swap has a negative mark-to-market value for Firm A, Firm A will be required to make a payment of $185,000 to Counterparty B. Counterparty B then assumes Firm A's position in the

swap with the original counterparty. A key issue in swap sales is the creditworthiness of the firm or dealer who will assume the swap. If the creditworthiness is poor, the other counterparty may not agree to the sale.

In a buy-back, one of the counterparties to a swap sells the swap to the other counterparty. Unlike the swap assignment example above, buy-backs are between the original counterparties and do not involve a third party. Buy-backs usually involve a payment which is based on the mark-to-market value of the swap at the time of the buy-back. In the example above, Firm A would be required to make a payment of $185,000 to the other original counterparty to terminate the swap.

Market Transparency

Market transparency in the swaps market is generally high. Market quotes are readily available on sources such as Telerate and Bloomberg. Increased competition has, in part, led to the narrowing of bid/offer spreads on plain vanilla deals. For instance, in the early 1980s, bid/offer spreads were in the 40 to 50 basis point range for deals under five years, and liquidity was almost nonexistent for deals beyond 10 years. Today, spreads have narrowed to 1 to 3 basis points for swaps under 10 years, and liquidity has increased significantly on swaps beyond 10 years.

Liquidity in the secondary market is high but is somewhat less than in the primary market because it is cumbersome to unwind existing positions. To make the secondary market more liquid, several people have proposed the creation of a clearing corporation similar to the clearing corporations for futures and options. If this happens, the disadvantages for end-users would be less customization and more regulation. The advantages would be reduction in default (credit) risk and increased transparency.

PRICING

Market Conventions and Terminology

The market convention for pricing swaps is to quote the fixed rate in terms of a basis point spread over the Treasury rate (usually quoted on a semiannual bond-equivalent yield basis) as the price for receiving the floating-interest-rate index flat (no basis points are added to or subtracted from the floating rate). For example, if an investor wants to receive a floating rate, such as LIBOR, the fixed rate it will have to pay would be the current *on-the-run* Treasury yield for the appropriate maturity category of the swap, plus a basis point spread over that yield (on-the-runs are the securities of the relevant maturity that were most recently auctioned). This basis point spread over the relevant Treasury is called the swap spread. For example, assuming that the on-the-run two-year Treasury yield is 6.00 percent and a two-year swap is quoted at 18/20 (bid/offer), then a fixed-rate receiver would pay the dealer LIBOR and receive a fixed rate of 6.18 percent, and a fixed-rate payer would pay the dealer 6.20 percent to receive LIBOR flat.

It is important to distinguish between the swap spread and the bid/offer spread (discussed above in the primary market information). The swap spread is the spread over the Treasury yield to pay or receive fixed while the *bid/offer spread* is the difference between the fixed rate which must be paid to the market maker and the fixed rate that the market maker will pay. The swap spread represents the difference between investment-grade spreads (from Eurodollar futures and corporate bond markets) and the risk-free rate of Treasury securities. This spread adjustment is appropriate because non-U.S.-government swap counterparties typically cannot borrow at risk-free Treasury rates. The supply and demand for fixed-rate funds also influences the swap spread. For instance, if there is a predominance of fixed-rate payers in the market, swap spreads will increase as the demand for paying fixed on swaps will exceed the supply of dealers willing to book these swaps, thus bidding up the spread.

Swaps are priced relative to other funding and investment vehicles with the same type of exposure. For shorter maturities, in which liquid interest-rate futures contracts are available, swaps are priced relative to futures contracts. Swaps of one- to five-year maturities are generally priced relative to Eurodollar futures.

At longer maturities, swaps are priced relative to rates in alternative traditional fixed- and floating-rate instruments. For instance, swap spreads for 5- to 10-year maturities are roughly equivalent to investment-grade (single A or higher) corporate spreads over U.S. Treasuries.

Pricing Using Eurodollar Futures Contracts

An interest-rate swap can be thought of as a series of forward contracts. As such, if forward rates are observable, a swap can be priced as a series of these forward contracts. Eurodollar futures contracts are observable, liquid market forward rates for U.S. dollar LIBOR. As the fixed rate on a swap is simply the blended forward rates for each floating reset date, swaps can be priced by reference to the Eurodollar strip (a series of Eurodollar futures contracts) out to the maturity date of the swaps contract. For example, consider a hypothetical one-year swap starting March 19, 1997, and terminating March 18, 1998 (March to March contract dates).

Step 1: Determine forward rates by reference to the one-year Eurodollar strip.

Month	*Futures Price*	*Rate*
March '97		5.75% (spot 3-month LIBOR)
June '97	94.07	5.93% (100 – 94.07)
September '97	93.82	6.18% (100 – 93.82)
December '97	93.60	6.40% (100 – 93.60)

Step 2: Calculate the swap rate based on the following formula:

$$\begin{aligned} R = {} & ([1 + R_0(D_0/360)] \\ & \times [1 + F_1(D_1/360)] \\ & \times \ldots \\ & \times [1 + F_n(D_n/360)] - 1) \\ & \times 360/365 \end{aligned}$$

where

R = Eurodollar strip rate (swap rate) stated as an annualized money market yield

R_0 = spot LIBOR to first futures expiration

F_1 = first futures contract (100 – futures price)

F_n = futures rate for the last relevant contract in the strip

D_i = actual number of days in each period

$$\begin{aligned} R = {} & ([1 + .0575(91/360)] \\ & \times [1 + .0593(91/360)] \\ & \times [1 + .0618(91/360)] \\ & \times [1 + .064(91/360)] - 1) \\ & \times 360/364 \\ R = {} & 6.21\% \end{aligned}$$

The above example is simplified because the swap begins and terminates on contract expiration dates. However, a similar methodology incorporating stub periods can be used to price swaps which do not fall on contract expiration dates by using the following generalized formula:

$$\begin{aligned} & [1 + R_0(D_0/360)] \\ & \times [1 + F_1(D_1/360)] \\ & \times \ldots \\ & \times [1 + F_n(D/360)] \\ = {} & [1 + R(365/360)]^N \\ & \times [1 + R(D_r/360)] \end{aligned}$$

where

D_r = total number of days in the partial-year period of the strip

N = number of whole years in the strip

Swaps are often priced using the Eurodollar strip for maturities of five years or less when liquidity in the Eurodollar strip is high.

Pricing Using Zero-Coupon Methodology

A zero-coupon methodology, another method used to value swap contracts, is often used to value swaps with maturities greater than five years. Unlike a yield-to-maturity (*YTM*) method in which each cash flow is valued at a constant discount rate, a zero-coupon methodology discounts each cash flow by a unique zero-coupon (spot) rate. A zero-coupon rate (zero) can be

thought of as the *YTM* of a zero-coupon bond. As such, the return in period *n* on a zero-coupon bond can be derived by making *n* period investments at the current forward rates. For instance, the discount factors for a three-period instrument priced on a *YTM* basis would be derived as follows.

YTM discount factors:

$$[1/(1 + YTM)] + [1/(YTM)^2] + [1/(YTM)^3],$$

where *YTM* = constant yield-to-maturity rate.

The discount factors for a three-period instrument priced on a zero-coupon basis would be derived as follows.

Zero-coupon discount factors:

$$[1/(1 + S_0)] + [1/(1 + S_0)(1 + {}_1f_2)] + [1/(1 + S_0)(1 + {}_1f_2)(1 + {}_2f_3)],$$

where

S_0 = Spot zero rate at time 0
${}_1f_2$ = forward rate for time period 1 to 2
${}_2f_3$ = forward rate for time period 2 to 3.

Zero-coupon swap rates can be calculated either from the price of an appropriate zero-coupon swap or from a series of forward rates such as the Eurodollar futures strip. The market in zero-coupon swaps, however, is not active and zero-coupon prices are not observable. However, zero-coupon swap rates can be derived from observable coupon-bearing swaps trading in the market using a technique called *bootstrapping*. Once zero-coupon swap rates have been derived, an interest-rate swap can be priced similar to a fixed-rate bond by solving for the swap rate which, when discounted by the appropriate zero-coupon rates, will equate the swap to par.

The first step in the bootstrapping method is to construct a swap yield curve based on coupon-paying swaps trading in the market. Once this yield curve has been constructed, the coupon rates on the swaps can be used to calculate zero swap rates. Based on the observable first-period swap rate, a zero rate can be derived for the first period. Often, this rate may already be stated on a zero-coupon basis, such as six-month LIBOR (coupons are not paid on the instrument). The first period zero rate (z_1) is derived by discounting the coupon rate on the first-period instrument by the zero-coupon rate which gives a price equal to par.

$$100 = (100 + c_1)/(1 + z_1),$$

where

c_1 = coupon rate on first-period instrument
z_1 = zero coupon rate for first period.

The first-period zero rate and the second-period coupon swap rate are then used to calculate the second-period zero rate (z_2) using the following relationship:

$$100 = [c_2/(1 + z_1)] + [(100 + c_2)/(1 + z_2)^2],$$

where

c_2 = coupon rate on second-period instrument
z_1 = zero-coupon rate for period 1
z_2 = zero-coupon rate for period 2.

This process is then continued to calculate an entire zero-rate curve. Zero rates for all other dates can then be calculated by interpolation.

As an example of the zero-coupon pricing methodology, consider the following simplified example for a $100 million two-year amortizing fixed-for-floating interest-rate swap, quoted on an annual basis. The swap amortized by $50 million at the end of year one, and amortizes to zero at the end of year two.

Step 1: Construct the cash-swap yield curve for two years.

Maturity	*On-the-Run Treasury Yield*	*Swap Spread*	*Swap Rate (Offer)*
1 year	4.80%	.18%–.20%	5.00%
2 year	5.70%	.28%–.30%	6.00%

Step 2: Derive the zero-coupon rates by the bootstrap method.

Using the coupon swap rates from the swap yield curve above, the first-period zero-coupon rate can be solved using the bootstrap method:

$$100 = 105/(1 + z_1)$$
$$z_1 = 5.00\%$$

Likewise, using the above cash-market swap rates to solve for the zero rate in year 2 by the bootstrap method:

$$100 = [6.00/(1.05)] + [106/(1 + z_2)^2$$
$$z_2 = 6.02\%$$

Step 3: Using iteration, solve for the swap-coupon rate which equates the cash flows on the swap to par using the zero rates obtained in step 2 as the discount factors.

$$\begin{aligned}\$100\text{mm} = [&\$50\text{mm} \\ &+ (100\text{mm} * \text{Swap Coupon}) \\ &\div (1.05)] \\ &+ [\$50\text{mm} \\ &+ (50\text{mm} * \text{Swap Coupon}) \\ &\div (1.0602)^2] \\ \text{Swap-Coupon Rate} &= 5.65\%\end{aligned}$$

Pricing Unwinds

After a swap has been entered into, the mark-to-market (MTM) value can be calculated by discounting the remaining cash flows on the swap by the appropriate zero-coupon rates prevailing at the time of the termination of the swap. The resulting value, above or below par, would then represent the amount which would be either received or paid to terminate the swap.

For example, using the amortizing swap example above, suppose that after one year, the counterparty who is a fixed-rate payer in the swap wishes to terminate the swap. At the time, one-year swap rates are 7.00 percent. The mark-to-market value of the swap would be calculated as follows:

Step 1: Determine the one-year (time remaining to maturity) zero-coupon rate.

$$100 = 107/(1.07)$$
$$z_1 = 7.00\%$$

Step 2: Discount remaining cash flows on the swap by the zero rate obtained in step 1.

$$\text{Price of Swap} = [\$50\text{mm} + (\$50\text{mm} \times .0565)] \div (1.07)$$

$$\text{Price of Swap} = \$49.37\text{ mm}$$

$$\text{MTM Value} = \$50\text{ mm} - \$49.37\text{ mm} = \$630{,}000$$

In this example, as rates have risen since the inception of the swap, the fixed-rate payer would receive a fee of $630,000 for terminating the swap.

HEDGING

Any firm that has a position in swaps is exposed to interest-rate, basis, and credit risks (discussed below). From a dealer standpoint, these risks are ideally hedged by entering immediately into mirror (offsetting) swaps, which eliminate exposure to these risks. However, in practice, dealers warehouse swap positions and hedge residual exposure with Eurodollar futures, forward rate agreements, or Treasuries until offsetting swaps can be established. End-users who have a swaps book face the same risks, and apply the same techniques, as dealers.

Hedging Interest-Rate and Basis Risk

Interest-rate risk in a swap portfolio is the risk that an adverse change in interest rates will cause the value of the portfolio to decline. Basis risk arises from an imperfect correlation between the hedge instrument and the instrument being hedged. Interest-rate and basis risk can be hedged one swap at a time (''microhedging''), or a portfolio (set) of swaps can be hedged (''macrohedging''). Microhedging is rare today. In macrohedging, the overall risks of the portfolio (or subsets of it) are evaluated and hedged using offsetting interest-rate swaps and other interest-rate derivatives. Residual exposures are hedged in the Eurodollar futures or Treasury markets. Most dealers dynamically hedge the residual exposure of their swap portfolio by adjusting the hedge position as interest rates change.

Risk managers usually take into account the effect of various interest-rate changes on the profitability of a swap book—for example, when interest rates change by 5, 10, 50, or 100 basis points. Dealers usually hedge for an arbitrary movement in rates, such as 50 basis points, which generally depends on senior management's risk appetite.

Hedging Credit Risk

The main techniques by which credit risk is hedged are (1) to require collateral if a counter-

party is out of money; (2) to establish termination clauses in the master agreement for assessment of damages in the event of default; (3) to net payments (when several swaps are outstanding with the same counterparty), according to terms established in a master netting agreement (or master agreement); and (4) to sell the swap to another party.

Hedging the credit risk of a swap book is difficult for a number of reasons. First, since there is no formal secondary market in swaps, it may not be immediately possible to trade out of a position. Second, assumptions about the certainty of cash flows and the level and term structure of interest rates are implicit in swap valuation. If these assumptions do not hold, the value of a swap book may not behave as expected, depending on how it is hedged. Third, to the extent to which some contracts are customized, they may be difficult to value accurately and to hedge.

If risk models are used to estimate a market maker's potential future credit exposure, the assumptions between the risk-management model and the credit-risk model should be consistent. As is the case for risk management, it is important to understand the assumptions in the model in order to estimate potential credit risk.

RISKS

The principal risks in swap contracts are interest-rate, basis, credit, and legal and operating risk. For participants entering into highly customized transactions, liquidity risk may be important because hedging or an assignment of the contract may be difficult.

Interest-Rate Risk

Interest-rate risk for swaps is the risk that an adverse change in interest rates causes the swap's market value to decline. The price risk of interest-rate swaps is analogous to that of bonds. In fact, a swap can be described as an exchange of two securities: a hypothetical fixed-rate bond and a floating-rate note. The swap involves the simultaneous exchange of these two securities of equal amount and maturity, in which netting of principal payments at origination and maturity results in no principal cash flow. Along these lines, a swap dealer who makes fixed-rate payments is considered to be short the bond market. This dealer has established the price sensitivities of a longer-term liability and a floating-rate asset. The price risk here is that if short-term interest rates decrease, the dealer would be receiving less on the asset but still paying out the same amount on the liability. This interest-rate exposure could be hedged by buying Eurodollar futures (or by being long Treasuries of the same maturity as the swap). Then, if short-term interest rates decrease, the gain on the hedge should offset the loss on the swap.

Basis Risk

A major form of market risk that dealers are exposed to is basis risk. Dealers have to hedge the price exposure of swaps they write until offsetting swaps are entered into, and the hedges may not be perfect.

Basis risk affects profitability. The bid/offer spread is the profit a dealer can make on a hedged swap book, but the dealer can earn less than this due to basis risk.

Sources of Basis Risk

When a dealer hedges swaps that have some credit risk with instruments of little or no credit risk (Treasuries), it creates basis risk. For instance, dealers often hedge swaps with maturities of five or more years with Treasuries. The risks in the swaps usually include credit risks, which are reflected in the floating rate(s). Since Treasuries are credit-risk-free securities, they do not provide a perfect hedge; this is a source of basis risk for the dealer, since there can be divergence between the two rates. Dealers are exposed to TED (Treasury-Eurodollar) spread risk when they hedge swaps of shorter maturities with Treasuries. In essence, the price of Eurodollar futures can change, which will cause swap spreads to change even if Treasury prices remain the same, since the swap spread is linked to the difference between the Eurodollar and Treasury markets.

Credit Risk

After the swap is executed, changes in interest rates cause the swap to move in the money for one counterparty and out of the money for the

other. For example, an increase in market interest rates would increase the floating-rate payments from a swap, causing the value of the swap to the fixed-rate payer to rise, and the value of the swap to the floating-rate payer to fall.

As no principal amount is exchanged in an interest-rate swap contract, credit risk is significantly less than it is on instruments in which principal is at risk. Credit-related loss can occur when the counterparty of an in-the-money swap defaults. The credit loss would be limited to the present value of the difference between the original and current market rates over the remaining maturity of the contract, which is called the replacement cost of the swap. For example, if a dealer had originally swapped fixed payments at 8.5 percent for six-month LIBOR for seven years, and the current market rate for the same transaction is 10 percent, the actual loss when a counterparty defaulted at the end of the first year would be the present value of 1.5 percent over six years on the notional principal amount of the swap.

Credit risk is a function of both current credit exposure and potential future credit exposure. The example above only illustrates current credit exposure. Potential future exposure depends primarily on the volatility of interest rates. One approach to estimating peak potential credit exposure (PkCE) is to perform a full-blown Monte Carlo simulation on a counterparty's portfolio. This strategy has many appealing features and is the most statistically rigorous. In essence, the model is calculating ''maximum'' potential market value of the transaction, given a set of market conditions and a set confidence interval. However, problems arise from having to assume desired correlations among variables when making multiple simulations of market conditions. These correlations need to hold true over the life of the contract and be adjusted for the introduction of new instruments. Aside from these methodology problems, it is almost impossible to run the necessary number of simulated portfolio market values within response times acceptable to the trading floor. Also, Monte Carlo simulations do not readily highlight the specific sources of potential exposure or suggest ways to neutralize this exposure.

An alternative to the full-blown Monte Carlo strategy can be characterized as the ''primary risk-source approach.'' This approach attempts to identify the market variable that is the primary source of changes in the contract's value and then simulate values based on changes in this variable. In practice, a single market variable is not usually the only factor that causes a contract's value to change. However, other factors that might affect the value are generally of secondary importance. In addition, if the secondary-market variables are not highly correlated with the primary risk source, their impact on market value is further reduced.

Estimating PkCE for a single contract can be complex. Accurately estimating PkCE for a portfolio of contracts executed with one counterparty can be so analytically difficult or computationally intensive that it is not always feasible. A trade-off has to be made between the ideal methodology and the computational demands.

Other factors which affect potential credit exposure include the shape and level of the yield curve, the frequency of payments, the maturity of the transaction, and whether collateral has been posted. In addition, the changing credit quality of counterparties can affect potential credit risk.

Legal Risk

Legal risk arises from the possibility that a swap contract will not be enforceable or legally binding on the counterparty. For instance, the enforcement of netting agreements with foreign counterparties varies by country and may expose a counterparty to risk in case of nonenforceability. As such, the adequacy of legal documentation, including master swap agreements and netting agreements, should be reviewed.

ACCOUNTING TREATMENT

The accounting treatment for swap instruments is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of an interest-rate swap contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are as follows.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	0.00%
Five years or less	0.50%
Greater than five years	1.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'')

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Swaps are not considered investments under 12 USC 24 (seventh). The use of these instruments is considered to be an activity incidental to banking within safe and sound banking practices.

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GENERAL DESCRIPTION

Options transfer the right but not the obligation to buy or sell an underlying asset, instrument, or index on or before the option's exercise date at a specified price (the *strike price*). A *call option* gives the option purchaser the right but not the obligation to purchase a specific quantity of the underlying asset (from the call option seller) on or before the option's exercise date at the strike price. Conversely, a *put option* gives the option purchaser the right but not the obligation to sell a specific quantity of the underlying asset (to the put option seller) on or before the option's exercise date at the strike price.

The designation ''option'' is only applicable to the buyer's status in the transaction. An option *seller* has an obligation to perform, while a *purchaser* has an option to require performance of the seller and will only do so if it proves financially beneficial.

Options can be written on numerous instruments. Commercial banks are typically involved most with interest-rate, foreign-exchange, and some commodity options. Options can be used in bank dealer activities, in a trading account, or to hedge various risks associated with the underlying instruments or portfolio.

CHARACTERISTICS AND FEATURES

A basic option has six essential characteristics, as described below.

1. *Underlying security*. An option is directly linked to and its value is derived from a specific security, asset, or reference rate. Thus, options fit into the classification of ''derivative instruments.'' The security, asset, index, or rate against which the option is written is referred to as the option's *underlying instrument*.
2. *Strike price*. The strike price is the price at which an option contract permits its owner to buy or sell the underlying instrument. The strike price is also referred to as the exercise price. A call option is said to be in the money when the price of the underlying asset exceeds the strike price. A put option is in the money when the price of the asset is less than the exercise price.
3. *Expiration date.* Options are ''wasting assets''; they are only good for a prespecified amount of time. The date after which they can no longer be exercised is known as the *expiration date*.
4. *Long or short position*. Every option contract has a buyer and a seller. The buyer is said to have a long option position, while the seller has a short option position. This is not the same as having a long or short position in the *underlying instrument, index,* or *rate*. A bank which is *long puts* on government bonds has bought the right *to sell* government bonds at a given strike price. This gives the bank protection from falling bond prices. Conversely, if the bank were *short puts*, it would be obligating itself *to purchase* government bonds at a specific price.
5. *American or European.* The two major classifications of options are American and European. American options can be exercised on any date after purchase, up to and including the final expiration date. European options can be exercised only on the expiration date of the contract. Because American options give the holder an additional privilege of early exercise, they will generally be more valuable than European options. Most exchange options are American, while most over-the-counter (OTC) options are European.
6. *Premium.* The price paid for an option is referred to as the option's *premium*. This premium amount is a dynamic measure of the factors which affect the option's value. Therefore, options with identical contract terms can trade at a multitude of different premium levels over time. Premium has two components: *time value* and *intrinsic value*. Intrinsic value refers to the amount of value in the option if it were exercised today. Time value is the difference between the total premium and the intrinsic value; it encompasses the uncertainty of future price moves. The time value of an option is a function of the security's volatility (or risk); the current level of interest rates; and the option's maturity (or time to expiration). The option's positive time value gradually approaches zero at expiration, with the option price at expiration equal to its intrinsic value.

