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.

Please note that some material may have been redacted from this document if that material was received on a confidential basis. Redacted material is indicated by occasional gaps in the text or by gray boxes around non-text content. All redacted passages are exempt from disclosure under applicable provisions of the Freedom of Information Act.

JULY 31, 2008

MONETARY POLICY ALTERNATIVES

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

MONETARY POLICY ALTERNATIVES

Recent Developments

Summary

(1) During the intermeeting period, investors' growing concerns about the health of financial institutions, which were exacerbated by the failure of a large regional thrift institution, uncertainties about the solvency of Fannie Mae and Freddie Mac, and the difficulties of certain major investment banks, added to market worries about the potential consequences of financial strains for the broader economy. In response, market participants pushed back the expected timing of the onset of monetary policy tightening. Concerns about the government-sponsored enterprises (GSEs) eased as Congress moved to pass legislation, subsequently signed by the President, authorizing the Treasury to provide liquidity and capital to the GSEs. Sentiment about the broader financial sector also received a boost from second-quarter earnings reports of some financial firms that were not as weak as anticipated.

(2) Investors currently place very high odds on the Committee leaving the target federal funds rate unchanged at the upcoming FOMC meeting. On net over the intermeeting period, shorter-horizon TIPS-based measures of inflation compensation dropped as energy prices retraced some of their recent rise. Functioning of short-term funding markets remained strained. Broad equity price indexes were down on the period; stock prices of financial firms were down sharply in mid-July but subsequently recouped most of those losses. Spreads of yields on investment- and speculative-grade corporate bonds over yields on comparable-maturity Treasury securities widened. Bond issuance slowed further, as did lending by banks to businesses and households, and issuance of leveraged loans remained very weak. In the July Senior Loan Officer Opinion Survey (SLOOS), large fractions of

banks reported having tightened lending standards further across a wide range of loan types over the previous three months. The trade-weighted index of the dollar against the currencies of major trading partners was little changed on net.

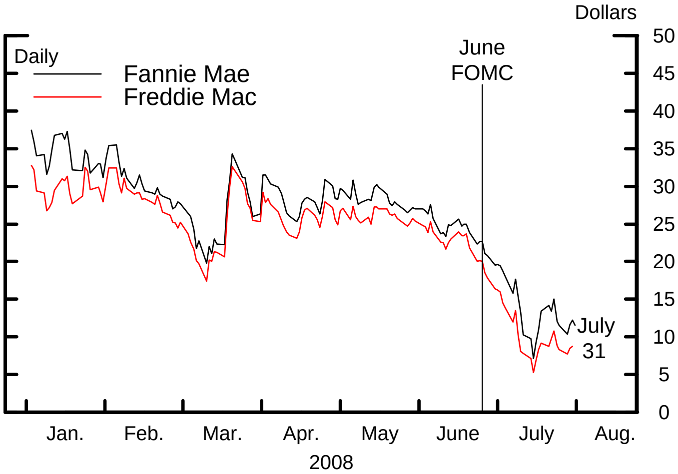
Financial Institutions

(3) Financial markets were roiled over the intermeeting period by developments at major financial institutions. The stock prices of the GSEs tumbled and their credit default swap (CDS) spreads shot up early in the period amid concerns that their capital would be insufficient to absorb mounting losses on their mortgage portfolios (Chart 1). The worries about the GSEs were augmented by speculation that a large amount of previously issued mortgage-backed securities (MBS) might need to be brought back onto the GSEs' balance sheets. On July 13, the Treasury Department proposed a rescue plan to support the liquidity and solvency of the two institutions, and the Federal Reserve announced that the Federal Reserve Bank of New York was authorized to lend to the institutions if necessary. Fannie Mae's and Freddie Mac's stock prices subsequently retraced a portion of their earlier declines in response to the announcement, and their CDS spreads, which had narrowed in anticipation of the government action, moved even lower. The housing bill passed by the Congress and signed by the President gives the Treasury Department the authority to provide support to the two GSEs through loans and equity investments, and assigns to the Federal Reserve a consultative role with regard to the safety and soundness of the GSEs and potential provisions of capital.

