

## **Prefatory Note**

The attached document represents the most complete and accurate version available based on original files from the FOMC Secretariat at the Board of Governors of the Federal Reserve System.

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OCTOBER 29, 2009

# MONETARY POLICY ALTERNATIVES

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PREPARED FOR THE FEDERAL OPEN MARKET COMMITTEE  
BY THE STAFF OF THE BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

## RECENT DEVELOPMENTS

### SUMMARY

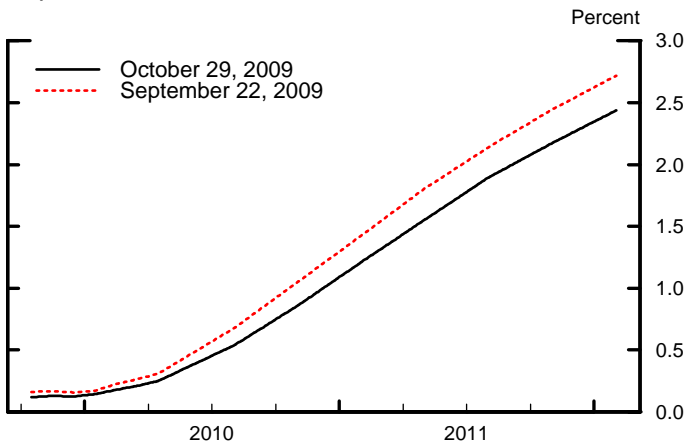
Changes in financial market conditions have been mixed over the intermeeting period. Rates on corporate debt fell somewhat. Broad equity price indexes fell slightly, even though third-quarter earnings reports have generally been better than analysts had anticipated. The expected path of monetary policy moved a bit lower, while Treasury yields were little changed. Consistent with improved funding market conditions, borrowing from Federal Reserve facilities declined further over the intermeeting period. Bank credit continued to decline sharply, and banks again tightened terms and standards on loans in all major categories in the third quarter. Financial market conditions abroad were generally little changed on balance, although stock prices in many of the major foreign centers ended the period down.

### MONETARY POLICY EXPECTATIONS AND TREASURY YIELDS

The path of the federal funds rate anticipated by investors appears to have rotated down somewhat on balance over the intermeeting period (Chart 1). The Committee's decisions to leave the target range for the federal funds rate unchanged and to extend and taper Federal Reserve purchases of mortgage-backed and agency debt were largely anticipated by market participants. However, policy expectations declined in reaction to the FOMC statement, as investors may have interpreted the reiteration of the "extended period" language and continued mention of "ongoing job losses, sluggish income growth, lower housing wealth, and tight credit" as indicating that policy accommodation would remain in place for longer than previously anticipated. Subsequently, the expected path of policy has changed little on balance, against the backdrop of remarks about monetary policy prospects by FOMC officials and mixed data on economic activity.

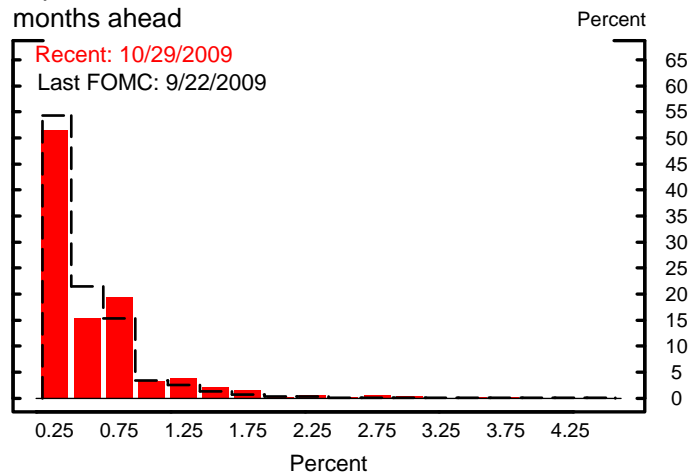
### Chart 1 Interest Rate Developments

Expected federal funds rates



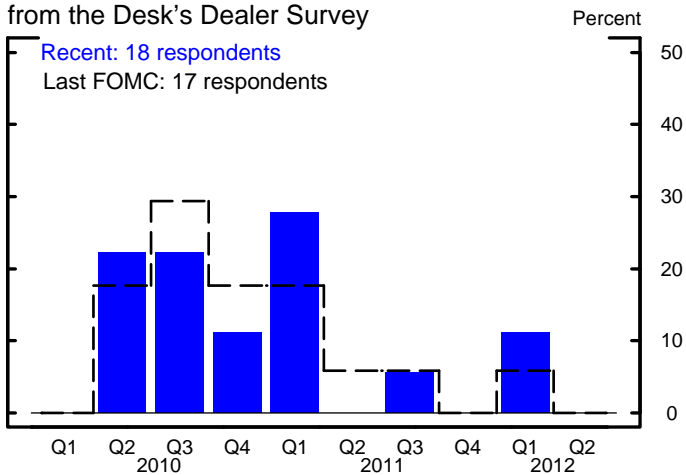
Note. Estimates from federal funds and Eurodollar futures, with an allowance for term premiums and other adjustments.  
Source. CME Group.

Implied distribution of federal funds rate six months ahead



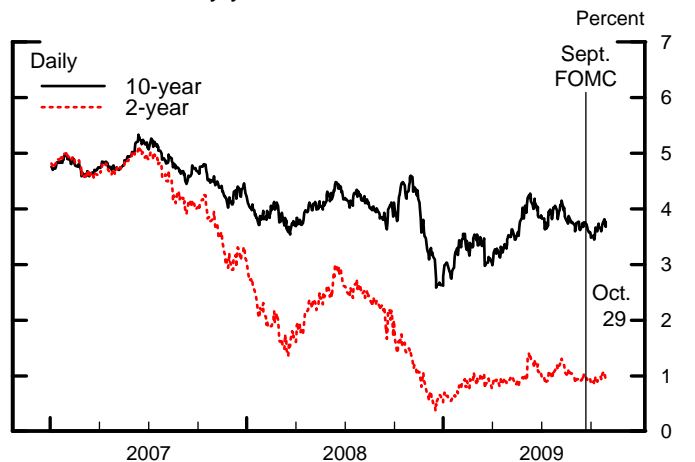
Note. Derived from options on Eurodollar futures contracts, with term premium and other adjustments to estimate expectations for the federal funds rate.

Distribution of expected quarter of first rate increase from the Desk's Dealer Survey



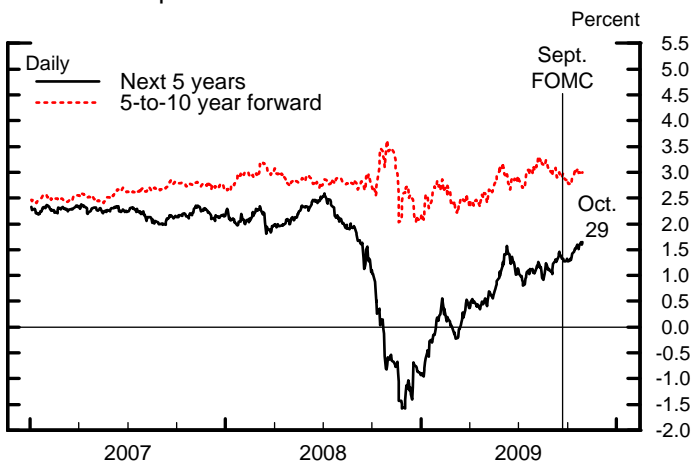
Source. Federal Reserve Bank of New York.

Nominal Treasury yields



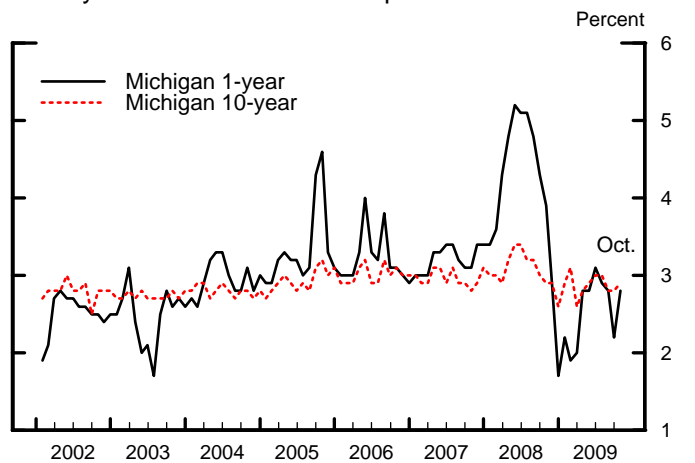
Note. Par yields from a smoothed nominal off-the-run Treasury yield curve.  
Source. Staff estimates.

Inflation compensation



Note. Estimates based on smoothed nominal and inflation-indexed Treasury yield curves and adjusted for the indexation-lag (carry) effect.  
Source. Barclays, PLC., and staff estimates.

Survey measures of inflation expectations



Source. Reuters/University of Michigan.

Based on the staff's standard assumptions about term premiums, futures quotes continue to suggest that market participants expect the target federal funds rate to remain within its current range through the first quarter of 2010, and then to rise gradually to about 2¼ percent by the end of 2011. All 18 respondents to the Desk's dealer survey in October anticipated that the federal funds rate would remain in its current range through the first quarter of 2010. The average expected date for the first rate increase was the fourth quarter of 2010. The distribution of dealers' expectations for policy rates 12- and 18-months hence widened noticeably; in contrast, options-implied measures of uncertainty about the expected near-term path of monetary policy were about unchanged over the intermeeting period.

Nominal Treasury yields were about unchanged over the interval since the September meeting. Gross public issuance of Treasury coupon securities was \$190 billion across the term structure. Several of the auctions were again for record amounts, but the auctions still were generally well received. Proxies for foreign participation continued to suggest solid demand from abroad. Federal debt subject to the debt ceiling of about \$12.1 trillion now stands at about \$11.8 trillion. Staff projections currently suggest that the limit will be reached at the end of December.

Five-year inflation compensation—the difference between yields on five-year nominal Treasury securities and yields on five-year Treasury inflation-protected securities (TIPS)—rose about 30 basis points over the intermeeting period, owing in part to an increase in oil and other commodity prices. Staff estimates suggest that reductions in liquidity premiums on TIPS also contributed to the increase in inflation compensation. TIPS-based mutual funds saw strong inflows. The five-year forward measure of inflation compensation was little changed. Year-ahead inflation expectations as measured by the Reuters/Michigan survey increased 20 basis points, while longer-term expectations from the same survey were unchanged.

## CAPITAL MARKETS

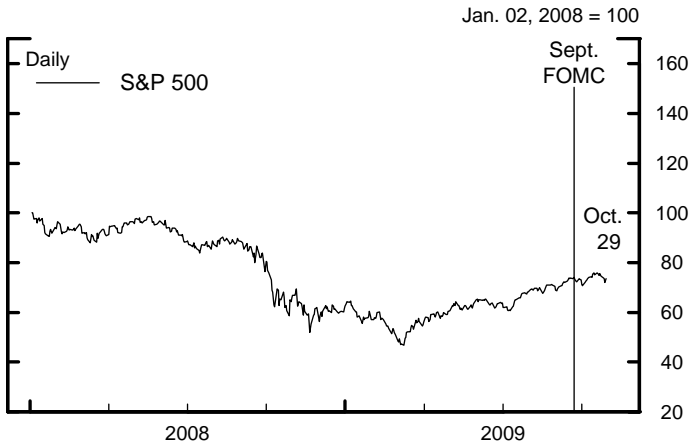
Broad equity price indexes fell slightly over the intermeeting period even though third-quarter earnings releases were generally better than expected (Chart 2). The implied volatility of equity prices, as gauged by the VIX index, moved up slightly, and the equity premium—as measured by the staff's estimate of the expected real return on equity over the next ten years relative to the real 10-year yield on Treasury securities—continued to narrow, although it remained high by historical standards.

In the financial sector, third-quarter earnings reports were mixed. Earnings at some larger banking organizations were solid, but several institutions attributed their strong profits to increased revenues from fixed income, currency, and commodities trading rather than from lending. Other large banks and many smaller ones reported losses, as provisions for loan losses increased significantly in response to higher actual and anticipated charge-offs. Reflecting these results and investor concerns about the adequacy of banks' provisioning, bank equity price indexes declined, on net, over the intermeeting period. Credit-default swap (CDS) spreads for larger bank holding companies were about flat, while those for other banking organizations widened modestly. Equity prices for large insurance companies fell, while CDS spreads were about unchanged.

Yields on investment- and speculative-grade corporate bonds decreased more than those on comparable-maturity Treasury securities over the intermeeting period, further narrowing risk spreads. The expected year-ahead default rate from Moody's KMV, which covers both financial and nonfinancial firms, inched downward over the period, and now stands below its September 2008 level. Municipal bond issuance remained robust and the ratio of yields on such instruments to comparable-maturity Treasury securities was about unchanged.

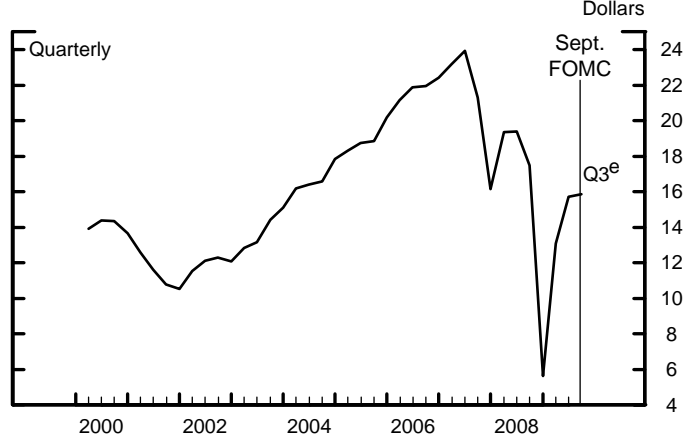
### Chart 2 Asset Market Developments

#### Equity prices



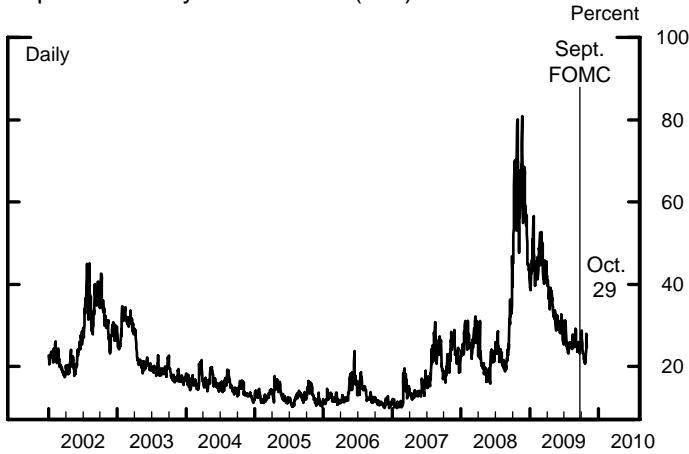
Source. Bloomberg.

#### S&P 500 earnings per share (seasonally adjusted)



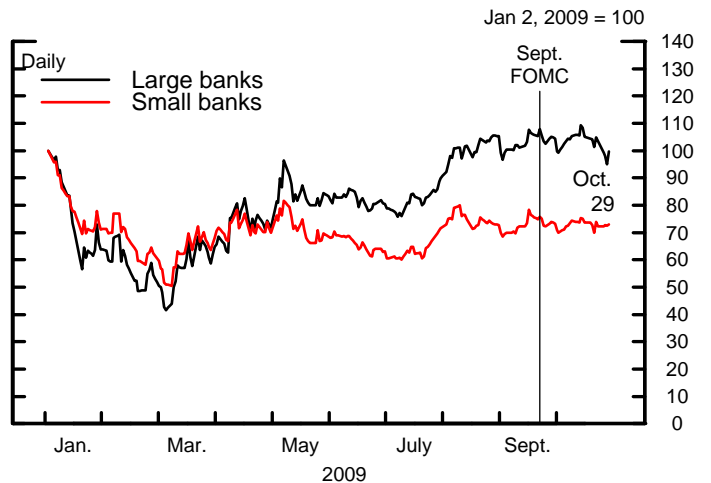
e Estimated.  
Source. Thomson Financial.

#### Implied volatility on S&P 500 (VIX)



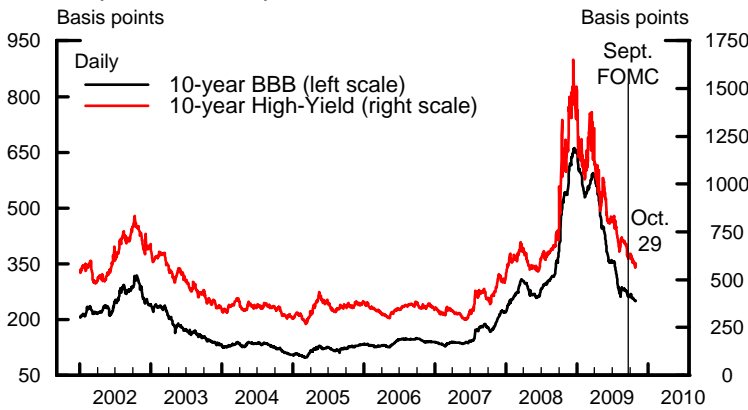
Source. Chicago Board Options Exchange.

#### Bank ETFs



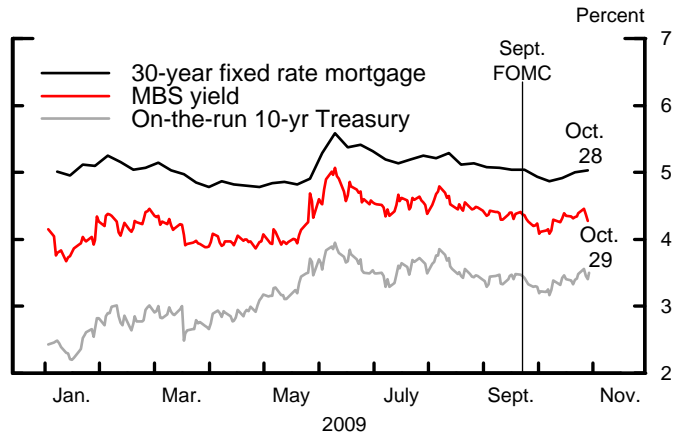
Note. Large banks ETF includes 24 banks. Small banks ETF includes 51 banks.  
Source. Bloomberg.

#### Corporate bond spreads



Note. Measured relative to an estimated off-the-run Treasury yield curve.  
Source. Merrill Lynch and staff estimates.

#### Select interest rates



Note. Data are business daily except for the 30-year fixed rate mortgage which is weekly.  
Source. Bloomberg.

Nonfinancial corporate bond issuance remained solid in September, but has slowed this month. Net commercial paper (CP) issuance began to rebound in September and October after having declined earlier in the year. On the whole, net debt financing by nonfinancial firms appears to have increased in October, after having declined in the third quarter.

Interest rates on 30-year conforming fixed-rate residential mortgages were about unchanged over the intermeeting period at slightly over 5 percent. Indicators of refinancing activity rose a bit. Issuance of agency mortgage-backed securities was again solid in August. The market for new issuance of commercial mortgage-backed securities remained closed, as conditions in the commercial real-estate sector continued to be weak.

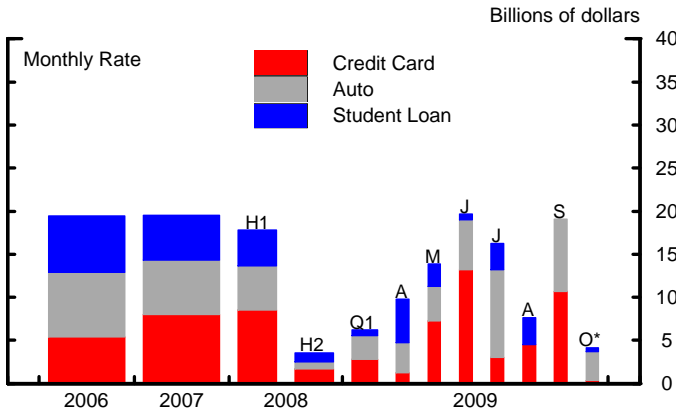
In consumer credit markets, interest rates on auto loans moved down slightly over the intermeeting period, while interest rates on both new credit card offers and existing credit card lines increased slightly in August. In response to a set of special questions on the October Senior Loan Officer Opinion Survey (SLOOS), many banks reported that they had tightened or expected to tighten many of the terms and conditions of their credit card lines by the end of February 2010 as they moved to comply with aspects of the Credit Card Responsibility and Disclosure Act of 2009, although some also noted that they would likely trim penalty fees and extend grace periods.