For example, a long call option with a strike price of $50 on an underlying security which is trading at $52 has an intrinsic value of $2. If the option is trading for a *total* price of $3.50, $1.50 of the price ($3.50 – $2.00) would be time value, reflecting the fact that the underlying security may further increase in value before the option's expiration. Not all options will have an intrinsic value component; often the entire premium amount is time value.

Exotic Options

In the past few years, the growth of so-called "exotic" derivative products has been significant. Options have been no exception, and many varied types of exotic options exist today which are traded in the OTC markets. Some of the more common exotic options are discussed below.

In general, markets for many of the exotic options are not as liquid as their more generic counterparts. Thus, a quoted price may not be a good indication of where actual liquidation of the trade could take place.

Asian options, also called average-price options, depend on the *average price* of the underlying security during the life of the option. For example, a $60 call on a security which settled at $65 but traded at an average price of $63.5 during the option's life would be worth only $3.50 at expiration, not $5. Because of this feature, which essentially translates into lower volatility, Asian options tend to trade for a lower premium than conventional options. These options are generally cash settled, meaning that the actual underlying does not change hands. They belong in the category known as *path-dependent options*, meaning that the option's payoff depends on the path taken by the underlying security before the option's expiration.

Barrier options, are options which either come into existence or cease to exist based on a specified (or barrier) price on the underlying instrument. This also puts them in the category of path-dependent options. The two basic types of barrier options are knock-in and knock-out. A knock-in option, either put or call, comes into existence only when the underlying asset's price reaches a specified level. A knock-out option, either put or call, ceases to exist when the barrier price is reached.

A typical knock-in put option has a barrier price which is higher than the strike price. Thus, the put only comes into existence when and if the barrier price is reached. A knock-out call barrier price is generally below the strike price. A $60 call with a $52 barrier would cease to exist if at any time during the option's life the security traded $52 or lower. Because of this cancelable feature, barrier options trade for lower premiums than conventional options.

An important issue for barrier options is the frequency with which the asset price is monitored for the purposes of testing whether the barrier has been reached. Often the terms of the contract state that the asset price is observed once a day at the close of trading.

Bermudan options give the holder the right to exercise on multiple but specified dates over the option's life.

Binary options, also called digital options, are characterized by discontinuous payoffs. The option pays a fixed amount if the asset expires above the strike price, and pays nothing if it expires below the strike price. Regardless of how much the settlement price exceeds the strike price, the payoff for a binary option is fixed.

Contingent-premium options are options on which the premium is paid only if the option expires in the money. Because of this feature, these premiums tend to be higher than those for conventional options. The full premium is also paid at expiration, regardless of how in the money the option is. Thus, the premium paid can be significantly higher than the profit returned from the option position.

Installment options are options on which the total premium is paid in installments, with the actual option issued after the final payment. However, the buyer can cancel the payments before any payment date, losing only the premium paid to date and not the full premium amount.

Lookback options, also in the category of path-dependent, give call buyers the right to purchase the security for the lowest price attained during the option's life. Likewise, put sellers have the right to sell the security for the highest price attained during the option's life. The underlying asset in a lookback option is often a commodity. As with barrier options, the value of a lookback can depend on the frequency with which the asset price is monitored.

USES

Options can be used for hedging or speculative purposes. Hedgers can use options to protect against price movements in an underlying instrument or interest-rate exposure. Speculators can use options to take positions on the level of market volatility (if delta-hedged with the underlying instrument) or the direction and scope of price movements in the underlying asset.

The asymmetric payoff profile of an option is a unique feature that makes it an attractive hedging vehicle. For example, an investor with a long position in an underlying asset can buy a put option to offset losses from the long position in the asset if its price falls. In this instance, the investor's position in the asset will be protected at the strike price of the option, and yet the investor will still gain from any rise in the asset's value above the strike price. Of course, this protection against loss combined with the ability to gain from appreciation in the asset's value carries a price—the premium the investor pays for the option. In this sense, the purchase of an option to hedge an underlying exposure is analogous to the purchase of insurance.[1]

Options may also be used to gain exposure to a desired market for a limited amount of capital. For instance, by purchasing a call option on a Treasury security, a portfolio manager can create a leveraged position on a Treasury security with limited downside. For the cost of the option premium, the portfolio manager can obtain upside exposure to a movement in Treasury rates on the magnitude of the full underlying amount.

Many banks sell interest-rate caps and floors to customers. Banks also frequently use caps and floors to manage their assets and liabilities. Caps and floors are essentially OTC interest-rate options customized for a borrower or lender. Most caps and floors reference LIBOR (and thus are effectively LIBOR options). Eurodollar options are essentially the exchange-traded equivalent of caps and floors.

A cap, which is written independent of a borrowing arrangement, acts as an insurance policy by capping the borrower's exposure (for a fee, the option premium) to higher borrowing costs if interest rates rise. This is equivalent to the cap writer selling the purchaser a call on interest rates. Above the cap rate, the purchaser is entitled to remuneration from the cap writer for the difference between the higher market rate and the cap rate. Often caps have a sequence of (three-month) expiration dates. Each of these three-month pieces is known as a *caplet*. A bank looking to ensure that it does not pay above a specified rate on its LIBOR-based liabilities can achieve this objective by purchasing an interest-rate cap.

A floor is the opposite of a cap and sets a minimum level on interest rates. Thus, it is like a put option on interest rates. If interest rates fall below the floor rate, the purchaser is entitled to remuneration from the floor writer for the difference between the lower market rate and the floor rate. An asset manager with floating-rate LIBOR assets can purchase a floor to ensure that his or her return on the asset does not fall below the level of the floor.

An option strategy consisting of selling a floor and buying a cap is referred to as an interest-rate collar. Collars specify both the upper and lower limits for the rate that will be charged. It is usually constructed so that the price of the cap equals the price of the floor, making the net cost of the collar zero. Caps and floors are also linked to other indexes such as constant maturity Treasury rates (CMT), commercial paper, prime, 11th District Cost of Funds Index (COFI), and Treasury bills.

DESCRIPTION OF MARKETPLACE

Options trade both on exchanges and OTC. The vast majority of exchange options are American, while most OTC options tend to be European. Exchange-traded (or simply traded) options are generally standardized as to the underlying asset, expiration dates, and exercise prices. OTC options are generally tailored to meet a customer's specific needs.

Banks, investment banks, and certain insurance companies are active market makers in OTC options. End-users of options include banks, money managers, hedge funds, insurance

1. Note that the investor's position in this example, a long position in the underlying asset and a purchased put option, has exactly the same payoff profile as a position consisting of only a purchased call option. This example illustrates the ability to combine options and the underlying asset in combinations that can replicate practically any desired payoff profile. For example, a purchased call combined with a written put, both with the same exercise price, have the same exposure profile as a long position in the underlying asset.

companies, corporations, and sovereign institutions.

PRICING

In terms of valuation and risk measurement, instruments with option characteristics differ significantly from other assets. In particular, options require an assessment of the probability distribution of possible movements in the relevant market-risk factors. Changes in the expected volatility of an instrument's price will affect the value of the option. Option values not only vary with the degree of expected volatility in the price of the underlying asset, but also vary with the price of the underlying in a decidedly asymmetric way.

Although the supply and demand for options is what directly determines their market prices, option valuation theory plays a crucial role in informing market participants on both sides of the market. A number of valuation techniques are used by market participants and are described below.

Approaches to Option Valuation

Black-Scholes

The ''standard'' model used to value options is the Black-Scholes option pricing model. Based on a few key assumptions—including that asset prices follow a ''random walk'' (they fluctuate randomly up or down), the risk-free interest rate remains constant, and the option can be exercised only at expiration—the Black-Scholes model can incorporate all the main risk concepts of options and, therefore, provides a useful basis for discussion. In practice, many financial institutions use more sophisticated models, in some cases proprietary models.

The Black-Scholes formula for the value of a call option depends on five variables: (1) the price of the underlying asset, (2) the time to expiration of the option, (3) the exercise price, (4) the risk-free interest rate (the interest rate on a financial institution deposit or a Treasury bill of the same maturity as the option), and (5) the asset's expected volatility. Of the five variables, only four are known to market participants. The asset price and the deposit or Treasury bill rate of the appropriate maturity can be ascertained from dealers or a public information source. The maturity of the option and the strike price are known from the terms of the option contract.

Assuming that the price of an asset follows a random walk, Black and Scholes derived their formula for pricing a call option on that asset given the current spot price (S_t) at time t, the exercise price (X), the option's remaining time to maturity (T), the probability distribution (standard deviation) of the asset price (σ), and a constant interest rate r. Specifically, the price C at time t of a call option with a strike price of X which matures at time T is—

$$C(S_t,t;X,T,\sigma,r) = S_t N(d + \sigma\sqrt{T-t}) - Xe^{-r(T-t)}N(d),$$

where $N(d)$ is the probability that a standardized normally distributed random variable takes on a value less than d, and

$$d = \frac{\ln(S_t/X) + (r - \sigma^2/2)(T-t)}{\sigma\sqrt{T-t.}}$$

The easiest way to understand this formula is as the present value of the expected difference between the future price of the underlying asset and the exercise price, adjusted for the probability of exercise. In other words, it is the expected value of the payoff, discounted to the present at the risk-free rate. The first term in the Black-Scholes equation is the present value of the expected asset price at expiration given that the option finishes in the money. The standard normal term, $N(d)$, is the probability that the option expires in the money; hence, the entire second term, $Xe - r(T - t)N(d)$, is the present value of the exercise price times the probability of exercise.

The key unknown in the formula is future volatility of the underlying asset price. There are two ways of estimating this price. First, it can be estimated directly from historical data on the asset price, for example, by calculating the standard deviation of daily price changes over some recent period. When calculating volatility using historical prices, different estimates of volatility may be arrived at (and consequently, also different estimates of an option's value), depending on the historical period chosen and other factors. Hence, the historical period used in volatility estimates should be chosen with some care.

Alternatively, volatility can be estimated by using the Black-Scholes formula, together with the market prices of options, to back out the estimate of volatility implicit in the market price of the option, given the four known variables. This is called the implied volatility of the option. Note that the use of implied volatility may not be appropriate for thinly traded options due to the wide variation of options prices in thin markets.

Some institutions use a combination of both historical and implied volatilities to arrive at an appropriate estimate of expected volatility. Examiners should determine if management and the traders understand the benefits and shortcomings of both the estimated implied volatility and historical methods of calculating volatility, considering that the values derived under either or both methods may be appropriate in certain instances and not appropriate in others. In any case, the method used to estimate volatility should be conservative, independent of individual traders, and not subject to manipulation in risk and profitability calculations. The last point is especially important because volatilities are a critical component for calculating option values for internal control purposes.

Other Closed-Form Models

Since the publication of Black-Scholes, other widely-used formula-based valuation techniques have been developed for use by market makers to value European options as well as options on interest-bearing assets. These techniques include the Hull and White model and the Black, Derman, and Toy (BDT) model. These models are often described as *no-arbitrage models* and are designed so that the model is, or can be made, consistent with the current term structure of interest rates. Other models, such as the Cox, Ingersoll, and Ross (CIR) model, apply other disciplines to the term structure but allow prices to evolve in a way that need not be consistent with today's term structure of interest rates.

Binomial Model

An alternative technique used to value options is the binomial model. It is termed ''binomial'' because it is constructed as a ''tree'' of successive event points in which each branch has two possible events: the asset price either rises or falls. The amount of the rise or fall at each event point depends on the volatility of the underlying asset price. Each path of the variable—from the valuation date through each event point until expiration—then leads to an ultimate profit or loss for the option holder. The value of the option is then the ''average'' present value of these various ultimate outcomes.

The binomial approach is attractive because it is capable of pricing a wider variety of options than Black-Scholes. For example, a binomial model can allow for a different value function to be applied at different points in time or for options with multiple exercise dates. The binomial model is used by some to value options because it is perceived to be a more reasonable representation of observed prices in particular markets. It is also used to check the accuracy of modifications to the Black-Scholes model. (The Ho-Lee model of interest-rate options, for example, is an elaboration of a binomial model.) In addition, although it requires more computing time than the Black-Scholes model, the binomial model can be more easily adapted for computer use than other still more rigorous techniques. Under the same restrictive assumptions described above, the binomial model and the Black-Scholes formula will produce identical option values.

Monte Carlo Simulations

A final approach to valuing options is simply to value them using a large sample of randomly drawn potential future movements in the asset price, and calculate the average or expected value of the option. The random draws are based on the expected volatility of the asset price so that a sufficiently large sample will (by the Law of Large Numbers) accurately portray the expected value of the option, considering the entire probability distribution of the asset price.

The advantage of this technique is that it allows for different value functions under different conditions, particularly if the value of an instrument at a point in time depends in part on past movements in market-risk factors. Thus, for example, the value of a collateralized mortgage obligation security at a point in time will depend in part on the level of rate-motivated mortgage prepayments that have taken place in the past, making Monte Carlo simulation the valuation technique market participants prefer. Because of the time and computer resources required, this

technique is generally reserved for the most complex option valuation problems.

Sensitivity of Market Risk for Options

Given the complexity of the market risk arising from options, and the different models of option valuation, a set of terms has evolved in the market and in academic literature that now serves as a common language for discussing options risk. The key terms (loosely known as ''the greeks'') are described below. Each term is linked to one of the key variables needed to price an option, as described earlier; however, there is no ''greek'' for the exercise price.

Delta and Gamma

Delta and gamma both describe the sensitivity of the option price with respect to changes in the price of the underlying asset. The delta of an option is the degree to which the option's value will be affected by a (small) change in the price of the underlying instrument. As such, the estimate of an instrument's delta can be used to determine the appropriate option hedge ratio for an unhedged position in that instrument.

Gamma refers to the degree to which the option's delta will change as the instrument's price changes. The existence of gamma risk means that the use of delta hedging techniques is less effective against large changes in the price of the underlying instrument. While a delta-hedged short option position is protected against small changes in the price of the underlying asset, large price changes in either direction will produce losses (though of smaller magnitude than would have occurred had the price moved against a naked written option).

Vega

The vega of an option, or a portfolio of options, is the sensitivity of the option value to changes in the market's expectations for the volatility of the underlying instrument. An option value is heavily dependent upon the expected price volatility of the underlying instrument over the life of the option. If expected volatility increases, for example, there is a greater probability that an option may become in the money (profitable for the holder to exercise); thus the vega is typically positive. As noted above, market participants rely on implied rather than historical volatility in this type of analysis and measurement.

Theta

The theta of an option, or a portfolio of options, is the measure of how much an option position's value changes as the option moves closer to its expiration date (simply with the passage of time). The more time remaining to expiration, the more time for the option to become profitable to the holder. As time to expiration declines, option values tend to decline.

Rho

The rho of an option, or a portfolio of options, is the measure of how much an option's value changes in response to a change in short-term interest rates. The impact of rho risk is more significant for longer-term or in-the-money options.

HEDGING

Financial institutions using options may choose from basically three hedging approaches:

1. hedging on a ''perfectly matched'' basis,
2. hedging on a ''matched-book'' basis, and
3. hedging on a portfolio basis.

Hedging on a Perfectly Matched Basis

Some financial institutions prefer to trade and hedge options on a perfectly matched basis. In this instance, the financial institution arranges an option transaction only if another offsetting option transaction with exactly the same specifications (that is to say, the same underlying asset, amount, origination date, and maturity date) is simultaneously available. The trade-off in trading options on a perfectly matched basis is that the financial institution may miss opportunities to enter into deals while it is waiting to find the perfect match. However, many risks are reduced or eliminated when options and other

instruments are traded on a perfectly matched basis. In any event, the financial institution continues to assume credit risk when hedging on a perfectly matched basis.

Hedging on a Matched-Book Basis

As a practical matter, managing a portfolio of perfectly matched transactions is seldom possible because of the difficulty in finding two customers with perfectly offsetting needs. Less than perfectly matched hedging, called the matched-book hedging, attempts to approximate the perfectly matched approach. In matched-book hedging, all or most of the terms of the offsetting transactions are close but not exactly the same, or transactions are booked ''temporarily'' without an offsetting transaction.

For example, a financial institution may enter into an option transaction with a customer even if an offsetting OTC option transaction with similar terms is not available. The financial institution may temporarily hedge the risk associated with that option by using futures and exchange-traded options, or forward contracts. When an appropriate offsetting transaction becomes available, the temporary hedge is unwound. In reality, it may be some time before an offsetting transaction occurs, and it may never occur. Typically, institutions that run a matched book establish position limits on the amount of residual exposure permitted. By offering transactions on a matched-book basis, financial institutions are able to assist their customers without waiting for a counterparty with simultaneous, offsetting needs to appear.

Hedging on a Portfolio Basis

More sophisticated institutions usually find it more practical to hedge their exposure on a portfolio basis when trading options (and other traded instruments) in more liquid markets, such as those for interest rates and foreign exchange. Portfolio hedging does not attempt to match each transaction with an offsetting transaction, but rather attempts to minimize and control the residual price exposure of the entire portfolio.

Risk-management or hedging models determine the amount of exposure remaining in the portfolio after taking into consideration offsetting transactions currently in the book. Offsetting transactions using futures, swaps, exchange-traded options, the underlying asset, or other transactions are then entered into to reduce the portfolio's residual risk to a level acceptable to the institution. Portfolio hedging permits financial institutions to act more effectively as market makers for options and other traded instruments, entering into transactions as requested by customers. It is also more efficient and less costly than running a matched book since there is less need to exactly match the particulars of a transaction with an offsetting position.

RISKS

Credit Risk

One of the key risks in an option transaction is the risk that the counterparty will default on its obligation to perform.[2] Accordingly, credit risk arises when financial institutions purchase options, not when they write (sell) options. For example, when a financial institution sells a put or call option, it receives a premium for assuming the risk that it may have to perform if the option moves in the money and the buyer chooses to exercise. On the other hand, when a financial institution purchases a put or call option, it is exposed to the possibility that the counterparty may not perform if the option moves in the money.

When estimating the credit risk associated with an option contract, some institutions calculate credit risk under a worst-case scenario. To develop this scenario, financial institutions typically rely on statistical analysis. In essence, the financial institution attempts to project, within a certain confidence level, how far, in dollar terms, the option can move in the money. This amount represents the ''maximum potential loss exposure'' if the counterparty (option seller) defaults on the option contract and the financial institution is required to replace the transaction in the market. For a discussion of other ways financial institutions measure credit risk, see

2. This discussion of credit risk is relevant for over-the-counter products. Exchange-traded options are guaranteed by a clearing organization and have minimal credit risk.

section 2020.1, ''Counterparty Credit and Presettlement Risk.''

Settlement Risk

The importance of settlement risk may vary materially among countries, depending on the settlement procedures used. In the United States, for example, transactions are typically settled on a net payment basis, with payment being made to only one party to the contract. The beneficiary of the payment incurs the credit risk that the counterparty will not make payment and will default, but does not face the greater settlement risk that a one-sided exchange of securities will occur. Examiners should determine what settlement procedures are used by the markets in which the financial institution participates and should determine what procedures the financial institution takes to minimize any settlement risk. For further discussion of settlement-risk issues, see section 2020.1, ''Counterparty Credit and Presettlement Risk.''

Liquidity Risk

The financial institution's ability to offset or cancel outstanding options contracts is an important consideration in evaluating the usefulness and safety and soundness of its options activities. OTC options contracts are often illiquid since they can only be canceled by agreement of the counterparty. If the counterparty refuses to cancel an open contract, the financial institution must either find another party with which to enter an offsetting contract or go to one of the exchanges to execute a similar, but offsetting, contract. On the other hand, if a counterparty defaults and the financial institution is unable to enter into an offsetting contract because of market illiquidity, then the default will expose the financial institution to unexpected market risk.

Exchanges also do not ensure liquidity. First, not all financial contracts listed on exchanges are heavily traded. While some contracts have greater trading volume than the underlying cash markets, others trade infrequently. In addition, even with actively traded futures and options contracts, the bulk of trading occurs in the first or second expiration month. Thus, to be able to offset open contracts quickly as needs change, the financial institution must take positions in the earlier expiration months when the bulk of trading occurs.

Some exchange-traded contracts limit how far prices can move on any given day. When the market has moved ''limit up'' or ''limit down'' for the day, trading ceases until the next day. These limits cause illiquidity in certain instances. Hedging contracts with such limited price-movement potential may not adequately protect the holders against large changes in the value of underlying asset prices. Examiners should review the financial institution's policies and procedures to determine whether the financial institution recognizes problems that these limits could create (for example, ineffective hedges). This review should also determine whether the financial institution has contingency plans for dealing with such situations.

ACCOUNTING TREATMENT

The accounting treatment for option contracts is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

Purchased Options

The purchaser of an option has the right, but not the obligation, to purchase a fixed amount of the underlying instrument according to the terms of the option contract. If a purchased option is held as a trading asset or otherwise does not qualify for hedge accounting, it should be marked to market. Options that qualify for hedge accounting should record unrealized gains and losses in the appropriate period to match the recognition of the revenue or expense item of the hedged item. The premium paid on options qualifying as hedges generally are amortized over the life of the option.

Written Options

The writer of an option is obligated to perform according to the terms of the option contract. Written options are generally presumed to be speculative and, therefore, should be marked to market through the income statement.

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of an option contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are listed below.

Remaining Maturity	*Interest Rate*	*Exchange Rate*
One year or less	0.00%	1.00%
Five years or less	0.50%	5.00%
Greater than five years	1.50%	7.5%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'')

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Options are not considered investment securities under 12 USC 24 (seventh). However, the use of these contracts is considered to be an activity incidental to banking within safe and sound banking principles.

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GENERAL DESCRIPTION

A currency swap is a private over-the-counter (OTC) contract which commits two counterparties to exchange, over an agreed period, two streams of interest payments denominated in different currencies, and, at the end of the period, to exchange the corresponding principal amounts at an exchange rate agreed upon at the start of the contract. The term ''currency swap'' can sometimes be used to refer to foreign-exchange swaps. Foreign-exchange swaps refers to the practice of buying or selling foreign currency in the spot market and simultaneously locking in a forward rate to reverse that transaction in the future. Foreign-exchange swaps, unlike currency swaps, do not involve interest payments—only principal amounts at the start and maturity of the swap.