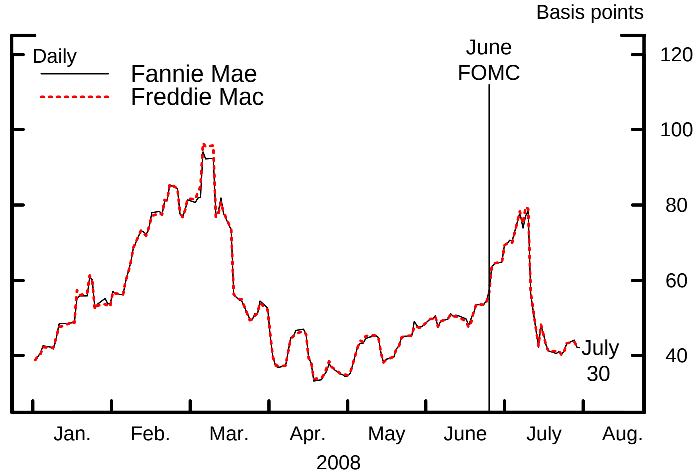
(4) Developments at Fannie Mae and Freddie Mac left an imprint on agency-related cash and financing markets. The ability of the two GSEs to issue debt received considerable scrutiny in July as investors tried to gauge the institutions' health. Weekly auctions of short-term debt were reasonably well covered but at higher rates than previously: Spreads of three- and six-month auction stop-out rates

Chart 1
Financial Institutions

GSE stock prices

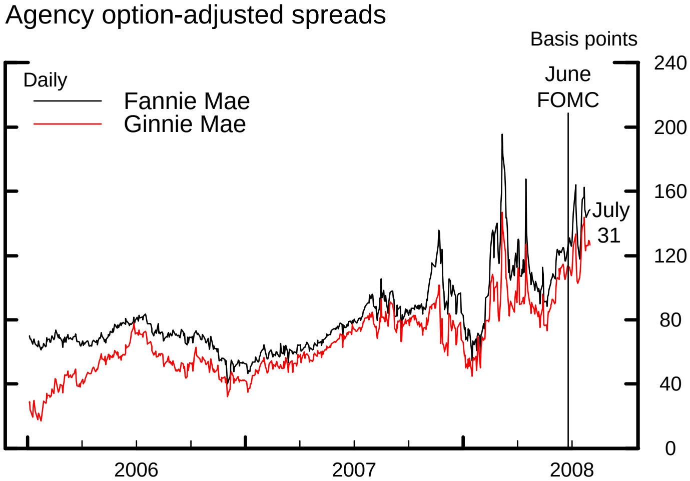


CDS spreads for GSEs



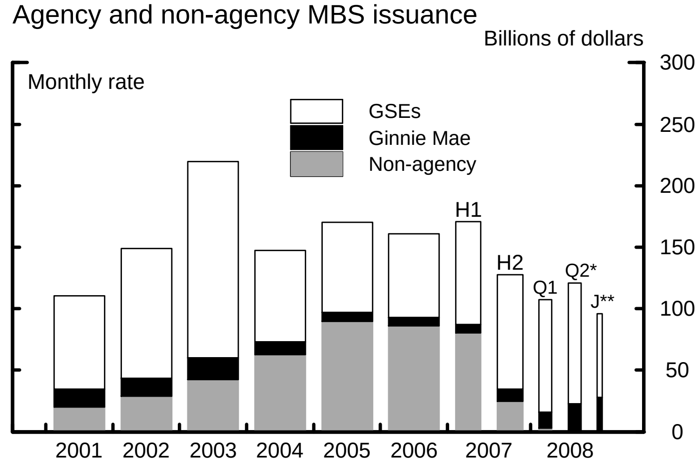
Source. Markit.

Agency option-adjusted spreads



Note. Spreads over Treasury.
Source. Bloomberg.

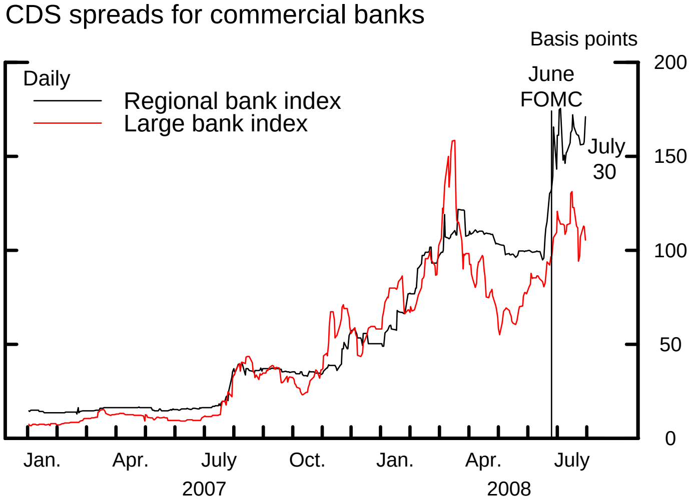
Agency and non-agency MBS issuance



*Estimate based on Inside Mortgage Finance MBS database. **Estimate based on Inside Mortgage Finance MBS database as of July 25 for the GSEs and Bloomberg as of July 28 for Ginnie Mae.