Changes in conditions in the consumer asset-backed securities (ABS) market were mixed over the period. Spreads of AAA- and BBB-rated consumer ABS to swaps continued to edge downwards, and in September, issuance of auto and credit-card ABS rose sharply (Chart 3). However, issuance of credit-card ABS came to a halt in October after major rating agencies declined to rate most of these ABS as AAA,



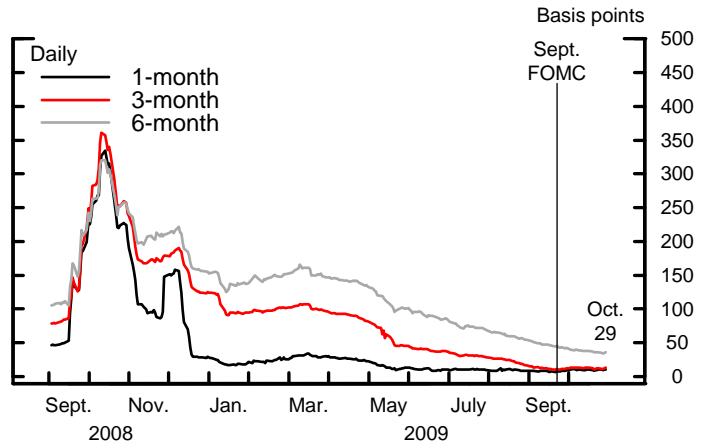
### Chart 3 Market Functioning and Federal Reserve Facilities

Gross ABS issuance



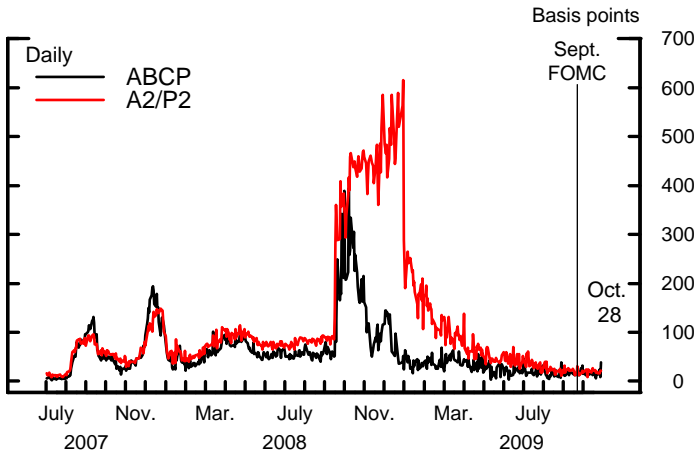
\*Actual issuance as of October 23, 2009.  
Note. Auto ABS include car loans and leases and financing for buyers of motorcycles.  
Source. Inside MBS & ABS, Merrill Lynch, Bloomberg, and the Federal Reserve.

Libor over OIS spread



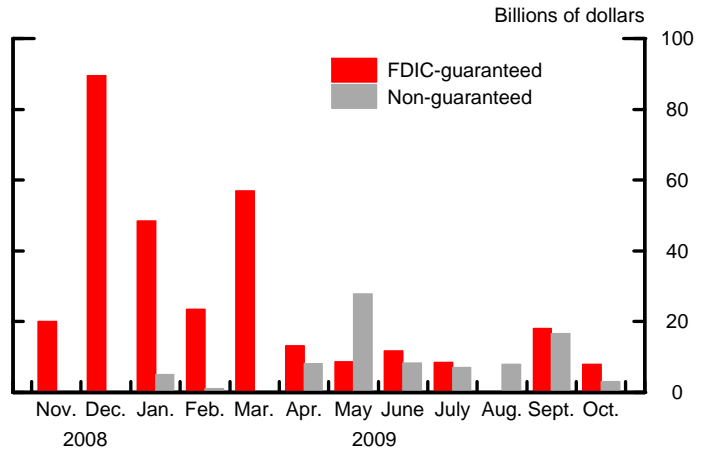
Source. British Bankers' Association and Prebon.

Spreads on 30-day commercial paper



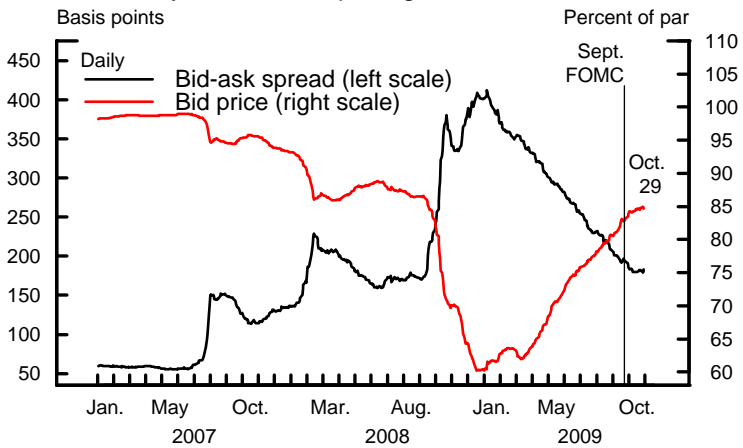
Note. The ABCP spread is the AA ABCP rate minus the AA nonfinancial rate. The A2/P2 spread is the A2/P2 nonfinancial rate minus the AA nonfinancial rate.  
Source. Depository Trust & Clearing Corporation.

Senior unsecured debt issuance



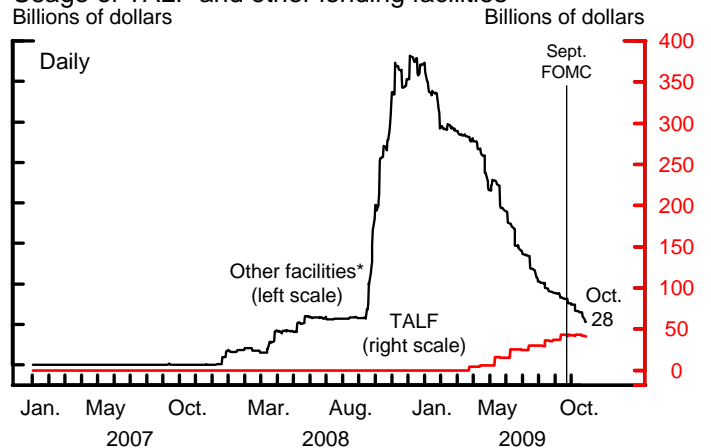
Note. Staff estimates.  
Source. Bloomberg.

Secondary loan market pricing



Source. LSTA/LPC Mark-to-Market Pricing.

Usage of TALF and other lending facilities



\* Includes primary, secondary, and seasonal credit; TAF; PDCF; dollar liquidity swaps; CPFF; and AMLF.  
Source. Federal Reserve.

pending FDIC clarification of the likely handling of noteholders' claims in the event of the failure of the issuing bank.<sup>1</sup>

## **MARKET FUNCTIONING AND FEDERAL RESERVE FACILITIES**

Financial market functioning appeared to improve further over the intermeeting period. In short-term funding markets, spreads between one- and three-month Libor rates and overnight index swap (OIS) rates remained about unchanged at their pre-crisis levels, while the six-month Libor-OIS spread narrowed somewhat further but remained above pre-crisis levels. The effective federal funds rate averaged about 12 basis points to date over the intermeeting period, down a little from the 15 basis point average in the previous intermeeting period. Market participants attributed some of the decline in the federal funds rate as well as in overnight repurchase agreement rates to the increase in reserve balances resulting from the Treasury's September 16 decision to run down the balance of the Supplementary Financing Program (SFP) to \$15 billion. Spreads on 30-day A2/P2-rated CP and AA-rated asset-backed CP over AA nonfinancial CP remained at the lower end of their range over the past two years.

Overall, year-end pressures in funding markets so far appear modest. For example, the yield premium in Libor and CP rates as maturities extend into the new year is quite small. However, the demand for Treasury securities with maturities that extend over the turn of the year is somewhat elevated. Yields on Treasury bills that mature just after year-end are noticeably lower than those maturing before year-end.

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<sup>1</sup> Over the intermeeting period, Moody's and Fitch joined Standard and Poor's in declining to rate credit card ABS as AAA (unless the sponsoring bank's rating is AA or higher) until the FDIC provides guidance on whether it might repudiate the securitization contract in the event of a bank receivership. FDIC's current guidance establishes a safe harbor from repudiation for asset-backed securities that are off-balance sheet under FASB regulations. The adoption of FAS 166 and 167 later this year will make it difficult for credit card ABS to receive off-balance sheet treatment.

Investors have speculated that the relative scarcity of Treasury bills that has developed as a result of the rundown in the Treasury's Supplementary Financing Program may be contributing to year-end pressures in that market.

Issuance of non-guaranteed senior unsecured debt by financial firms rose in September. Two firms issued FDIC-guaranteed debt in September, but issuance is expected to decline in October before the end-of-month expiration of the FDIC's Temporary Liquidity Guarantee Program (TLGP).<sup>2</sup> On October 15, a large corporate credit union became the first issuer of debt under a new guarantee program provided by the National Credit Union Association. In late October, GMAC issued about \$3 billion in debt under the TLGP, and was reportedly in discussion with the Treasury to receive additional funds from the Troubled Asset Relief Program. Conditions continued to improve in the secondary market for leveraged loans. The average bid-asked spread declined to below 2 percent, and the average bid price rose to about 85, although prices for the most widely held loans, at around 90, moved sideways over the period.

Total Federal Reserve assets were about unchanged over the intermeeting period at around \$2.2 trillion, with increases in securities purchased under the large-scale asset purchase (LSAP) program offsetting declines in credit supplied through liquidity and credit facilities. (See box entitled "Balance Sheet Developments during the Intermeeting Period.") On October 19, the Federal Reserve Bank of New York announced that it had been testing its ability to conduct triparty reverse purchase agreements with primary dealers as a tool for reducing monetary policy accommodation but noted that no actual operations had occurred.

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<sup>2</sup> An emergency facility, which would allow banking firms to issue guaranteed debt under less attractive terms, and subject to FDIC approval, will be available through April 30, 2010.

## Balance Sheet Developments during the Intermeeting Period

Since the September FOMC meeting, the Federal Reserve's total assets were roughly unchanged at \$2.17 trillion.<sup>1</sup> As a result of ongoing asset purchases, securities held outright increased by \$102 billion while lending through liquidity and credit facilities declined \$103 billion. Liabilities were likewise about unchanged, but the composition shifted notably with the level of reserve balances rising above \$1 trillion.

The System Open Market Account added \$9 billion in Treasury securities, \$12 billion in agency debt securities, and \$81 billion in agency mortgage-backed securities (MBS) during the intermeeting period.<sup>2</sup> Following the September FOMC statement, the Desk has begun a gradual reduction in its average weekly purchases of agency MBS and it plans to gradually reduce both the size and frequency of agency debt purchases during the first quarter of 2010. In addition, the last purchase of Treasury securities under the large-scale asset purchase program was conducted on October 29, bringing total purchases to \$300 billion.

Most of the System's liquidity and credit programs contracted further over the intermeeting period. Term auction credit declined \$57 billion, and—as announced in September—the Federal Reserve began to phase out the 84-day Term Auction Facility (TAF) operations. Foreign central bank liquidity swaps declined \$26 billion, the net portfolio holdings of the Commercial Paper Funding Facility LLC (CPFF) fell by more than half to \$19 billion, primary credit declined \$6 billion, and the already minimal amount of credit outstanding under the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) dropped to zero. Securities lent through the Term Securities Lending Facility (TSLF)—which do not affect on-balance-sheet assets because the Federal Reserve retains ownership of the securities lent—and lending under the Primary Dealer Credit Facility (PDCF) remained at zero. As previously announced, the authorization for the Money Market Investor Funding Facility (MMIFF), which has never been used, expires on October 30.

Credit extended by the Term Asset-Backed Securities Loan Facility (TALF) was about unchanged over the intermeeting period, reflecting prepayments that approximately equaled new lending.<sup>3</sup> Prepayments have in part been driven by a

<sup>1</sup> These data are through October 28, 2009.

<sup>2</sup> The figures for securities holdings reflect only trades that have settled. Over the intermeeting period, the Open Market Desk committed to purchase, but has not yet settled, an additional \$82 billion of MBS, on net.

<sup>3</sup> On October 5, the Federal Reserve announced two changes to the procedures for evaluating asset-backed securities (ABS) pledged to the TALF. First, the Board announced that it has proposed a rule that would

pickup in secondary market activity for asset-backed securities (ABS) that has led some early TALF borrowers to sell ABS and lock-in gains. The two TALF operations conducted during the intermeeting period were of relatively modest size. After the October 2 subscription, there were \$2.4 billion in loans settled, supporting seven deals totaling \$6.5 billion collateralized by auto loans, student loans, credit card loans, equipment loans, floorplan loans, loans guaranteed by the Small Business Administration, and residential mortgage servicing advances. On October 21, there were \$2.1 billion in requests for TALF loans to finance legacy commercial mortgage-backed securities.

Assets related to the Federal Reserve's support for specific institutions rose by \$10 billion over the intermeeting period, as a result of increased credit extended to American International Group (AIG), and third quarter revaluations of the net portfolio holdings of the three Maiden Lane LLCs.<sup>4</sup>

On the liability side of the Federal Reserve's balance sheet, the U.S. Treasury reduced the balance it held in the supplementary financing account by \$170 billion to preserve flexibility in managing its debt as it approaches the federal debt ceiling.<sup>5</sup> The balance in the Treasury's general account decreased \$29 billion. Reserve balances of depository institutions increased \$191 billion and moved above the \$1 trillion mark, ending the period at \$1,083 billion.

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establish criteria for determining the credit rating agencies whose ratings on ABS would be accepted by the facility. Second, the Federal Reserve indicated that, beginning with the November subscription, on top of the requirement that collateral for TALF loans receive two triple-A ratings from TALF-eligible credit rating agencies, the Federal Reserve Bank of New York will conduct a formal risk assessment of the ABS. Commercial mortgage-backed securities used as collateral are already subject to a formal risk assessment.

<sup>4</sup> The figure for credit extended to AIG is net and includes outstanding principal and capitalized interest net of unamortized deferred commitment fees and allowance for loan restructuring but excludes credit extended to consolidated LLCs.

<sup>5</sup> On October 29, Treasury reduced the supplementary financing account an additional \$15 billion bringing the account balance to \$15 billion.

## Federal Reserve Balance Sheet

Billions of dollars

	Change since last FOMC	Current (10/28/2009)	Maximum level	Date of maximum level
<b>Total assets</b>	<b>3</b>	<b>2,165</b>	<b>2,256</b>	<b>12/17/08</b>
Selected assets:				
Liquidity programs for financial firms	-89	195	1,247	11/06/08
Primary, secondary, and seasonal credit	-6	23	114	10/28/08
Term auction credit (TAF)	-57	139	493	03/11/09
Foreign central bank liquidity swaps	-26	33	586	12/04/08
Primary Dealer Credit Facility (PDCF)	0	0	156	09/29/08
Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)	-0	0	152	10/01/08
Lending through other credit facilities	-24	60	351	01/23/09
Net portfolio holdings of Commercial Paper Funding Facility LLC (CPFF)	-23	19	351	01/23/09
Term Asset-Backed Securities Loan Facility (TALF)	-1	41	44	09/11/09
Support for specific institutions	10	110	118	04/02/09
Credit extended to AIG, net	6	45	91	10/27/08
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	4	65	75	12/30/08
Securities held outright*	102	1,690	1,693	10/23/09
U.S. Treasury securities	9	775	791	08/14/07
Agency securities	12	142	142	10/28/09
Agency mortgage-backed securities**	81	774	777	10/23/09
Memo: Term Securities Lending Facility (TSLF)	0	0	236	10/01/08
<b>Total liabilities</b>	<b>3</b>	<b>2,112</b>	<b>2,213</b>	<b>12/04/08</b>
Selected liabilities:				
Federal Reserve notes in circulation	3	875	878	10/14/09
Reserve balances of depository institutions	191	1,083	1,097	10/23/09
U.S. Treasury, general account	-29	31	137	10/23/08
U.S. Treasury, supplemental financing account	-170	30	559	10/22/08
Other deposits	11	11	53	04/14/09
<b>Total capital</b>	<b>-0</b>	<b>53</b>	<b>53</b>	<b>10/28/09</b>

+0 (-0) denotes positive (negative) value rounded to zero.

\* Par value.

\*\* Includes only mortgage-backed security purchases that have already settled. Over the intermeeting period, the Open Market Desk committed to purchase an additional \$82 billion of MBS, on net. Total MBS purchases are about 973 billion.

Credit extended under the Term Asset-Backed Securities Lending Facility (TALF) was about unchanged over the intermeeting period, as requests for a moderate volume of loans were offset by early loan repayments. At the October 2 ABS subscription, there were \$2.4 billion in loan requests, supporting seven deals totaling \$6.5 billion. While over the period from May through August, the fraction of eligible ABS issues that were financed through the TALF equaled about two-thirds, in September it fell to one-third and in October to less than one-quarter. The October 21 commercial mortgage-backed security (CMBS) subscription saw \$2.1 billion in loan requests in support of legacy CMBS. Usage of facilities other than the TALF continued to decline. Of note, in late October, CP issued to the Commercial Paper Funding Facility fell by more than half as issuers paid down a significant volume of maturing paper.

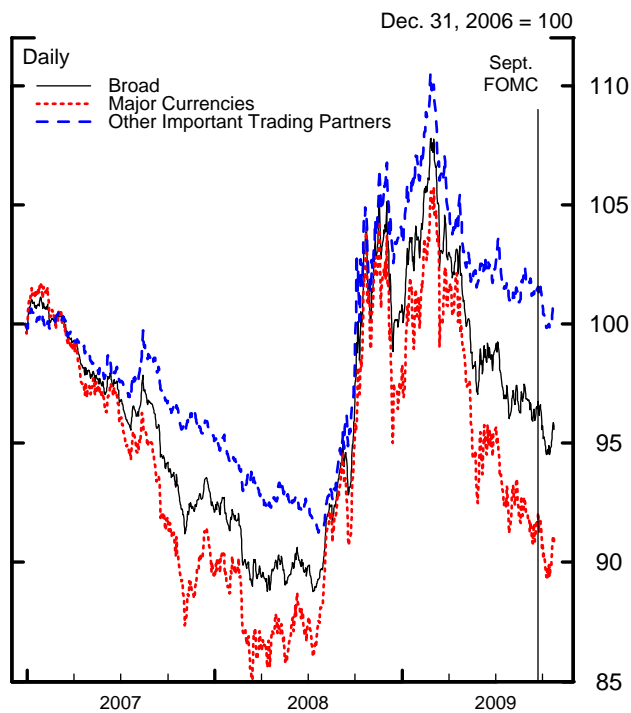
## **FOREIGN DEVELOPMENTS**

The trade-weighted index of the exchange value of the dollar against the major foreign currencies has changed little on net since the September FOMC meeting (Chart 4). The dollar depreciated 4 percent against the Australian dollar and moved sideways against most other major foreign currencies. Amid intervention by several Asian and Latin American central banks to stem appreciation of their currencies, the exchange value of the dollar against the other important trading partners of the United States decreased slightly.