CHARACTERISTICS AND FEATURES

The term ''currency swap'' is used to describe interest-rate swaps involving two currencies. The strict application of the term is limited to fixed-against-fixed interest-rate swaps between currencies. Cross-currency swaps, a generic variation of the currency swap, involve an exchange of interest streams in different currencies, at least one of which is at a floating rate of interest. Those swaps that exchange a fixed rate against a floating rate are generally referred to as cross-currency coupon swaps, while those that exchange floating-against-floating using different reference rates are known as cross-currency basis swaps.

Other types of cross-currency swaps include annuity swaps, zero-coupon swaps, and amortizing swaps. In cross-currency annuity swaps, level cash-flow streams in different currencies are exchanged with no exchange of principal at maturity. Annuity swaps are priced such that the level payment cash-flow streams in each currency have the same net present value at the inception of the transaction. Annuity swaps are often used to hedge the foreign-exchange exposure resulting from a known stream of cash flows in a foreign currency. For example, a U.S. corporation which receives a deutschemark (DM) 2 million semiannual dividend payment from its German subsidiary can execute an annuity swap with a dealer in which it will make semiannual payments of DM 2 million and receive semiannual payments of $300,000—thus locking in a dollar value of its DM-denominated dividend payments.

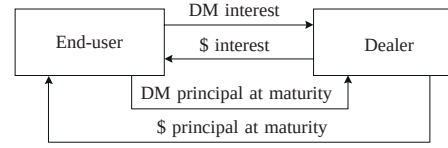
A zero-coupon swap involves no periodic payments (representing ''coupon'' payments). Rather, these cash flows are incorporated into the final exchange of principal. Cross-currency zero-coupon swaps are equivalent to a long-dated forward contract and are used to hedge long-dated currency exposures when the exchange-traded and OTC foreign-exchange market may not be liquid.

An amortizing cross-currency swap is structured with a declining principal schedule, usually designed to match that of an amortizing asset or liability. Amortizing cross-currency swaps are typically used to hedge a cross-border project-financing loan in which the debt is paid down over a series of years as the project begins to generate cash flow.

Plain Vanilla Example

Figure 1 illustrates the most simple example of a currency swap. An institution enters into a currency swap with a counterparty to exchange U.S. dollar interest payments and principal for offsetting cash flows in German DM.

Figure 1—Plain Vanilla Currency Swap



As illustrated, there are three stages to a currency swap. The first stage is an initial exchange of principal at an agreed rate of exchange, usually based on the spot exchange rate. The initial exchange may be on either a *notional basis* (no physical exchange of principal) or a *physical exchange* basis. The initial exchange is

important primarily to establish the quantity of the respective principal amounts for the purpose of calculating the ongoing payments of interest and for the re-exchange of principal amounts under the swap. Most commonly, the initial exchange of principal is on a notional basis.

The second stage involves the exchange of interest. The counterparties exchange interest payments based on the outstanding principal amounts at the respective fixed interest rates agreed on at the outset of the transaction. The third stage entails the re-exchange of principal. On maturity, the counterparties re-exchange principal at the original exchange rate agreed on at the execution of the swap.

USES

Currency swaps create exposures to the risk of changes in exchange rates and interest rates. Therefore, they can be used to take risk positions based on expectations about the direction in which the exchange rate, interest rates, or both will move in the future. Firms can alter the exposures of their existing assets or liabilities to changes in exchange rates by swapping them into foreign currency. Also, a reduction in borrowing costs can be achieved by obtaining more favorable financing in a foreign currency and using currency swaps to hedge the associated exchange-rate risks. Conversely, a firm can enhance the return on its assets by investing in the higher-yielding currency and hedging with currency swaps.

DESCRIPTION OF MARKETPLACE

Market Participants

Sell Side

Most of the major international financial institutions are willing to enter into currency swaps. However, the group of those institutions acting as market makers (that is, quoting firm buying and selling prices for swaps in all trading conditions) is limited to a handful of the most active swap participants who make markets for interest-rate swaps in the major currencies. Even this group is focused largely on swaps involving U.S. dollar LIBOR as one of the legs. Furthermore, because of the credit risk involved, many customers prefer only to deal with the highest-rated institutions. In fact, most of the investment banking dealers book these swaps in special-purpose, ''AAA''-rated, derivative product subsidiaries.

Buy Side

The end-users of currency swaps are mainly financial institutions and corporations. These firms can enter into a swap either to alter their exposures to market risk, enhance the yields of their assets, or lower their funding costs.

Quoting Conventions

Currency swaps are generally quoted in terms of all-in prices, that is, as absolute annual fixed percentage interest rates. Swap intermediaries may quote two all-in prices for each currency swap, for example, 6.86–6.96 percent for the U.S. dollar leg and 7.25–7.35 percent for the DM leg. This is a two-way price, meaning a dual quotation consisting of a buying and selling price for each instrument. The terms buying and selling can be ambiguous in the case of swaps; the terms paying and receiving should be used instead. In currency swaps, that is, fixed-against-fixed swaps, both sides of the swap should be specified. It may not be obvious which side of a two-way price is being paid and which is being received.

Trading

Since the market for currency swaps is a highly customized OTC market, most of the trading is done by telephone. In negotiating swaps, key financial details are agreed on orally between dealers. Key details are confirmed in writing.

In the early days of the swaps market, intermediaries tried to avoid the risk of acting as principals by acting as arrangers of swap deals between end-users. Arrangers act as agents, introducing matching counterparties to each other and then stepping aside. Arrangers were typically merchant and commercial banks. Arrangement continues to be a feature of currency swaps. Brokers act as agents, arranging deals by matching swap counterparties, but they do not

participate in the actual transactions. Brokers do not earn dealing spreads, but are paid a flat fee based on the size of the deal. Brokers disclose indicative swap price information over networks such as Reuters and Telerate.

The market for currency swaps has become more complex and diverse. Commercial banks have begun entering this market as principal intermediaries to provide their expertise in assessing credit risk to end-users of swaps. Many end-users lack credit analysis facilities and prefer having credit exposure to a large financial intermediary rather than to another end-user counterparty. However, in several cases, the credit rating of the financial intermediary is not strong enough for a particular end-user. For this reason, a large number of these swaps are booked in the AAA subsidiaries.

The secondary market for currency swaps is more limited than the market for single-currency interest-rate swaps due to the credit risk involved. There are cases in which a buyer of a swap has assigned it to a new counterparty (that is, the buyer substitutes one of the original counterparties). Recently, assignment has been by novation, meaning that the swap contract to be assigned is in fact terminated and a new but identical contract is created between the remaining counterparty and the assignee.

Market Transparency

A large volume of currency swaps consists of customized transactions whose pricing is sensitive to credit considerations. Consequently, the actual pricing of these swaps is less transparent than it is for single-currency interest-rate swaps. Price information is distributed over screen-based communication networks, such as Reuters and Telerate, but this consists primarily of broker's indicative prices for plain vanilla cross-currency transactions.

PRICING

A currency swap is valued as the present value (*PV*) of the future interest and principal payments in one currency against the *PV* of future interest and principal payments in the other currency, denominated in the same currency:

$$\textit{Value of currency swap} = PV_{\textit{currency A cash flow}} - \frac{PV_{\textit{currency B cash flow}}}{\textit{Exchange rate}_{B/A}}$$

The cash flows above (the streams of interest and principal payments) are functions of the current market exchange rate, which is used to translate net present values into the same currency, and the current market interest rates, which are used to discount future cash flows.

Calculating the present value of the stream of fixed interest payments is done as follows:

$$PV_{\textit{fixed interest + principal}} = \sum_{n=1}^{N} \frac{C_n}{V^n} + \frac{P}{V^n},$$

where $V^n = [1 + (\text{day count}/360 \times I)]^n$
and C_n = fixed interest cash flow at time n
P = principal cash flow
I = prevailing annual market interest rate
N = years to maturity
n = settlement period number
day count = number of days between regular coupon payments

For example, a $/DM currency swap is used with these specifications:

Remaining life = 3 years
$ fixed interest rate = 5% APR
DM fixed interest rate = 9% APR
$ principal = $100 million
DM principal = DM 170 million
Agreed-upon swap
exchange rate = 1.700 DM/$
Current prevailing rates:
3-year DM interest rate = 8% APR
3-year $ interest rate = 6% APR
Spot exchange rate = 1.5 DM/$

The *PV* of the deutschemark part of the transaction would be—

$$PV = \text{DM } 174{,}381{,}065.$$

To find the *PV* of the dollar cash flow, the following constants are known:

N = 3 (years)
I = 6% APR

such that—

$$PV = \$97{,}326{,}988.$$

The value of the swap is the difference between the *PV*s of the deutschemark and dollar cash flows. To calculate the difference, first convert the DM leg to dollar amounts, using the spot exchange rate of 1.5:

(DM 174,381,065/1.50 =) $116,254,043
– $97,326,988 = $18,927,055.

The pricing of currency swaps is similar to that used for interest-rate swaps, with the difference that the exchange rate has to be accounted for in assessing cash flows. A currency swap in which the two counterparties are both paying fixed interest should have a net present value of zero at inception. The fixed interest rate is set at inception accordingly. For a cross-currency swap in which at least one side is paying a floating interest rate, implied forward interest rates are used to price the swap.

HEDGING

Currency swaps are used to manage interest-rate risk and currency risk. A company with mainly deutschemark revenues that has borrowed fixed-rate dollars is faced with the prospect of currency appreciation or depreciation, which would affect the value of its interest payments and receipts. In this example, the prospect of a dollar appreciation would mean that the DM revenue would have to increase in order to raise enough (stronger) dollars to repay the fixed-rate (dollar) loan. The German firm could hedge its exposure to the appreciating dollar by entering into a DM/$ currency swap.

Furthermore, if the German company expects not only that the dollar will appreciate but that German interest rates will fall, then a cross-currency swap could be used. The German firm could swap fixed-rate dollars for floating-rate marks to take advantage of the expected fall in German interest rates, as well as hedge against exchange-rate risk.

In the example above, initial exchange of principal is not needed. Exchange of principal is needed only when a swap counterparty needs to acquire foreign currency or needs to convert new borrowing from one currency to another. If the foreign currency of a liability is expected to depreciate (in the example above, if the dollar is expected to depreciate) or the domestic currency is expected to appreciate, a currency swap would restrict currency gains. In such cases, the only risk that would need to be hedged against would be interest-rate risk, in which case engaging in a domestic currency interest-rate swap would be appropriate. (In these hedges, assumptions must be made about the movement of the exchange rate. The swap counterparty is still exposed to exchange-rate risk, but is hedging only interest-rate risk based on an assumption about the exchange rate.)

RISKS

Market Risk

A currency swap that is not hedged or used as a hedge exposes the institution to dual market risks: exchange-rate risk and interest-rate risk. Exchange-rate risk refers to movements in the prices of a swap's component parts (specifically, the spot rate), while interest-rate risk is caused by movements in the corresponding market interest rates for the two currencies.

Liquidity Risk

As stated earlier, the market for currency swaps is confined to a small number of institutions and is very credit intensive. Reversing out of a trade at short notice can be very difficult, especially for the more complicated structures. Occasionally, an institution can go to the original counterparty, resulting in the cancellation or novation of the trade, which frees up credit limits needed for some other transaction.

Credit Risk

Credit risk in currency swaps may be particularly problematic. Whereas interest-rate swaps involve the risk of default on interest payments only, for currency swaps, credit and settlement risk also extends to the payment of principal. The consequences of an actual default by a currency-swap counterparty depends on what the swap is being used for. If the currency swap is being used to hedge interest-rate and currency

risk, the default of one counterparty would leave the other counterparty exposed to the risk being hedged. This could translate into an actual cost if any of those risks are actually realized. If the swap is held to take advantage of expected rate movements, the default of a counterparty would mean that any potential gains would not be realized.

ACCOUNTING TREATMENT

The accounting treatment for foreign-currency transactions, including currency swaps, is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a currency-swap contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are listed below.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	1.00%
Five years or less	5.00%
Greater than five years	7.50%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, "Capital Adequacy.") For institutions applying market-risk capital standards, all foreign-exchange transactions are included in value-at-risk (VAR) calculations for general market risk.

LEGAL LIMITATIONS FOR BANK INVESTMENT

Currency swaps are not considered investments under 12 USC 24 (seventh). However, the use of currency swaps is considered to be an activity incidental to banking, within safe and sound banking practices.

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GENERAL DESCRIPTION

Options on swap contracts (swaptions) are over-the-counter (OTC) contracts providing the right to enter into an interest-rate swap. In exchange for a one-time, up-front fee, the buyer of the swaption has the right, but not the obligation, to enter into a swap at an agreed-on interest rate at a specified future date for an agreed-on period of time and interest rate. As such, swaptions exhibit all of the same characteristics inherent in options (including asymmetric risk-return profiles).

In general, an interest-rate call swaption gives the purchaser the right to receive a specified fixed rate, the strike rate, in a swap and to pay the floating rate for a stated time period. (In addition to interest rates, swaptions can be traded on any type of swap, such as currencies, equities, and physical commodities.) An interest-rate put swaption gives the buyer the right to pay a specific fixed interest rate in a swap and to receive the floating rate for a stated time period. Conversely, the writer of a call swaption sells the right to another party to receive fixed (the writer will thus be obligated to pay fixed if the option is exercised), while the writer of a put swaption sells the right to another party to pay fixed (the writer will thus be obligated to receive fixed if the option is exercised).

CHARACTERISTICS AND FEATURES

Swaptions are typically structured to exchange a stream of floating-rate payments for fixed-rate payments in one currency. The fixed rate is identified as the strike yield and is constant throughout the life of the swaption, while floating rates are based on a variety of indexes including LIBOR, Eurodollar futures, commercial paper, and Treasury bills.

The swap component of a swaption is not restricted to the fixed versus floating format. As with simple swaps, the structure of swaptions may vary. For a discussion of swap variations, see section 4325.1, ''Interest-Rate Swaps.''

Swaption maturities are not standardized, as all swaptions are OTC transactions between the buyer and the seller. Maturities for swaptions typically range from one month to two years on the option and up to 10 years on the swap. The option component of the swaption can be designated to be exercised only at its expiration date (a European swaption—the most common type), on specific prespecified dates (a Bermudan swaption), or at any time up to and including the exercise date (an American swaption).

Swaptions are generally quoted with references to both the option and swap maturity. For example, a quote of ''3 into 5'' references a 3-year option into a 5-year swap, for a total term of eight years. Terms can be arranged for almost any tenor from a 3-month to a 10-year option, or even longer. In general, the 5-year into 5-year swaption might be considered the end of the *very* liquid market. Longer-tenor instruments (for example, 10-year into 20-year) are not uncommon but do not display the same degree of liquidity. As with options, active swaption dealers are really speculating on volatility more than market direction.

Important Variations

Cancelable Swaps

Cancelable (callable or putable) swaps are popular types of swaptions. In exchange for a premium, a callable swap gives the fixed-rate payor the right, at any time before the strike date, to terminate the swap and extinguish the obligation to pay the present value of future payments. A putable swap, conversely, gives the fixed-rate receiver the right to terminate the swap. (In contrast, a counterparty in a plain vanilla swap may be able to close out a swap before maturity, but only by paying the net present value of future payments.) Cancelable swaptions are typically used by institutions that have an obligation in which they can repay principal before the maturity date on the obligation, such as callable bonds. Cancelable swaps allow companies to avoid maturity mismatches between (1) assets and liabilities with prepayment options and (2) the swaps put in place to hedge them. A ''3x5 cancelable swap'' would describe a five-year swap that may be terminated by one of the counterparties after three years.

Extendible Swaps

In exchange for a premium, extendible swaps allow the owner of the option to extend the tenor of an already-existing swap. If a firm has assets or liabilities whose maturities are uncertain, an extendible swap allows the investor to hedge the associated price risk more precisely.

Amortizing or Accreting Swaptions

Two additional instruments, amortizing and accreting swaptions, are useful for real estate–related or project-finance-related loans. Amortizing and accreting swaptions represent options to enter into an amortizing or accreting swap, where the principal amount used to calculate interest-rate payments in the swap decreases or increases during the life of the obligation. Specifically, the notional amount of the underlying swap decreases (amortizes) or increases (accretes) depending on loan repayments or drawdowns. For example, the swaption can be constructed to give the owner of the option some flexibility in reducing the prepayment risk associated with a loan.

USES

Swaptions are most commonly used to enhance the embedded call option value in fixed-rate callable debt and to manage the call risk of securities with embedded call features. Swaptions may be used to provide companies with an alternative to forward, or deferred, swaps, allowing the purchaser to benefit from favorable interest-rate moves while offering protection from unfavorable moves. Swaptions are also used to guarantee a maximum fixed rate of interest on anticipated borrowing.

Enhancing Embedded Call Option Value in Fixed-Rate Callable Debt

Through a swaption, the bond issuer sells the potential economic benefit arising from the ability to call the bonds and refinance at lower interest rates. This technique, known as ''call monetization,'' is effectively the sale (or early execution) of debt-related call options. The following example illustrates call monetization.

A firm has $100 million of 11 percent fixed-rate debt which matures May 15, 2002, and is callable May 15, 1999. The company sells to a bank a $100 million notional principal European call swaption with a strike yield of 11, an option exercise date of May 15, 1999, and an underlying swap maturity date of May 15, 2002. In return for this swaption, the firm receives $4 million. The company has sold to the bank the right to enter into a swap to receive a fixed rate of 11 and pay a floating rate. As a result of the sale, the firm's financing cost is reduced by $4 million, the amount of the premium. From the bank's perspective, a fee was paid for the right to receive fixed-rate payments that may be above market yields at the exercise date of May 15, 1999.

If, at May 15, 1999 (the call date), the company's three-year borrowing rate is 10, the debt will be called and the bank will exercise the call swaption against the firm. The company becomes a fixed-rate payer at 11 percent on a three-year interest-rate swap from May 15, 1999, through May 15, 2002, while receiving the floating rate from the bank. The firm will now attempt to refinance its debt at the same or lower floating rate than it receives from the bank. As long as the floating rate that the company receives does not fall below the firm's net refinancing cost, the monetization of the call lowers net borrowing costs because the firm starts out paying 11 percent interest and is still paying 11 percent interest, but has received the $4 million premium.

If, on the other hand, the company's three-year funding rate, as of May 15, 1999, is 11 percent or higher, the bank will allow the option to expire and the firm will not call the debt. The company will continue to fund itself with fixed-rate debentures at 11 percent, but the $4 million premium will reduce its effective borrowing cost.

Managing the Call Risk of Securities with Embedded Call Features

Investors also use swaptions to manage the call risks of securities with embedded call features. For example, an investor buys a seven-year $100 million bond that has a 12 coupon and is callable after five and wishes to purchase protection against the bonds' being called. Thus, in year four, the investor purchases

from a bank a one-year European call swaption, with a strike yield of 12 and a swap maturity of two years based on a notional principal of $100 million. The firm pays the bank a $1 million up-front fee for this option. In this case, the higher the strike yield, the higher the up-front fee will be.

At year five, if two-year floating rates are 10, the bond will be called, and the investor will exercise the swaption. The investor will reinvest its money at the current floating rate of 10, pass along the 10 interest to the bank, and receive 12 from the bank. Thus, the investor guarantees that it will not earn less than 12 on its investment. If, on the other hand, two-year floating rates are above 12, the bonds will not be called and the investor will let the option expire.

Guaranteeing a Maximum Interest Rate on Variable-Rate Borrowing

An additional use of swaptions is to guarantee a maximum interest rate on variable-rate borrowing. A company, for example, issues a two-year $10 million floating-rate note. The firm does not want to pay more than 10 interest so it purchases from a bank a one-year European put swaption for the right to enter into a one-year swap in which it will pay a fixed rate (strike yield) of 10 on a notional principal of $10 million. The bank, on the other hand, agrees to pay floating-rate interest payments to the firm if the option is exercised. The company pays the bank an up-front fee of $100,000 for this option.

At the end of the first year, if the floating rate increases to 12, the firm will exercise the option and pay 10 interest to the bank, and the bank will pay the current floating rate of 12 to the company. While this option will cost the firm $100,000, it will save $200,000 in interest costs ((12 – 10) × $10 million). Therefore, in total, the company will save $100,000. Once the option is exercised, however, the firm cannot return to floating rates even if floating rates should fall below 10 (unless the company reverses the swap, which can be very expensive). On the other hand, if the floating rate is below 10 at the end of the first year, the firm will let the option expire and continue to pay a floating rate.

DESCRIPTION OF MARKETPLACE

Swaptions are OTC-traded instruments, and they can easily be customized to suit a particular investor's needs. The market is very active and can be loosely coupled with other markets (for example, Eurodollar caps and floors and the OTC bond options market) in certain maturities. In addition, there is a very active secondary market.

In general, U.S. dollar swaptions with an option component of less than five years can be thought of as relatively short-term; the five-year to seven-year maturity is considered medium-term, with 10-year and longer options being considered long-term and displaying relatively more limited liquidity. A tenor such as a 10-year into 10-year swaption can be thought of as the upper bound on the liquid market.

PRICING

The pricing of swaptions relies on the development of models that are on the cutting edge of options theory. Dealers differ greatly in the models they use to price such options, and the analytical tools range from modified Black-Scholes to binomial lattice versions to systems based on Monte Carlo simulations. As a result, bid/ask spreads vary greatly, particularly from more complicated structures that cannot be easily backed off in the secondary markets. The price of a swaption, known as the premium, depends on several factors: the expected shape of the yield curve, the length of the option and swap periods, the strike yield's relationship to market interest rates, and expected interest-rate volatility.

HEDGING

Swaptions are often hedged using Eurodollar futures, Treasuries, and interest-rate swaps. Market participants have introduced a variety of features to mitigate counterparty credit risk, such as cash settlement and posting of cash collateral. Of these, cash settlement, in which the seller pays the net present value of the swap to the buyer upon exercise of the option, has been the most common. Cash settle-

ment has two significant benefits: (1) it limits the length of credit exposure to the life of the option and (2) banks are not required to allocate capital for the swap, since neither party actually enters into the swap.

