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?