Over the period, despite indications that central banks in major foreign industrial economies will continue to remain accommodative for some time, expected policy rates 12 month hence in the major foreign economies rose in response to the improved global economic outlook, with increases of about 15 and 10 basis points in the euro area and the United Kingdom, respectively, about 25 basis points in Canada, and about 5 basis points in Japan. The Reserve Bank of Australia (RBA) became the

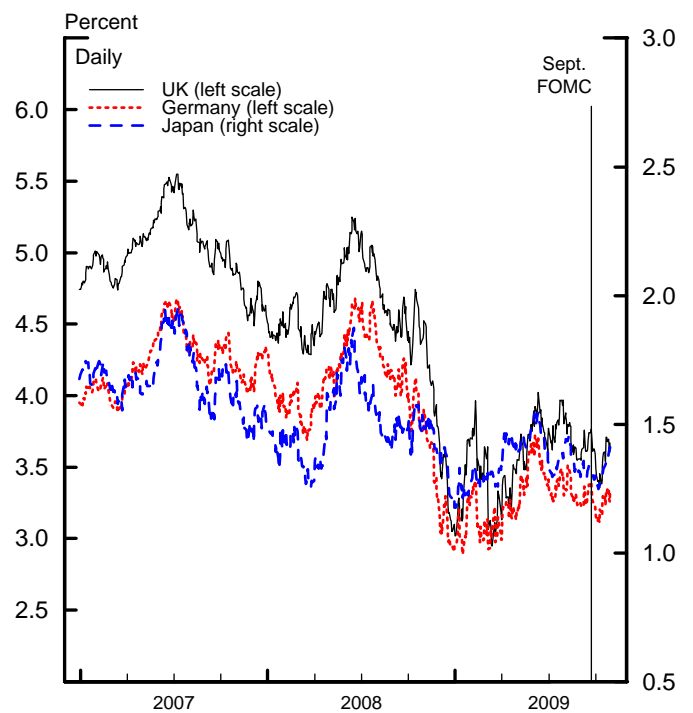
### Chart 4 International Financial Indicators

Nominal trade-weighted dollar indexes



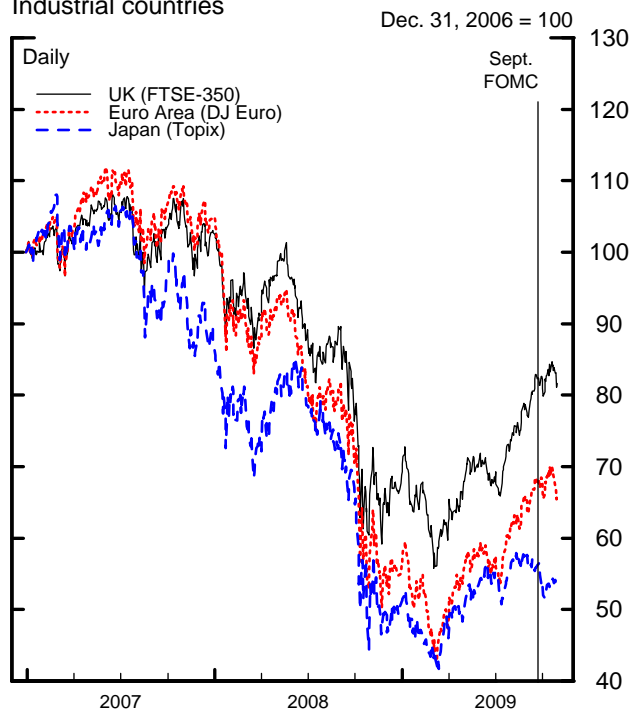
Source: FRBNY and Bloomberg.

Nominal ten-year government bond yields



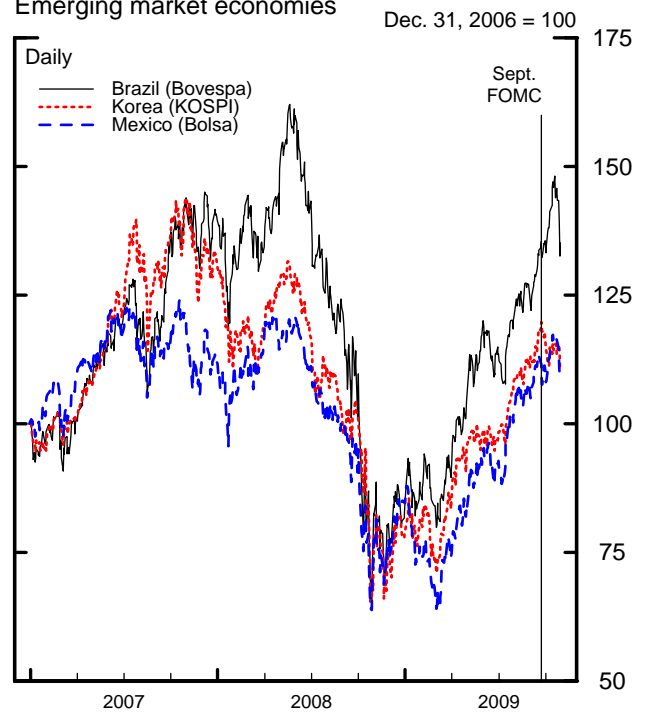
Source: Bloomberg.

Stock price indexes  
Industrial countries



Source: Bloomberg.

Stock price indexes  
Emerging market economies



Source: Bloomberg.

Note. Last daily observation is for October 29, 2009.



first central bank among G-20 countries to hike rates since the start of the financial crisis, raising its policy rate 25 basis points to 3¼ percent. The Norges Bank subsequently raised its policy rate 25 basis points to 1½ percent.

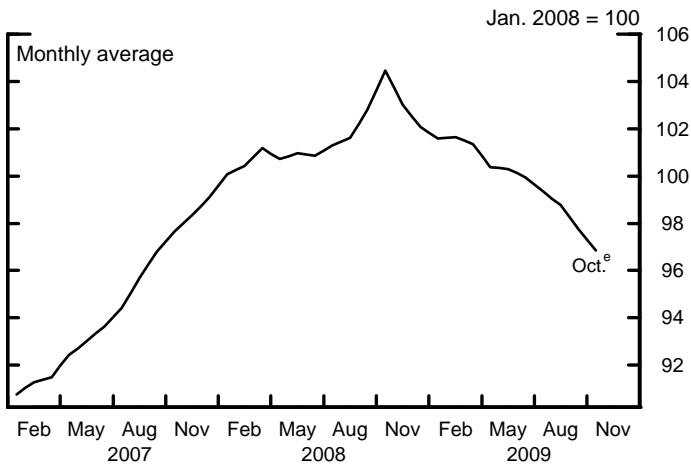
Headline equity price indexes decreased 1 to 2 percent on net in Europe, and 5 percent in Japan and Canada. Equity prices also declined 8 percent in South Korea, but rose 3 percent in China and Brazil and 10 percent in Russia. Changes in ten-year sovereign yields in major foreign industrial economies were mixed on net, with increases of about 9 and 6 basis points in Canada and Japan, respectively, but decreases of 7 to 9 basis points in Europe. The spot price of WTI crude oil has risen about 12 percent over the intermeeting period to \$80 per barrel. The increase likely reflects a more positive assessment of global growth prospects and U.S. data pointing to a more rapid drawdown in crude oil inventories than had previously been expected. The price of gold rose to \$1,064 per ounce, a record in nominal terms, before pulling back some. The price increase may have reflected in part concerns about the weakness of the dollar and about higher inflation, although the price of gold is up in terms of other major currencies as well.

## **BANK CREDIT, DEBT, AND MONEY**

Commercial bank credit contracted at a 12½ percent annual rate in September and is projected to fall at about a 10½ percent pace in October (Chart 5). On balance, sharp declines in loans more than offset a modest increase in securities holdings. Every major category of loans ran off. The decline was especially pronounced for C&I loans. In response to a special question on C&I loans in the October 2009 SLOOS, banks attributed the steep contraction in such loans since the beginning of 2009 primarily to decreased originations of term loans and decreased draws on revolving credit lines, as well as to paydowns of outstanding loans. In addition, some firms may have shifted to bond issuance given the continued decline in

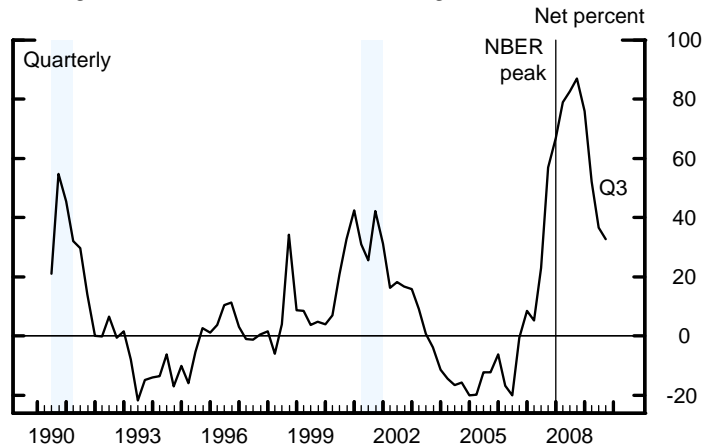
### Chart 5 Debt and Money

Bank credit



Source. Federal Reserve.  
e Estimated.

Changes in commercial banks' lending standards



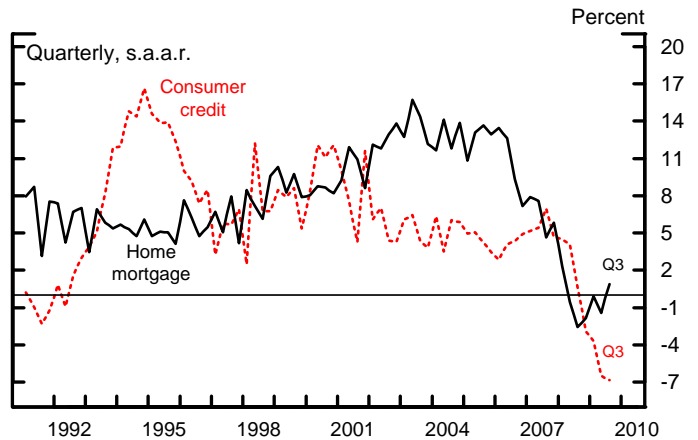
Note. Series plots net percentage of core loans in categories for which banks reported a tightening of lending standards.  
Source. Senior Loan Officer Opinion Survey and Call Reports.

Growth of debt of nonfinancial sectors

Percent, s.a.a.r.	Total	Business	Household	Government
2007	8.7	13.4	6.6	6.1
2008	5.9	5.3	0.2	17.5
Q1	5.4	7.8	2.9	6.7
Q2	3.3	6.4	0.2	4.4
Q3	8.2	5.1	-0.5	28.6
Q4	6.3	1.7	-1.8	26.7
2009				
Q1	4.1	0.0	-1.1	17.9
Q2	4.5	-1.8	-1.7	22.0
Q3	4.1	-1.5	-0.3	17.0

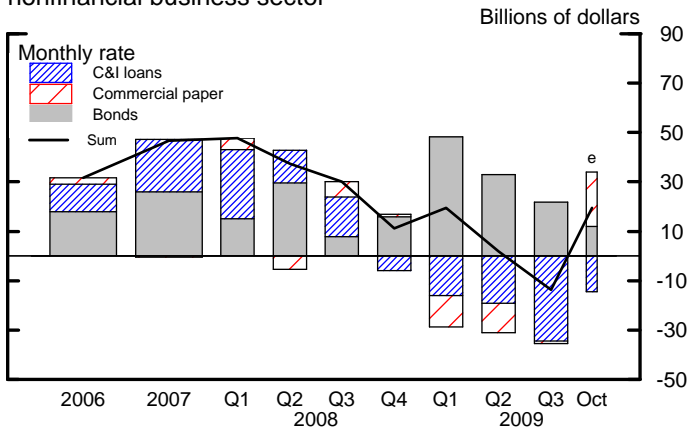
Source. Flow of Funds.

Growth of debt of household sector



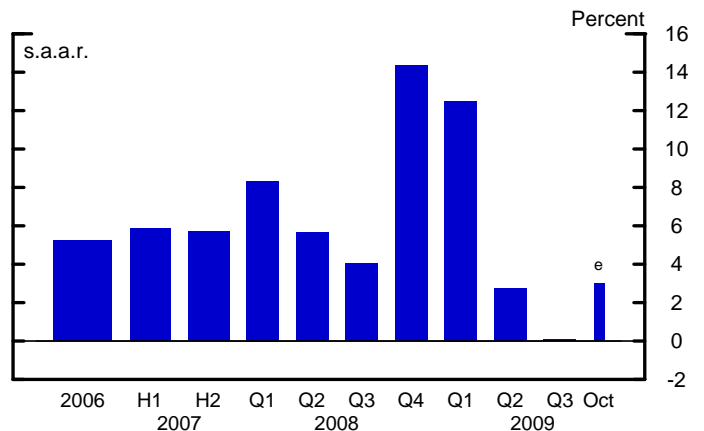
Source. Flow of Funds, Federal Reserve G.19 release.

Changes in selected components of debt of nonfinancial business sector



Note. CP and C&I loans are seasonally adjusted; bonds are not.  
Source. Depository Trust & Clearing Corporation, Thomson Financial, and Federal Reserve H.8 release.  
e Estimated.

Growth of M2



Source. Federal Reserve.  
e Estimated.

yields on corporate bonds. Residential real estate loans held on banks' books also dropped substantially in September and October, as sales to the government-sponsored enterprises have more than offset sizable originations. Commercial real estate loans shrank as well, amid widespread reported paydowns and charge-offs of existing loans. Banks' holdings of consumer loans fell, despite the return of some previously securitized assets onto banks' books. In some cases, banks' re-booking of such assets may have been the consequence of their having provided credit support to the securitization structure. Banks continued to add substantially to their allowance for loan and lease losses through mid-October. Cash assets—which include reserve balances and are not included in bank credit—grew very rapidly through mid-October, especially at large and foreign banks, and now account for more than 10 percent of total assets at all commercial banks. On the liabilities side, deposits increased, while managed liabilities continued to run off.

The October SLOOS indicated that banks continued to tighten their lending standards and terms over the preceding three months on all major categories of loans to businesses and households. However, the net percentages of banks that tightened declined further for all loan types except prime residential mortgages and revolving home equity lines of credit, for which the net fractions of banks that reported having tightened standards and terms were little changed. Demand reportedly continued to weaken for most loan categories. The exceptions were nontraditional mortgages, for which demand was about flat and prime mortgages, for which a fairly large fraction of banks reported a strengthening of demand over the preceding three months. In response to a special question on commercial real estate loans, banks reported that a substantial fraction of loans that had been scheduled to mature over the course of this year were extended rather than refinanced. Consistent with the SLOOS responses, the September NFIB survey on loan availability suggested that credit conditions for small businesses continued to be tight.

Debt of the domestic nonfinancial sector is projected to have grown at about a 4 $\frac{1}{4}$  percent annual rate in the third quarter, close to the 4 $\frac{1}{2}$  percent pace recorded in the second quarter. The slight deceleration was attributable to decreased borrowing by the federal government (on a seasonally adjusted basis). In contrast, state and local government borrowing increased last quarter, while the pace of private-sector borrowing was not quite as weak as in the second quarter. Household debt is projected to have declined at about a  $\frac{1}{4}$  percent annual rate in the third quarter, with a small increase in home mortgage debt more than offset by a further contraction in consumer credit.

M2 has picked up a bit recently. After having contracted in July and August, this aggregate expanded at a 4 percent annual rate in September, and is estimated to have risen at a 3 percent pace in October. Growth in liquid deposits was robust in both September and October, while the declines in small time deposits and retail money market funds intensified over these months. The compositional shift within M2 is consistent with very low yields on the latter instruments. Currency grew modestly over September and October, amid indications of moderating foreign demand for U.S. banknotes. The monetary base surged at about a 100 percent annual rate, on balance, over September and October, as the Federal Reserve's large-scale asset purchases and the decline in the Treasury's Supplemental Financing Account more than offset reduced usage of Federal Reserve credit and liquidity facilities, resulting in a boost to reserve balances.

## ECONOMIC OUTLOOK

Information received since the September meeting has been consistent with the staff's expectation of solid growth in economic activity in the second half of the year. Accordingly, the staff outlook for output and inflation is broadly unchanged from that presented in the September Greenbook. As in September, the staff anticipates that the expansion of real GDP over the next several years will increasingly outpace the rise in potential output, thereby gradually narrowing the output gap. However, this output gap is wider in every quarter of the forecast period than was the case in September because of the staff's upward revision to the level of potential output this year and throughout the forecast period.<sup>3</sup> Consistent with the projected narrowing of the output gap over time, the unemployment rate is expected to decline gradually over 2010 and 2011, but its path is higher than in the September forecast. As in September, the staff projects core and total PCE inflation to slow further, to about 1 percent in 2011.

The staff outlook continues to assume that the federal funds rate will remain in its current range through 2011. No significant changes have been made to the assumptions regarding the sizes or timing of the Federal Reserve's LSAP programs.<sup>4</sup> Fiscal policy is anticipated to contribute about 1 percentage point, on average, to real GDP growth in 2009 and 2010, but to be roughly

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<sup>3</sup> The staff now interprets the recent weaker-than-expected employment data and unexpectedly strong gains in output per hour as signaling a higher level of structural productivity than previously estimated. That revision resulted in a higher level of potential output and wider output gaps throughout the forecast period.

<sup>4</sup> Purchases of \$300 billion in Treasury securities were completed at the end of October. Purchases of \$1.25 trillion in agency MBS and \$175 billion in agency debt are projected to be finished by the end of the first quarter of 2010.

neutral in 2011, about the same as in September. The staff continues to project that foreclosure activity will cause house prices to fall somewhat this quarter and through the end of next year but that prices will begin to edge up in 2011.

Longer-term Treasury yields and 30-year fixed mortgage rates are projected to rise through 2011, and the spread between the two rates widens from unusually low levels as the Federal Reserve completes its purchases of agency MBS. Yields on investment-grade corporate bonds are projected to decline as continued improvements in financial markets and the economic outlook lead to a further sizable narrowing in risk spreads by the end of 2011. Similarly, the equity risk premium is expected to continue to decline from elevated levels over coming quarters, causing stock prices to rise at a brisk annual rate of about 15 percent on average over the next two years. Bank lending conditions for firms and households are expected to ease gradually over time but to remain tight by historical standards. The real foreign exchange value of the dollar is assumed to fall at about a 2 percent annual rate over 2010 and 2011. Consistent with readings from futures markets, the projected path for oil prices has been revised up across the forecast horizon. The staff expects West Texas Intermediate oil prices to rise to \$86 per barrel by the end of 2011, which is \$9 per barrel higher than in the September Greenbook.

Against this backdrop, the staff expects real GDP to grow at an annual rate of about 3 percent during the second half of 2009, about 3½ percent in 2010, and about 4½ percent in 2011. The unemployment rate is projected to peak at slightly above 10 percent late this year and early next year and then to decline slowly to 9½ percent by the end of 2010 and to 8¼ percent by the end of 2011, well above the staff's 5¼ percent estimate of the NAIRU. On average, this unemployment rate path is ¼ to ½ percentage point higher than in the

September Greenbook. In light of the current and prospective level of economic slack, as well as longer-term inflation expectations that are expected to remain stable, the staff projects core PCE inflation to slow to about 1¼ percent in the second half of this year and to about 1 percent in 2010 and 2011. With energy prices rising at a diminishing rate, total PCE inflation is projected to be about 2½ percent in the second half of 2009, 1½ percent in 2010, and 1 percent in 2011.

Looking further ahead, the staff assumes that the federal funds rate will rise steadily starting in 2012, climbing to about 2 percent by the end of that year and to 3½ percent in 2013, before leveling out at about 3¾ percent in 2014. The staff forecasts that real GDP will grow nearly 5 percent in 2012 but then decelerate to about 3¼ percent in 2014. With real GDP growth outpacing the rise in potential output, which is forecast to average about 2¾ percent per year over 2012 to 2014, the unemployment rate falls rapidly for a time and then stabilizes at about 4¾ percent, close to the staff's estimate of the NAIRU in 2014. Longer-term inflation expectations remain stable and, as the output gap narrows, total PCE inflation slowly rises to slightly above 1½ percent by 2014, still below the inflation objectives implicit in the majority of policymakers' longer-run projections.

## MONETARY POLICY STRATEGIES

Chart 6 shows various estimates of short-run  $r^*$ , that is, the real federal funds rate that, if maintained over time, would bring output to its potential level at a horizon of twelve quarters. The Greenbook-consistent estimate of short-run  $r^*$  computed using the FRB/US model edged down over the intermeeting period; the estimate is now -2 percent, about 80 basis points lower than the actual real federal funds rate. The appreciable widening in the staff's projection of the output gap tended to reduce this estimate of  $r^*$ , but that downward pressure was largely offset by the shift from the third quarter to the fourth quarter in the starting point used in the calculation of  $r^*$  since the previous Bluebook.<sup>5</sup> The additional stimulus needed to close the output gap is larger in the EDO model, and hence the Greenbook-consistent measure from that model moved down about  $\frac{3}{4}$  percentage point to -3.7 percent.