RISKS

The risks of purchasing or selling a swaption include the price and credit risks associated with both swaps and options. For a more detailed discussion of the risks connected with these instruments, see sections 4325.1 and 4330.1, ''Interest-Rate Swaps'' and ''Options,'' respectively.

As a hybrid instrument, a swaption generates two important exposures: the probability of exercise and the credit risk emerging from the swap. The first risk is a function of the option's sensitivity to the level and volatility of the underlying swap rates. The swaption's credit risk is the cost to one counterparty of replacing the swaption in the event the other counterparty is unable to perform.

As mentioned earlier, liquidity risk is most pronounced for swaptions with option components of greater than 10 years. However, swaptions with five-year option components will have greater liquidity than those with 10-year option components.

ACCOUNTING TREATMENT

The accounting treatment for swaptions is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a swaption contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are listed below:

Remaining Maturity	*Credit-Conversion Factor*
One year or less	0.00
Five years or less	0.50
Greater than five years	1.50

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'')

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Swaptions are not considered investments under 12 USC 24 (seventh). The use of these instruments is considered to be an activity incidental to banking within safe and sound banking practices.

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GENERAL DESCRIPTION

The term ''equity derivatives'' refers to the family of derivative products whose value is linked to various indexes and individual securities in the equity markets. Equity derivitives include stock index futures, options, and swaps. As in the interest-rate product sector, the over-the-counter (OTC) and futures markets are closely linked. Banks are involved in these markets in a variety of ways, depending on their customer base. Some banks are actively involved as market makers in all products, while others only use this market to satisfy customer needs or as part of a structured financial transaction.

CHARACTERISTICS AND FEATURES

Equity derivatives range in maturity from three months to five years or longer. The maturities in the OTC market are generally longer than those in the futures market. However, maturities in the futures market are gradually changing with the development of the LEAPs (Long-Term Equity AnticiPation) market on the exchanges. As with other futures markets, there is a movement towards more flexibility in the maturities and strike prices of equity derivitives.

The following are the major instruments that comprise the equity derivatives market and are available for most major markets around the world:

- *Equity swaps* are transactions in which an exchange of payments referenced to the change in a certain index and an interest rate are exchanged and are usually based on a fixed notional amount. For example, counterparty A may pay a spread over LIBOR to counterparty B and receive the return on a specified equity index. These swaps are documented using standard ISDA documentation. Some of these transactions also have a currency component and in many cases are done as quantos.[1]
- *Stock index futures* are futures on various stock indexes and are traded on most of the major exchanges.
- *Stock index options* are options on either the cash value of the indexes or on the stock index futures.
- *Equity options* are options on the individual stocks and are also traded on most major exchanges.
- *Warrants* are longer-term options on either individual stocks or on certain indexes. They are popular in Europe and Asia (especially Japan).
- *Equity-index-linked notes* are fixed-income securities issued by a corporation, bank, or sovereign in which the principal repayment of the note at maturity is linked to the performance of an equity index. The formula for principal repayment can reflect a long or short position in an equity index and can also provide an exposure to the equity market which is similar to an option or combination of options.
- *Other instruments* include ADRs (American Depository Receipts), and SPDRs (S&P 500 Depository Receipts).
- *Index arbitrage* is strictly not a product, but an activity; however, it is an important part of the equity derivatives market. As its name implies, index arbitrage is the trading of index futures against the component stocks.

As these markets have developed, various enhancements have been made to them, such as the introduction of futures on individual stocks. Some of the more structured deals that banks are involved in use more than one of the above products.

USES

Equity derivatives are used for investment, hedg-

1. Quantos (guaranteed exchange-rate options/quantity-adjusting options) are cross-border equity or equity index options that eliminate currency-exchange-rate exposure on an option or option-like payout by translating the percentage change in the underlying into a payment in the investor's base currency at a spot exchange rate set at the start of the contract. The investor holding a quanto option obtains participation in a foreign equity or index return, denominated in the domestic currency. Currency exchange rates are fixed at issuance by setting the option payoff in the investor's base currency as a multiple of the foreign equity or index rate of return. The rate of return determining the payoff can be positive (calls) or negative (puts). Guaranteed-exchange-rate put options are more common in some markets than guaranteed exchange-rate call options.

ing, and speculative purposes. The growth in this market has coincided with developments in other derivative markets. Users and customers of the banks have shown increased interest in equity derivitive products for purposes ranging from hedging to speculation. Some of the major users of these products are investment funds. Some banks also use them to hedge their index-linked certificates of deposit (CDs) (these are longer-term CDs, whose principal is guaranteed and whose yield is linked to the return on a certain stock index, for example, S&P 500). Some corporations also use equity derivatives to lower the yield on their issuance of securities. Some speculators (hedge funds) might use equity swaps or options to speculate on the direction of equity markets.

Equity-index-linked swaps are often used as an overlay to a portfolio of fixed-income assets to create a synthetic equity investment. For example, a portfolio manager may have a fixed-income portfolio whose yield is based on LIBOR. The manager can enter into an equity-index-linked swap with a bank counterparty in which the manager pays the bank LIBOR and receives the return on an equity index, plus or minus a spread. If the portfolio manager earns a positive spread on the LIBOR-based investments, an equity-index-linked swap may result in an overall return which beats the market index to which the portfolio manager is evaluated. For example, if the LIBOR-based portfolio yields LIBOR + 20 basis points, and the manager enters into an equity-index-linked swap in which he or she pays LIBOR flat and receives the return on the equity index flat, the manager will receive a return on the equity index plus 20 basis points, thus outperforming the index. In this way, equity-index-linked swaps allow portfolio managers to transfer expertise in managing one class of assets to another market.

Equity-index options, warrants, and futures are often used as hedging vehicles. A portfolio manager, for example, can protect an existing indexed equity portfolio against a decline in the market by purchasing a put option on the index or by selling futures contracts on the index. In the case of the put option, the portfolio will be protected from a decline in the index, while being able to participate in any future upside movement of the index. The protection of the put option, however, involves the cost of a premium which is paid to the seller of the option. In the case of selling futures contracts on the index, the portfolio is protected against a decline in the index, but will not be able to participate in future upside movement in the index. Unlike the put option, the futures contract does not involve an up-front payment of a premium.

Equity-linked options are also used by portfolio managers to gain exposure to an equity market for a limited amount of capital. For instance, by purchasing a call option on an equity index, a portfolio manager can create a leveraged position in an equity index with limited downside. For the cost of the option premium, the portfolio manager will obtain upside exposure to an equity market on the magnitude of the full underlying amount.

DESCRIPTION OF MARKETPLACE

Sell Side

The major sell-side participants in this market can be divided into three groups: investment banks, exchanges, and commercial banks. Investment banks have the greatest competitive advantages in these markets because of their customer base and the nature of their businesses and, therefore, have the largest market share. While commercial banks have much of the necessary technical expertise to manage these instruments, they are hampered by regulations and lack of a customer base.

The underlying instruments for equity derivative products are primarily the various stock indexes traded around the world. Even though there is a lot of activity in the individual stock options, banks are mostly active in the derivatives market on the various indexes. Their involvement in the market for individual stocks is affected by various regulations restricting bank ownership of individual equities.

Buy Side

Buy-side participants in the equity derivatives market include money managers; hedge funds; insurance companies; and corporations, banks, and finance companies which issue equity securities. Commercial banks are not very active users of equity derivatives because of regulations restricting bank ownership of equities.

PRICING

Because of the large volumes traded in equity derivatives markets, the pricing of most of these products is very transparent and widely disseminated—at least for the products that are based on the equity markets of the major industrialized countries. This transparency does not hold true for the prices in some of the developing countries or those countries which are highly regulated. The pricing of some of these products is also affected by tax considerations and regulatory constraints for certain cross-border transactions. As with some of the other derivative markets, there is less transparency for structured products, especially those that involve some of the swaps that include exotic options in both the interest-rate and index components.

HEDGING

Since banks' activities with customers often involve nonstandard maturities and amounts, equity derivatives instruments are often hedged using exchange-traded instruments. The hedges take the form of combinations of the products that are available on the relevant exchanges and also involve the interest-rate markets (swaps and futures) to hedge out the interest-rate risk inherent in equity derivatives.

The risks of individual equity securities, or a basket of equity securities are often hedged by using futures or options on an equity index. This hedge may be over- or underweighted based on the expected correlation between the index and the individual security or basket of securities. To the extent that the underlying and the hedge instrument are not correlated as expected, the hedge may not be effective and may lead to incremental market risk on the trade.

RISKS

Market Risk

Market risk in equity derivative products arises primarily from changes in the prices of the underlying indexes and their component stocks. There is also correlation risk associated with hedging certain transactions with the most liquid instrument available, which may be less than perfectly correlated with the instrument being hedged.

Interest-Rate Risk

Interest-rate risk in equity derivative products can be substantial, especially for those transactions with relatively long maturities. The implied interest rate is a very important component in the calculation of the forward prices of the index. For hedges that use futures to closely match the maturities of the transaction, interest-rate risk is minimized because the price of the future already has an implied interest rate. Interest-rate risk may arise in those transactions in which the maturity of the transaction is longer than the maturity of the hedges which are available. In swap transactions, this may affect the hedging of implied forward cash flows. In certain cross-border transactions, additional risks arise from the necessity of hedging the nondomestic interest-rate component.

Volatility Risk

A substantial portion of transactions in the equity derivatives market have option components (both plain vanilla and, increasingly, various exotic types, especially barrier options). In certain shorter-dated transactions, hedges are available on the exchanges. But when the maturity is relatively long, the options may carry substantial volatility risks. These risks may be especially high in certain developing equity markets, in which the absolute level of volatility is high and the available hedges lack liquidity.

Liquidity Risk

Liquidity risk is not significant for most equity derivative products in the major markets and for products with maturities of less than a year. Liquidity risk increases for longer maturities and for those transactions linked to emerging markets.

Currency Risk

Currency risk is relevant for cross-border and quanto products. As these transactions are often

dynamically hedged by the market maker, currency risk can be significant when there are extreme movements in the currency.

ACCOUNTING TREATMENT

The accounting treatment for equity derivatives, except those indexed to a company's own stock, is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.) Derivatives indexed to a company's own stock can be determined by Accounting Principles Board (APB) Opinion No. 18, "The Equity Method of Accounting for Investments in Common Stock," and SFAS 123, "Accounting for Stock-Based Compensation."

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of an equity derivative contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are listed below.

Remaining Maturity	*Credit-Conversion Factor*
One year or less	6.00%
Five years or less	8.00%
Greater than five years	10.00%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, "Capital Adequacy.")

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Equity derivatives are not considered investments under 12 USC 24 (seventh). A bank must receive proper regulatory approval before it engages in certain types of equity-linked activities.

REFERENCES

Allen, Julie A., and Janet L. Showers. *Equity-Index-Linked Derivatives, An Investor's Guide.* Salomon Brothers, April 1991.

Federal Reserve Bank of Chicago. *The Equity Derivatives Market: A Product Summary.* February, 1997.

GENERAL DESCRIPTION

Credit derivatives are off-balance-sheet financial instruments that permit one party (the *beneficiary*) to transfer the credit risk of a *reference asset*, which it typically owns, to another party (the *guarantor*) without actually selling the asset. In other words, credit derivatives allow users to ''unbundle'' credit risk from financial instruments and trade it separately.

Based on dealer estimates, the market for credit derivatives approached $40 billion in 1996, with total-return swaps and default puts (including default swaps and outright put options) accounting for more than half of the market. The average transaction size is rather small at $10 million to $25 million, while the average tenor of transactions is less than two years. The tenor of new transactions is lengthening, however, and swaps up to five years are not uncommon. While the slowly expanding market for credit derivatives has encouraged dealers and end-users to enter the market, secondary-market activity is very limited.

CHARACTERISTICS AND FEATURES

In general, credit derivatives have three distinguishing features:

1. the transfer of the credit risk associated with a reference asset through contingent payments based on events of default and, usually, the prices of instruments before, at, and shortly after default (reference assets are most often traded sovereign and corporate debt instruments or syndicated bank loans)
2. the periodic exchange of payments or the payment of a premium rather than the payment of fees customary with other off-balance-sheet credit products, such as letters of credit
3. the use of an International Swap Derivatives Association (ISDA) master agreement and the legal format of a derivatives contract

Credit derivatives fall into three basic transaction types: total-rate-of-return swaps, credit-default swaps, and credit-default notes. Presently, total-rate-of-return swaps are the most commonly used credit derivatives.

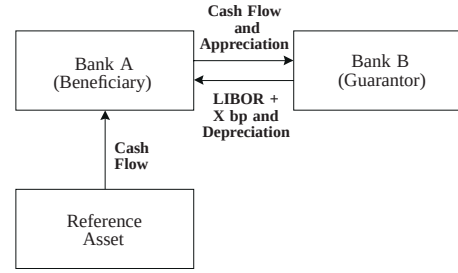
Total-Rate-of-Return Swaps

In a total-rate-of-return (TROR) swap, one counterparty (Bank A) agrees to pay the total return on an underlying reference asset to its counterparty (Bank B) in exchange for LIBOR plus a spread. Most often, the reference asset is a corporate or sovereign bond or a traded commercial loan. Since many commercial loans are based on the prime rate, both ''legs'' of the swap float with market rates. In this manner, credit risk is essentially isolated and potential interest-rate risk is generally limited to some form of basis risk (for example, prime vs. LIBOR).

TROR swaps are intended to be an efficient means of transferring or acquiring credit exposure without actually consummating a cash transaction. This feature may be desirable if a bank (Bank A) has credit exposure to a borrower which it would like to reduce while retaining the borrower as a customer, preserving the banking relationship. Also, entities which are not able to bear the administrative costs of purchasing or administering loans, or loan participations, may still acquire exposure to these loans through TROR swaps (Bank B).

In the example in figure 1, Bank A receives a LIBOR-based payment in exchange for paying out the return on an underlying asset. The total return payments due to Bank B include not only the contractual cash flows on the underlying assets, but also any appreciation or depreciation of that underlying asset that occurs over the life of the swap. Periodically (usually quarterly), the asset's market price is determined by an agreed-upon mechanism. Bank B would pay Bank A for any depreciation in the value of the

Figure 1—Total-Rate-of-Return Swap



underlying asset while receiving any appreciation. Consequently, for the term of the swap, it is as if Bank B actually owns the reference asset that resides on Bank A's balance sheet.

At the maturity of the swap, or in the event of default of the underlying asset, the swap is terminated[1] and the underlying asset is priced for purposes of determining the final swap obligations. The post-default price of the asset is most often determined by a poll of asset dealers or by direct market quotation, if available. Often, the final price will be the average of sample prices taken over time to mitigate any post-default volatility in the reference asset's value.

If Bank B is not satisfied with the pricing of the asset upon maturity of the swap or default (that is, believes the valuation is too low), then Bank B will often have the option of purchasing the underlying reference asset directly from Bank A and pursuing a workout with the borrower directly. However, it is not clear how often Bank B would choose to purchase the underlying instrument, particularly if the swap vehicle were used to avoid direct acquisition in the first place.

The final termination payment is usually based on the following formula:

Final Payment = Dealer Price – Notional Amount

The notional amount is essentially the price of the reference asset when the credit derivative is initiated. If the dealer price is greater than the notional amount, then the asset has appreciated and Bank A must pay Bank B this difference to settle the swap. On the other hand, if the dealer price is below the notional amount, either depreciation (for example, downgrade or default) or principal reduction (for example, amortization, prepayment) has occurred, and Bank B owes Bank A this difference. Therefore, the final payment (either at maturity or upon default) ultimately defines the nature and extent of the transfer of credit risk.

Default events are described in the transaction documentation, usually the trade confirmation. These events may include bankruptcy, payment defaults, breached covenants in loan or bond documentation, or even the granting of significant security interests by the reference obligor to one of its creditors. Often, a default event is defined so as to apply to any class of outstanding securities of the reference obligor in excess of a specified amount. In other words, a default can be triggered if the reference asset defaults or if any material class of securities issued by the underlying obligor defaults.

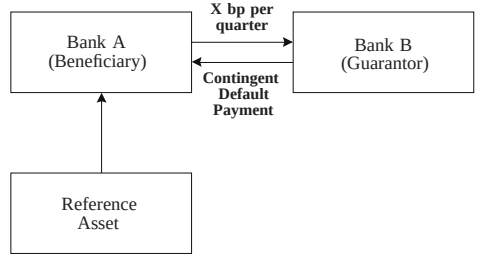
In an alternative structure, two banks may exchange the total return on underlying groups of loans. For example, a large money-center bank may receive the total return on a concentrated loan portfolio of a regional bank in exchange for the total return on a more diversified group of loans held by the money-center bank. These types of swaps may be readily marketable to smaller banks that are seeking to comply with the concentration of credit limitations of section 305(b) of the Federal Deposit Insurance Corporation Improvement Act (FDICIA).

Credit-Default Swaps

In a credit-default swap, one counterparty (Bank A) agrees to make payments of X basis points of notional amount, either per quarter or per year, in return for a payment in the event of the default of a prespecified reference asset (or name). (See figure 2.) Since the payoff of a credit-default swap is contingent on a default event (which may include bankruptcy, insolvency, delinquency, or a credit-rating downgrade), calling the structure a ''swap'' may be a misnomer; the transaction more closely resembles an option.

As with TROR swaps, the occurrence of default in credit-default swaps is contractually well defined. Usually, the default event must be publicly verifiable. The default definition must be specific enough to exclude events whose

Figure 2—Credit-Default Swap



1. Alternatively, the swap may continue to maturity with payments based on quarterly changes in the post-default asset price.

inclusion would be undesirable, such as when a reference name is delinquent due to the intentional withholding of a payment in a legal dispute that does not affect the creditworthiness of the organization. Further, a materiality threshold may be involved; that is, a default event must have occurred, *and* the cumulative loss on the underlying must be greater than Y percent. The materiality thresholds increase the likelihood that only significant changes in credit quality will trigger the default payment (rather than small fluctuations in value that tend to occur over time).

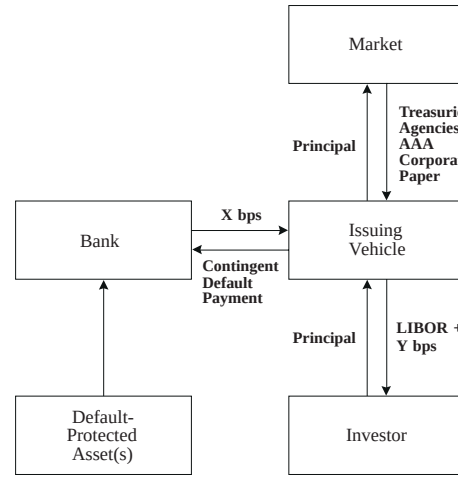
Finally, upon default, the ''swap'' is terminated and a default payment is calculated. The default payment is often calculated by sampling dealer quotes or observable market prices over some prespecified period after default has occurred. Alternatively, the default payment may be specified in advance as a set percentage of notional (for example, 25, 50, or 100 percent). Such swaps are usually referred to as *binary swaps*; they either pay the prespecified amount or nothing, depending on whether default occurs. Binary swaps are often used when the reference asset is not liquid but when loss in the event of default is otherwise subject to estimation. For example, if the reference asset is a senior, unsecured commercial bank loan, and such loans have historically recovered 80 percent of face value in the event of default, a binary default swap with a 20 percent contingent payout may be appropriate.

When the counterparty making the default payment (guarantor) is unhappy with the valuation, the option to purchase the reference asset is often available. On the other hand, some versions of default swaps may allow the beneficiary to put the asset to the guarantor in the event of default rather than receive a cash payment. Finally, when there is more than one underlying instrument (or name), which is often found in a ''basket'' structure, the counterparty making the contingent default payment is exposed to only the first instrument or name to default.

Credit-Default Notes

A credit-default note is a structural note and is the on-balance-sheet equivalent of a credit-default swap. In a credit-default note, an investor purchases a note from an issuing vehicle, often a trust. The proceeds of the note purchase are used by the trust to purchase paper of the highest credit quality: Treasuries, agencies, or AAA corporate paper. The note is structured such that a default by the underlying reference instrument(s) or name(s) results in a reduction of the repayment of principal to the investor. Default payments are calculated in the same manner as for TROR and credit-default swaps. In return for the contingent default payment, the arranging bank pays a spread to the investor through the issuing vehicle. The investor, meanwhile, receives a premium yield over LIBOR for accepting the default risk of the underlying instrument(s) or name(s). (See figure 3.)

Figure 3—Credit-Default Note



USES

Both total rate-of-return swaps and credit-default swaps are used to transfer the credit risk of the asset(s) referenced in the transaction. The counterparty seeking to transfer the credit risk (the *beneficiary*) often owns the reference asset. The counterparty receiving the credit risk of the reference asset (the *guarantor*) is able to do so without purchasing the reference asset directly.

Banks may use credit derivatives in several ways. They may elect to receive credit exposure (provide protection) for a fee or in exchange for credit exposure which they already hold in an effort to better diversify their credit portfolios.

Banks may also elect to receive credit exposure through credit derivatives rather than through some other transaction structure due to the relative yield advantage (arbitrage of cash-market pricing) of derivatives.

Alternatively, banks may use credit derivatives to reduce either individual credit exposures or credit concentrations in their portfolios. In other words, the banks are purchasing credit protection from another institution. Banks may use credit derivatives to synthetically take a short position in an asset which they do not wish to sell outright. From the bank customer's perspective, credit derivatives may be written to allow nonbank counterparties to obtain access to bank loan exposures and related returns either as a new asset class (for credit diversification) or without up-front funding (perhaps to obtain greater leverage). In the last example, the bank is essentially performing traditional credit intermediation using a new off-balance-sheet vehicle.

Finally, banks may seek to establish themselves as dealers in credit derivatives. Rather than pursuing credit portfolio efficiency or portfolio yield enhancement, dealer banks will seek to profit from buying and selling credit derivatives exposures quite apart from their portfolio management goals. Dealer banks may or may not hold the assets referenced in their credit-derivative transactions, depending on their risk tolerance, credit views, and (ultimately) their ability to offset contracts in the marketplace.