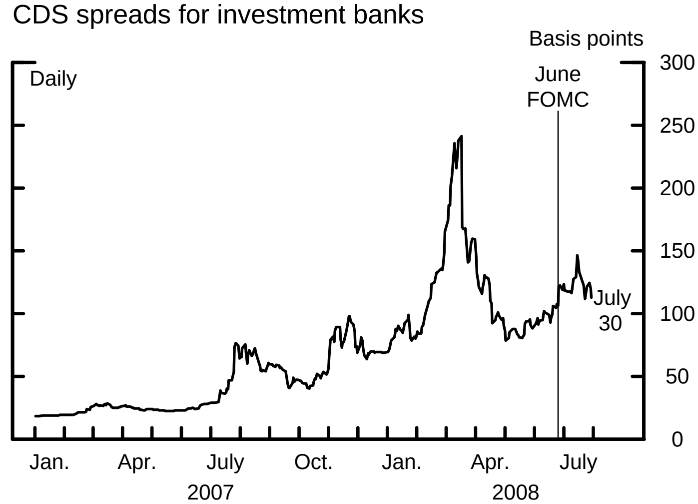
Source. Fannie Mae, Freddie Mac, Ginnie Mae, Inside Mortgage Finance MBS database, and Bloomberg.

CDS spreads for commercial banks



Note. Median spreads for 7 regional and 5 large commercial banks.
Source. Markit.

CDS spreads for investment banks



Note. Median spread for 10 investment banks.
Source. Markit.

over comparable-maturity overnight index swap (OIS) rates widened to their highest level since the beginning of the year. Developments at the GSEs spurred higher short-term borrowing costs at the Federal Home Loan Banks (FHLBs). Secondary-market yields on the FHLBs' discount notes moved higher, and many dealers stopped reporting quotes for CDS spreads on FHLB debt, an indication that liquidity in this market was impaired. Anecdotal reports suggest that foreign official demand for agency debt has dropped off, but custody holdings at the Federal Reserve Bank of New York have continued to rise. In repo markets, spreads of rates on agency and agency MBS collateral over Treasury general collateral (GC) repo rates widened modestly in response to the concerns about the GSEs, but did not reach the levels seen in March. Dealer haircuts on agency debt collateral increased somewhat, and bid-asked spreads for these transactions increased noticeably. Meanwhile, haircuts on agency MBS collateral were little changed and bid-asked spreads on these transactions increased only modestly.

(5) Likely reflecting reduced demand for agency MBS, constraints on GSEs balance sheets, and difficult liquidity conditions in mortgage markets, option-adjusted spreads (OAS) of agency MBS yields over those on Treasuries widened about 25 basis points, on net, over the intermeeting period. However, the agencies continued to perform their securitization role without disruption. Domestic banks sold significant amounts of conforming mortgages to the agencies ahead of quarter end, boosting MBS issuance in June. Issuance of agency MBS appears to have slowed somewhat in July, likely reflecting the weak pace of underlying originations. In contrast, issuance by Ginnie Mae (the Government National Mortgage Association) rose in July, extending a trend since mid-2007, as the Federal Housing Administration (FHA) has begun to guarantee mortgages that, until recently, would likely have been issued without federal guarantee and securitized as non-agency MBS.

(6) Investors also became more concerned about the outlook for the broader banking sector. The failures of a large thrift and two small commercial banks raised investors' concerns about the profitability and asset quality of depositories and caused stock prices of banks to swing widely over the intermeeting period.[1] Most large bank holding companies reported significantly lower earnings in the second quarter than at the same time last year and boosted their provisions for loan losses in light of higher delinquency and charge-off rates. CDS spreads for large U.S. commercial banks were also volatile over the intermeeting period, and ended the period a little higher, on balance. CDS spreads for regional banks moved up noticeably, and in response to market rumors, two regional depository institutions issued statements in mid-July reassuring investors about the strength of their liquidity positions and their ability to raise funds.