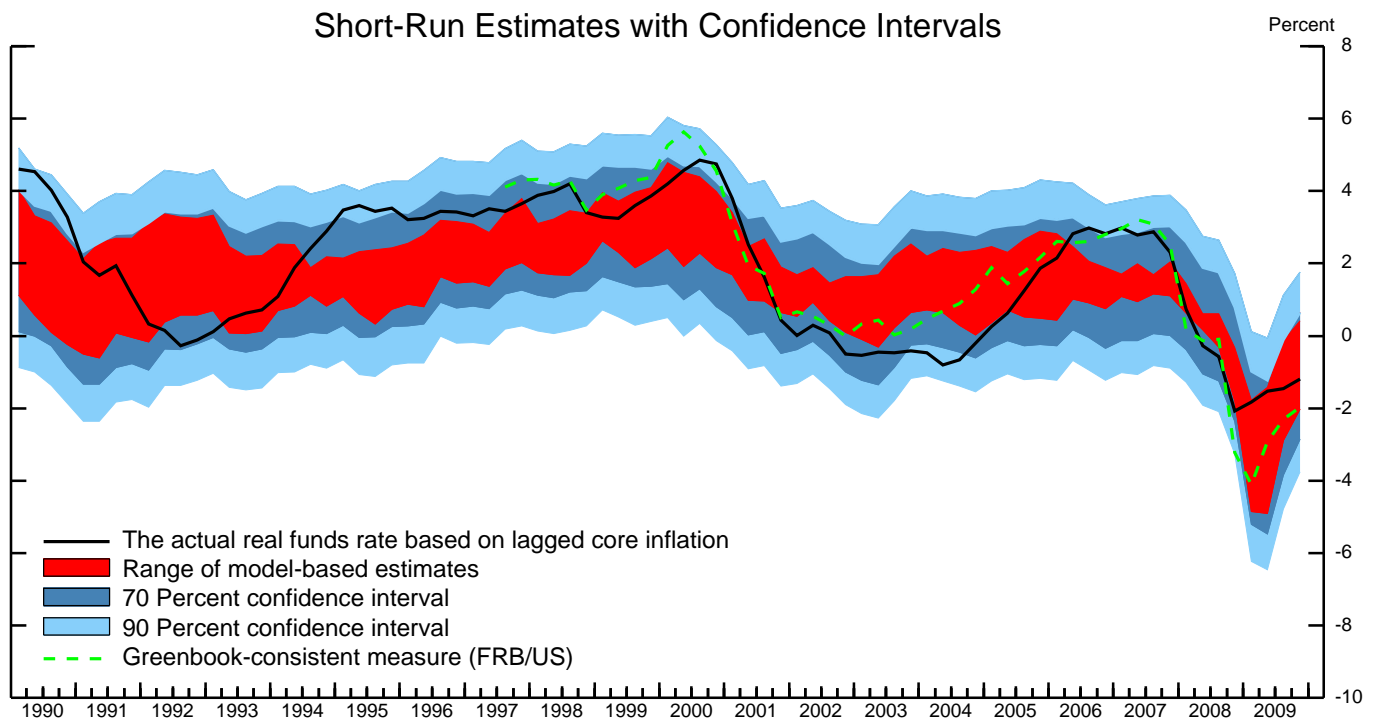
The measures of  $r^*$  based on the single-equation model and the small structural model use the staff's estimate of the current output gap as the jumping-off point for the model's outlook. The measure of short-run  $r^*$  from the small structural model is little changed from the previous Bluebook, while the measure from the single-equation model is about 40 basis points lower than in September. By contrast, the FRB/US and EDO model-based measures of  $r^*$  do not make any use of the staff's judgmental assessment of the output gap, because each model generates its own estimated path for potential output; these two measures of short-run  $r^*$  have risen by  $\frac{1}{2}$  and  $\frac{3}{4}$  percentage point, respectively. The FRB/US model-based measure is now

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<sup>5</sup> In the September Bluebook, the twelve-quarter window for computing short-run  $r^*$  ran from 2009Q3 through 2012Q2. With the passage of time, the current Bluebook uses the period from 2009Q4 through 2012Q3. The output gap is narrower on average over the latter period than over the former.



Chart 6  
Equilibrium Real Federal Funds Rate



Short-Run and Medium-Run Measures

	Current Estimate	Previous Bluebook
<b>Short-Run Measures</b>		
Single-equation model	-1.7	-1.3
Small structural model	-1.2	-1.1
EDO model	0.4	-0.3
FRB/US model	-2.0	-2.4
Confidence intervals for four model-based estimates		
70 percent confidence interval	-2.9 to 0.7	
90 percent confidence interval	-3.8 to 1.8	
Greenbook-consistent measures		
EDO model	-3.7	-3.1
FRB/US model	-2.0	-1.9
<b>Medium-Run Measures</b>		
Single-equation model	1.3	1.3
Small structural model	1.9	1.3
Confidence intervals for two model-based estimates		
70 percent confidence interval	0.6 to 2.5	
90 percent confidence interval	-0.2 to 3.0	
TIPS-based factor model	2.0	2.0
<b>Memo</b>		
Actual real federal funds rate	-1.2	-1.2

Note: Appendix A provides background information regarding the construction of these measures and confidence intervals. The actual real federal funds rate shown is based on lagged core inflation as a proxy for inflation expectation. For information regarding alternative measures, see Appendix A.

about 80 basis points below the actual real funds rate, while the EDO model-based measure has turned positive and stands at 0.4 percent.

Chart 7 shows the results of optimal control simulations of the FRB/US model. These simulations use the extended staff baseline projection—including liquidity and credit actions by the Federal Reserve—as a starting point. Policymakers are assumed to place equal weight on keeping core PCE inflation close to a 2 percent inflation goal, on keeping unemployment close to the NAIRU, and on minimizing changes in the federal funds rate. As in recent Bluebooks, optimal monetary policy under these simulations is constrained by the effective lower bound, and the nominal funds rate does not lift off from this bound until the second half of 2012 (black solid lines). The unemployment rate at the end of 2011 is well above the NAIRU, and core PCE inflation stays appreciably below the 2 percent goal.

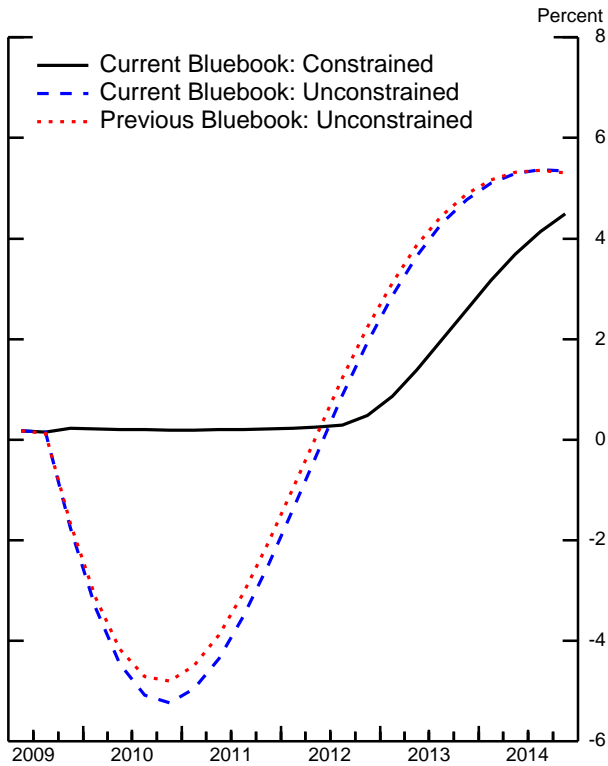
Chart 7 also displays the optimal control results that are obtained when the path of the nominal funds rate is not constrained by the effective lower bound (blue dashed lines). With a more accommodative stance of monetary policy, real activity exhibits a faster recovery and the inflation outcomes are markedly closer to the assumed goal of 2 percent. This unconstrained policy path has shifted down slightly since the September Bluebook, mainly reflecting the staff's less favorable assessment of the labor market outlook.

As depicted in Chart 8, the outcome-based estimated policy rule prescribes a lower trajectory for the federal funds rate than in the previous Bluebook (upper-left panel). In particular, the funds rate does not start rising above the effective lower bound until 2012Q2, two quarters later than in September. According to stochastic simulations of the FRB/US model, the 90 percent confidence band for the funds rate in 2011Q4 spans an interval from the effective lower bound to about 3 percent.

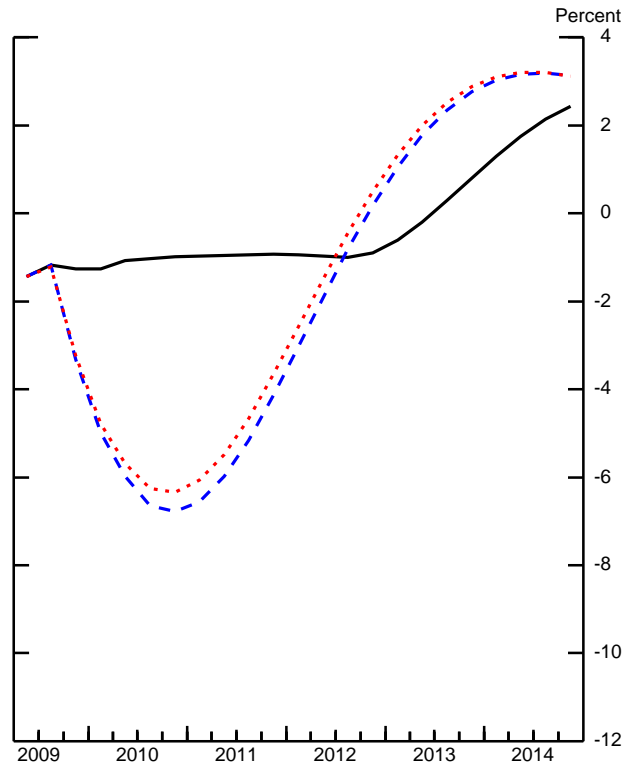
### Chart 7

## Constrained vs. Unconstrained Monetary Policy (2 Percent Inflation Goal)

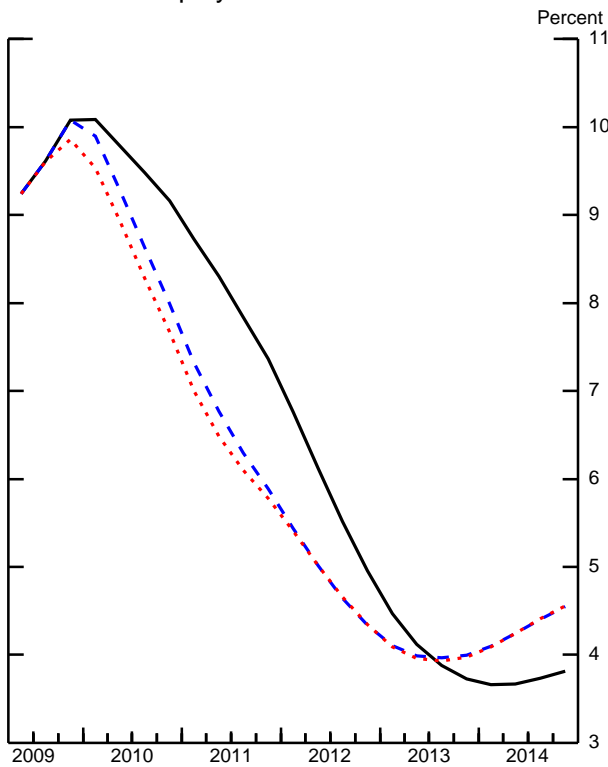
#### Nominal Federal Funds Rate



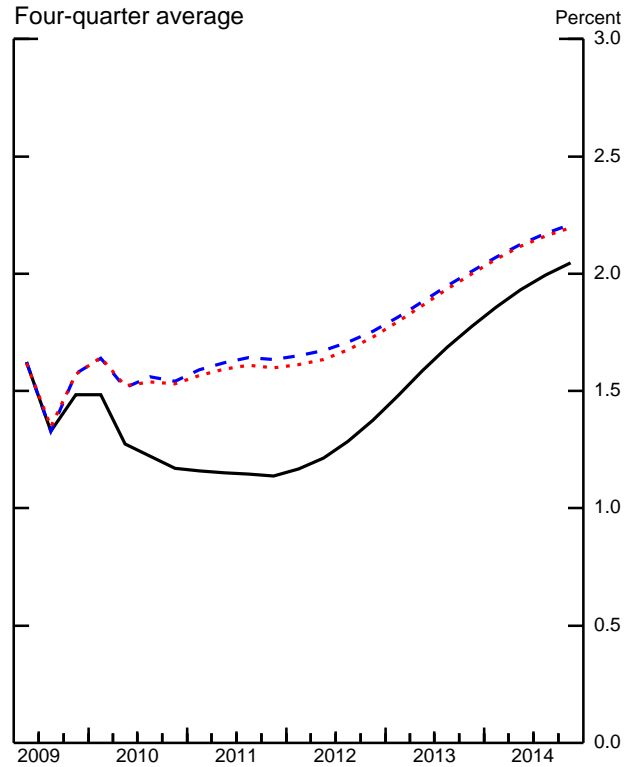
#### Real Federal Funds Rate



#### Civilian Unemployment Rate



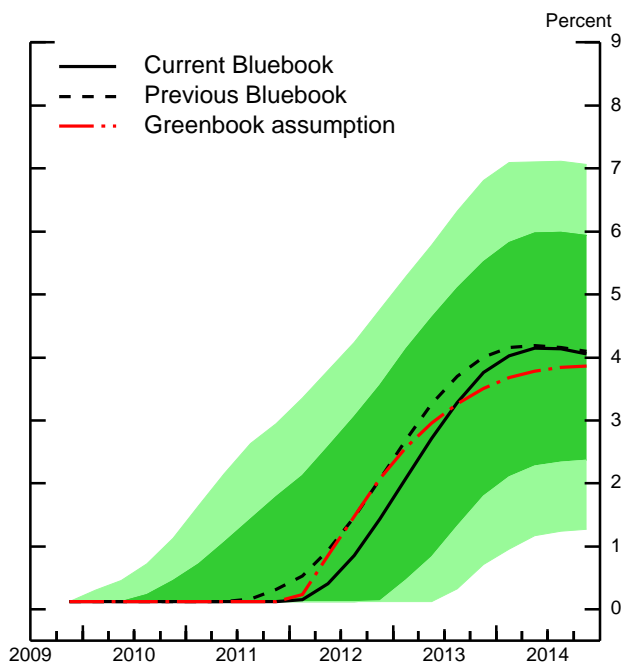
#### Core PCE Inflation Four-quarter average



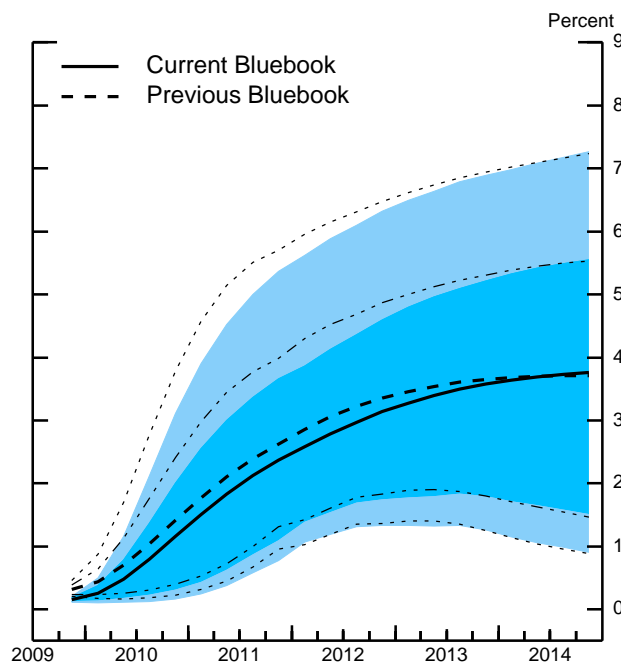
### Chart 8

#### The Policy Outlook in an Uncertain Environment

FRB/US Model Simulations of Estimated Outcome-Based Rule



Information from Financial Markets



Note: In both panels, the dark and light shading represent the 70 and 90 percent confidence intervals respectively.

#### Near-Term Prescriptions of Simple Policy Rules

	Constrained Policy		Unconstrained Policy	
	<u>2009Q4</u>	<u>2010Q1</u>	<u>2009Q4</u>	<u>2010Q1</u>
Taylor (1993) rule	<b>0.13</b>	<b>0.13</b>	<b>-0.67</b>	<b>-0.56</b>
<i>Previous Bluebook</i>	0.13	0.13	-0.32	-0.24
Taylor (1999) rule	<b>0.13</b>	<b>0.13</b>	<b>-4.46</b>	<b>-4.23</b>
<i>Previous Bluebook</i>	0.13	0.13	-3.79	-3.62
Estimated outcome-based rule	<b>0.13</b>	<b>0.13</b>	<b>-0.61</b>	<b>-1.34</b>
<i>Previous Bluebook</i>	0.13	0.13	-0.40	-1.00
Estimated forecast-based rule	<b>0.13</b>	<b>0.13</b>	<b>-0.57</b>	<b>-1.34</b>
<i>Previous Bluebook</i>	0.13	0.13	-0.44	-1.08
First-difference rule	<b>0.13</b>	<b>0.25</b>	<b>0.11</b>	<b>0.23</b>
<i>Previous Bluebook</i>	0.22	0.39	0.22	0.39
<b>Memo</b>				
		<u>2009Q4</u>	<u>2010Q1</u>	
Greenbook assumption		0.13	0.13	
Fed funds futures		0.13	0.18	
Median expectation of primary dealers		0.13	0.13	
Blue Chip forecast (October 1, 2009)		0.20	0.20	

Note: In calculating the near-term prescriptions of these simple policy rules, policymakers' long-run inflation objective is assumed to be 2 percent. Appendix B provides further background information.

Market participants' expectations regarding the path of the federal funds rate also appear to have shifted somewhat lower (upper-right panel). Financial quotes imply a 90 percent confidence interval for the federal funds rate in 2011Q4 that spans a range from about  $\frac{3}{4}$  percent to about  $5\frac{1}{2}$  percent; the width of this interval is roughly the same as in the previous Bluebook.

The lower panel of Chart 8 provides near-term prescriptions from simple policy rules. Both variants of the Taylor rule and both of the estimated policy rules leave the federal funds rate at its effective lower bound over the next two quarters. When this bound is not imposed, all four of those rules prescribe funds rates that are lower than in the previous Bluebook, reflecting the staff's assessment of a wider output gap. In contrast, the first-difference rule responds to economic growth rather than the estimated level of resource utilization; this rule prescribes a slightly upward tilt from the effective lower bound in this quarter to 25 basis points next quarter, when the effective lower bound is imposed.

## POLICY ALTERNATIVES

This Bluebook presents three policy alternatives—labeled A, B, and C—for the Committee’s consideration. Table 1 gives an overview of key elements of these alternatives. Draft statements are provided on the subsequent pages, followed by summaries of the cases for each alternative and a discussion of a possible sequence of policy language and actions for future meetings.

Each of the three alternatives maintains the target range for the federal funds rate at 0 to  $\frac{1}{4}$  percent, but the alternatives differ with respect to the size and timing of the Federal Reserve’s purchases of agency MBS and agency debt, and with respect to their forward guidance on the target federal funds rate path. Under Alternative A, the Committee would increase its purchases of agency MBS to a total of \$1.5 trillion (from the currently planned amount of \$1.25 trillion), reaffirm its intention to purchase up to \$200 billion of agency debt securities, and extend the time over which these purchases would be executed through the second quarter of 2010. The increase would provide additional macroeconomic stimulus, while the extension would permit the pace of transactions to be tapered to promote a smooth transition in markets. Alternative B would maintain essentially the current stance of monetary policy. The statement would reiterate the Committee’s intention to purchase \$1.25 trillion of agency MBS and indicate that the previously announced “up to \$200 billion” would likely entail purchasing a total of \$175 billion of agency debt; these transactions would be executed by the end of the first quarter of 2010. Under Alternative C, the amount of agency MBS purchases would be reduced to \$1.1 trillion and that of agency debt to \$160 billion. These levels would permit the pace of the purchases to be tapered even with an earlier completion date of the end of January 2010.

Alternatives A and B maintain the forward guidance from September, but specify the economic conditions under which the Committee anticipates maintaining exceptionally low levels of the federal funds rate for an extended period. These conditions include low rates of resource utilization and subdued inflation; Alternative B adds stable inflation expectations to the list. Alternative A also specifies that the exceptionally low level anticipated is 0 to  $\frac{1}{4}$  percent. Alternative C changes the forward guidance by indicating that the Committee anticipates “low levels of the federal funds rate for some time.”

The characterization of the economic outlook differs somewhat across the alternatives. Alternative A states that economic activity “has turned up” but notes that the economic recovery could be relatively weak. Alternative B says that economic activity has “continued to pick up,” while Alternative C states that a “recovery in economic activity is under way.” All three alternatives acknowledge increased activity in the housing sector over recent months, an apparent expansion in household spending, and roughly unchanged conditions in financial markets, on balance, over the intermeeting period. Like the September statement, Alternatives A and B reiterate the Committee’s expectation that inflation “will remain subdued for some time.” To explain this view, these alternatives note that “substantial resource slack [is] likely to continue to dampen cost pressures” and “longer-term inflation expectations [are] stable.” Alternative A adds that “inflation has fallen considerably over the past year.” Alternative C also characterizes longer-term inflation expectations as stable and says that the Committee expects inflation to “remain at levels consistent with price stability,” basing this expectation on appropriate adjustments to monetary policy rather than slack in resource utilization.