DESCRIPTION OF MARKETPLACE

Issuing Practices

Credit derivatives are transacted by banks, securities firms, and insurance companies through financial contracts traded over the counter. The size of the marketplace is fairly small, with up to 15 organizations actively transacting in credit derivatives by year-end 1996. Due to the small size and name-specific nature of the credit-derivative market, there is very little secondary-market support.

Market Participants

Commercial and investment banks, insurance companies, and hedge funds are active as both buyers and sellers of credit derivatives. Pension funds and money managers have also acted as counterparties to credit-derivative transactions.

Market Transparency

Currently, there is no market transparency in the pricing or volume of credit derivatives. Most transactions are highly structured, negotiated deals between sophisticated counterparties. One money-center bank has made price quotes publicly available for several transactions structures that reference the obligors most often found in current transactions or in whom there is the most interest at the time. However, pricing transparency is poor.

Further, regulatory and public reporting standards for credit derivatives have not yet been established. Consequently, the level of business activity is also not readily transparent. The estimates of the market size and composition available to date are the result of surveys conducted by credit-derivatives dealer banks (for example, CIBC/Wood-Gundy) or industry groups (for example, the British Bankers' Association). At year-end 1996, the market for credit derivatives was estimated to be $40 billion.

PRICING

To understand credit-derivative pricing and how different prices for reference assets might be obtained for different counterparties, consider the following example. A bank offers to provide default protection to another bank on a five-year loan to a BBB-rated borrower. Since reliable default and recovery data for pricing credit derivatives are not available, credit-derivatives providers rely on credit spreads to price these products. One of the more common pricing techniques is to price an asset swap of the reference asset. In an asset swap, a fixed-for-floating interest-rate swap is used to convert a fixed-rate instrument (here, a BBB-rated note) into a floating-rate instrument. The spread above LIBOR required for this conversion to take place is related to the creditworthiness of the reference borrower. That is, the lower the creditworthiness of the reference borrower, the greater the spread above LIBOR to complete the asset swap. Hence, if LIBOR is viewed as a base rate at which the most creditworthy institutions

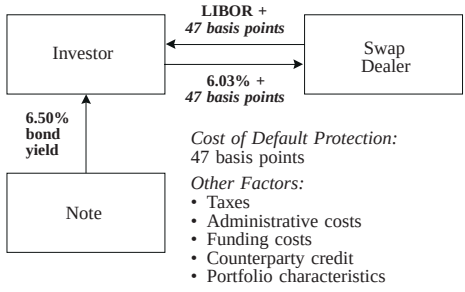
can fund themselves, then the spread above LIBOR represents the ''credit premium,'' or the cost of default risk, associated with that particular reference asset.

The credit premium is the most fundamental component of pricing. The credit premium is meant to capture the default risk of the reference asset. Often, the credit premium is the periodic payment rate required by market participants in exchange for providing default protection. In a total-return swap, LIBOR plus this credit premium is paid in exchange for receiving the total return on the underlying reference asset. Intuitively, the owner of the reference asset, who receives LIBOR plus the credit premium, is being compensated for funding costs and default risk of the reference asset.

Furthermore, assume the reference asset is a BBB-rated, senior unsecured note of five-year maturity yielding 6.50 percent. Further, assume that the asking price for a five-year, fixed-for-floating interest-rate swap is 6.03 percent against LIBOR flat. To complete the asset swap, the interest-rate swap legs need to be increased by 47 basis points each to convert the reference asset to a floating-rate instrument. (See figure 4.) Consequently, 47 basis points is the credit premium, or the implied market price to be charged, per year, for providing default protection on this BBB-rated reference asset. Alternatively, LIBOR plus 47 basis points would be the price to be paid in a TROR swap for receiving the total return on this asset for five years.

However, the borrower-specific factors that produced the implied market price of 47 basis points for the default swap are not the only factors considered in pricing. The spread may be adjusted for any number of factors which are unique to the counterparties. For example, the spread may need to be adjusted for counterparty credit considerations. In the example in figure 2, if the credit quality of the guarantor counterparty (Bank B) was a concern to the beneficiary (Bank A), the beneficiary might negotiate payment of a lower spread (fee) than 47 basis points to compensate for counterparty risk.

Figure 4—Asset Swap



Often, differences in funding costs between counterparties also affect pricing. A counterparty that could obtain credit exposure through direct acquisition of the asset on a favorable basis due to funding advantages might require a higher return for taking on the same exposure through a default swap, which is priced by analogy to an asset swap. Operational considerations, such as the inability of a guarantor counterparty to actually own the asset, may result in a pricing premium for the risk seller (protection buyer) who can own the asset. Similarly, tax consequences may have an impact on transaction pricing. For example, a beneficiary may wish to reduce credit exposure to an obligor without actually selling the reference asset to avoid triggering an unfavorable taxable event, such as a taxable gain or a capital loss that is not fully deductible. Clearly, these considerations may have an impact on the price which the protection buyer (risk seller) is willing to pay.

HEDGING

Credit derivatives may be hedged in two basic ways: users may *match* (or offset) their credit-derivative contracts, or they may *use a cash position* in the reference asset to hedge their contracts.

The ideal hedging strategy for dealers is to match positions, or to conduct ''back-to-back'' trading. Many deals actually are backed to back with offsetting transactions as a result of the highly structured nature of deals. That is, dealer banks won't enter into a credit-derivative trade unless a counterparty willing to enter the offsetting transaction has been identified. Alternatively, the credit-derivative-trading function may back to back trades with an internal counterparty (for example, the bank's own loan book). Because the secondary-market support for credit derivatives is characterized by substantial illiquidity, credit positions which are taken through credit derivatives may be ''warehoused'' for substantial periods of time before an offsetting trade can be found. Banks often set trading limits on the amount and time period over which

they will warehouse reference-asset credit exposures in credit-derivative transactions.

The second basic hedging practice is to own the underlying reference asset. Essentially, the risk-selling bank hedges by going long the reference asset and going short the swap. This is the simplest form of matched trading and is illustrated by Bank A in figures 1 and 2. Generally, whether or not the bank owned the reference asset before it entered the swap is a good indication of the purpose of the swap. If the bank owned the asset before executing the swap, it has most likely entered the swap for risk-management reasons. If the bank acquired the asset for purposes of transacting the swap, it is more likely to be accommodating a customer.

Interestingly, hedging a credit derivative in the cash market is not common when the cash position required is a short. Generally speaking, going short the reference asset and long the swap is problematic. To show this, consider what happens in a declining market: The long credit-derivative position (total-return receiver) declines in value, while the short cash position rises in value as the market falls. Unfortunately, most lenders of a security which is falling in value will not agree to continually lend and receive back a security that is undergoing a sustained depreciation in value. Since most short sales are very short term (in fact, overnight), the short cash hedge becomes unavailable when needed most—when there is a prolonged decline in the value of the reference asset. For this reason, a short credit-derivative position may be superior to a short cash position that must be rolled over.

A third and less common practice is to simply add or subtract the notional amount of long or short positions, respectively, to or from established credit lines to reference obligors. This is the least sophisticated risk-management treatment and is inadequate for trading institutions as it does not address counterparty risks. This method may be used effectively *in conjunction with* other methods and is useful in determining total potential credit exposure to reference obligors.

At some point, the potential exists for credit-derivatives dealers to apply a portfolio risk-management model that recognizes diversification and allows hedging of residual portfolio risks. However, the fundamental groundwork for quantitative modeling approaches to credit derivatives is still in development.

Finally, two other hedging issues are worth considering. First, it is not uncommon for banks to hedge a balance-sheet asset with a credit derivative that references a different asset of the same obligor. For example, a bank may hedge a loan to ABC Company that is highly illiquid with a credit-default swap that references the publicly traded debt of ABC Company. The fact that the public debt is more liquid and has public pricing sources available makes it a better reference asset than the loan. However, the bank is exposed to the difference in the recovery values of the loan and the debt if ABC Company defaults. Second, it is very common for the term of the credit derivative to be less than the term of the reference asset. For example, a two-year credit default swap could be written on a five-year bond. In this case, the last three years of credit risk on the underlying bond position would not be hedged. The appropriate supervisory treatment for credit derivatives is provided in SR-96-17 (see section 3020.1, ''Securitization and Secondary-Market Credit Activities'').

RISKS

Credit Risk

Banks using credit derivatives are exposed to two sources of credit risk: counterparty credit risk and reference-asset credit risk. In general, the most significant risk faced by banks in credit derivatives will be their credit exposure to the reference asset.

When a bank acquires credit exposure through a credit-derivative transaction, it will be exposed primarily to the credit risk of the reference asset. As with credit risk that is acquired through direct purchase of assets, banks should perform sufficient credit analysis of all reference assets to which they will be exposed through credit-derivative transactions. The financial analysis performed should be similar to that done for processing a loan or providing a letter of credit. Further, banks should have procedures in place to limit their overall exposure to certain borrowers, industries, or geographic regions, regardless of whether exposures are taken through cash instruments or credit-derivative transactions.

Examiners should be aware that the degree of reference-asset credit risk transferred in credit-derivative transactions varies significantly. For example, some credit derivatives are structured so that a payout only occurs when a predefined

event of default or a downgrade below a prespecified credit rating occurs. Other credit derivatives may require a payment only when a defined default event occurs *and* a predetermined materiality (or loss) threshold is exceeded. Default payments may be based on an average of dealer prices for the reference asset during some period of time after default using a prespecified sampling procedure or may be specified in advance as a set percentage of the notional amount of the reference asset. Lastly, the terms of many credit-derivative transactions are shorter than the maturity of the underlying asset and, therefore, provide only temporary credit protection to the beneficiary. In these cases, some of the credit risk of the reference asset is likely to remain with the asset holder (protection buyer).

Alternatively, a bank may own an asset whose risk is passed on to a credit-derivative counterparty. As such, the bank will only lose money if the asset deteriorates *and* the counterparty is unable to fulfill its obligations. Therefore, banks using credit derivatives to reduce credit exposure will be exposed primarily to counterparty risk. Because the ultimate probability of a loss for the bank is related to the default of both the reference credit *and* the inability of a counterparty to meet its contractual obligations, banks should seek counterparties whose financial condition and credit standing are not closely correlated with those of the reference credit.

In all credit-derivative transactions, banks should assess the financial strength of their counterparty before entering into a credit-derivative transaction. Further, the financial strength of the counterparty should be monitored throughout the life of the contract. In some cases, banks may deem it appropriate to require collateral from certain counterparties or for specific types of credit-derivative transactions.

Market Risk

While banks face significant credit exposure through credit-derivative transactions, significant market risk is also present. The prices of credit-derivative transactions will fluctuate with changes in the level of interest rates, the shape of the yield curve, and credit spreads. Furthermore, because of the illiquidity in the market, credit derivatives may not trade at theoretical prices suggested by asset-swap pricing methodologies. Therefore, price risk is a function of market rates as well as prevailing supply and demand conditions in the credit-derivative market.

The relative newness of the market for credit derivatives and the focus of some products on events of default makes it difficult for banks to hedge these contingent exposures. For example, banks that sell default swaps will probably make payments quite infrequently because events of default are rare. Hence, the payoff profile for a default swap includes a large probability that default will not occur and a small probability that a default will occur with unknown consequences. This small probability of a default event is difficult for banks to hedge, especially as the reference asset deteriorates in financial condition.

Liquidity Risk

Typically, liquidity risk is measured by the size of the bid/ask spread. Similar to other new products, credit derivatives may have higher bid/ask spreads because transaction liquidity is somewhat limited. Banks buying credit derivatives should know that their shallow market depth could make it hard to offset positions before a credit derivative's contract expires. Accordingly, banks selling credit derivatives must evaluate the liquidity risks of credit derivatives and assess whether some form of reserves, such as close-out reserves, is needed.

Banks using credit derivatives should include the cash-flow impact of credit derivatives into their regular liquidity planning and monitoring systems. Banks should also include all significant sources and uses of cash and collateral related to their credit-derivative activity into their cash-flow projections. Lastly, the contingency funding plans of banks should assess the effect of any early termination agreements or collateral/margin arrangements, along with any particular issues related to specific credit-derivative transactions.

Legal Risk

Because credit derivatives are new products that have not yet been tested from a legal point of view, many questions remain unanswered. At a minimum, banks should ensure that they and

their counterparties have the legal and regulatory authority to participate in credit-derivative transactions before committing to any contractual obligations. Moreover, banks should ensure that any transactions they enter into are in agreement with all relevant laws governing their activities.

While standard documentation for credit derivatives has yet to be developed, participating banks should use standardized documentation as soon as it becomes available. ISDA has been developing a standardized master agreement for use with credit-derivative transactions. Banks should have their legal counsel review all credit-derivative contracts to confirm that they are legally sound and that all terms, conditions, and contingencies are clearly addressed.

Examiner Guidance

When reviewing credit derivatives, examiners should consider the credit risk of the reference asset as the primary risk. A bank providing credit protection through a credit derivative can become as exposed to the credit risk of the reference asset as it would if the asset were on its own balance sheet. Thus, for supervisory purposes, the exposure typically should be treated as if it were a letter of credit or other off-balance-sheet guarantee. For example, this treatment would apply when determining an institution's overall credit exposure to a borrower when evaluating concentrations of credit.

In addition, examiners should perform the following procedures.

- Review SR-96-17.
- Note the bank's credit-derivative activities and ascertain (1) the level of credit-derivative activity, (2) the types of counterparties, (3) the typical underlying reference assets, (4) the structures and maturities of the transactions, (5) why management is using these instruments, and (6) whether the bank's credit exposure is being increased or reduced.
- Evaluate whether the bank subjects its credit-derivatives activities to a thorough, multifunctional new-product review and determine if senior management is aware of and approves the activities undertaken.
- Ensure that credit derivatives are reported correctly for regulatory purposes based on amendments to the call report and the FRY-9C as of March 31, 1997. Examiners should determine that any transfer risk received or passed on in a credit-derivative structure is captured in the bank's regulatory transfer risk reports.
- Ensure that the bank maintains documentation for its accounting policies for credit derivatives; examiners should determine whether the bank has consulted with outside accountants when determining its accounting policies and procedures for credit derivatives. Additionally, examiners should assess the bank's mark-to-market, profit recognition, and hedge-accounting practices.
- Review management's strategy for using credit derivatives, assessing the impact on the bank's risk profile and ensuring that adequate internal controls have been established for the conduct of all trading and end-user activities in credit derivatives.
- Review risk-management practices to ensure that bank systems capture and trading desks report all credit exposures to senior management, including counterparty and reference-asset exposures from credit derivatives.
- Ensure that risk-management reports are done on a timely basis and are disseminated to the appropriate personnel.
- Assess the bank's treatment of credit derivatives for purposes of legal lending limits, that is, when should the bank use credit derivatives to lower borrower concentrations and which type of credit derivative should the bank use. Further, examiners should ensure that the bank is in compliance with all regulatory lending limits.
- Review the bank's asset quality and loan-loss reserve policies with respect to credit derivatives and any reference assets owned. Examiners should ensure that assets protected by credit derivatives that are nonperforming are recognized in internal credit reports and assess how the bank's loan-loss reserves are affected by the use of credit derivatives. Moreover, examiners should ensure that the bank's classification system is reasonable given the types of credit-derivatives structures used, the degree to which credit risk is transferred, and the creditworthiness of its credit-derivative counterparties.
- Procure and review relevant marketing materials and policies regarding sales practices. Dealers should assess the financial character and sophistication of all counterparties. Since credit derivatives are new and complex instru-

ments, dealers should provide end-users with information sufficient to understand the risks associated with particular credit-derivative structures.

ACCOUNTING TREATMENT

The accounting treatment for certain credit derivatives is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, "Accounting for Derivatives and Hedging Activities." (See section 2120.1, "Accounting," for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The appropriate risk-based capital treatment for credit-derivative transactions is included in SR-96-17. The appropriate treatment for credit derivatives under the market-risk capital amendment to the BIS Accord is not finalized as of this writing. As a general rule, SR-96-17 provides the appropriate capital treatment for credit derivatives which are carried in the banking book and for institutions which are not subject to the market-risk rules.

Under SR-96-17, credit derivatives generally are to be treated as off-balance-sheet direct credit substitutes. The notional amount of the contract should be converted at 100 percent to determine the credit-equivalent amount to be included in risk-weighted assets of the guarantor.[2] A banking organization providing a guarantee through a credit-derivative transaction should assign its credit exposure to the risk category appropriate to the obligor of the reference asset or any collateral. On the other hand, a banking organization that owns the reference asset upon which credit protection has been acquired through a credit derivative may, under certain circumstances, assign the unamortized portion of the reference asset to the risk category appropriate to the guarantor, for example, the 20 percent risk category if the guarantor is a bank, or the 100 percent risk category if the guarantor is a bank holding company.

Whether the credit derivative is considered an eligible guarantee for purposes of risk-based capital depends on the degree of credit protection actually provided. As explained earlier, the amount of credit protection actually provided by a credit derivative may be limited depending on the terms of the arrangement. For example, a relatively restrictive definition of a default event or a materiality threshold that requires a comparably high percentage of loss to occur before the guarantor is obliged to pay could effectively limit the amount of credit risk actually transferred in the transaction. If the terms of the credit-derivative arrangement significantly limit the degree of risk transference, then the beneficiary bank cannot reduce the risk weight of the "protected" asset to that of the guarantor bank. On the other hand, even if the transfer of credit risk is limited, a banking organization providing limited credit protection through a credit derivative should hold appropriate capital against the reference exposure while it is exposed to the credit risk of the reference asset. See section 3020.1, "Securitization and Secondary-Market Credit Activities."

Banking organizations providing a guarantee through a credit derivative may mitigate the credit risk associated with the transaction by entering into an offsetting credit derivative with another counterparty, a so-called "back-to-back" position. Organizations that have entered into such a position may treat the first credit derivative as guaranteed by the offsetting transaction for risk-based capital purposes. Accordingly, the notional amount of the first credit derivative may be assigned to the risk category appropriate to the counterparty providing credit protection through the offsetting credit-derivative arrangement (for example, to the 20 percent risk category if the counterparty is an OECD bank).

In some instances, the reference asset in the credit-derivative transaction may not be identical to the underlying asset for which the beneficiary has acquired credit protection. For example, a credit derivative used to offset the credit exposure of a loan to a corporate customer may use a publicly traded corporate bond of the customer as the reference asset, whose credit quality serves as a proxy for the on-balance-sheet loan. In such a case, the underlying asset will still generally be considered guaranteed for capital purposes as long as both the underlying

2. Guarantor banks which have made cash payments representing depreciation on reference assets may deduct such payments from the notional amount when computing credit-equivalent amounts for capital purposes. For example, if a guarantor bank makes a depreciation payment of $10 on a $100 notional total-rate-of-return swap, the credit-equivalent amount would be $90.

asset and the reference asset are obligations of the same legal entity and have the same level of seniority in bankruptcy. In addition, banking organizations offsetting credit exposure in this manner would be obligated to demonstrate to examiners that (1) there is a high degree of correlation between the two instruments; (2) the reference instrument is a reasonable and sufficiently liquid proxy for the underlying asset so that the instruments can be reasonably expected to behave similarly in the event of default; and (3) at a minimum, the reference asset and underlying asset are subject to mutual cross-default provisions. A banking organization that uses a credit derivative, which is based on a reference asset that differs from the protected underlying asset, must document the credit derivative being used to offset credit risk and must link it directly to the asset or assets whose credit risk the transaction is designed to offset. The documentation and the effectiveness of the credit-derivative transaction are subject to examiner review. Banking organizations providing credit protection through such arrangements must hold capital against the risk exposures that are assumed.

LEGAL LIMITATIONS FOR BANK INVESTMENT

While examiners have not seen credit-derivative transactions involving two or more legal entities within the same banking organization, the possibility of such transactions exists. Transactions between or involving affiliates raise important supervisory issues, especially whether such arrangements are effective guarantees of affiliate obligations, or transfers of assets and their related credit exposure between affiliates. Therefore, banking organizations should consider carefully the existing supervisory guidance on interaffiliate transactions before entering into credit-derivative arrangements involving affiliates, especially when substantially the same objectives could be achieved using traditional guarantee instruments.

Legal lending limits are established by individual states for state-chartered banks and by the Office of the Comptroller of the Currency (OCC) for national banks. Therefore, the determination of whether credit derivatives are guarantees to be included in the legal lending limits are the purview of the state banking regulators and the OCC.

REFERENCE

Board of Governors of the Federal Reserve System. SR-96-17, ‘‘Supervisory Guidance for Credit Derivatives.’’ August 12, 1996.

GENERAL DESCRIPTION

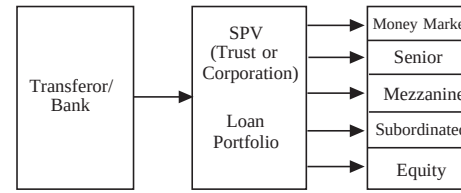
Collateralized loan obligations (CLOs) are securitizations of large portfolios of secured or unsecured corporate loans made to commercial and industrial customers of one or more lending banks. CLOs offer banking institutions a means of achieving a broad range of financial objectives, including, but not limited to, the reduction of credit risk and regulatory capital requirements, access to an efficient funding source for lending or other activities, increased liquidity, and increased returns on assets and equity. Furthermore, institutions are able to realize these benefits without disrupting customer relationships. CLO structures generally fall into two categories: cash-flow structures and market-value structures. Cash-flow structures are transactions in which the repayment and ratings of the CLO debt securities depend on the cash flow from the underlying loans. Market-value structures are distinct from cash-flow structures in that credit enhancement is achieved through specific overcollateralization levels assigned to each underlying asset. Most bank CLOs have been structured as cash-flow transactions.

To date, most bank-sponsored CLOs have been very large transactions—typically ranging from $1 billion to $6 billion—undertaken by large, internationally active banking institutions. However, as the CLO market evolves and the relative costs decline, progressively smaller transactions may become feasible, and the universe of banks that can profitably use the CLO structure will increase significantly.

CHARACTERISTICS AND FEATURES

In a CLO transaction, loans are sold, participated, or assigned into a trust or other bankruptcy-remote special-purpose vehicle (SPV), which, in turn, issues asset-backed securities consisting of one or more classes, or tranches. Alternatively, a CLO may be synthetically created through the use of credit derivatives, for example, default swaps or credit-linked notes, that are used to transfer the credit risk of the loans into the trust or SPV and, ultimately, into the capital markets.