(7) Investment banks' equity prices also declined and their CDS spreads widened early in the period, although the declines were subsequently partly reversed. Anxiety about the financial condition of some institutions, particularly Lehman Brothers, reemerged for some time over the intermeeting period. Merrill Lynch reported large second-quarter losses, reflecting significant credit valuation adjustments on mortgage-related assets. On July 28, the firm announced expected writedowns for the third quarter of almost $6 billion resulting from a large sale of collaterized debt obligations backed by asset-backed securities (ABS CDOs) for a price well below their face value, and the termination of ABS CDO hedges with a monoline guarantor. The firm also indicated that it would enhance its capital position through substantial issuance of new equity. Anecdotal reports suggest that the ability of investment banks to raise capital in the current environment is very limited.

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[1] The failure of IndyMac—a thrift with $32 billion in assets—on July 11, 2008, is expected to cost the FDIC's Deposit Insurance Fund between $4 and $8 billion, making it one of the largest bank failures in U.S. history. The Federal Reserve extended credit to IndyMac for a brief period to facilitate an orderly closure and least-cost resolution of the institution.

Monetary Policy Expectations and Treasury Yields

(8) The FOMC's decision at its June meeting to leave the target federal funds rate unchanged at 2 percent had largely been anticipated, but the policy statement was reportedly viewed by investors as placing more emphasis on the downside risks to growth than they had anticipated. As a result, short-term interest rate futures maturing in 2009 fell 10 to 15 basis points on the announcement.[2] The Chairman's Monetary Policy Testimony also led investors to mark down the expected path of the federal funds rate, as did intensifying concerns about the health of financial institutions and the outlook for the GSEs. Economic data released over the intermeeting period had little net impact on the anticipated path for policy. Judging from options on federal funds futures, investors attach very high odds to no change in the target rate at the upcoming FOMC meeting, as do respondents to the Desk's survey of primary dealer economists (Chart 2). Futures quotes suggest that investors currently expect the federal funds rate to reach 2¼ percent by early 2009 and about 3½ percent by mid 2010, about 40 and 50 basis points lower than at the time of the June meeting, respectively. Respondents to the Desk's survey anticipated the federal funds rate would reach 2¾ percent by the end of 2009, about 25 basis points less than implied by futures rates. The option-implied distributions of the federal funds rate six and twelve months ahead moved lower over the intermeeting period, and policy uncertainty, as measured by the width of these distributions, decreased to about the middle of its range since last August, but remained high by historical standards.

(9) Two-year nominal Treasury yields declined about 30 basis points over the intermeeting period, in line with the revision to policy expectations, while ten-year

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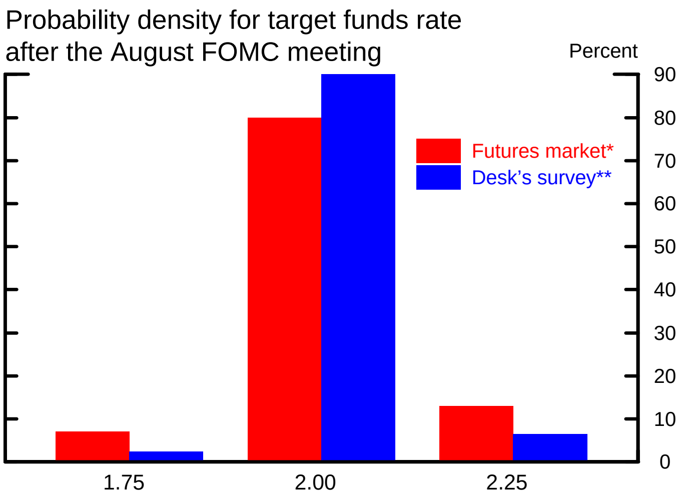
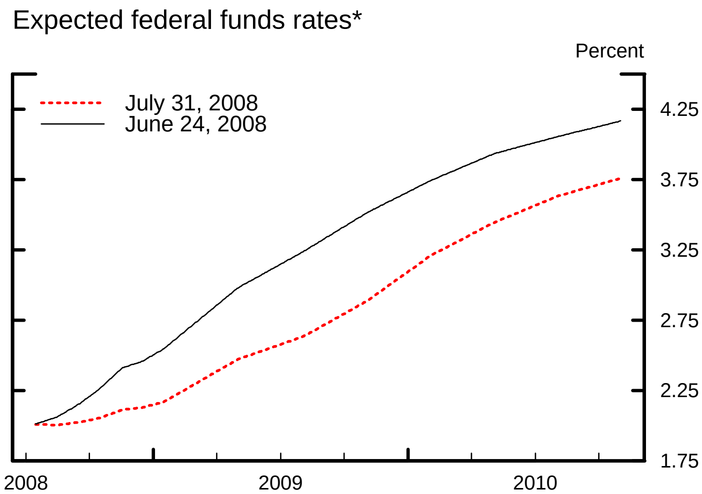
[2] The effective federal funds rate averaged 2.02 percent over the intermeeting period. Volatility in the market, though elevated by historical standards, was lower than it had been over the last several intermeeting periods. Over this intermeeting period, the volume of long-term repurchase agreements (RPs) was unchanged, and the Desk did not redeem any Treasury securities.