**Table 1: Overview of Alternative Language for the November 3-4, 2009 FOMC Announcement**

**November Alternatives**

September FOMC	A	B	C	
<i>Forward Guidance on Funds Rate Path</i>				
	“exceptionally low levels of the federal funds rate for an extended period”	“this exceptionally low range for the federal funds rate for an extended period”	“exceptionally low levels of the federal funds rate for an extended period”	“low levels of the federal funds rate for some time”
<i>Agency MBS Purchases</i>				
<b>Total Amount</b>	“a total of” \$1.25 trillion	“a total of” \$1.5 trillion	“a total of” \$1.25 trillion	“cap” at \$1.1 trillion
<b>Pace</b>	pace will “gradually slow”	pace will “gradually slow”		
<b>Completion</b>	by the end of the first quarter of 2010	through the second quarter of 2010	by the end of the first quarter of 2010	by the end of January 2010
<i>Agency Debt Purchases</i>				
<b>Total Amount</b>	“up to” \$200 billion	“up to” \$200 billion	“a total of” \$175 billion	“cap” at \$160 billion
<b>Pace</b>	pace will “gradually slow”	pace will “gradually slow”		
<b>Completion</b>	by the end of the first quarter of 2010	through the second quarter of 2010	by the end of the first quarter of 2010	by the end of January 2010
<i>Evaluation of LSAP Timing and Overall Amounts</i>				
	timing and amounts of all LSAPs will continue to be evaluated	timing and amounts of all LSAPs will continue to be evaluated		



## ***September FOMC Statement***

Information received since the Federal Open Market Committee met in August suggests that economic activity has picked up following its severe downturn. Conditions in financial markets have improved further, and activity in the housing sector has increased. Household spending seems to be stabilizing, but remains constrained by ongoing job losses, sluggish income growth, lower housing wealth, and tight credit. Businesses are still cutting back on fixed investment and staffing, though at a slower pace; they continue to make progress in bringing inventory stocks into better alignment with sales. Although economic activity is likely to remain weak for a time, the Committee anticipates that policy actions to stabilize financial markets and institutions, fiscal and monetary stimulus, and market forces will support a strengthening of economic growth and a gradual return to higher levels of resource utilization in a context of price stability.

With substantial resource slack likely to continue to dampen cost pressures and with longer-term inflation expectations stable, the Committee expects that inflation will remain subdued for some time.

In these circumstances, the Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability. The Committee will maintain the target range for the federal funds rate at 0 to  $\frac{1}{4}$  percent and continues to anticipate that economic conditions are likely to warrant exceptionally low levels of the federal funds rate for an extended period. To provide support to mortgage lending and housing markets and to improve overall conditions in private credit markets, the Federal Reserve will purchase a total of \$1.25 trillion of agency mortgage-backed securities and up to \$200 billion of agency debt. The Committee will gradually slow the pace of these purchases in order to promote a smooth transition in markets and anticipates that they will be executed by the end of the first quarter of 2010. As previously announced, the Federal Reserve's purchases of \$300 billion of Treasury securities will be completed by the end of October 2009. The Committee will continue to evaluate the timing and overall amounts of its purchases of securities in light of the evolving economic outlook and conditions in financial markets. The Federal Reserve is monitoring the size and composition of its balance sheet and will make adjustments to its credit and liquidity programs as warranted.

## **November FOMC Statement – Alternative A**

1. Information received since the Federal Open Market Committee met in **September** suggests that economic activity **has turned up**. Conditions in financial markets **were roughly unchanged, on balance, over the intermeeting period**, and activity in the housing sector has increased **over recent months**. Household spending **appears to be expanding**, but remains constrained by ongoing job losses, sluggish income growth, lower housing wealth, and tight credit. **Business spending is being damped by firms' efforts to reduce inventories to bring them** into better alignment with sales and **by cutbacks in** fixed investment. **Partly reflecting these factors, the Committee anticipates that the economic recovery will be relatively weak and that slack in resource utilization will diminish quite slowly absent further policy action.**
2. **Inflation has fallen considerably over the past year.** With substantial resource slack likely to continue to dampen cost pressures and with longer-term inflation expectations stable, the Committee expects that inflation will remain subdued for some time.
3. **To promote a sustained economic recovery and higher resource utilization, the Committee will provide additional monetary stimulus by increasing its purchases of agency mortgage-backed securities to a total of \$1.5 trillion, up from the previously announced amount of \$1.25 trillion, and it is also in the process of purchasing** up to \$200 billion of agency debt. The Committee will **extend these purchases through the second quarter of 2010 and** gradually slow **their** pace in order to promote a smooth transition in markets. The Committee will continue to evaluate the timing and overall amounts of its purchases of securities, in light of the evolving economic outlook and conditions in financial markets. The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that **low rates of resource utilization and subdued inflation** are likely to warrant **this** exceptionally low **range for** the federal funds rate for an extended period. The Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability. The Federal Reserve is monitoring the size and composition of its balance sheet and will make adjustments to its credit and liquidity programs as warranted.

## **November FOMC Statement – Alternative B**

1. Information received since the Federal Open Market Committee met in **September** suggests that economic activity has **continued to pick up**. Conditions in financial markets **were roughly unchanged, on balance, over the intermeeting period**, and activity in the housing sector has increased **over recent months**. Household spending **appears to be expanding** but remains constrained by ongoing job losses, sluggish income growth, lower housing wealth, and tight credit. Businesses are still cutting back on fixed investment and staffing, though at a slower pace; they continue to make progress in bringing inventory stocks into better alignment with sales. Although economic activity is likely to remain weak for a time, the Committee anticipates that policy actions to stabilize financial markets and institutions, fiscal and monetary stimulus, and market forces will support a strengthening of economic growth and a gradual return to higher levels of resource utilization in a context of price stability.
2. With substantial resource slack likely to continue to dampen cost pressures and with longer-term inflation expectations stable, the Committee expects that inflation will remain subdued for some time.
3. In these circumstances, the Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability. The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that **low rates of resource utilization, subdued inflation, and stable inflation expectations** are likely to warrant exceptionally low levels of the federal funds rate for an extended period. To provide support to mortgage lending and housing markets and to improve overall conditions in private credit markets, the Federal Reserve will purchase a total of \$1.25 trillion of agency mortgage-backed securities and **\$175 billion** of agency debt. The Committee will gradually slow the pace of these purchases in order to promote a smooth transition in markets and anticipates that they will be executed by the end of the first quarter of 2010. The Committee will continue to evaluate the timing and overall amounts of its purchases of securities in light of the evolving economic outlook and conditions in financial markets. The Federal Reserve is monitoring the size and composition of its balance sheet and will make adjustments to its credit and liquidity programs as warranted.

## **November FOMC Statement – Alternative C**

1. Information received since the Federal Open Market Committee met in **September indicates** that **a recovery in** economic activity **is under way**. Conditions in financial markets **were roughly unchanged, on balance, over the intermeeting period,** and activity in the housing sector has increased **over recent months**. Household spending **appears to be expanding**. Businesses **have made additional** progress in bringing inventory stocks into better alignment with sales. The Committee anticipates that policy actions to stabilize financial markets and institutions, fiscal and monetary stimulus, and market forces will support a strengthening of economic growth in a context of price stability.
2. Longer-term inflation expectations **have been** stable, **and** the Committee expects that, **with appropriate monetary policy adjustments,** inflation will remain **at levels consistent with price stability**.
3. **At this meeting, the Committee maintained** the target range for the federal funds rate at **its exceptionally low level** of 0 to ¼ percent, and **it** anticipates that economic conditions are likely to warrant low levels of the federal funds rate **for some time. In view of continued improvements in financial market conditions and the economic outlook, the Committee decided to cap its purchases of agency mortgage-backed securities at \$1.1 trillion and its purchases of agency debt at \$160 billion.** The Committee will gradually slow the pace of these purchases in order to promote a smooth transition in markets and anticipates that they will be executed by the end of **January 2010**. The Committee will continue to evaluate the timing and overall amounts of its purchases of securities in light of the evolving economic outlook and conditions in financial markets. The Federal Reserve is monitoring the size and composition of its balance sheet and will make adjustments to its credit and liquidity programs as warranted.

## THE CASE FOR ALTERNATIVE B

If policymakers believe that the policy stimulus already in train is likely to foster the most satisfactory economic outcomes that are feasible given current economic circumstances, the Committee could continue implementing its previously announced LSAPs and reaffirm its forward guidance regarding the funds rate, as in Alternative B. Maintaining the current stance of monetary policy might appeal to the Committee if it shares the staff's assessment that incoming economic and financial news is consistent with inflation remaining subdued and economic growth picking up to an acceptable pace in coming quarters. While output expands at a pace above trend in the staff's forecast, projected employment growth remains modest. Even by the end of 2011, the level of private payroll employment is still 1.5 percent below its pre-recession peak, suggesting that a very accommodative stance of monetary policy is still appropriate. Indeed, the Greenbook-consistent measures of short-run  $r^*$  remain negative, and the anticipation that the federal funds rate is likely to stay exceptionally low "for an extended period" continues to be consistent with the funds rate path implied by the estimated outcome-based rule (Chart 8). Alternative B indicates that the economic conditions on which the Committee's anticipation of extraordinarily low interest rates is based are the low rates of resource utilization, subdued inflation, and stable inflation expectations that are expected to prevail over an extended period.

Even though the anticipated economic recovery has only a protracted return to full employment, Committee participants may believe that the potential benefits of providing further monetary stimulus through expanded LSAPs are likely to be outweighed by the potential costs. They may believe the LSAPs have done about as much as they can to reduce mortgage rate spreads.

Potential costs of increased LSAPs include the risk that an expanded balance sheet could lead to higher inflation expectations, the increased complications that a larger balance sheet could pose for the Committee's exit strategy given its inexperience with the tools for draining reserves in such an environment, and potential losses on the Federal Reserve's portfolio under scenarios involving a sharp increase in interest rates over the next few years.

Indeed, the Committee may find this to be a good time to be more explicit about the anticipated scale of its agency debt purchases, as it was about its agency MBS purchases in September. On the current trajectory, agency debt purchases will not reach the previously stated maximum, and the Committee may want to indicate that these purchases are likely to total \$175 billion, as in Alternative B. The Committee may judge that agency debt purchases are providing relatively little macroeconomic support and so there would be little cost in establishing a target for the program that is lower than its current maximum, especially since some market participants already expect the Federal Reserve to purchase less than \$200 billion. Also, the Committee might see some benefit in indicating that another one of the Federal Reserve's credit and liquidity programs was being scaled back or eliminated.

Given the improvements in financial markets since earlier in the year and the continued accumulation of positive economic data, some participants may now expect a stronger recovery than in the Greenbook. Still, the Committee may prefer to maintain the current policy stance for a while longer. Even with somewhat more rapid growth, resource slack is likely to be substantial for some time. Also, policymakers may see the weakness in the banking system and in bank credit as posing significant downside risks to the economic outlook and so be concerned about possibly removing stimulus too early. Even under the

more robust conditions of the Greenbook's "V-Shaped Recovery" alternative scenario, the policy rule does not prescribe a tightening until 2011.

Federal funds futures suggest market participants see the first monetary policy tightening coming significantly earlier than assumed in the Greenbook; many private-sector forecasters also assume a steeper federal funds rate path. If these observers expect policy tightening sooner than the Committee anticipates, it may be useful now to give a clearer indication of the economic conditions that will factor into the Committee's future decisions about policy rates. These factors could include the level of resource utilization, inflation, and inflation expectations, as in Alternative B.

A statement such as that suggested for Alternative B would be close to market expectations in terms of the LSAPs and federal funds rate target, but the change in forward guidance suggesting that resource utilization will be a factor in the Committee's decisions regarding the stance of policy might be viewed as suggesting a longer period of very low interest rates than currently anticipated. On the other hand, market participants might see the change in forward guidance as indicating that the Committee was moving toward an exit from the period of exceptionally low short-term interest rates. The Desk's survey of primary dealers indicates that they uniformly expect no change in the funds rate target or in the levels of the LSAPs, and the vast majority expect no change in forward guidance. On average, agency debt traders now expect purchases of agency debt to reach a level near their previously stated maximum and higher than the \$175 billion in Alternative B. All in all, it seems likely that a statement along the lines of Alternative B would have only muted effects on most interest rates, equity prices, and the foreign exchange value of the dollar,

although yields on agency debt issues could increase given the reduction in expected purchases.

## **THE CASE FOR ALTERNATIVE C**

If policymakers view the continued accumulation of positive data on spending as pointing to more underlying momentum in the recovery than they previously anticipated and are more concerned than the staff about the inflation outlook, they might choose to trim the size of the LSAPs and to adjust the language regarding the anticipated period over which the funds rate is likely to remain low, as in Alternative C. Under this alternative, the Committee would announce both lower amounts of planned purchases of agency MBS and agency debt compared with the current amounts and a faster end to these programs. Given the amounts purchased to date, the smaller quantities specified in Alternative C would allow for an earlier conclusion of the program—the end of January 2010 instead of the end of the first quarter—while still permitting the purchases to be tapered. This statement would also begin to prepare the public and the markets for the withdrawal of policy accommodation by indicating that the Committee now anticipates maintaining “low levels” of the federal funds rate for “some time” rather than “exceptionally low levels” of the federal funds rate for an “extended period.”<sup>6</sup>

Participants might prefer Alternative C if they viewed the improvement in financial market conditions and economic activity in recent months as

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<sup>6</sup> A possible subsequent step in preparing the public and markets for the normalization of policy would be to include in the statement a description of the tools that would be used to drain excess reserves or neutralize their effects on broader measures of money and credit, and thereby on economic growth and inflation. See the section “A Possible Sequence of Policy Language and Actions,” below for further discussion.



suggesting that less monetary policy support from the Federal Reserve is required and, given the increase in activity in the housing sector in recent months, that a reduction in the maximum amount of purchases of mortgage-related assets, in particular, could be appropriate. Although bank lending continues to contract, money market conditions have improved dramatically this year. Also, large firms have increasingly accessed debt and equity markets for financing, and many firms also have high levels of retained earnings with which to fund their operations and investment. Business caution has been a factor holding back spending and hiring, but once firms are more convinced that the recovery is going to be sustained, both hiring and investment could rebound more sharply than in the staff's baseline forecast.

Participants might also prefer not to purchase the previously announced amounts if they saw greater upside risks to inflation than does the staff. The recent rise in oil and other commodity prices, the fall in the value of the dollar, the increase in some measures of inflation expectations, and greater investor interest in TIPS may be read as possibly signaling higher future inflation. If so, the Committee may prefer to begin taking action now to avoid a buildup in inflation pressures and to change its forward guidance to better match its anticipated policy path. (The "Earlier Liftoff" scenario in the Greenbook illustrates the possible need to remove policy accommodation earlier than in the baseline.)

Participants might also have some concern that if bankers' attitudes toward lending were to shift rapidly with continued improvement in the economic outlook, the large amount of reserves in the banking system could spur a rapid expansion of bank credit independent of the level of the policy rate, fueling stronger aggregate demand growth than in the staff forecast, and potentially

leading to significantly increased upward pressure on prices. Some participants might find the decline in Treasury yields over the past few months as suggestive of a decline in the demand for reserves that is effectively providing more stimulus. Moreover, the reduction in the Treasury's Supplementary Financing Program (SFP), all else equal, is materially increasing the amount of reserves in the banking system, likely putting further downward pressure on short-term interest rates. Committee members may believe that the effects of these developments should be offset by a reduction in the amounts of longer-term securities purchased relative to the previously announced levels.

In addition, some participants may prefer to base their monetary policy decisions more on output growth rates and inflation than on the levels of resource utilization and output gaps. Indeed, Alternative C omits reference to resource utilization. Accurately measuring the output gap is difficult, so there may be less slack in the economy than in the staff forecast. A less optimistic outlook for aggregate supply, and the attendant consequences for inflation, might incline the Committee to scale back the LSAPs even though unemployment remains high.

If policymakers put less weight on output gaps and more weight on inflation expectations when forecasting inflation, they may prefer to slow the growth of the Federal Reserve's balance sheet out of concern that rapid expansion could fuel inflation expectations. For the same reason, they may also want to signal an earlier increase in the federal funds rate target than suggested in the Committee's recent policy statements.

The adoption of Alternative C would certainly surprise market participants. As noted above, primary dealer economists expect the agency MBS purchases

to reach their previously announced amount, and market participants expect agency debt purchases to be near their previously announced maximum; the vast majority of primary dealers expect no change in forward guidance at this meeting. The implied path of the federal funds rate based on futures quotes, using the staff's standard assumptions about term premiums, suggests that market participants expect the Committee to maintain the current target range until the first quarter of 2010, about the same timing as anticipated in September. Moreover, the average expected date for the first rate increase in the dealer survey was the fourth quarter of 2010. The release of a statement along the lines of Alternative C would likely cause short- and intermediate-term interest rates to rise sharply, and equity prices to drop, while the foreign exchange value of the dollar would probably rise. Forward inflation compensation might decline over time if the Committee's decision caused investors to mark down their inflation expectations at longer horizons.

## **THE CASE FOR ALTERNATIVE A**

The Committee may view the staff's economic outlook, with its very protracted return to full employment, as producing unacceptably poor outcomes given the Committee's dual mandate. Or participants might believe there remains a non-negligible risk that the economy could suffer a relapse and fall back into recession next year when some of the lending facilities and other government programs wind down. Policymakers may also be troubled by continued inflation readings well below the inflation objectives implicit in the majority of their longer-run projections. For these reasons, they may judge that additional monetary stimulus would be appropriate. The Committee might conclude that an effective way to provide such stimulus would be to expand the amount of agency MBS purchases and to extend the timeframe for

conducting agency MBS and agency debt transactions (thereby allowing a higher amount of agency debt to be bought without causing market disruption), as in Alternative A. Although the staff's output growth forecast is largely unchanged since September, recent weaker-than-expected employment growth has led the staff to mark up its forecast for the unemployment rate. Moreover, the projected unemployment rate remains high (at 9½ percent at the end of next year and near 8¼ percent at the end of 2011); core inflation hovers around 1 percent for several years; and the output gap has been revised up in light of recently observed higher productivity.

The Committee might also judge that the staff forecast is overly optimistic with regard to both growth and the risks of disinflation. The recent improvement in economic activity might have been caused importantly by temporary factors and thus may be overstating the degree of underlying momentum of the economy. For example, the increases in house prices since the spring may have been driven by government programs aimed at reducing the level of foreclosures and by the Federal Reserve's LSAPs, which resulted in lower mortgage rates. Participants may see some risk that house price declines may not ebb as in the staff forecast once these programs are ended. If so, the apparent bottoming out in the housing market could be illusory. In addition, the continued sharp decline in bank lending and the weakness in M2 might be interpreted as pointing to slower economic growth than in the staff forecast. Given the significant deceleration in wages and hourly compensation during the recession, and the larger projected output gaps, policymakers might see a significant risk of greater disinflation than in the staff forecast, as discussed in the Greenbook alternative scenario, "Greater Disinflation."

Moreover, based on the experience to date, the Committee may now be more confident that the LSAPs are lowering mortgage rates and that a further expansion in LSAPs would be effective in supporting aggregate demand. The staff's ongoing work may have given the Committee more confidence that the FOMC has the necessary tools to exit from this period of extraordinarily low interest rates despite a further expansion of the Federal Reserve's balance sheet. Furthermore, the public may have become more confident in the viability of the Federal Reserve's exit strategy as it continues to be explained in various speeches and testimony by Committee participants. Thus, the perceived benefits of increased LSAPs may have risen while their perceived costs may have declined. If so, the Committee may decide that increasing the LSAPs at this juncture is desirable for fostering better economic outcomes.

In order to expand the amount of these purchases and to allow for a gradual reduction in the pace of transactions so as to avoid adverse effects on market functioning, the Committee may judge that it would be prudent to extend execution of the purchases through the second quarter of 2010. Expanding the amount of purchases of agency debt beyond \$200 billion could generate significant distortions in the market for those securities, so this is not proposed in Alternative A.

To the degree that the policy path currently expected by market participants is steeper than policymakers see as likely to be optimal in current circumstances, the Committee might deem it appropriate to change its forward guidance. Market expectations might be brought into better alignment with the Committee's views by being more specific about the economic conditions that would warrant maintaining an exceptionally low target range for an extended

period, and by eliminating any ambiguity that “exceptionally low” in this context is a range of 0 to  $\frac{1}{4}$  percent.

An announcement along the lines of Alternative A would come as a considerable surprise to market participants. None of the participants in the Desk’s survey of primary dealers said they expected an increase in the LSAPs. Judging by recent experience, the announcement of an additional \$250 billion in agency MBS could generate a significant drop in mortgage yields and other long-term rates. Equity prices would probably edge up, and the foreign exchange value of the dollar might well decline. Inflation compensation could increase if the Committee’s decision prompted renewed investor concerns about the size of the Federal Reserve’s balance sheet and future inflation. All of these effects could be magnified if market participants saw the increase in asset purchases as opening the door to further increases in such transactions at coming meetings.