Figure 1—Collateralized Loan Obligation



Typically, the asset-backed securities issued by the trust or SPV consist of one or more classes of rated debt securities, one or more unrated classes of debt securities that are generally treated as equity interests, and a residual equity interest. These tranches generally have different rates of interest and projected weighted average lives to appeal to different types of investors. They may also have different credit ratings. It is common for the bank to retain a subordinated or equity interest in the securitized assets to provide the senior noteholders with additional credit enhancement. This provision of credit support by the sponsoring bank triggers regulatory ''low-level recourse'' capital treatment.

Conceptually, the underlying assets collateralizing the CLO's debt securities consist of whole commercial loans. In reality, the underlying assets frequently consist of a more diverse mix of assets which may include participation interests, structured notes, revolving credit facilities, trust certificates, letters of credit, and guarantee facilities, as well as synthetic forms of credit.

One or more forms of credit enhancement are almost always necessary in a CLO structure to obtain the desired credit ratings for the most highly rated debt securities issued by the CLO. The types of credit enhancements used by CLOs are essentially the same as those used in other asset-backed securities structures—''internal'' credit enhancement provided by the underlying assets themselves (such as subordination, excess spread, and cash collateral accounts) and ''external'' credit enhancement provided by third parties (principally financial guaranty insurance issued by monoline insurers). In the past, most bank CLOs have relied on internal credit enhancement.

Bank CLOs can be further divided into linked and de-linked structures. In a linked structure, the sponsoring bank provides some degree of implicit or explicit credit support to the transaction as a means of improving the credit rating of some or all of the tranches. While such credit linkage may improve the pricing of a transaction, the bank's provision of credit support may constitute recourse for risk-based capital purposes, thus increasing the capital cost of the transaction. In contrast, the CLO issuer in a de-linked structure relies entirely on the underlying loan assets and any third-party credit enhancement for the credit ratings of the debt securities.

CLO transactions are evolving into highly customized and complex structures. Some transactions that may appear similar on the surface differ greatly in the degree to which credit risk has been transferred from the bank to the investor. In some cases, the actual transference of credit risk may be so limited that the securitization meets the regulatory definition of ''asset sales with recourse,'' thus requiring the bank to hold capital against the securitized assets.

TYPES

CLOs Using the Master Trust Structure

CLOs are complex transactions that typically use a master trust structure. Historically, the master trust has been used for revolving, short-term assets such as credit card receivables. This format affords the issuer a great deal of flexibility in structuring notes with different repayment terms and characteristics, and provides for the ongoing ability to transfer assets and offer multiple series, which allows for greater diversification and minimized transaction costs. Consequently, securitizations through a master trust structure are often assigned series numbers, such as 1998-1, 1998-2, etc., to identify each specific securitization. These transactions may have many interrelated components that make them particularly difficult to analyze.

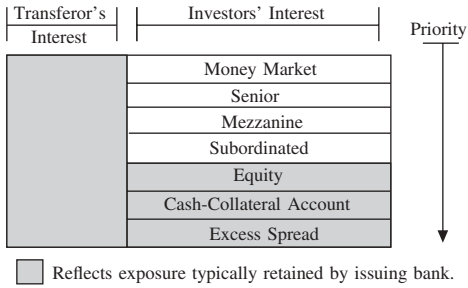
CLO master trust applications need to be carefully designed. In contrast to typical master trust assets such as credit card receivables, corporate loan portfolios are less diversified, cash flows are not as smooth, and lower yields generate less excess spread. The CLO master trust also needs to be structured to mitigate the resulting mismatches between the maturities of heterogeneous collateral assets and liabilities, and to pay all series by their stated maturities.

The master trust structure can be contrasted with other types of trusts, such as the grantor's and owner's trusts, that restrict the types of asset-backed securities that can be issued or have other limitations. The simplest trust form requires the straight pass-through of the cash flows from trust assets to investors without any restructuring of those cash flows.

A distinguishing feature of CLOs using the master trust structure is the transferor's (seller's) interest, which represents the selling bank's required retained interest in the assets transferred to the master trust. One purpose of the transferor's interest in credit card securitizations is to ensure that the principal balance of assets in the trust is more than sufficient to match the principal balance of notes that have been issued to investors. In addition, the transferor's interest is essentially a ''shock absorber'' for fluctuations in principal balances due to additional draws under credit facilities and principal paydowns, whether scheduled or not. In definitional terms, the transferor's interest is equal to the total trust assets less the investors' interest, or that portion of the pool allocated to backing the notes issued to investors. The issuing bank is usually required to maintain its transferor's interest at a predetermined percentage of the overall trust size, usually 3 to 6 percent in a CLO transaction. As such, the transferor's interest within the master trust framework is on an equal footing with the investors' interest.

However, the use of a master trust structure and the creation of a transferor's interest in a CLO transaction may create some unique problems. The very existence of the two interests (transferor's and investors'), the nonhomogeneity of the loans being securitized, and the comparatively concentrated nature of commercial loan portfolios suggest that the distribution of those loans between the two interests must be reviewed and monitored carefully. It is critical to understand the basis for the distribution of credits between the two interests and the conditions under which this distribution may change over the life of the securitization in order to determine whether the transaction contains embedded recourse to the bank.

Figure 2—CLO Master-Trust Structure



Common Features of CLO Master-Trust Structures

In order for issuers of CLOs to attract institutional investors, for example, insurance companies and pension funds, the securities being issued are often rated. Rating agencies consider the credit quality and performance history of the securitized loan portfolio in determining the credit rating to be assigned, as well as the structure of the transaction and any credit enhancements supporting the transaction.

In CLO transactions, the three most common forms of credit enhancement are (1) subordination, (2) the funding of a cash-collateral account, and (3) the availability of any excess spread on the transaction to fund investor losses. Subordination refers to securitization transactions that issue securities of different seniority, that is, senior noteholders are paid before subordinated noteholders. It is common for the issuing bank to retain the most junior tranche of the investor notes. This interest is included in the investors' interest. It is distinct from the transferor's interest and is held on the transferor's balance sheet as an asset. Thus, third-party investors gain assurance that the bank will maintain the credit quality of the loans when the bank retains the first-loss exposure in the investor interest.

In addition to retaining the most junior tranche of investor notes, the bank may fund a cash-collateral account. The cash-collateral account functions as another layer of credit protection for the investors' interest. If there is a shortfall in loan collections in any period that prevents asset-backed noteholders from being paid, the cash collateral account may be drawn down.

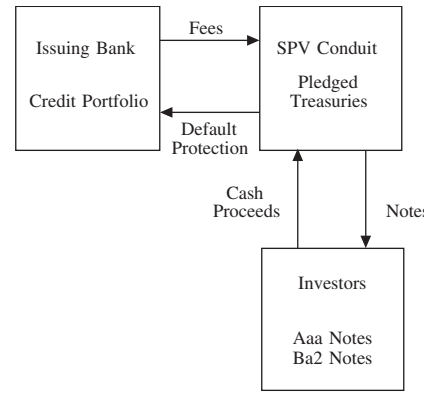
Finally, the yield of the loans placed in the trust often exceeds the total coupon interest payments due investors on the asset-backed notes issued. The residual yield is called excess spread and is usually available to fund investor losses.[1]

Synthetic CLO Securitizations

Recent innovations in securitization design have resulted in a class of synthetic securitization that involves different risk characteristics than the standard CLOs described above. One type of synthetic securitization uses credit derivatives to transfer a loss potential in a designated portfolio of credit exposures to the capital markets. The intent of the transaction is to transfer credit risk on a specific reference portfolio of assets to the capital markets and to achieve a capital charge on the reference portfolio that is significantly lower than 8 percent.

In the example in figure 3, the banking organization identifies a specific portfolio of credit exposures, which may include loan commitments, and then purchases default protection from a special-purpose vehicle. In this case, the

Figure 3—Synthetic CLO Securitization



1. Note that any loss position that a bank retains in its own securitization is subject to low-level-recourse capital treatment. A loss position would include retention of the most junior investor notes, the cash-collateral account, and excess spread, if recorded as an asset on the bank's balance sheet. (See Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities," for more information on the sale of assets and the recording of resulting assets and liabilities on the balance sheet.)

credit risk on the identified reference portfolio is transferred to the SPV through the use of credit-default swaps. In exchange for the credit protection, the institution pays the SPV an annual fee.

To support its guarantee, the SPV sells credit-linked notes (CLNs) to investors and uses the cash consideration to purchase Treasury notes that are then pledged to the banking organization to cover any default losses.[2] CLNs are obligations whose principal repayment is conditioned upon the default or nondefault of a referenced asset. The CLNs may consist of more than one tranche, for example, Aaa-rated senior notes and Ba2-rated subordinated notes, and are issued in an amount that is sufficient to cover some multiple of expected losses—typically, about 7 percent of the notional amount of the reference portfolio.

There may be several levels of loss in a synthetic securitization. The first-loss position may be a small cash reserve that accumulates over a period of years and is funded from the excess of the SPV's income (that is, the yield on the Treasury securities plus the fee for the credit-default swap) over the interest paid to investors on the notes. The investors in the SPV assume a second-loss position through their investment in the SPV's notes. Finally, the banking organization retains the risks associated with any credit losses in the reference portfolio that exceed the first- and second-loss positions.

In figure 3, default swaps on each of the obligors in the reference portfolio are executed and structured to pay the average default losses on all senior, unsecured obligations of defaulted borrowers. Typically, no payments are made until maturity, regardless of when a reference obligor defaults. A variation of this structure uses CLNs to transfer the credit risk from the transferring bank to the SPV instead of using credit-default swaps as in the above structure. In turn, the SPV issues a series of floating-rate notes (''notes'') in several tranches to investors. The notes are then collateralized by a pool of CLNs, with each CLN representing one obligor and its credit-risk exposure (such as bonds, loans, or counterparty exposure). Thus, the dollar amount of notes issued to investors equals the notional amount of the reference portfolio.

The institution has the option to call any of the CLNs before maturity so long as they are replaced by CLNs that meet individual obligor and portfolio limits. These limits include concentration limits, maturity limits, and credit-quality standards that must be met to maintain the credit ratings of the notes. If the CLNs no longer meet collateral guidelines, there are early-amortization provisions that will cause the transaction to wind down early.

If any obligor linked to a CLN in the SPV defaults, the institution will call the note and redeem it based either on the post-default market value of the reference security of the defaulted obligor or on a fixed percentage of par that reflects the average historical recovery rate for senior unsecured debt. The fixed percentage method is used when the linked obligor has no publicly traded debt. Finally, the term of each CLN is set such that the credit exposure to which it is linked matures before the CLN, ensuring that the CLN will be in place for the full term of the exposure to which it is linked.

Synthetic CLO structures differ from many traditional CLO structures in two significant ways:

1. In most CLO structures, assets are actually transferred into the SPV. In the synthetic securitizations, the underlying exposures that make up the reference portfolio remain on the institution's balance sheet. The credit risk is transferred into the SPV through credit-default swaps or CLNs. In this way, the institution is able to avoid sensitive client relationship issues arising from loan-transfer notification requirements, loan-assignment provisions, and loan-participation restrictions. Client confidentiality may also be maintained. The CLN-backed synthetic CLO also simplifies the legal work involved by avoiding the transfer of collateral and the creation or perfection of a security interest in anything other than the CLN.
2. In many CLO structures, the opportunity to remove credit risk from—or add credit risk to—the underlying collateral pool is severely limited. In the CLN-backed CLO, the institution may actively manage the pool of CLNs, thereby managing the credit risk of the linked exposures on an ongoing basis. In this way, the structure can be used to free up credit lines for core clients with whom the institution would like to conduct more business.

2. The names of corporate obligors included in the reference portfolio may be disclosed to investors in the CLNs.

RISK-TRANSFERENCE ISSUES

Reallocation of Cash Flows

One of the provisions commonly associated with complex CLOs is the provision for the reallocation of cash flows under certain circumstances. Cash-flow reallocation may take a number of forms, but is usually provided to ensure that senior noteholders get paid before junior noteholders. For example, if loan collections are insufficient to fund the payments of the senior notes of a CLO and other credit enhancements have been exhausted, or the securitization has entered an amortization phase, the servicer may be required to redirect payments from junior noteholders to senior noteholders. In some structures, principal payments on loans that are originally allocated to paying down the principal balance of the junior notes may be reallocated to the payment of current (or delinquent) interest on senior notes. This recharacterization of principal to interest may be a source of recourse if investor note balances are not reduced for the principal payment, due to the fact that a loan underlying the investor interest has paid off and is no longer available to support outstanding investor principal balances. Therefore, the bank will be required to provide new loans to back the investors' interest, either from the transferor's interest or from its own balance sheet.

Another distinguishing feature of CLOs that use the master trust structure is the revolving period. During the revolving period of a CLO, the investor notes are only paid interest, that is, the notes have not yet entered the amortization phase.[3] However, some of the underlying loan balances are actually being repaid during this time. During the revolving period, such repayments are automatically reinvested in new loans to maintain the principal balance of loans backing the investor notes. In some securitizations, this allocation of cash flows may be interrupted. Specifically, under certain conditions, such as a deteriorating collection rate, a collateral deficiency, or noncompliance with rating-agency guidelines, principal repayments on loans may be withheld from the transferor during the revolving period. Thereafter, if the deficiencies remain uncorrected, the funds thus withheld may be available to pay down investor notes. Examiners need to carefully review the conditions under which cash flows are reallocated and circumstances under which normal flows are interrupted to determine the overall impact on the credit-risk transference achieved in CLOs.

Early Amortization

A standard feature of CLO securitizations is a provision for early amortization. Early amortization provisions are designed to protect noteholders in the event the loans in the trust experience significant difficulty, diminishing the prospects for repayment of investor notes. When an early amortization event occurs (for example, defaults in the loan pool reach a certain predetermined level), collections on the underlying loans are reallocated so that investors are paid off at an accelerated rate. Typically, cash flows are allocated based on the proportional share of the trust that the transferor and investor interests represent when the early amortization event occurs. The allocation percentage thereafter remains fixed. This mechanism works to favor the investor interest, as additional drawdowns on facilities in the trust cause the transferor interest to increase (that is, additional lending under existing lines participated into the trust is assigned to the transferor's interest). Therefore, the size of the transferor interest grows rapidly relative to the size of the investor interest, but cash flow from the entire pool of trust assets continues to be allocated based on the fixed percentage that was determined when the early amortization event occurred. For example, assume the current allocation based on the relative size of investors' and transferor's interest is 80 percent and 20 percent, respectively. If early amortization were triggered, this percentage would be used to allocate all future principal collections, regardless of the actual relative size of the transferor and investor interests at any future date. While the existence of early amortization provisions has not been treated as recourse for regulatory purposes, early amortization is viewed in the marketplace as a form of credit enhancement. Credit-rating agencies indi-

3. Investor notes may either mature at a point in time or may amortize over a specific period, usually one year. In either case, principal payments on the underlying loans may begin to accumulate a few months before maturity or the commencement of an amortization period in order to provide additional assurance that contractual principal payments can be made.

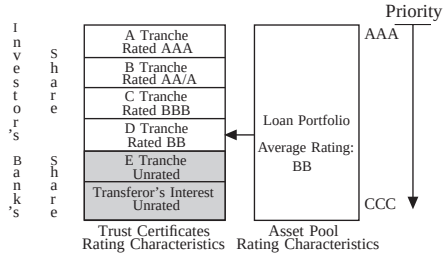
cate that such provisions can reduce the amount of credit enhancements or recourse needed to secure a given rating by more than half.

While early amortization provisions alone have not been deemed recourse to the bank, they have been recognized as creating conditions that might result in the transferring bank's retaining a degree of credit risk.[4] When a securitization triggers an early amortization event, the bank has two choices. It can allow the early amortization to proceed, causing the securitization to unwind. If a bank were to allow an early amortization to occur, its access to the asset-backed market in the future could become impaired and more expensive. Alternatively, the bank may choose to voluntarily correct the deficiency leading to the early amortization condition. Banks may be willing to support their securitizations, notwithstanding any legal obligation to do so, to preserve their name in the marketplace. However, such actions may have regulatory capital implications.

Other Issues

In some CLO transactions, it may be unclear whether a significant portion of underlying credit risk has been passed along to investors in the asset-backed securities. Assume that a $4 billion CLO has been completed in which the average underlying loan is rated BB. Further, assume that interests in these loans were segregated into a traditional CLO structure (see figure 4). In this case, the underlying loan pool has been transformed into interests in the securitization vehicle (trust or other SPV), and all of the securities issued to investors are rated equal to—or higher than—the average rating of the loans in the pool. The only other interests in the pool are retained by the issuing bank, that is, the subordinated piece of the investor interest and the transferor's interest. These interests are typically unrated. However, since the investor securities are all rated above the average loan rating of the loan pool, one could reasonably presume that the implicit credit rating of the bank's retained interests are lower than average. Further, since the dollar volume of the bank's retained interest is usually much smaller than the investors' interest, one might reasonably conclude that the implicit credit rating of these interests is much lower than the investor interest. In such cases, it is not clear whether the investors have assumed a meaningful portion of the credit risk of the underlying loans. Hence, the issue is not recourse in the traditional sense, but whether significant transference of risk has occurred in the first place.

Figure 4—Distribution of Risks



In some situations, certain trust covenants may function as credit support, leading to recourse to the securitizing bank. For example, the trust may require the bank to maintain the average credit rating of the loans in the trust. This may be accomplished by a requirement to remove deteriorating loans from the trust and replace them with higher-quality loans. Alternatively, the deteriorating loans may be ''reallocated'' to the transferor's interest, with the bank providing new loans of higher quality to the trust to back the investors' interest. In either case, the potential for recourse to the issuing bank is significant.[5]

To obtain a favorable credit rating, covenants may place limitations on the amount of credit extended to a particular industry as well as on the maximum exposure to any particular obligor. For example, rating agencies may require that total credit exposure to any particular industry not exceed 5 percent of the trust in order for the notes issued to achieve a particular rating. Any exposures over the limit may be assigned to

4. See SR-97-21, ''Risk Management and Capital Adequacy of Exposures Arising from Secondary Market Credit Activities,'' July 11, 1997.

5. One factor in determining whether transactions include recourse is the sharing of loss that occurs when deteriorating assets are sold from the trust. If the loss is shared proportionately between investor and transferor interests, it is less likely that the transaction will be deemed to have recourse to the bank.

the transferor's interest as an ''overconcentration'' amount. Because revolving credit facilities vary in size over time and their balances tend to be large, industry overconcentration appears to be common in these structures. The end result is that the investors' interest remains well diversified at all times, while the transferor's interest absorbs all overconcentration amounts. In this case, the risk of the transferor's interest and the investors' interest is not the same. However, such industry concentration limits by themselves generally will not result in a determination that the bank is providing recourse to the trust.

Similarly, trust documents may limit the exposure of any particular obligor in the trust. Obligor concentration limits may become problematic when the limit assigned is a function of the credit rating of the obligor. When a credit in the trust is downgraded below a defined threshold level, the ''excess'' exposure to the obligor may either be removed from the trust by the issuing bank or may be assigned to an overconcentration amount within the transferor's interest. In this case, it is not only possible that the transferor is absorbing credit exposures that exceed industry concentration limits (as described above), but it may also absorb exposures to credits that are deteriorating. If these requirements function in a manner that tends to reallocate deteriorating credits to the transferor's interest before default, the transaction may meet the regulatory definition of asset sales with recourse.

In addition to the common structural features described above, there may be other conditions under which loan balances may be reallocated between transferor and investor interests. Further, unique contractual requirements may specify how losses will be shared between the two interests in the event of default (or some other defined credit event). Through these contractual provisions, the bank may continue to have significant or contingent exposure to the securitized assets.

In summary, while examiners may be able to highlight recourse issues, it is not always clear where the lines should be drawn, as the mechanisms involved in these transactions are not always transparent. The issue is further complicated by the fact that banking organizations outside the United States are engaging in these transactions, and the treatment applied by foreign bank supervisory authorities may not parallel U.S. supervisory treatment.

USES

Banks have used CLOs to achieve a number of different financial objectives, including the important goal of maximizing the efficient use of their economic capital in the context of the current regulatory capital rules. Considering the small margins on commercial loans relative to other banking assets, the high risk-based capital requirement of these loans, especially those of investment-grade quality, makes holding them a less profitable or efficient use of capital for some banks. Using a CLO to securitize and sell a portfolio of commercial loans can free up a significant amount of capital that can be used more profitably for other purposes, such as holding higher-yielding assets, holding lower risk-weighted assets, making acquisitions, paying dividends, and repurchasing stock. As a result, this redeployment of capital can have the effect of reducing capital requirements, and/or improving return on equity and return on assets.

Issuers also obtain other advantages by using CLOs and synthetic securitizations, including accessing more favorable capital-market funding rates and, in some cases, transferring credit risk; increasing institutional liquidity; monetizing gains in loan value; generating fee income by providing services to the SPV; and eliminating a potential source of interest-rate risk. In addition, CLOs can be used for balance-sheet management and credit-risk hedging, that is, securitizations enable the sponsor to transfer assets with certain credit-quality, spread, and liquidity characteristics from the balance sheet while preserving relationships with borrowers. In this manner, the bank can reduce its exposure to risk concentrations.

From the viewpoint of investors, CLO spreads are attractive compared with those of other, more commoditized asset classes and can offer portfolio-diversification benefits. The various tranches represent a significant arbitrage opportunity to yield- seeking investors, and investment-grade CLOs can provide a spread premium to investors who are limited by regulatory or investment restrictions from directly purchasing individual non-investment-grade securities. In addition, the performance history of CLOs has so far been favorable—an important factor in attracting investors, especially in the lower, supporting mezzanine or equity tranches in a CLO capital structure. These subordinated investors demand a premium return that is commensurate with the higher risk they bear.

DESCRIPTION OF MARKETPLACE

The primary buyers for CLO securities have been insurance companies and pension funds seeking attractive returns with high credit quality. To date, banking organizations typically have not been not active buyers of these securities. The secondary market is less fully developed and less active than the market for more traditional types of asset-backed securities. However, as the market grows and expands globally to spread-seeking investors, CLO securities are becoming more liquid.

Market transparency can be less than perfect, especially when banks and other issuers retain most of the economic risk despite the securitization transaction. In addition, the early amortization features of some CLO transactions may not be fully understood by potential buyers.