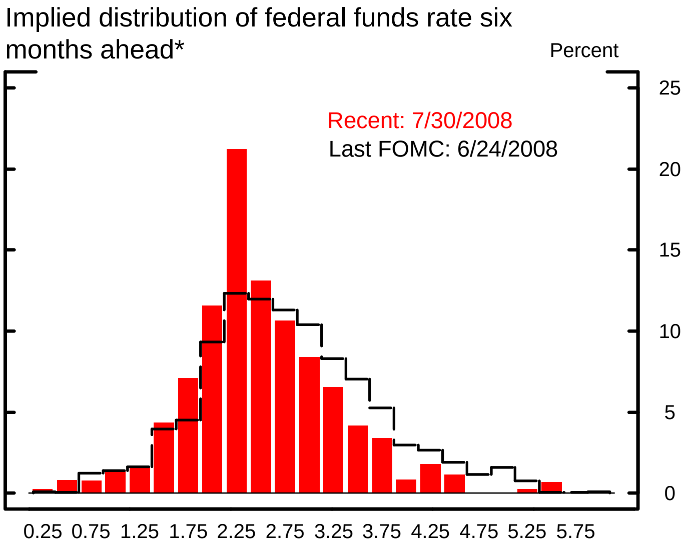
Chart 2
Interest Rate Developments



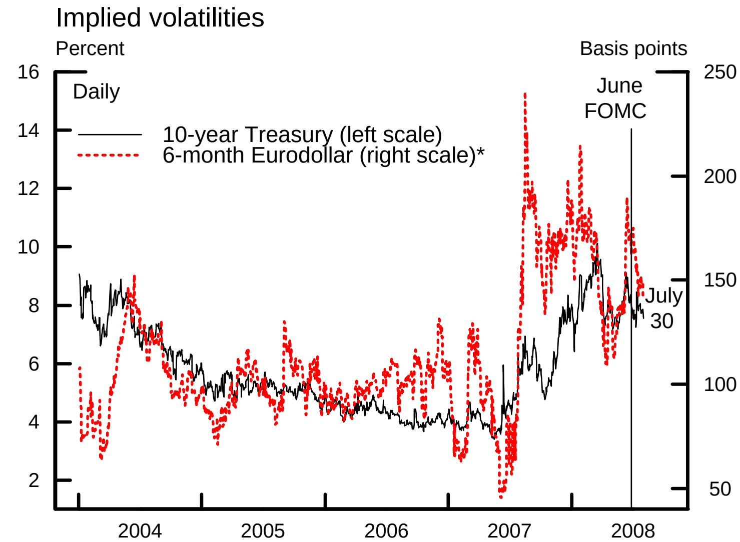
*Derived from options on federal funds futures.
**Survey of primary dealer economists on July 28, 2008.



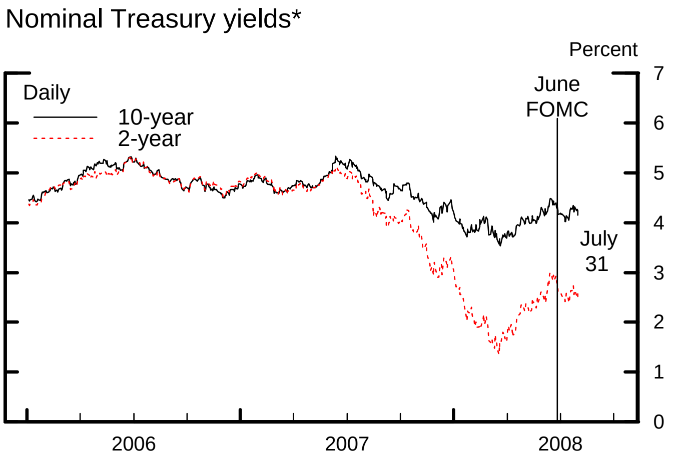
*Estimates from federal funds and Eurodollar futures, with an allowance for term premiums and other adjustments.