## **A POSSIBLE SEQUENCE OF POLICY LANGUAGE AND ACTIONS**

Although the timing of the eventual exit from the current period of extraordinary policy accommodation is uncertain because it depends on how the economic outlook evolves, the Committee may find it prudent to begin considering how the decisions it makes about policy instruments and language at this and subsequent meetings might fit into a broader plan for removing policy accommodation over time. Several basic components of policy and communication will need to be considered as the economy strengthens and the Committee begins to normalize policy. These include the use of nontraditional tools (including LSAPs, the TAF, and other liquidity facilities), the target level of the federal funds rate, the level of the interest rate on excess reserves, forward guidance about monetary policy, and the size and composition of the

Federal Reserve's balance sheet (which could be affected by the use of its exit-strategy tools such as reverse RPs, term deposits, and asset sales). Of course, the timing and sequence of policy and statements, including how the Committee chooses to combine these various instruments, will depend on the evolution of the outlook.

Table 2 exhibits a possible sequence of language and policy settings that the Committee may find useful as it contemplates the possible trajectory of its future decisions. The wording shows a particular combination of some of the basic components, and it presumes the economy evolves along a path that is broadly similar to the staff forecast. The language is for illustrative purposes; it is by no means the only approach. The basic components could be combined in other ways depending on the decisions the Committee makes regarding its exit strategy. The pace at which the Committee might choose to progress through the stages, and whether it chooses to skip or to add stages, would depend on how the outlook for economic activity and inflation evolves.

For reference, the first entry provides the forward rate guidance included in the Committee's September 2009 policy statement. The second entry includes key language from the draft statements for Alternatives A, B, and C in this Bluebook. As noted above, Alternatives A and B change the forward guidance by being more specific about the economic conditions that the Committee anticipates will warrant exceptionally low levels of the federal funds rate for an extended period. Market participants presumably would read this revised language as suggesting that, should any of the specified circumstances change materially, the Committee would be prepared to adjust the stance of policy in response.

When the Committee has determined that the economic recovery is sufficiently established, it could make another change to the forward guidance, namely, shortening the time frame over which it expects to maintain low or exceptionally low levels of the federal funds rate from “extended period” to “some time.” This is done in Alternative C, as discussed above, and also in the third entry in Table 2, which might be the next stage in the sequence should the Committee opt at this meeting to maintain the current stance of policy as in Alternative B.<sup>7</sup> The change in this language would surely be seen by market participants as indicating that the time of some reduction in monetary accommodation was approaching. If it had not already done so, the Committee also could drop its reference to using a wide range of tools.<sup>8</sup> With the economic recovery well established, the likelihood of further use of LSAPs would have diminished. Usage of the liquidity facilities has already declined significantly, and most are currently scheduled to expire on February 1, 2010. Dropping the reference to a “wide range of tools” would reinforce the notion that the conduct of policy was being normalized. Alternatively, the Committee might narrow the reference to “a number of tools” before eliminating it.

Language similar to that in the fourth entry could be used when the Committee judged that the time for policy firming likely was near. (As shown, various options for language could be selected, depending on the nuances of the message that the Committee wished to send.) At this stage of the sequence,

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<sup>7</sup> When the Committee reduced the federal funds rate target to 0 to  $\frac{1}{4}$  in December 2008 it included forward guidance indicating that it anticipated exceptionally low levels of the federal funds rate for “some time.” At the March 2009 meeting, this guidance was changed to “extended period.”

<sup>8</sup> The Committee began referring to using “all available tools” in December 2008, the same meeting at which it lowered the federal funds rate target to 0 to  $\frac{1}{4}$ . At its September 2009 meeting, the Committee changed this to “wide range of tools.”



the Committee's statement could indicate that some reduction in the exceptionally large degree of monetary accommodation will be appropriate before long, and might even indicate the likely timing of that step, based on the outlook at the time. The statement could also indicate how the Committee intended to accomplish that reduction, presumably using some combination of its tools: reverse repurchase agreements (RPs), term deposits for depository institutions, an increase in the interest rate paid on excess reserve balances, and asset sales. The illustrative language in Table 2 notes that the Federal Reserve may conduct some small-scale tests of its tools in advance of policy firming, although this testing—and the notification thereof—could take place well before this stage is reached.

The fifth entry illustrates possible language that could be used when the Committee had decided to commence policy firming. It assumes that, at least initially, the FOMC would choose to raise the target federal funds rate modestly (by  $\frac{1}{4}$  percentage point) and that it would initially retain a target range with a width of  $\frac{1}{4}$  percentage point; of course, these assumptions could easily be modified. It also assumes that, in association with the policy firming, the interest rate on reserves would be increased  $\frac{1}{4}$  percentage point and that the primary credit rate would be increased commensurately.<sup>9</sup> The statement could indicate that the Committee had directed the Desk to reduce the quantity of reserves in the banking system; such a reduction would help reinforce the effects on money market interest rates of the increase in the interest rate on excess reserves. Indeed, as an intermediate step, the Committee might consider

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<sup>9</sup> The indicated level of the discount rate after the increase (1 percent) also incorporates an assumption that the discount rate had previously been raised  $\frac{1}{4}$  percentage point without an increase in the target federal funds rate as a step toward normalizing the spread between the primary credit rate and the fed funds rate.

first reducing the level of excess reserves in the banking system using reverse RPs and/or term deposits to move the federal funds rate up to near the top of its current target range, and then raising the interest rate on excess reserves to firm the funds rate further. There may be, at least initially, substantial uncertainty about the response of the funds rate to changes in the quantity of reserves. So rather than specify a particular dollar amount of reserves to drain, which might conflict with its federal funds rate target, the Committee could indicate that it had directed the Desk to conduct reverse RPs to lower the quantity of reserves in the banking system and keep the federal funds rate close to the interest rate on excess reserves. At the same time, the Committee might also want to include forward guidance indicating that it expects to further reduce the degree of monetary accommodation over subsequent months.

Again, the wording of the entries provided in Table 2 is for illustrative purposes. At this stage, given the uncertainty surrounding the economic and financial outlook, it is unclear when the Committee will judge it appropriate to begin to firm the stance of monetary policy. Moreover, with the development of some of the reserve-management tools still in progress, the exact combination and sequence in which they would best be used are also uncertain at present. The language provided here should be regarded simply as an example of the kind of sequence the Committee might consider as it adjusts its forward guidance and its policy stance, possibly starting with an adjustment to the language at this meeting.

## Table 2. Illustration of Possible Sequence of Forward Guidance and Policy Actions

### 1. Language from the September 2009 statement

In these circumstances, the Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability. The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that economic conditions are likely to warrant exceptionally low levels of the federal funds rate for an extended period.

### 2. Language from the November 2009 statement

**Alternative A.** The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that low rates of resource utilization and subdued inflation are likely to warrant this exceptionally low range for the federal funds rate for an extended period. The Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability.

**Alternative B.** In these circumstances, the Federal Reserve will continue to employ a wide range of tools to promote economic recovery and to preserve price stability. The Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that low rates of resource utilization, subdued inflation, and stable inflation expectations are likely to warrant exceptionally low levels of the federal funds rate for an extended period.

**Alternative C.** At this meeting, the Committee maintained the target range for the federal funds rate at its exceptionally low level of 0 to ¼ percent, and it anticipates that economic conditions are likely to warrant low levels of the federal funds rate for some time.

### 3. Economic recovery is sufficiently established

In these circumstances, the Committee will maintain the target range for the federal funds rate at 0 to ¼ percent and continues to anticipate that low levels of resource utilization, subdued inflation, and stable inflation expectations are likely to warrant [exceptionally] low levels of the federal funds rate for some time.

(Table 2 is continued on the next page)

## Table 2, continued

### 4. Policy firming is likely soon

In these circumstances, the Committee maintained its target range for the federal funds rate at 0 to ¼ percent at this meeting. With the economic recovery now reasonably well established, [resource utilization increasing,] and inflation stable, the Committee anticipates that [some | a gradual] reduction in the exceptionally large degree of monetary accommodation will be appropriate before long. The timing [and pace] of this reduction will depend on the evolution of economic and financial conditions, [but at present it appears likely that the Committee could [begin to] implement some [a] reduction in accommodation in the [first | second] half of 20xx]. The reduction in accommodation will likely be accomplished in part through an increase in the interest rate paid on reserve balances held by depository institutions at the Federal Reserve; that increase will have the effect of putting upward pressure on the federal funds rate and other money market rates. In order to reinforce the upward pressure on short-term interest rates, the Federal Reserve may [likely will] also employ tools to drain reserves from the banking system, such as conducting reverse repurchase agreements and offering term deposits to depository institutions. [In order to ensure the readiness of such tools, the Federal Reserve plans to conduct some small-scale operations of the facilities over the next few months.] Although the Federal Reserve does not currently have plans to sell assets from its portfolio, it retains the option of asset sales as a means of further reducing monetary accommodation.

### 5. Policy firming is commencing

In these circumstances, the Committee increased its target range for the federal funds rate to ¼ to ½ percent. In association with this increase, the Board of Governors increased the rate of interest on bank reserves to ½ percent and approved requests from Federal Reserve Banks to raise the discount rate to [1] percent, and the Committee directed the Federal Reserve Bank of New York to use reverse repurchase agreements to lower the quantity of excess reserves in the banking system, consistent with the higher target range for the federal funds rate. With the economic recovery now well established, resource utilization continuing to increase, and inflation stable, the Committee anticipates that it will [further] [gradually] reduce the still-exceptional degree of monetary accommodation in coming months. This reduction is likely to be accomplished by additional increases in the interest rate on bank reserves, by further use of reverse repurchase agreements (possibly with a broader set of counterparties than just primary dealers), and potentially by offering term deposits to depository institutions. Although the Federal Reserve does not currently have plans to sell assets from its portfolio, it retains the option of asset sales as a means of further reducing monetary accommodation.

## LONG-RUN PROJECTIONS OF THE BALANCE SHEET AND MONETARY BASE

Three balance sheet scenarios are presented in this section; they differ in terms of the size and timing of large-scale asset purchases (LSAP) of agency debt securities and agency MBS. The baseline scenario corresponds to Alternative B in the Policy Alternatives section. Under this scenario, agency MBS purchases of \$1.25 trillion and agency debt securities purchases of \$175 billion are completed by the end of the first quarter of 2010. The second scenario corresponds to Alternative A, in which agency MBS purchases are increased by \$250 billion to \$1.5 trillion, while the maximum for agency debt securities purchases is left at \$200 billion; these purchases are completed by the end of the second quarter of 2010. The third scenario corresponds to Alternative C, in which the quantity of agency MBS purchases is reduced by \$150 billion to \$1.1 trillion and the quantity of agency debt securities purchases is reduced from its current \$200 billion maximum to \$160 billion; these purchases are completed by January 2010 in this scenario.

To construct the projections, we made assumptions about each component of the balance sheet. Details on the assumptions are available in Appendix C.

On the asset side of the balance sheet, all three scenarios assume that the assets purchased as a part of the LSAP program are held to maturity and are not replaced. Consequently, in all scenarios, agency debt securities peak at levels below the target purchase amounts, reflecting the maturity of agency debt securities already in the SOMA portfolio. Due to expected settlement lags and prepayments, agency MBS holdings under each alternative peak at a slightly lower level than the total amount purchased and do so a few months after purchases have ceased. An assumed slower-than-historical-average path for the prepayment of agency MBS implies that more

than half of the agency MBS purchased remain on the balance sheet at the end of the projection period in 2016.

The projections for liquidity and credit programs are the same in all three scenarios, because it is assumed that the remaining borrowing reflects idiosyncratic financing needs and not, given the high level of reserve balances, a general shortage of liquidity. Primary, secondary, and seasonal credit wind down to \$5 billion by the end of 2010, drop further to \$1 billion by the end of 2011, and remain at this level over the rest of the projection period. The Term Auction Facility (TAF) is scaled back to zero by July 2010 with no further activity for the facility thereafter. The Term Asset-Backed Securities Loan Facility (TALF) is assumed to reach a peak of \$94 billion at the end of the second quarter of 2010, with \$60 billion in three-year loans and \$34 billion in five-year loans. As these loans mature, TALF loans reach zero at the end of 2015. The Commercial Paper Funding Facility (CPFF) and the foreign central bank liquidity swap lines are assumed to expire on February 1, 2010; funds extended through these facilities drop to zero by mid-year 2010 as these credit extensions mature. Support to AIG, in the form of direct credit extensions and the Federal Reserve's ownership of preferred stock, remains above \$40 billion for the remainder of 2009 and throughout the first quarter of 2011, and then declines to zero by the end of 2013. The assets held by Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC are assumed to be managed and sold over time; assets of Maiden Lane II LLC and Maiden Lane III LLC fall to zero by the end of 2014, while those of Maiden Lane LLC are near zero by 2016. Finally, the Special Drawing Rights (SDR) certificate account is projected to increase by \$5 billion, to \$10 billion, by the end of 2011, as a result of an assumed monetization of an allocation of SDRs.

On the liability side of the Federal Reserve's balance sheet, all liability and capital assumptions are the same across scenarios except where noted below. Currency (Federal Reserve notes in circulation) is assumed to grow at the same rate as the staff

forecast for money stock currency through 2011 and after that point to expand at the projected growth rate of nominal GDP in the extended Greenbook forecast.

The U.S. Treasury is assumed to continue its recent pattern of maintaining all of its operating balances in the Treasury general account (TGA) in the near term. By the end of next year, however, we assume that the Treasury will complete its ongoing work to implement a new cash management system. Consequently, the TGA is assumed to drop back to its historical level of \$5 billion by the end of next year and remain at this level thereafter.

To allow the Treasury greater flexibility to manage its debt in the face of the debt ceiling, the supplementary financing account (SFA) has run down to \$15 billion and remains there through the end of the year. Subsequently, we assume that the Congress raises the debt limit, and the balances in the SFA gradually return to \$200 billion over the first quarter of 2010 and remain at this level going forward unless otherwise adjusted to keep reserve balances at a minimum \$25 billion. That is, as loans and securities mature, reserve balances decline and because we continue to assume that reserve balances will not be allowed to fall below \$25 billion, in each of the scenarios, the SFA is wound down to prevent this development. If the SFA reaches zero, it is assumed that the Desk resumes the purchase of Treasury securities to maintain \$25 billion in reserve balances. This latter development occurs under the baseline and Alternative C scenarios.

All liabilities other than those mentioned above are assumed to be constant at their level as of October 28, 2009. Federal Reserve Bank capital is projected to grow in line with its average pace of expansion over the past ten years.

Under these scenarios, the Federal Reserve's balance sheet peaks at different amounts and at slightly different times over the projection period. For the baseline and Alternative C scenarios, the balance sheet reaches a peak of \$2.4 trillion and \$2.3

trillion, respectively; both peaks occur in the second quarter of 2010. In Alternative A, the size of the balance sheet peaks at \$2.6 trillion in the third quarter of 2010. The difference in the size and timing of the peak level of the balance sheet across scenarios primarily reflects differences in the amounts of agency MBS purchased in each scenario. By the end of 2016, the size of the balance sheet in each scenario declines to roughly \$1.5 trillion.<sup>10</sup>

With respect to the level of reserve balances, projections for liabilities and capital, combined with the assumed path for assets, largely imply a path for reserve balances under each scenario. Under the baseline scenario, reserve balances peak at the end of 2009 at \$1.2 trillion. Despite asset purchases continuing through March of 2010, reserve balances begin to decline in the beginning of the year because of prepayments of agency MBS holdings, the decline in lending through liquidity and credit facilities, and a return of the SFA to \$200 billion. Under Alternative C, reserve balances peak earlier than in the baseline scenario, because asset purchases are completed earlier. In contrast, under Alternative A, reserve balances peak in the third quarter of 2010, because a greater quantity of assets is purchased and the purchases last well into next year.

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<sup>10</sup> The composition of Federal Reserve assets in all three of these projections differs notably from historical patterns. Prior to August 2007, U.S. Treasury securities were about 90 percent of assets and the Federal Reserve did not hold any agency mortgage-backed securities. By contrast, under the baseline scenario, Treasury securities are projected to account for only around 34 percent of total assets at the end of 2009 and rise to just 47 percent of total assets at the end of the projection period.



Balance Sheet Projections Summary			
	Alternative A	Alternative B	Alternative C
Agency Debt Securities			
Total Purchased	\$200 billion	\$175 billion	\$160 billion
December 2016	\$34 billion	\$25 billion	\$19 billion
Agency MBS			
Total Purchased	\$1.5 trillion	\$1.25 trillion	\$1.1 trillion
December 2016	\$0.8 trillion	\$0.7 trillion	\$0.6 trillion
Total Assets			
Peak month	September 2010	June 2010	April 2010
Peak amount	\$2.6 trillion	\$2.4 trillion	\$2.3 trillion
December 2016	\$1.5 trillion	\$1.5 trillion	\$1.5 trillion
Reserve Balances			
Peak month	September 2010	December 2009	November 2009
Peak amount	\$1.3 trillion	\$1.2 trillion	\$1.1 trillion

Projections for the growth rate of the monetary base are derived from these balance sheet projections as the growth rate of the sum of Federal Reserve notes in circulation and reserve balances.<sup>11</sup> Under the baseline scenario, the monetary base continues to expand through the first quarter of 2010, and then begins to contract as the SFA is rebuilt to its previous level and, subsequently, total assets begin to decline. Given the different assumptions for asset purchases, the monetary base begins to contract earlier under Alternative C and later under Alternative A. Under all scenarios, the monetary base shrinks until the latter part of the projection period

<sup>11</sup> The calculated growth rates of the monetary base presented in the table are based on an approximation for month-average values.

when growth in currency and the assumed stabilization of reserve balances at \$25 billion lead to a resumption in growth of the monetary base.

In terms of revisions, changes to the projections in the baseline scenario have been minor. The size of the balance sheet at the end of October is projected to be \$15 billion higher than at the time of the last Bluebook, primarily because of larger-than-projected purchases of agency debt securities and agency MBS and greater amounts of credit extended to specific institutions, such as AIG and the Maiden Lane LLCs. However, the lower projected level of mortgage interest rates has led us to revise up our path for MBS prepayments, which results in a lower level of MBS holdings over time. On balance, total assets are higher at the end of this year and year-end 2016 than forecasted in the September Bluebook, but total assets are lower for all year-ends in between.

On the liability side, we have adjusted our long-run forecast for reverse repurchase agreements with foreign official and international accounts. Instead of declining toward historical levels, we have kept this liability at its recent level over the projection period. The level of reserve balances remains below that projected in the September Bluebook through 2015, mostly because of lower asset levels due to higher prepayments assumed on agency MBS and the increased level of reverse repurchase agreements with foreign official and international accounts.