PRICING

Securities issued in CLOs and synthetic securitizations carry coupons that can be fixed (generally yielding between 50 and 300 basis points over the Treasury curve) or floating (for example, 15 basis points over one-month LIBOR). Pricing is typically designed to reflect the coupon characteristics of the loans being securitized. The spread will vary depending on the credit quality of the underlying collateral, degree and nature of the credit enhancement, and degree of variability in the cash flows emanating from the securitized loans.

HEDGING

CLO issuers often use a variety of hedging instruments, including interest-rate swaps, currency swaps, and other derivatives, to hedge against various types of risk. For example, if the underlying assets are not denominated in U.S. dollars, currency risk may be hedged with swaps, caps, or other hedging mechanisms. Convertibility risk is considered for certain currencies in which the sovereign may be likely to impose currency restrictions. In such cases, certain currencies may not be permitted in the collateral pool regardless of the hedging mechanisms in place. Hedging instruments may also be used to address cash-flow mismatches between the payment characteristics of the CLO debt obligations and the underlying loans, such as differences in frequency of payments, payment dates, interest-rate indexes (basis risk), and interest-rate reset risk.

RISKS

Credit risk in CLOs and synthetic securitizations arises from (1) losses due to defaults by the borrowers in the underlying collateral and (2) the issuer's or servicer's failure to perform. These two elements can blur together, for example, a servicer who does not provide adequate credit-review scrutiny of the serviced portfolio, leading to a higher incidence of defaults. CLOs and synthetic securitizations are rated by major ratings agencies.

Market risk arises from the cash-flow characteristics of the security. The greatest variability in cash flows comes from credit performance, including the presence of wind-down or acceleration features designed to protect the investor in the event that credit losses in the portfolio rise well above expected levels. For certain dynamic CLO structures that allow for active management, adequate disclosure should be made regarding a manager's ability to sell assets that may have appreciated or depreciated in value. This trading flexibility represents an additional level of risk to investors because an investor is exposed to the collateral manager's decisions. As a result, there may be a greater risk in CLOs (versus, for example, credit card securitizations) that its rating can change over time as the composition of the asset pool deteriorates.

Interest-rate risk arises for the issuer from the relationship between the pricing terms on the underlying loans and the terms of the rate paid to noteholders, as well as from the need to mark to market the excess servicing or spread-account proceeds carried on the balance sheet. For the holder of the security, interest-rate risk depends on the expected life or repricing of the security, with relatively minor risk arising from embedded options. The notable exception is the valuation of the wind-down option.

Liquidity risk can arise from credit deterioration in the asset pool when early amortization provisions are triggered. In that situation, the seller's interest is effectively subordinated to the

interests of the other investors by the payment-allocation formula applied during early amortization. Other investors effectively get paid first, and the seller's interest will therefore absorb a disproportionate share of losses. Also, closure of the securitization conduit can create liquidity problems for the seller because the seller must then fund a steady stream of new receivables. When a conduit becomes unavailable due to early amortization, the seller must either find another buyer for the receivables or have receivables accumulate on its balance sheet, creating the need for another source of funding. In addition, these factors can create an incentive for the seller to provide implicit recourse—credit enhancement above and beyond any preexisting contractual obligation—to prevent early amortization. Although incentives to provide implicit recourse are present in other types of securitizations to some extent, the early-amortization feature of CLOs creates additional and more direct financial incentives to prevent its occurrence because of concerns about damage to the seller's reputation if one of its securitizations performs poorly.

Operational risk arises through the potential for misrepresentation of loan quality or terms by the originating institution, misrepresentation of the nature and current value of the assets by the servicer, and inadequate controls over disbursements and receipts by the servicer.

ACCOUNTING TREATMENT

Holder

The accounting treatment for investments in CLOs and synthetic securitizations is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards No. 115 (FAS 115), "Accounting for Certain Investments in Debt and Equity Securities," as amended by Statement of Financial Accounting Standards No. 140 (FAS 140), "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities." See section 2120.1, "Accounting," for further discussion.

Seller

FAS 140 covers the accounting treatment for the securitization of receivables. These standards address (1) when a transaction qualifies as a sale for accounting purposes and (2) the treatment of excess spread and servicing assets arising from a securitization transaction when a sale is deemed to have occurred.

RISK-BASED CAPITAL WEIGHTING

The current capital treatment for the standard master-trust CLO described in this section has three components. First, banks use the low-level-recourse rule when calculating capital charges against any first-loss exposures they retain. Thus, the most junior tranche would carry a dollar-for-dollar capital charge up to 8 percent of the investor interest. Second, banks receive transferor certificates for their investments in the trust through the transferor's interest. As this represents the bank's proportional share in a larger pool of assets, 8 percent capital is held against the transferor's interest. Finally, the loan facilities which the bank has assigned or participated into the trust typically are not fully drawn. The bank maintains capital for its commitment to lend up to the limit of these facilities. If the transferring bank that sponsors the CLO retains a subordinated tranche that would provide credit protection, then the low-level-recourse rule would apply, that is, dollar-for-dollar capital generally would be assessed on the retained risk exposure. This is also true if an interest-only receivable representing the future spread is booked as a receivable on the transferring bank's balance sheet. If the sale of assets is accounted for, in part or in its entirety, as a servicing asset under FAS 140, then the capital charge takes the form of a tier 1 capital limitation. The current capital treatment limits the total amount of mortgage- and nonmortgage-servicing assets that can be included in tier 1 capital to no more than 100 percent. It further limits the amount of nonmortgage-servicing assets that can be included in tier 1 capital to no more than 25 percent.

Examiners should evaluate whether the transferor's interest is of lower credit quality than the investors' interest and, if so, determine whether the 8 percent capital charge against the on-balance-sheet amount is sufficient given the issuing institution's risk exposure. If examiners determine that the transferor's interest is effectively subordinated to the investors' interest and

thus provides credit protection to the issued securities, then the low-level-recourse treatment may be appropriate. SR-96-17, "Supervisory Guidance for Credit Derivatives," provides some guidance for the capital treatment of synthetic securitizations.

Synthetic CLOs can raise questions about the appropriate capital treatment when calculating the risk-based and leverage capital ratios. Capital treatments for three synthetic transactions follow.

Transaction 1—Entire Notional Amount of Reference Portfolio Is Hedged

In the first type of synthetic securitization, the sponsoring banking organization, through a synthetic CLO, hedges the entire notional amount of a reference asset portfolio. An SPV acquires the credit risk on a reference portfolio by purchasing credit-linked notes (CLNs) issued by the sponsoring banking organization. The SPV funds the purchase of the CLNs by issuing a series of notes in several tranches to third-party investors. The investor notes are in effect collateralized by the CLNs. Each CLN represents one obligor and the banking organization's credit-risk exposure to that obligor, which could take the form of bonds, commitments, loans, and counterparty exposures. Since the noteholders are exposed to the full amount of credit risk associated with the individual reference obligors, all of the credit risk of the reference portfolio is shifted from the sponsoring banking organization to the capital markets. The dollar amount of notes issued to investors equals the notional amount of the reference portfolio. In the example shown in figure 1, this amount is $1.5 billion.

If the obligor linked to a CLN in the SPV defaults, the sponsoring banking organization will call the individual CLN and redeem it based on the repayment terms specified in the note agreement. The term of each CLN is set so that the credit exposure (to which it is linked) matures before the maturity of the CLN, which ensures that the CLN will be in place for the full term of the exposure to which it is linked.

An investor in the notes issued by the SPV is exposed to the risk of default of the underlying reference assets, as well as to the risk that the sponsoring banking organization will not repay principal at the maturity of the notes. Because of the linkage between the credit quality of the sponsoring banking organization and the issued notes, a downgrade of the sponsor's credit rating most likely will result in the notes also being downgraded. Thus, a banking organization investing in this type of synthetic CLO should assign the notes to the higher of the risk cate-

Figure 1—Transaction 1

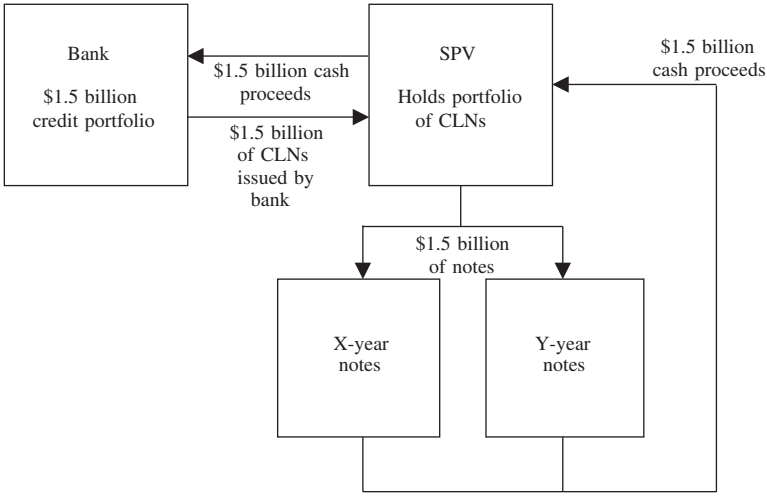
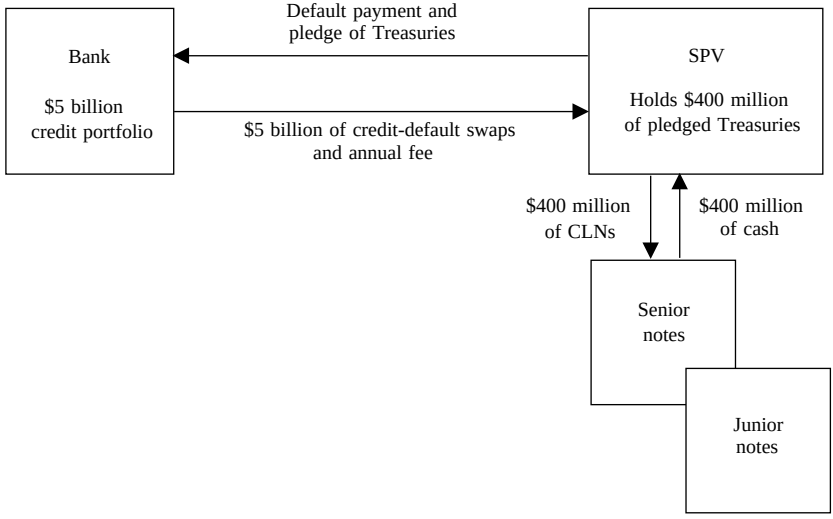


Figure 2—Transaction 2



gories appropriate to the underlying reference assets or the issuing entity.

For purposes of risk-based capital, the sponsoring banking organizations may treat the cash proceeds from the sale of CLNs that provide protection against underlying reference assets as cash collateralizing these assets.[6] This treatment would permit the reference assets, if carried on the sponsoring banking organization's books, to be assigned to the zero percent risk category to the extent that their notional amount is fully collateralized by cash. This treatment may be applied even if the cash collateral is transferred directly into the general operating funds of the banking organization and is not deposited in a segregated account. The synthetic CLO would not confer any benefits to the sponsoring banking organization for purposes of calculating its tier 1 leverage ratio, however, because the reference assets remain on the organization's balance sheet.

Transaction 2—High-Quality, Senior Risk Position in Reference Portfolio Is Retained

In the second type of synthetic CLO transaction, the sponsoring banking organization hedges a portion of the reference portfolio and retains a high-quality, senior risk position that absorbs only those credit losses in excess of the junior-loss positions. For some noted synthetic CLOs, the sponsoring banking organization used a combination of credit-default swaps and CLNs to transfer to the capital markets the credit risk of a designated portfolio of the organization's credit exposures. Such a transaction allows the sponsoring banking organization to allocate economic capital more efficiently and to significantly reduce its regulatory capital requirements.

In the structure illustrated in figure 2, the sponsoring banking organization purchases default protection from an SPV for a specifically identified portfolio of banking-book credit exposures, which may include letters of credit and loan commitments. The credit risk on the identified reference portfolio (which continues to remain in the sponsor's banking book) is transferred to the SPV through the use of credit-default swaps. In exchange for the credit protection, the sponsoring banking organization

6. The CLNs should not contain terms that would significantly limit the credit protection provided against the underlying reference assets, for example, a materiality threshold that requires a relatively high percentage of loss to occur before CLN payments are adversely affected, or a structuring of CLN post-default payments that does not adequately pass through credit-related losses on the reference assets to investors in the CLNs.

pays the SPV an annual fee. The default swaps on each of the obligors in the reference portfolio are structured to pay the average default losses on all senior unsecured obligations of defaulted borrowers. To support its guarantee, the SPV sells CLNs to investors and uses the cash proceeds to purchase U.S. government Treasury notes. The SPV then pledges the Treasuries to the sponsoring banking organization to cover any default losses.[7] The CLNs are often issued in multiple tranches of differing seniority and in an aggregate amount that is significantly less than the notional amount of the reference portfolio. The amount of notes issued typically is set at a level sufficient to cover some multiple of expected losses, but well below the notional amount of the reference portfolio being hedged.

There may be several levels of loss in this type of synthetic securitization. The first-loss position may consist of a small cash reserve, sufficient to cover expected losses. The cash reserve accumulates over a period of years and is funded from the excess of the SPV's income (that is, the yield on the Treasury securities plus the credit-default-swap fee) over the interest paid to investors on the notes. The investors in the SPV assume a second-loss position through their investment in the SPV's senior and junior notes, which tend to be rated AAA and BB, respectively. Finally, the sponsoring banking organization retains a high-quality, senior risk position that would absorb any credit losses in the reference portfolio that exceed the first- and second-loss positions.

Typically, no default payments are made until the maturity of the overall transaction, regardless of when a reference obligor defaults. While operationally important to the sponsoring banking organization, this feature has the effect of ignoring the time value of money. Thus, the Federal Reserve expects that when the reference obligor defaults under the terms of the credit derivative and when the reference asset falls significantly in value, the sponsoring banking organization should, in accordance with generally accepted accounting principles, make appropriate adjustments in its regulatory reports to reflect the estimated loss that takes into account the time value of money.

For risk-based capital purposes, the banking organizations investing in the notes must assign them to the risk weight appropriate to the underlying reference assets.[8] The sponsoring banking organization must include in its risk-weighted assets its retained senior exposure in the reference portfolio, to the extent these underlying assets are held in its banking book. The portion of the reference portfolio that is collateralized by the pledged Treasury securities may be assigned a zero percent risk weight. Unless the sponsoring banking organization meets the stringent minimum conditions for transaction 2 as outlined in the subsection ''Minimum Conditions'' (below), the remainder of the portfolio should be risk weighted according to the obligor of the exposures.

When the sponsoring banking organization has virtually eliminated its credit-risk exposure to the reference portfolio through the issuance of CLNs, and when the other minimum requirements are met, the sponsoring banking organization may assign the uncollateralized portion of its retained senior position in the reference portfolio to the 20 percent risk weight. However, to the extent that the reference portfolio includes loans and other on-balance-sheet assets, the sponsoring banking organization would not realize any benefits in the determination of its leverage ratio.

In addition to the three stringent minimum conditions, the Federal Reserve may impose other requirements as it deems necessary to ensure that a sponsoring banking organization has virtually eliminated all of its credit exposure. Furthermore, the Federal Reserve retains the discretion to increase the risk-based capital requirement assessed against the retained senior exposure in these structures if the underlying asset pool deteriorates significantly.

Federal Reserve staff will make a case-by-case determination, based on a qualitative review, as to whether the senior retained portion of a sponsoring banking organization's synthetic securitization qualifies for the 20 percent risk weight. The sponsoring banking organization must be able to demonstrate that virtually all the credit risk of the reference portfolio has been transferred from the banking book to the capital markets. As they do when banking organizations are engaging in more traditional securiti-

7. The names of corporate obligors included in the reference portfolio may be disclosed to investors in the CLNs.

8. Under this type of transaction, if a structure exposes investing banking organizations to the creditworthiness of a substantive issuer, for example, the sponsoring banking organization, then the investing banking organizations should assign the notes to the higher of the risk categories appropriate to the underlying reference assets or the sponsoring banking organization.

zation activities, examiners must carefully evaluate whether the sponsoring banking organization is fully capable of assessing the credit risk it retains in its banking book and whether it is adequately capitalized given its residual risk exposure. The Federal Reserve will require the sponsoring banking organization to maintain higher levels of capital if it is not deemed to be adequately capitalized given the retained residual risks. In addition, a sponsoring banking organization involved in synthetic securitizations must adequately disclose to the marketplace the effect of its transactions on its risk profile and capital adequacy.

The Federal Reserve may consider a sponsoring banking organization's failure to require the investors in the CLNs to absorb the credit losses that they contractually agreed to assume to be an unsafe and unsound banking practice. In addition, such a failure generally would constitute ''implicit recourse'' or support to the transaction, which results in the sponsoring banking organization's losing preferential capital treatment on its retained senior position.

If a sponsoring banking organization of a synthetic securitization does not meet the stringent minimum conditions, it may still reduce the risk-based capital requirement on the senior risk position retained in the banking book by transferring the remaining credit risk to a third-party OECD bank through the use of a credit derivative. Provided the credit-derivative transaction qualifies as a guarantee under the risk-based capital guidelines, the risk weight on the senior position may be reduced from 100 percent to 20 percent. Sponsoring banking organizations may not enter into nonsubstantive transactions that transfer banking-book items into the trading account to obtain lower regulatory capital requirements.[9]

Minimum Conditions

The following stringent minimum conditions are those that the sponsoring banking organizations must meet to use the synthetic securitization capital treatment for transaction 2. The Federal Reserve may impose additional requirements or conditions as deemed necessary to ascertain that a sponsoring banking organization has sufficiently isolated itself from the credit-risk exposure of the hedged reference portfolio.

Condition 1—Demonstration of transfer of virtually all the risk to third parties. Not all transactions structured as synthetic securitizations transfer the level of credit risk needed to receive the 20 percent risk weight on the retained senior position. To demonstrate that a transfer of virtually all of the risk has been achieved, sponsoring banking organizations must—

- produce credible analyses indicating a transfer of virtually all the credit risk to substantive third parties;
- ensure the absence of any early-amortization or other credit-performance-contingent clauses;[10]
- subject the transaction to market discipline through the issuance of a substantive amount of notes or securities to the capital markets;
- have notes or securities rated by a nationally recognized credit rating agency;
- structure a senior class of notes that receives the highest possible investment-grade rating, for example, AAA, from a nationally recognized credit rating agency;
- ensure that any first-loss position they retain in the form of fees, reserves, or other credit enhancement—which effectively must be deducted from capital—is no greater than a reasonable estimate of expected losses on the reference portfolio; and
- ensure that they do not reassume any credit risk beyond the first-loss position through another credit derivative or any other means.

Condition 2—Demonstration of ability to evaluate remaining banking-book risk exposures and provide adequate capital support. To ensure that the sponsoring banking organization has adequate capital for the credit risk of its unhedged exposures, it is expected to have adequate systems that fully account for the effect of these transactions on its risk profiles and capital adequacy. In particular, the sponsoring banking organiza-

9. For instance, a lower risk weight would not be applied to a nonsubstantive transaction in which the sponsoring banking organization (1) enters into a credit-derivative transaction to pass the credit risk of the senior retained portion held in its banking book to an OECD bank, and then (2) enters into a second credit-derivative transaction with the same OECD bank, in which it reassumes into its trading account the credit risk initially transferred.

10. Early-amortization clauses may generally be defined as features that are designed to force a wind-down of a securitization program and rapid repayment of principal to asset-backed securities investors if the credit quality of the underlying asset pool deteriorates significantly.

tion's systems should be capable of fully differentiating the nature and quality of the risk exposures it transfers from the nature and quality of the risk exposures it retains. Specifically, to gain capital relief sponsoring banking organizations are expected to—

- have a credible internal process for grading credit-risk exposures, including the following:
  - — adequate differentiation of risk among risk grades
  - — adequate controls to ensure the objectivity and consistency of the rating process
  - — analysis or evidence supporting the accuracy or appropriateness of the risk-grading system;
- have a credible internal economic capital-assessment process that defines them to be adequately capitalized at an appropriate insolvency probability and that readjusts, as necessary, their internal economic capital requirements to take into account the effect of the synthetic securitization transaction. (In addition, the process should employ a sufficiently long time horizon to allow necessary adjustments in the event of significant losses. The results of an exercise demonstrating that the organization is adequately capitalized after the securitization transaction must be presented for examiner review.);
- evaluate the effect of the transaction on the nature and distribution of the nontransferred banking-book exposures. This analysis should include a comparison of the banking book's risk profile and economic capital requirements before and after the transaction, including the mix of exposures by risk grade and by business or economic sector. (The analysis should also identify any concentrations of credit risk and maturity mismatches. Additionally, the sponsoring banking organization must adequately manage and control the forward credit exposure that arises from any maturity mismatch. The Federal Reserve retains the flexibility to require additional regulatory capital if the maturity mismatches are substantive enough to raise a supervisory concern. Moreover, as stated above, the sponsoring banking organization must demonstrate that it meets its internal economic capital requirement subsequent to the completion of the synthetic securitization.); and
- perform rigorous and robust forward-looking stress testing on nontransferred exposures (remaining banking-book loans and commitments), transferred exposures, and exposures retained to facilitate transfers (credit enhancements). The stress tests must demonstrate that the level of credit enhancement is sufficient to protect the sponsoring banking organization from losses under scenarios appropriate to the specific transaction.