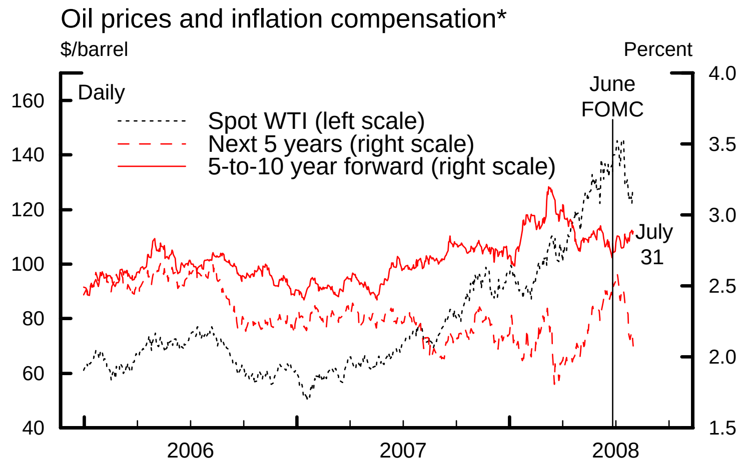
*Derived from options on Eurodollar futures contracts, with term premium and other adjustments to estimate expectations for the federal funds rate.



*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.



*Par yields from a smoothed nominal off-the-run Treasury yield curve.



*Estimates based on smoothed nominal and inflation-indexed Treasury yield curves and adjusted for the indexation-lag (carry) effect.

yields declined about 10 basis points, on net. Five-year inflation compensation adjusted for carry effects decreased 36 basis points, tracking the decline in energy prices, whereas five-year inflation compensation five years forward rose 18 basis points. Much of the increase occurred around the release of the June FOMC statement, the Chairman's testimony, and higher-than-expected CPI inflation data. One-year forward rates of inflation compensation ending eight through ten years ahead rose more noticeably, suggesting some increase in inflation expectations or inflation risk premiums (see the box "Interpreting Movements in TIPS-based Inflation Compensation"). Readings of household inflation expectations from the Michigan survey released over the intermeeting period remained elevated; the short-term measure was unchanged, while the long-term measure declined slightly. Many respondents to the Desk's primary dealer survey stated that they had become more uncertain about their inflation forecasts for core PCE inflation over the next two years, although their inflation forecasts were little changed.

Money Markets

(10) Functioning in the interbank funding markets remained strained over the intermeeting period. Banks reportedly continued to be reluctant to lend term funds, and the spreads of one- and three-month Libor over comparable-maturity OIS rates were unchanged and slightly higher, respectively (Chart 3). Also indicative of sustained bank funding pressures, stop-out rates of the Term Auction Facility (TAF) during the intermeeting period were above the primary credit rate. Demand at the ECB and SNB auctions of dollar funding remained strong, and the ECB's auctions in July drew record volumes of bids. Pressures in foreign funding markets eased slightly during the period. With the passing of quarter-end, overnight sterling and euro Libor fell about 20 and 30 basis points, respectively. Term spreads between Libor and OIS rates in these currencies also declined since the June meeting; in the case of sterling,

Interpreting Movements in TIPS based Inflation Compensation

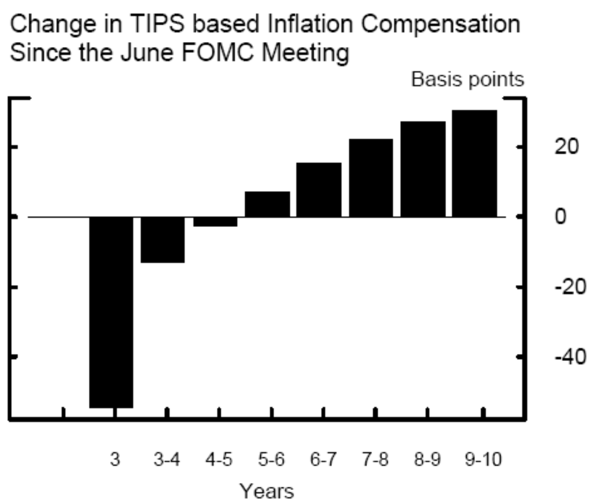
Over the intermeeting period, inflation compensation for the next five years—the spread between nominal and inflation-indexed Treasury securities—declined 36 basis points. In contrast, inflation compensation from five to ten years ahead increased 18 basis points. These diverging movements raise the question of whether the increase in longer-term inflation compensation reflects higher long-run inflation expectations, an increase in inflation risk premiums, or other factors. Much of the rise in forward inflation compensation occurred around FOMC communications that were interpreted by investors as suggesting a lower path for policy and the release of higher-than–expected CPI data—both of which could result in either higher long-run inflation expectations or greater inflation uncertainty.