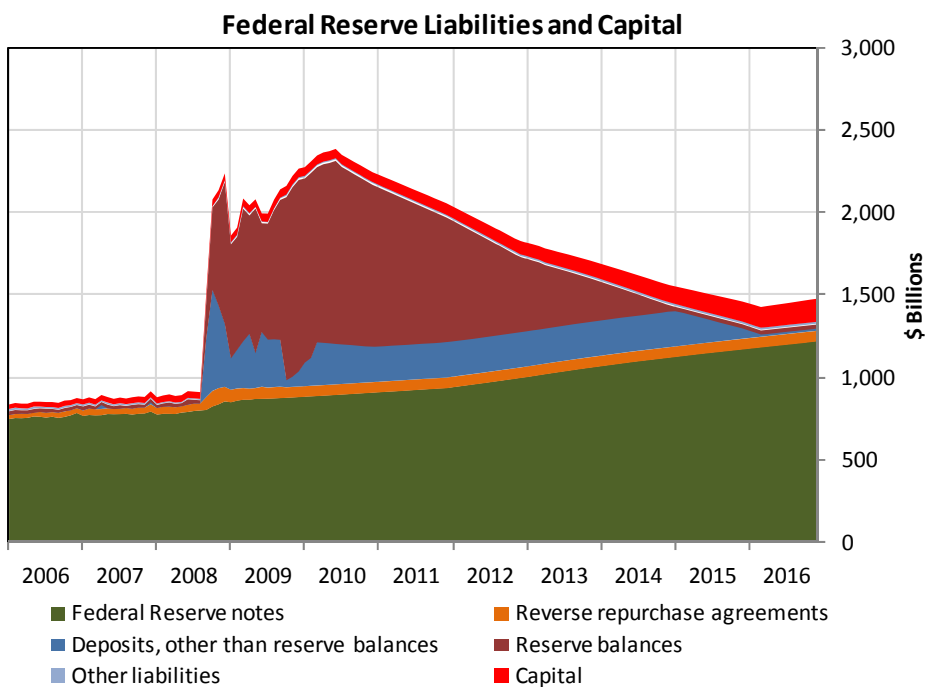
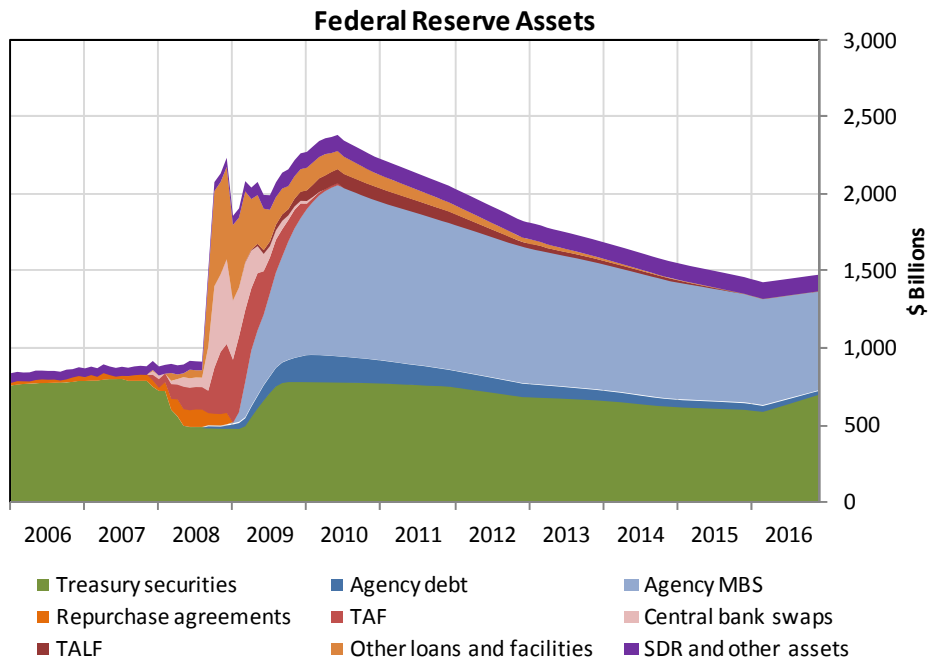
The extended Greenbook projection assumes that the target federal funds rate rises from the current 0 to  $\frac{1}{4}$  percent range to 2.1 percent over the course of 2012. Under the operating procedures employed before the financial crisis, the projected level of reserve balances at the end of 2012 of \$456 billion would not have been consistent with a federal funds rate significantly above zero. If the interest rate paid on excess reserve balances becomes an effective floor for the federal funds rate, a higher target rate could be achieved even with quite elevated reserve balances simply

by raising the excess reserves rate. Such a path is implicit in these projections. The experience last autumn, however, when the effective federal funds rate fell well below the rate paid on excess reserves, may suggest that other tools could be needed to improve the control over the funds rate. Such tools might include reverse repurchase agreements, a term deposit facility, outright sales of securities, or other strategies. The balance sheet effects of these tools, however, are not included in these projections.

Growth Rates for Monetary Base				
Date	Baseline	Alternative A	Alternative C	<i>Memo:</i> September baseline
Percent, annual rate				
Monthly				
Sep-09	66.9	66.9	66.9	38.5
Oct-09	88.4	88.4	88.4	109.1
Nov-09	94.9	101.1	89.4	94.2
Dec-09	16.0	27.4	5.9	27.1
Jan-10	-8.1	3.3	-18.3	-20.0
Feb-10	-10.3	1.2	-23.4	-30.7
Mar-10	-14.1	-2.4	-28.5	-2.5
Apr-10	-9.9	1.7	-19.8	11.2
May-10	10.4	21.1	-3.3	22.4
Jun-10	8.9	19.3	-10.8	25.0
Quarterly				
Q3 2009	-2.5	-2.5	-2.5	-11.5
Q4 2009	73.7	76.8	71.0	73.4
Q1 2010	6.9	17.9	-3.9	1.8
Q2 2010	-4.3	7.0	-17.3	7.5
Q3 2010	-2.4	15.4	-11.2	9.6
Q4 2010	-10.1	1.8	-9.3	-6.9
Annual - Q4 to Q4				
2009	45.0	45.9	44.1	42.8
2010	-2.5	10.9	-10.1	3.0
2011	-9.9	-10.5	-9.7	-7.4
2012	-13.1	-12.9	-13.4	-11.6
2013	-9.6	-9.4	-9.8	-9.9
2014	-10.8	-10.4	-5.9	-9.8
2015	0.6	-9.6	4.2	-8.8
2016	3.8	0.6	3.8	1.1

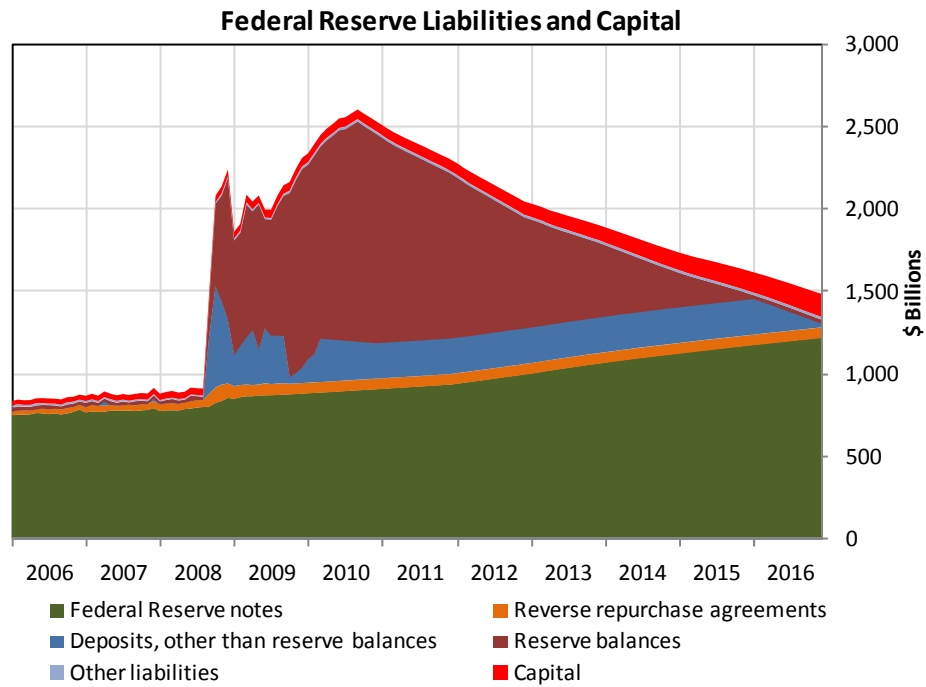
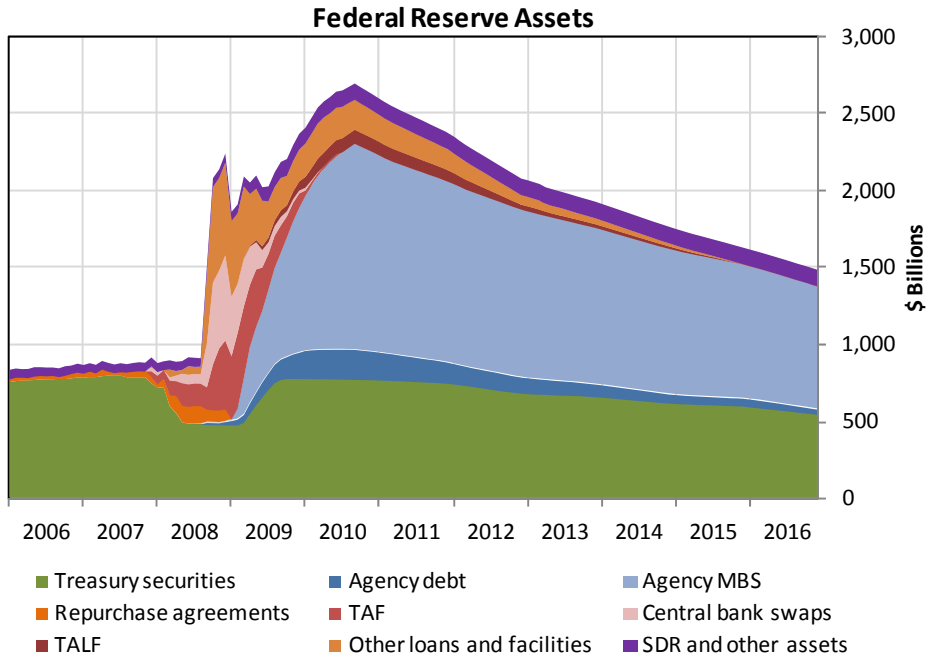
Note. Not seasonally adjusted.

**Baseline Scenario**



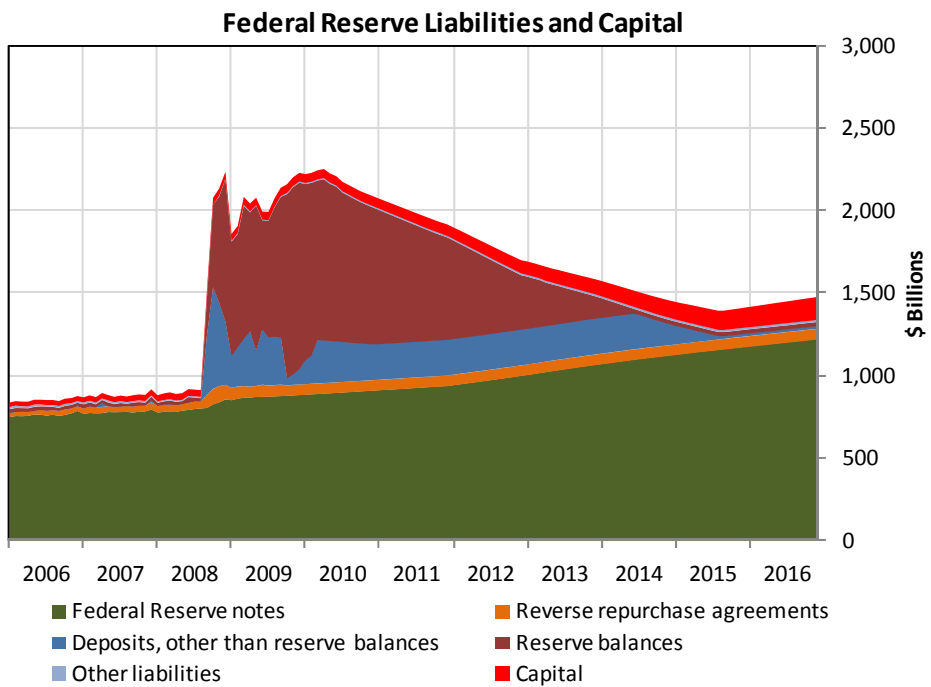
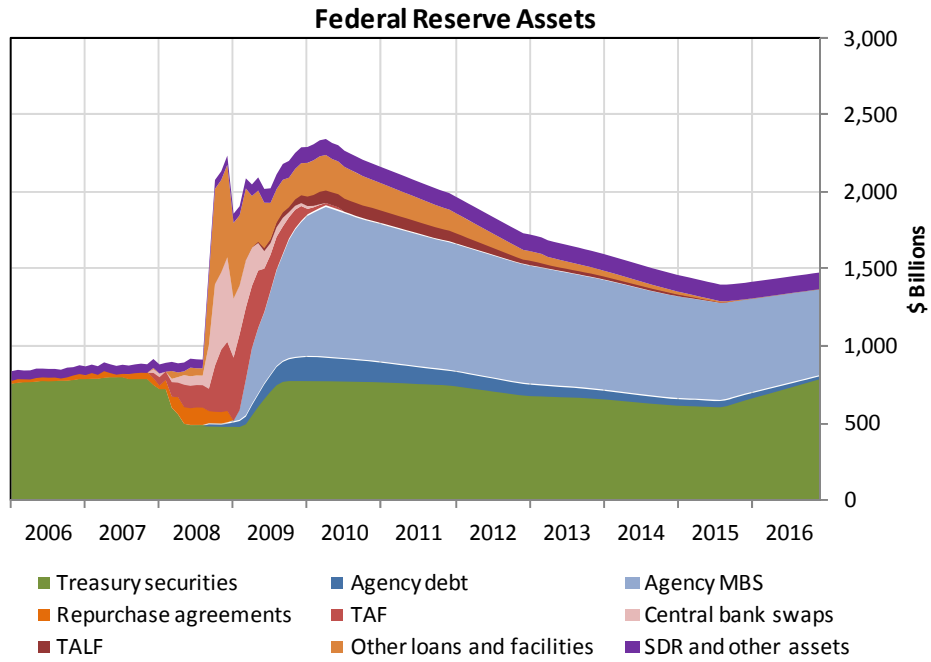
Source. Federal Reserve H.4.1 statistical release and staff calculations.

**Alternative A**



Source. Federal Reserve H.4.1 statistical release and staff calculations.

**Alternative C**



Source. Federal Reserve H.4.1 statistical release and staff calculations.

## BANK CREDIT, DEBT, AND MONEY FORECASTS

Growth of commercial bank credit, nonfederal sector debt, and M2 is projected to be quite subdued through the middle of next year and then pick up gradually over the remainder of the forecast horizon as the economic recovery takes hold, the health of the banking industry improves, and households' reallocation of wealth toward riskier assets wanes.

After declining about 5 percent in the fourth quarter, bank credit is forecast to expand by around 1½ percent next year and almost 5 percent in 2011. Total loans are expected to continue contracting through the middle of next year as banks face worsening asset quality, weak loan demand, and new financial accounting standards for securitizations and special-purpose entities.<sup>12</sup> Looking further ahead, loan growth is projected to resume in the second half of next year but to remain subdued as banks are expected to keep their lending policies relatively tight even as business and household spending picks up and the outlook for credit quality improves.

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<sup>12</sup> The Financial Accounting Standards Board announced in June the publication of Statement of Financial Accounting Standards No. 166 (FAS 166), *Accounting for Transfers of Financial Assets (an amendment to FASB Statement No. 140)*, and FAS 167, *Amendments to FIN 46R, Consolidation of Variable Interest Entities*, that will change the way companies account for securitizations and special-purpose entities. FAS 166 and 167 must be implemented with firms' first financial reporting period ending after November 15, 2009, which for commercial banks effectively means with their 2010:Q1 Call Reports. Industry analysts estimate that the amount of currently off-balance-sheet assets that will be brought onto banks' balance sheets by the end of the first quarter is likely to be more than \$1 trillion. In order to provide the Committee with an estimate of underlying trends in bank credit and its components over this period, the staff will report growth rates of bank credit that are adjusted to remove the effect of the initial implementation of these accounting changes.



Domestic nonfinancial sector debt is projected to expand at an annual rate of  $2\frac{3}{4}$  percent this quarter and at an average annual pace of  $5\frac{1}{2}$  percent over 2010 and 2011, buoyed significantly by rapid growth in federal sector debt. By contrast, the debt of nonfinancial businesses is forecast to resume growing only moderately over the forecast horizon, held down by weakness in C&I loans and borrowing to finance commercial real estate. Household debt is also projected to grow tepidly over the forecast horizon, amid the continued drag from relatively low levels of household spending and more restrictive credit availability.

M2 is forecast to expand notably slower than nominal GDP in the fourth quarter as households' reallocation of wealth toward higher-yielding assets continues to weigh on money demand. In 2010 and 2011, M2 growth gradually moves up to a pace closer to that of nominal GDP growth, as the runoffs in small time deposits and retail money market mutual funds wane while liquid deposits expand at a solid pace.

Growth Rates for M2  
(percent, annual rate)

Greenbook Forecast\*

Monthly Growth Rates		
	Apr-09	-7.7
	May-09	10.2
	Jun-09	4.6
	Jul-09	-2.5
	Aug-09	-7.4
	Sep-09	4.0
	Oct-09	3.0
	Nov-09	0.7
	Dec-09	0.3
	Jan-10	1.9
	Feb-10	2.3
	Mar-10	2.3
	Apr-10	2.4
	May-10	2.4
	Jun-10	2.6
	Jul-10	3.2
	Aug-10	3.3
	Sep-10	3.3
	Oct-10	3.7
	Nov-10	3.6
	Dec-10	3.7
Quarterly Growth Rates		
	2009 Q2	2.7
	2009 Q3	0.1
	2009 Q4	1.2
	2010 Q1	1.5
	2010 Q2	2.4
	2010 Q3	3.0
	2010 Q4	3.5
Annual Growth Rates		
	2008	8.3
	2009	4.2
	2010	2.7
	2011	4.7
Growth From	To	
Sep-09	Dec-09	1.3
2008 Q4	2009 Q4	4.2
2009 Q4	2010 Q2	2.0

\* This forecast is consistent with nominal GDP and interest rates in the Greenbook forecast. Actual data through October 19, 2009; projections thereafter.

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## DIRECTIVE

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The September directive and draft language for the November directive are provided below.

### SEPTEMBER FOMC MEETING

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to  $\frac{1}{4}$  percent. The Committee directs the Desk to purchase agency debt, agency MBS, and longer-term Treasury securities during the intermeeting period with the aim of providing support to private credit markets and economic activity. The timing and pace of these purchases should depend on conditions in the markets for such securities and on a broader assessment of private credit market conditions. The Desk is expected to complete purchases of about \$300 billion of longer-term Treasury securities by the end of October. It is also expected to execute purchases of up to \$200 billion in housing-related agency debt and about \$1.25 trillion of agency MBS by the end of the first quarter of 2010. The Desk is expected to gradually slow the pace of these purchases as they near completion. The Committee anticipates that outright purchases of securities will cause the size of the Federal Reserve's balance sheet to expand significantly in coming months. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

## **NOVEMBER FOMC MEETING — ALTERNATIVE A**

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to purchase agency debt and agency MBS during the intermeeting period with the aim of providing support to private credit markets and economic activity. The timing and pace of these purchases should depend on conditions in the markets for such securities and on a broader assessment of private credit market conditions. The Desk is expected to execute purchases of up to \$200 billion in housing-related agency debt and about \$1.5 trillion of agency MBS by the end of the second quarter of 2010. The Desk is expected to gradually slow the pace of these purchases as they near completion. The Committee anticipates that outright purchases of securities will cause the size of the Federal Reserve's balance sheet to expand significantly in coming months. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

## **NOVEMBER FOMC MEETING — ALTERNATIVE B**

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to purchase agency debt and agency MBS during the intermeeting period with the aim of providing support to private credit markets and economic activity. The timing and pace of these purchases should depend on conditions in the markets for such securities and on a broader assessment of private credit market conditions. The Desk is expected to execute purchases of about \$175 billion in housing-related agency debt and about \$1.25 trillion of agency MBS by the end of the first quarter of 2010. The Desk is expected to gradually slow the pace of these purchases as they near completion. The Committee anticipates that outright purchases of securities will cause the size of the Federal Reserve's balance sheet to expand significantly in coming months. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

## **NOVEMBER FOMC MEETING — ALTERNATIVE C**

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to  $\frac{1}{4}$  percent. The Committee directs the Desk to purchase agency debt and agency MBS during the intermeeting period with the aim of providing support to private credit markets and economic activity. The timing and pace of these purchases should depend on conditions in the markets for such securities and on a broader assessment of private credit market conditions. The Desk is expected to execute purchases of about \$160 billion in housing-related agency debt and about \$1.1 trillion of agency MBS by the end of January 2010. The Desk is expected to gradually slow the pace of these purchases as they near completion. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

## APPENDIX A: MEASURES OF THE EQUILIBRIUM REAL RATE

The equilibrium real rate is the real federal funds rate that, if maintained, would be projected to return output to its potential level over time. The short-run equilibrium rate is defined as the rate that would close the output gap in twelve quarters given the corresponding model's projection of the economy. The medium-run concept is the value of the real federal funds rate projected to keep output at potential in seven years, under the assumption that monetary policy acts to bring actual and potential output into line in the short run and then keeps them equal thereafter. The TIPS-based factor model measure provides an estimate of market expectations for the real federal funds rate seven years ahead.

The actual real federal funds rate is constructed as the difference between the nominal rate and realized inflation, where the nominal rate is measured as the quarterly average of the observed federal funds rate, and realized inflation is given by the log difference between the core PCE price index and its lagged value four quarters earlier. If the upcoming FOMC meeting falls early in the quarter, the lagged inflation measure ends in the last quarter. For the current quarter, the nominal rate is specified as the target federal funds rate on the Bluebook publication date.