Condition 3—Provide adequate public disclosures of synthetic CLO transactions regarding their risk profile and capital adequacy. In their 10-K and annual reports, sponsoring banking organizations must adequately disclose to the marketplace the accounting, economic, and regulatory consequences of synthetic CLO transactions. In particular, sponsoring banking organizations are expected to disclose—

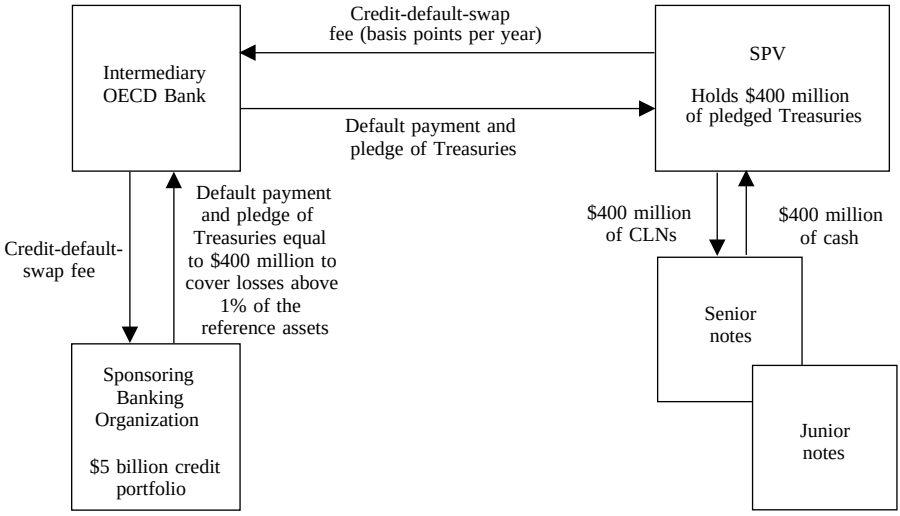
- the notional amount of loans and commitments involved in the transaction;
- the amount of economic capital shed through the transaction;
- the amount of reduction in risk-weighted assets and regulatory capital resulting from the transaction, both in dollar terms and in terms of the effect in basis points on the risk-based capital ratios; and
- the effect of the transaction on the distribution and concentration of risk in the retained portfolio by risk grade and sector.

Transaction 3—First-Loss Position Is Retained

In the third type of synthetic transaction, the sponsoring banking organization may retain a subordinated position that absorbs the credit risk associated with a first loss in a reference portfolio. Furthermore, through the use of credit-default swaps, the sponsoring banking organization may pass the second- and senior-loss positions to a third-party entity, most often an OECD bank. The third-party entity, acting as an intermediary, enters into offsetting credit-default swaps with an SPV, thus transferring its credit risk associated with the second-loss position to the SPV.[11] The SPV then issues CLNs to the capital markets for a portion of the reference

11. Because the credit risk of the senior position is not transferred to the capital markets but remains with the intermediary bank, the sponsoring banking organization should ensure that its counterparty is of high credit quality, for example, at least investment grade.

Figure 3—Transaction 3



portfolio and purchases Treasury collateral to cover some multiple of expected losses on the underlying exposures.

Two alternative approaches could be used to determine how the sponsoring banking organization should treat the overall transaction for risk-based capital purposes. The first approach employs an analogy to the low-level-capital rule for assets sold with recourse. Under this rule, a transfer of assets with recourse that contractually is limited to an amount less than the effective risk-based capital requirements for the transferred assets is assessed a total capital charge equal to the maximum amount of loss possible under the recourse obligation. If this rule applied to a sponsoring banking organization retaining a 1 percent first-loss position on a synthetically securitized portfolio that would otherwise be assessed 8 percent capital, the sponsoring banking organization would be required to hold dollar-for-dollar capital against the 1 percent first-loss risk position. The sponsoring banking organization would not be assessed a capital charge against the second- and senior-risk positions.[12]

The second approach employs a literal reading of the capital guidelines to determine the sponsoring banking organization's risk-based capital charge. In this instance, the 1 percent first-loss position retained by the sponsoring banking organization would be treated as a guarantee, that is, a direct credit substitute, which would be assessed an 8 percent capital charge against its face value of 1 percent. The second-loss position, which is collateralized by Treasury securities, would be viewed as fully collateralized and subject to a zero percent capital charge. The senior-loss position guaranteed by the intermediary bank would be assigned to the 20 percent risk category appropriate to claims guaranteed by OECD banks.[13]

The second approach may result in a higher risk-based capital requirement than the dollar-for-dollar capital charge imposed by the first approach, depending on whether the reference

12. The sponsoring banking organization would not realize any benefits in the determination of its leverage ratio since the reference assets remain on its balance sheet.

13. If the intermediary is a banking organization, then it could place both sets of credit-default swaps in its trading account and, if subject to the Federal Reserve's market-risk capital rules, use its general market-risk model and, if approved, specific-risk model to calculate the appropriate risk-based capital requirement. If the specific-risk model has not been approved, then the sponsoring banking organization would be subject to the standardized specific-risk capital charge.

portfolio consists primarily of loans to private obligors or undrawn long-term commitments. The latter generally have an effective risk-based capital requirement one-half of the requirement for loans because these commitments are converted to an on-balance-sheet credit-equivalent amount using the 50 percent conversion factor. If the reference pool consists primarily of drawn loans to private obligors, then the capital requirement on the senior-loss position would be significantly higher than if the reference portfolio contained only undrawn long-term commitments. As a result, the capital charge for the overall transaction could be greater than the dollar-for-dollar capital requirement set forth in the first approach.

Sponsoring banking organizations will be required to hold capital against a retained first-loss position in a synthetic securitization equal to the higher of the two capital charges resulting from application of the first and second approaches, as discussed above. Further, although the sponsoring banking organization retains only the credit risk associated with the first-loss position, it still should continue to monitor all the underlying credit exposures of the reference portfolio to detect any changes in the credit-risk profile of the counterparties. This is important to ensure that the sponsoring banking organization has adequate capital to protect against unexpected losses. Examiners should determine whether the sponsoring banking organization has the capability to assess and manage the retained risk in its credit portfolio after the synthetic securitization is completed. For risk-based capital purposes, banking organizations investing in the notes must assign them to the risk weight appropriate to the underlying reference assets.[14]

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Asset-backed securities can be either type IV or type V securities. Type IV securities include the following asset-backed securities that are fully secured by interests in a pool (or pools) of loans made to numerous obligors:

- investment-grade residential-mortgage-related securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- residential-mortgage-related securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade commercial mortgage securities offered or sold pursuant to section 4(5) of the Securities Act of 1933 (15 USC 77d(5))
- commercial mortgage securities as described in section 3(a)(41) of the Securities Exchange Act of 1934 (15 USC 78c(a)(41)) that are rated in one of the two highest investment-grade rating categories
- investment-grade, small-business-loan securities as described in section 3(a)(53)(A) of the Securities Exchange Act of 1934 (15 USC 78(a)(53)(A))

Type V securities consist of all asset-backed securities that are not type IV securities. Specifically, they are defined as marketable, investment-grade-rated securities that are not type IV and are ''fully secured by interests in a pool of loans to numerous obligors and in which a national bank could invest directly.'' CLOs and synthetic securitizations are generally classified as type V securities. A bank may purchase or sell type V securities for its own account provided the aggregate par value of type V securities issued by any one issuer held by the bank does not exceed 25 percent of the bank's capital and surplus.

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14. Under this type of transaction, if a structure exposes investing banking organizations to the creditworthiness of a substantive issuer, for example, the sponsoring banking organization, then the investing banking organizations should assign the notes to the higher of the risk categories appropriate to the underlying reference assets or the sponsoring banking organization.

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GENERAL DESCRIPTION

The term *commodity-linked transaction* is used to denote all transactions that have a return linked to the price of a particular commodity or to an index of commodity prices. The term *commodity-derivative transaction* refers exclusively to transactions that have a return linked to commodity prices or indexes and for which there is no exchange of principal.

The term *commodity* encompasses both traditional agricultural products, base metals, and energy products, so that all those transactions that cannot be characterized as interest or exchange-rate contracts under the Basle Accord are designated commodity transactions. Precious metals, which have been placed into the foreign-exchange-rate category in deference to market convention, are not included.

CHARACTERISTICS AND FEATURES

A commodity-linked contract specifies exactly the type or grade of the commodity, the amount, and the future delivery or settlement dates. In these transactions, the interest, principal, or both, or the payment streams in the case of swaps, is linked to a price of a commodity or related index. However, given that banks are not allowed to trade in the underlying physical commodity (with the exception of gold) without special permission, these contracts are settled for cash.

Factors that affect commodity prices and risk are numerous and of many different origins. Macroeconomic conditions, local disturbances, weather, supply and demand imbalances, and labor strikes are examples of factors that have a direct impact on commodity prices. In many other traded markets, such factors would have a more indirect effect.

USES

Commodity-linked markets offer participants a way to hedge or take positions in future commodity prices. Market participants include commodity producers or users, such as mining, energy, and transportation companies, that want to lock in future costs or revenues by entering into a contract at a given price.

In general, financial institutions view commodity-linked transactions as a financial risk-management service for customers with commodity-price exposure, similar to the foreign-exchange and interest-rate risk management products that banks have historically offered. Over-the-counter (OTC) transactions can be tailored to the customer's needs and, therefore, offer more flexibility than exchange-traded contracts, particularly for longer-term insurance.

Examples of commodity-linked products offered by banks include commodity-linked deposits, commodity-linked loans, commodity-linked swaps, and commodity-linked options. Examples of these products and the ways in which hedgers and speculators use these products are described below.

Commodity-Linked Deposits

The following is an example of a deposit with the return linked to a commodity index:

A $100,000 one-year deposit has a return linked to the price of oil. The deposit pays at maturity either (1) a guaranteed minimum return of 3 percent or (2) 90 percent of any gain in the market index (relative to an index rate set at the outset of the transaction) of oil over the life of the deposit, whichever is greater. The depositor is able to benefit from a rise in the price of oil (however, by only 90 percent of the rise that would have been received if he or she had purchased the physical oil). The asset is less risky compared to the purchase of the actual physical oil because the principal is protected against a fall in the price of oil.

Commodity-Linked Loans

The following is an example of a loan with interest payments linked to a commodity index:

A financial institution lends an oil company $1 million for five years with interest payments linked to the price of oil as opposed to a conventional loan at 8 percent. The initial oil

index is set at $20 per barrel. Interest payments are the greater of 4 percent or the excess of any gain in the market price of oil relative to the $20 per barrel base, up to a maximum of 25 percent. The borrower pays a lower interest rate compared to a non-commodity-linked loan when oil prices fall, but shares the upside potential of its oil revenues with the lender when the price of oil rises.

Commodity-Linked Swaps

Commodity-linked swaps are defined as an agreement between two counterparties to make periodic exchanges of cash based on the following terms:

- notional quantity (for example, number of barrels or tons) of the specified commodity
- index, based on a defined grade and type of commodity, whose prevailing price is publicly quoted
- fixed price agreed to by the counterparties (The fixed price is usually above the spot price per unit for the defined commodity at the date the swap is consummated.)
- at specified intervals during the term of the swap, there are settlement dates at which the counterparties agree to a net exchange of cash (The amount of cash to be exchanged is determined as follows:
  - — One counterparty is the fixed price payer. At each settlement date, the fixed price payer owes the counterparty the notional amount of the contract multiplied by the fixed price.
  - — The other counterparty is the floating-rate price payer. At each settlement date, the floating price payer owes the counterparty the notional amount multiplied by the index price prevailing on the settlement date.)

As an example, suppose an oil company wishes to protect itself against a decline in oil prices and enters into a commodity-swap agreement with a bank. The company will receive a fixed price and pay a floating price linked to an index of the price of oil. Thus, the company trades the upside potential of rising oil prices for the assurance that it will not receive a price below the fixed price agreed on at the inception of the trade.

As a further example, suppose a utility company wishes to protect itself from rising oil prices and enters into a commodity-swap agreement with a bank. The utility company will pay a fixed price and receive a floating price linked to an index of the price of oil. Thus, the utility trades its upside potential if oil prices fall for the assurance that it will not pay a price above that agreed on at the inception of the trade.

Commodity-Linked Options

Commodity-linked options convey the right to buy (call) or sell (put) the cash-equivalent amount of an underlying commodity at a fixed exercise price (there is no physical delivery of the underlying commodity). The purchase of a commodity-linked call by an oil user, for example, sets a cap on the price of oil that the user will pay. If oil prices rise, the oil user will exercise the call option, which is the right to buy oil at the lower exercise price. The seller of a call option may have a long position in a given underlying commodity, thus selling off the upside potential of the commodity in exchange for the premium paid by the purchaser of the call.

The purchase by an oil producer of a put option indexed to the price of oil sets a floor on the price of oil that the producer will receive. The bought put therefore allows the holder to establish a minimum price level on the underlying commodity. If the price of oil in the open market falls below the strike price of the option, the oil producer will exercise the put to lock in the strike price.

DESCRIPTION OF MARKETPLACE

Commodity-linked derivatives are traded in both the exchange and OTC markets. There are several fundamental differences between the futures exchanges and the OTC markets for commodities. First, futures contracts may entail delivery of the physical commodity upon expiration of the contract, whereas OTC contracts generally are settled for cash. Second, futures contracts are standardized, while OTC contracts are tailored, often specifying commodities and maturities that are not offered on the exchanges. Third, the OTC market typically handles only large transactions, whereas exchanges may

accommodate transactions as small as the value of a single contract in a given commodity. As a result, the OTC commodity markets tend to be less liquid than the exchanges, but at the same time they offer products that can be more customized to meet the users' specific needs.

Market Participants

Primary players in the commodity markets are commodity producers and end- users, hedge funds and mutual funds, and investment and commercial banks. Commercial banks are relatively small players in the commodity markets; it is estimated that they account for roughly 5 to 10 percent of trading activity in the domestic energy sector and even less in agricultural commodities. However, these banks fill an important niche by acting as intermediaries between producers and users of oil and gas products, which is also important for market participants. Banks apply tested risk-management techniques and market-making skills, which has helped to increase liquidity in the markets. Additionally, the ability of banks, acting as financial intermediaries, to transform risks has enabled entities to hedge attendant exposures (for example, credit risk) which are a component of energy transactions, though not directly related to the price of energy.

Market Transparency

For all exchange-traded commodity products, transparency is high. In the OTC markets, wide variations of transparency exist based on the product, volume traded, grade, delivery point, maturity, and other factors.

PRICING

Similar to the term structure of interest rates, commodity price curves exist which convey information about future expectations. In addition, they reflect the prevailing yield curve (cost-of-carry) and storage costs.

Energy prices are said to be in ''contango'' when the forward prices are greater than expected spot prices at some future date; prices are said to be in ''backwardation'' when future spot prices exceed forward prices. The term structure has little forecasting power, however. Forward prices have not been proven to be accurate forecasts of future spot prices.

The theory of contango holds that the natural hedgers are the purchasers of a commodity, rather than the suppliers. In the case of wheat, grain processors would be viewed as willing to pay a premium to lock in the price that they must pay for wheat. Because long hedgers will agree to pay high futures prices to shed risk, and because speculators require a premium to enter into the short position, the contango theory holds that forward prices must exceed the expected future spot price.

The contrasting theory of contango is backwardation. This theory states that natural hedgers for most commodities will want to shed risk, such as wheat farmers who want to lock in future wheat prices. These farmers will take short positions to deliver wheat in the future at a guaranteed price. To induce speculators to take the corresponding long positions, the farmers need to offer speculators an expectation of profit. The theory of backwardation suggests that future prices will be bid down to a level below the expected spot price.

Any commodity will have both natural long hedgers and short hedgers. The compromise traditional view, called the ''net hedging hypothesis,'' is that the forward price will be less than the expected future spot price when short hedgers outnumber long hedgers and vice versa. The side with the most natural hedgers will have to pay a premium to induce speculators to enter into enough contracts to balance the natural supply of long and short hedgers.

The future price of an energy product is determined by many factors. The no-arbitrage, cost-of-carry model predicts that futures prices will differ from spot prices by the storage and financing costs relevant to inventory. The future spot price is the only source of uncertainty in the basic model. Carry is the sum of the riskless interest rate and the marginal cost of storage. Because carry is always positive, the cost-of-carry model predicts that energy prices will always be in contango.

Empirical evidence suggests, however, that the term structure of energy is not fully explained by carry. The term structure of energy prices is not always in contango. Oil and natural gas markets often become backwardated due to external factors or supply concerns. Further, the market rarely shows full carrying charges. In other words, futures prices as predicted by a

cost-of-carry model generally exceed those observed in the market, even when prices are in contango.

HEDGING

Participants in the OTC commodity markets may have more difficulty hedging their positions than participants in the foreign-exchange and interest-rate markets because of the shallowness and illiquidity of OTC commodity markets. It is also difficult to match the terms and maturities of exchange-traded futures hedges with OTC commodities instruments.

To hedge the spot risk associated with commodity-linked transactions, traders will offset a long position with a short position. The choice of the hedge instrument used generally depends on (1) market conditions, that is, whether the financial institution has a natural offsetting position; (2) the risk appetite of the institution; and (3) cost. Because exchange-traded futures contracts are standardized, they are usually cheaper than the equivalent OTC contracts and are normally the preferred hedge instrument. However, the margin and collateral requirements of exchange-traded contracts may mean that OTC contracts have lower transactions costs than futures traded on exchanges. Moreover, the terms of a futures contract will rarely be identical to the terms of an OTC contract, leaving the financial institution with residual risk.

Commodity swaps, in particular, may be entered into on a perfectly matched basis, with the financial institution guaranteeing the payments of two parties with equal and opposite interests. In a perfectly matched transaction, the financial institution writes a separate, offsetting long-term swap contract with each party, incorporating a margin to cover costs and the risk of counterparty default, and closes simultaneously both sides of the transaction. When engaging in matched commodity swaps, a financial institution is exposed to commodity-price risk only when the counterparty on one side of a matched transaction defaults, and the financial institution must enter the market to hedge or rebalance its book.

However, the need to match transactions perfectly at all times would limit the ability of financial institutions to serve their customers and to compete in the existing market. For example, if a financial institution enters into swap agreements for its own account with one counterparty, it may not be able to establish a matching offsetting transaction immediately. Therefore, it may wish to hedge its commodity-price risk in the futures or related markets until an offsetting swap can be written. When an exact offset is found, the two swaps are matched and the hedge position is unwound.

Some financial institutions may seek a matched book by the end of the day, while others are willing to carry an open swap for weeks or to rely on other hedging techniques, such as hedging on a portfolio basis. For example, a financial institution may hedge the commodity-price exposure of the entire portfolio of independently contracted swaps without ever seeking exactly offsetting transactions. Hedging models help to determine the amount of exposure already offset by the transactions currently in the book. The residual exposure is then hedged using exchange-traded futures and options so that it is reduced to less than the position limits established by the financial institution's management. Some of the most serious financial-institution participants in the commodity swap market are hedging on a portfolio basis.

The use of futures and options to hedge an individual commodity-linked transaction, or a portfolio of such transactions, does not eliminate the residual basis risk resulting from differences between the movements in the prices of two commodities used to offset one another. When risk managers or traders cannot profitably execute a hedge in the same commodity, they may use a second commodity whose price tends to move in line with the first. Such a hedge is necessarily imperfect and cannot eliminate all risk. For example, prospective oil hedgers may incur basis risk because of discrepancies between the nature of the underlying instrument (for example, a crude oil futures contract versus a jet fuel swap) or the location of the deliverable-grade commodity (for example, North Sea oil versus West Texas Intermediate oil).

RISKS

Many of the risks associated with commodity-linked activities are similar to those connected with interest-rate and foreign-exchange products. Price, counterparty credit, and delivery risks all exist. In the case of commodity-linked

transactions, these risks may be further exaggerated due to illiquidity, volatility, and forward pricing problems.

Basis Risk

One of the primary risks facing investors in commodity-linked transactions is basis risk—the risk of a movement in the price of a specific commodity relative to a movement in the price of the commodity-linked transaction. The definition of commodity that is often used to signify like, interchangeable products cannot be applied freely. Variances of grade, delivery location, and delivery time frame—among other things—give rise to numerous basis issues which must be carefully managed. Price risk can be reduced by hedging with either exchange-traded or OTC contracts. However, if contract terms are not equivalent, substantial basis risk can result. Types of basis risk include, but are not limited to, grade risk; location risk; calendar (nearby versus deferred-month) risk; stack-and-roll risk (hedging deferred obligations in nearby months on a rolling basis); and, in the energy markets, risks associated with crack spreads (the price differential between refined and unrefined products).

Liquidity Risk

The OTC-commodity derivative markets are generally much less liquid than the foreign-exchange and interest-rate derivative markets, since commodity-linked derivative products are currently offered by relatively few financial institutions. As a result of the shallow nature of the market, liquidity usually drops off for contracts on forward prices beyond one year.

In addition to their relative scarcity, OTC commodity-linked transactions are customized to meet the needs of the user. This characteristic of the market exacerbates the ability of a financial institution to hedge commodity-linked derivative transactions; perfectly offsetting instruments are rarely available in the OTC market and there may be a significant degree of basis risk when hedging with exchange-traded instruments. For purposes of hedging long-dated (more than one year) crude oil, the OTC market is superior to exchange-traded markets in terms of liquidity.

Volatility Risk

Commodity prices can be much more volatile than interest rates or foreign-currency rates, although this is sensitive to the time period and market conditions. The smaller size of the commodity markets is partially responsible for the heightened volatility of commodity prices. Changes in supply or demand can have a more dramatic effect on prices in smaller markets, as reflected in the measured volatility. Thus, a disruption in any one source of supply may greatly affect the price since many commodities are dominated by only a few suppliers. In addition, the fact that only a few suppliers exist can result in prices that are subject to manipulation. Demand for commodities can also depend heavily on economic cycles.

ACCOUNTING TREATMENT

The accounting treatment for commodity-linked transactions is determined by the Financial Accounting Standards Board's Statement of Financial Accounting Standards (SFAS) No. 133, ''Accounting for Derivatives and Hedging Activities.'' (See section 2120.1, ''Accounting,'' for further discussion.)

RISK-BASED CAPITAL WEIGHTING

The credit-equivalent amount of a commodity-linked contract is calculated by summing—

1. the mark-to-market value (positive values only) of the contract and
2. an estimate of the potential future credit exposure over the remaining life of each contract.

The conversion factors are as follows.

	0–1 Years	*1–5 Years*	*Over 5 Years*
Gold contracts	1.0%	5.0%	7.5%
Other precious metals	7.0%	7.0%	8.0%
Other commodities	10.0%	12.0%	15.0%

If a bank has multiple contracts with a counterparty and a qualifying bilateral contract with the counterparty, the bank may establish its current and potential credit exposures as net credit exposures. (See section 2110.1, ''Capital Adequacy.'')

LEGAL LIMITATIONS FOR BANK INVESTMENTS

Commodity derivatives are not considered investments under 12 USC 24 (seventh). A bank must receive proper regulatory approvals before engaging in commodity-linked activities.

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