An examination of the forward term structure of inflation compensation, shown on the left below, sheds some light on these issues. First, the declines in near-term forward rates of inflation compensation are consistent with the drop in oil prices over the intermeeting period, and staff models of inflation compensation suggest that this factor explains about half of the fall in five-year inflation compensation. Second, the increase in the slope of forward inflation compensation beyond five years suggests that part of the increase in longer-term inflation compensation owes to higher inflation risk premiums. This follows if we assume that investors' expectations for inflation beyond six or seven years ahead are mainly determined by their views of the long-run equilibrium level of inflation and so are about flat. It is notable that the forward pattern of inflation compensation measured from inflation swaps, shown to the right below, follows the same general pattern as that from TIPS except at very long horizons, perhaps suggesting that some of the increase in far-forward TIPS-based inflation compensation could also be due to special factors in Treasury markets; in particular, a sense that the Treasury may need to issue more longer-term debt to finance a widening federal deficit may have put upward pressure on longer-term nominal yields. Of course, the readings from the inflation swaps market, which is quite small and illiquid, may also be influenced by special factors.

Survey evidence released over the intermeetting period was mixed but also points to an increase in inflation risk premiums and little change or a slight decline in long-term inflation expectations. The Desk's survey of primary dealers showed a significant increase in the number of dealers who reported they were more uncertain about their forecasts for core PCE inflation, but no change in the median forecast for either near-term core PCE or long-term headline CPI inflation. The Michigan survey of households showed no change in inflation expectations over the next twelve months and a modest decline in inflation expectations over the next five to ten years, although both these measures remained at elevated levels.

Interpreting Movements in TIPS based Inflation Compensation (cont'd)

In addition to risk premiums and expectations, TIPS-based inflation compensation can be affected by the relative liquidity of nominal and inflation-indexed coupon securities. Although liquidity in Treasury markets remains poorer than before August 2007, conditions have not changed much of late, suggesting that liquidity did not contribute importantly to changes in inflation compensation over the intermeeting period.



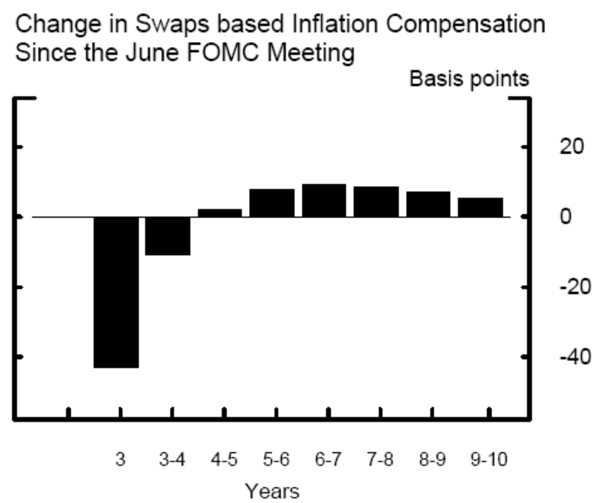
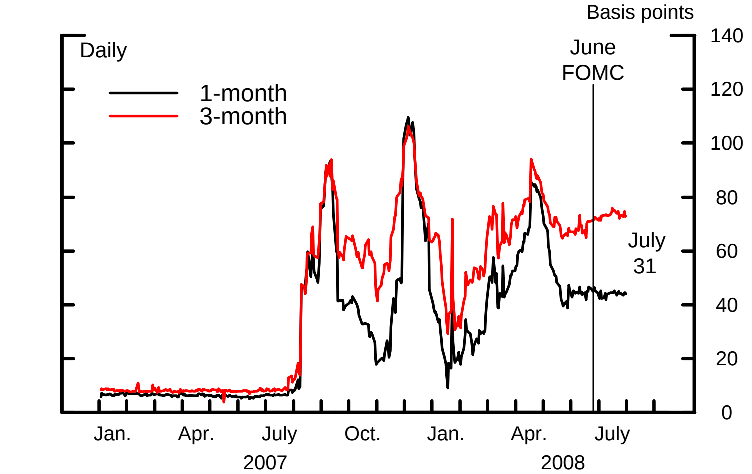