Measure	Description
<b>Single-equation Model</b>	The measure of the equilibrium real rate in the single-equation model is based on an estimated aggregate-demand relationship between the current value of the output gap and its lagged values as well as the lagged values of the real federal funds rate.
<b>Small Structural Model</b>	The small-scale model of the economy consists of equations for six variables: the output gap, the equity premium, the federal budget surplus, the trend growth rate of output, the real bond yield, and the real federal funds rate.
<b>EDO Model</b>	Estimates of the equilibrium real rate using EDO—an estimated dynamic-stochastic-general-equilibrium (DSGE) model of the U.S. economy—depend on data for major spending categories, price and wages, and the federal funds rate as well as the model's structure and estimate of the output gap.
<b>FRB/US Model</b>	Estimates of the equilibrium real rate using FRB/US—the staff's large-scale econometric model of the U.S. economy—depend on a very broad array of economic factors, some of which take the form of projected values of the model's exogenous variables.
<b>Greenbook-consistent</b>	Two measures are presented—based on the FRB/US and the EDO models. Both models are matched to the extended Greenbook forecast. Model simulations determine the value of the real federal funds rate that closes the output gap conditional on the extended baseline.
<b>TIPS-based Factor Model</b>	Yields on TIPS (Treasury Inflation-Protected Securities) reflect investors' expectations of the future path of real interest rates. The TIPS-based measure of the equilibrium real rate is constructed using the seven-year-ahead instantaneous real forward rate derived from TIPS yields as of the Bluebook publication date. This forward rate is adjusted to remove estimates of the term and liquidity premiums based on a three-factor arbitrage-free term-structure model applied to TIPS yields, nominal yields, and inflation.

Estimates of the real federal funds rate depend on the proxies for expected inflation used. The table below shows estimated real federal funds rates based on lagged core PCE inflation, the definition used in the Equilibrium Real Federal Funds Rate chart; lagged four-quarter headline PCE inflation; and projected four-quarter headline PCE inflation beginning with the next quarter. For each estimate of the real rate, the table also provides the Greenbook-consistent measure of the short-run equilibrium real rate and the average actual real federal funds rate over the next twelve quarters.

<b>Proxy used for expected inflation</b>	<b>Actual real federal funds rate (current value)</b>	<b>Greenbook-consistent measure of the equilibrium real funds rate (current value)</b>	<b>Average actual real funds rate (twelve-quarter average)</b>
Lagged core inflation	-1.2	-2.0	-0.8
Lagged headline inflation	0.8	-2.0	-0.9
Projected headline inflation	-1.3	-2.0	-0.9



## APPENDIX B: ANALYSIS OF POLICY PATHS AND CONFIDENCE INTERVALS

### RULE SPECIFICATIONS

For the following rules,  $i_t$  denotes the federal funds rate for quarter  $t$ , while the explanatory variables include the staff's projection of trailing four-quarter core PCE inflation ( $\pi_t$ ), inflation two and three quarters ahead ( $\pi_{t+2|t}$  and  $\pi_{t+3|t}$ ), the output gap in the current period and one quarter ahead ( $y_t - y_t^*$  and  $y_{t+1|t} - y_{t+1|t}^*$ ), and the three-quarter-ahead forecast of annual average GDP growth relative to potential ( $\Delta^4 y_{t+3|t} - \Delta^4 y_{t+3|t}^*$ ), and  $\pi^*$  denotes an assumed value of policymakers' long-run inflation objective. The outcome-based and forecast-based rules were estimated using real-time data over the sample 1988:1-2006:4; each specification was chosen using the Bayesian information criterion. Each rule incorporates a 75 basis point shift in the intercept, specified as a sequence of 25 basis point increments during the first three quarters of 1998. The first two simple rules were proposed by Taylor (1993, 1999). The prescriptions of the first-difference rule do not depend on assumptions regarding  $\pi^*$  or the level of the output gap; see Orphanides (2003).

<b>Outcome-based rule</b>	$i_t = 1.20i_{t-1} - 0.39i_{t-2} + 0.19[1.17 + 1.73 \pi_t + 3.66(y_t - y_t^*) - 2.72(y_{t-1} - y_{t-1}^*)]$
<b>Forecast-based rule</b>	$i_t = 1.18i_{t-1} - 0.38i_{t-2} + 0.20[0.98 + 1.72 \pi_{t+2 t} + 2.29(y_{t+1 t} - y_{t+1 t}^*) - 1.37(y_{t-1} - y_{t-1}^*)]$
<b>Taylor (1993) rule</b>	$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + 0.5(y_t - y_t^*)$
<b>Taylor (1999) rule</b>	$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + (y_t - y_t^*)$
<b>First-difference rule</b>	$i_t = i_{t-1} + 0.5(\pi_{t+3 t} - \pi^*) + 0.5(\Delta^4 y_{t+3 t} - \Delta^4 y_{t+3 t}^*)$

### FRB/US MODEL SIMULATIONS

Prescriptions from the two empirical rules are computed using dynamic simulations of the FRB/US model, implemented as though the rule were followed starting at this FOMC meeting. The dotted line labeled "Previous Bluebook" is based on the current specification of the policy rule, applied to the previous Greenbook projection. Confidence intervals are based on stochastic simulations of the FRB/US model with shocks drawn from the estimated residuals over 1969-2008.

### INFORMATION FROM FINANCIAL MARKETS

The expected funds rate path is based on Eurodollar quotes and implied three-month forward rates from swaps, and the confidence intervals for this path are constructed using prices of interest rate caps.

### NEAR-TERM PRESCRIPTIONS OF SIMPLE POLICY RULES

These prescriptions are calculated using Greenbook projections for inflation and the output gap. Because the first-difference rule involves the lagged funds rate, the value labeled "Previous Bluebook" for the current quarter is computed using the actual value of the lagged funds rate, and the one-quarter-ahead prescriptions are based on this rule's prescription for the current quarter.

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————— (1999). "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules*. The University of Chicago Press, pp. 319-341.

Orphanides, Athanasios (2003). "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics*, vol. 50 (July), pp. 983-1022.

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## APPENDIX C: LONG-RUN PROJECTIONS OF THE BALANCE SHEET AND MONETARY BASE

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This appendix presents more detail on the assumptions underlying the long-run projections of the Federal Reserve's balance sheet and the monetary base shown in the section entitled "Long-Run Projections of the Balance Sheet and Monetary Base."

### GENERAL ASSUMPTIONS

The projections are constructed on a monthly frequency from November 2009 to December 2016. The few balance sheet items that are not discussed below are assumed to be constant over the projection period at the level observed on October 28, 2009. The projections for all major asset and liability categories are summarized in the charts and table that follow the bullet points.

### ASSETS

#### *Asset Purchases*

- The baseline scenario incorporates large-scale asset purchases (LSAP) roughly in line with those that have been announced.
  - The Desk purchases \$175 billion of agency debt securities and \$1.25 trillion of agency MBS; both types of purchases are to be completed by the end of the first quarter of 2010.
    - Agency debt securities and agency MBS are held to maturity and are not replaced.
    - Holdings of agency debt securities peak at \$174 billion in February 2010, and decline slowly over the remainder of the forecast horizon as they mature. The peak is slightly below the target purchase amount, reflecting the maturity of agency debt securities already in the SOMA portfolio.
    - Due to expected settlement lags and prepayments, agency MBS holdings peak at \$1.1 trillion in June 2010, a somewhat lower level than the amount purchased. For agency MBS, the rate of prepayment is based on estimates from the investment manager. The historically low coupon on these securities implies a relatively slow prepayment rate. As a result, at the end of 2016, \$652 billion of the \$1.25 trillion of MBS purchased remains on the balance sheet.
  - The last of the purchases of U.S. Treasury securities related to the LSAP program will settle on October 30, 2009, which brings the amount acquired to \$300 billion.
    - The maturity distribution of the Treasury securities purchased as a part of the LSAP program is based on data from the Federal Reserve Bank of New York's Markets Group. The maturities of most purchases are between two and ten years, with the weighted average maturity being a little over six years.

- No sales of Treasury securities purchased as a part of the LSAP program are assumed, and maturing securities are not rolled over. As a result, total holdings of Treasury securities decline as issues mature. Treasury securities held in the SOMA portfolio prior to the initiation of the LSAP program are assumed to be reinvested as they mature.
- In the scenario corresponding to Alternative A, purchases of agency MBS are increased by \$250 billion to \$1.5 trillion and assumed purchases of agency debt securities amount to \$200 billion. Purchases are assumed to be completed by the end of the second quarter of 2010.
- In the scenario corresponding to Alternative C, purchases of agency MBS are decreased by \$150 billion to \$1.1 trillion and purchases of agency debt securities amount to \$160 billion. Purchases are assumed to be completed by the end of January 2010.
- By the end of the projection period under the scenarios corresponding to the baseline and Alternative C, the expansion of currency and capital combined with a runoff of other assets necessitates the resumption of Treasury security purchases to maintain reserve balances at a level of \$25 billion.

### ***Liquidity Programs and Credit Facilities***

- The assumptions about the liquidity programs and credit facilities are the same across scenarios.
- Primary credit is assumed to decline gradually from its current level to \$1 billion by the end of 2011 and remain at that level thereafter. Secondary credit is assumed to be zero over the forecast period.
- The Term Auction Facility (TAF) is scaled back in the near term as the funding size and maturity of auctions are reduced. In particular, the amounts offered at 84-day auctions will decrease to zero over the fourth quarter of 2009 and term lengths will be reduced gradually to 28 days. By December 2009, only 28-day auctions will be held. The size of these auctions is expected to be reduced from \$75 billion in early 2010 to zero by July 2010. The reduction in funding extended by this facility is primarily driven by weak demand by depository institutions.
- Foreign central bank liquidity swaps decline with expected improvements in market functioning and fall to zero a few months after the program's expiration date on February 1, 2010.
- Credit extended to and preferred stock interests in AIG wind down by the end of 2013.<sup>13</sup> In addition, the assets held by Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC are assumed to be sold over time and reach either zero or a nominal level by 2016.
- The Term Asset-Backed Securities Loan Facility (TALF), based on its current low utilization, is assumed to peak at \$94 billion in June 2010.

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<sup>13</sup> On March 2, the Federal Reserve and Treasury jointly announced a restructuring of the government's assistance to AIG. As part of this restructuring, the revolving credit facility will be reduced in exchange for preferred interests in two SPVs created to hold common stock of two AIG subsidiaries. It is assumed that the total size of the assistance to AIG is not directly affected by this restructuring.

- TALF loans with a three-year maturity reach \$62 billion by the program's assumed expiration date of March 31, 2010. A portion of these loans are expected to prepay, and the quantity outstanding reaches zero by the end of the second quarter of 2013.
- TALF loans with a five-year maturity reach \$34 billion by June 2010. These loans are assumed to be held to maturity, and the quantity outstanding reaches zero by the end of 2015.
- The Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) and Primary Dealer Credit Facility (PDCF) are expected to continue to be unused. Credit extended through the Commercial Paper Funding Facility (CPFF) winds down to zero a few months after the facility expires on February 1, 2010.

### **Other**

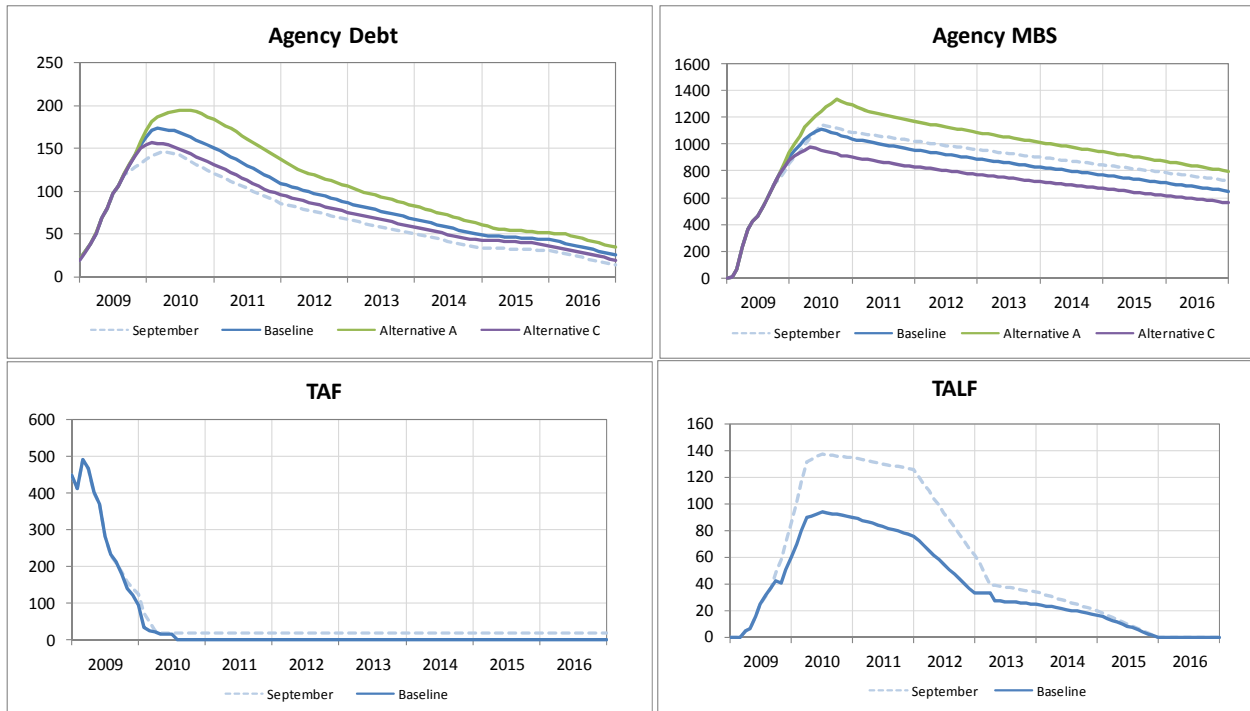
- The Special Drawing Rights (SDR) certificate account is projected to increase by \$5 billion, to \$10 billion, by the end of 2011, as a result of an assumed monetization of the allocation of SDRs.

### **LIABILITIES AND CAPITAL**

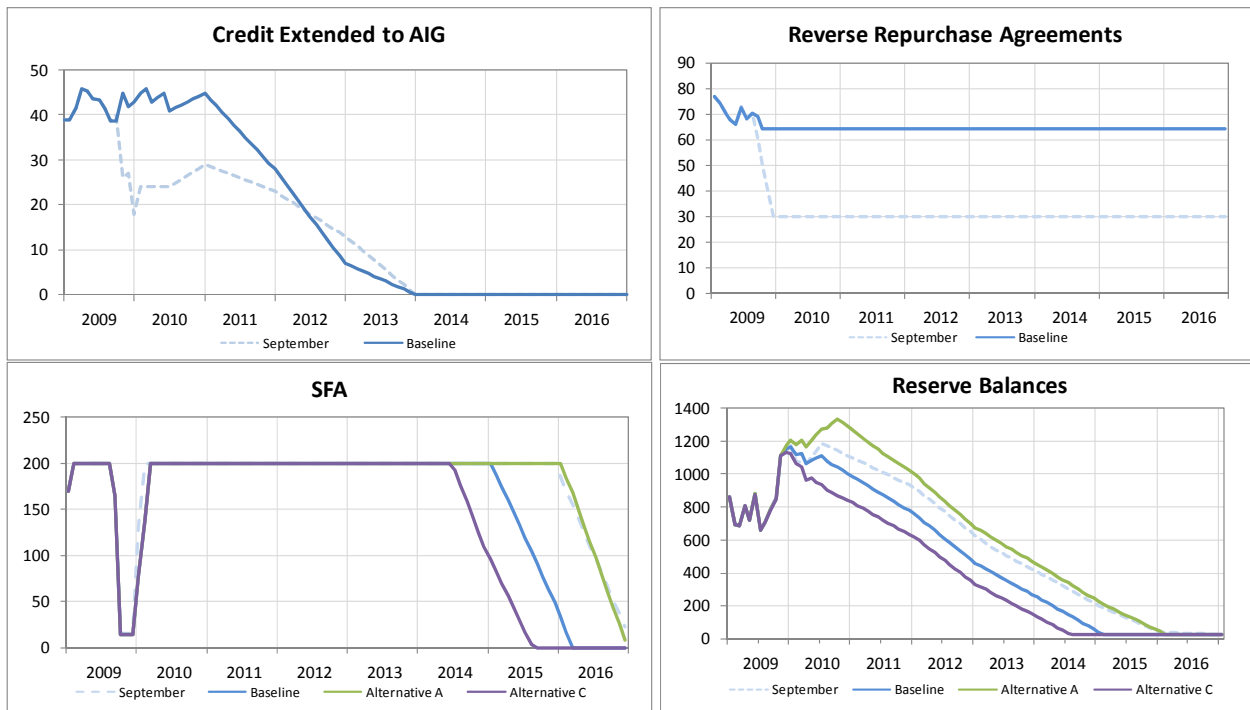
- Currency (Federal Reserve notes in circulation) grows in line with the staff forecast for money stock currency through the end of 2011. From 2011 to the end of the projection period, currency grows at the same rate as nominal GDP as projected in the extended Greenbook forecast.
- The U.S. Treasury's general account (TGA) is projected to follow the staff forecast for end-of-month TGA cash balances through March 2010. Thereafter, the TGA drops back to its historical target level of \$5 billion by the end of next year as it is assumed that the Treasury will have implemented a new cash management system. The TGA remains constant at \$5 billion over the remainder of the forecast period.
- In the near term, movements in the Treasury's supplementary financing account (SFA) reflect constraints the Treasury faces with regards to its debt limit. In line with the Treasury's announcement regarding the Supplementary Financing Program, the SFA is projected to run down to \$15 billion by the end of October 2009 and remain there through the end of the year. Subsequently, under the assumption that the Congress raises the debt limit, the balances in the SFA gradually increase to \$200 billion over the first quarter of 2010 and remain at this level in each of the scenarios until the SFA is reduced to ensure reserve balance levels do not fall below \$25 billion.
- Reverse repurchase agreements with foreign official and international accounts are assumed to remain at their current level of \$64 billion over the projection period.
- Capital is expected to grow at 15 percent per year, in line with the average rate of the past ten years.
- As the asset side of the balance sheet expands and contracts, so do reserve balances. Reserve balances under the three scenarios peak at different levels and at different times. However, in all scenarios, reserve balances fall back to \$25 billion by the end of the forecast horizon.

### APPENDIX C: INDIVIDUAL BALANCE SHEET ITEM PROFILES

#### Asset purchases and Federal Reserve liquidity programs and credit facilities



#### Federal Reserve liabilities and capital



Note. All values are in billions of dollars.

**Appendix C: Table**  
**Federal Reserve Balance Sheet: End-of-Year Projections -- Baseline Scenario**

	Oct 28, 2009	End-of-Year							
		2009	2010	2011	2012	2013	2014	2015	2016
		\$ Billions							
<b>Total assets</b>	2,165	2,270	2,248	2,059	1,829	1,705	1,564	1,463	1,480
Selected assets:									
Liquidity programs for financial firms	195	140	5	1	1	1	1	1	1
Primary, secondary, and seasonal credit	23	25	5	1	1	1	1	1	1
Term auction credit (TAF)	139	95	0	0	0	0	0	0	0
Foreign central bank liquidity swaps	33	20	0	0	0	0	0	0	0
Primary Dealer Credit Facility (PDCF)	0	0	0	0	0	0	0	0	0
Asset-Backed Commercial Paper Money Market									
Mutual Fund Liquidity Facility (AMLF)	0	0	0	0	0	0	0	0	0
Lending through other credit facilities	60	76	90	76	33	25	17	0	0
Net portfolio holdings of Commercial Paper									
Funding Facility (CPFF)	19	16	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	41	60	90	76	33	25	17	0	0
Support for specific institutions	110	108	86	60	30	14	3	2	1
Credit extended to AIG	45	43	45	28	7	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	65	65	41	32	23	14	3	2	1
Securities held outright	1,691	1,843	1,961	1,814	1,657	1,557	1,435	1,352	1,370
U.S. Treasury securities	775	775	768	746	679	659	615	597	693
Agency debt securities	142	164	151	109	86	67	48	43	25
Agency mortgage-backed securities	774	904	1,042	959	892	831	772	712	652
Memo: TSLF	0	0	0	0	0	0	0	0	0
Repurchase agreements	0	0	0	0	0	0	0	0	0
Special drawing rights certificate account	5	5	8	10	10	10	10	10	10
<b>Total liabilities</b>	2,113	2,218	2,188	1,990	1,749	1,613	1,459	1,342	1,340
Selected liabilities:									
Federal Reserve notes in circulation	875	879	906	934	995	1,062	1,119	1,169	1,217
Reverse repurchase agreements	64	64	64	64	64	64	64	64	64
Reserve balances of depository institutions	1,111	1,163	984	758	456	253	41	25	25
U.S. Treasury, general account	18	68	5	5	5	5	5	5	5
U.S. Treasury, supplemental financing account	15	15	200	200	200	200	200	50	0
<b>Total capital</b>	53	53	60	69	80	92	106	121	140

Source: Federal Reserve H.4.1 statistical release and staff calculations.