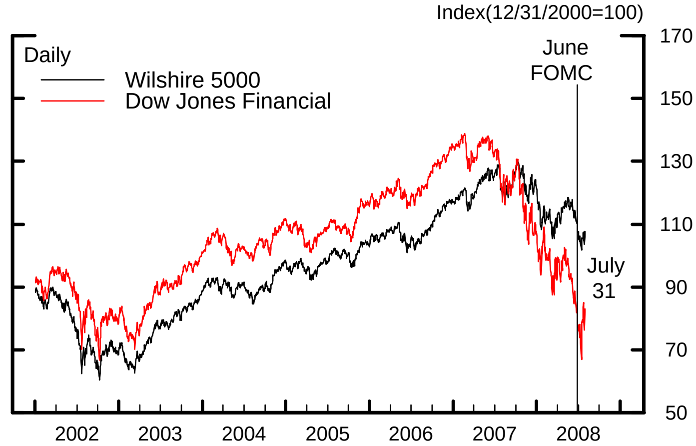
Chart 3
Asset Market Developments

Spreads of Libor over OIS

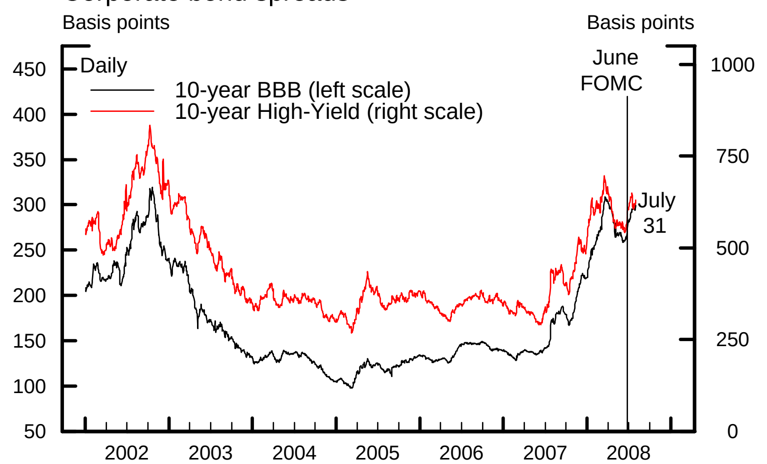


Note. Libor quotes are taken at 6:00 am, and OIS quotes are observed at the close of business of the previous trading day.

Equity prices

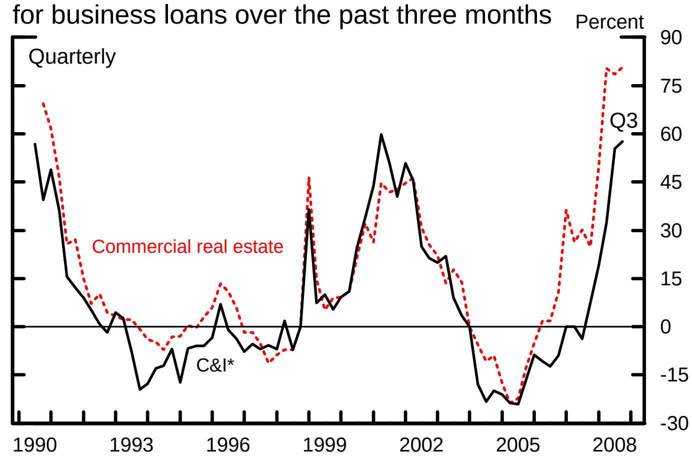


Corporate bond spreads*



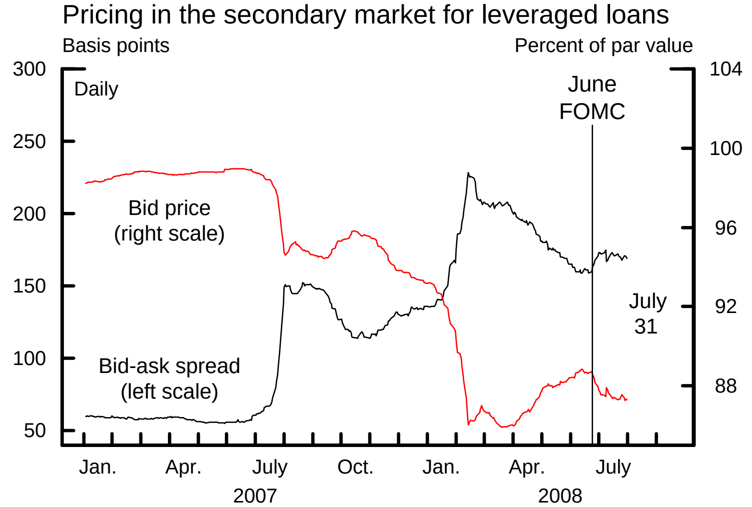
*Measured relative to an estimated off-the-run Treasury yield curve.

Net percentage of banks tightening standards for business loans over the past three months



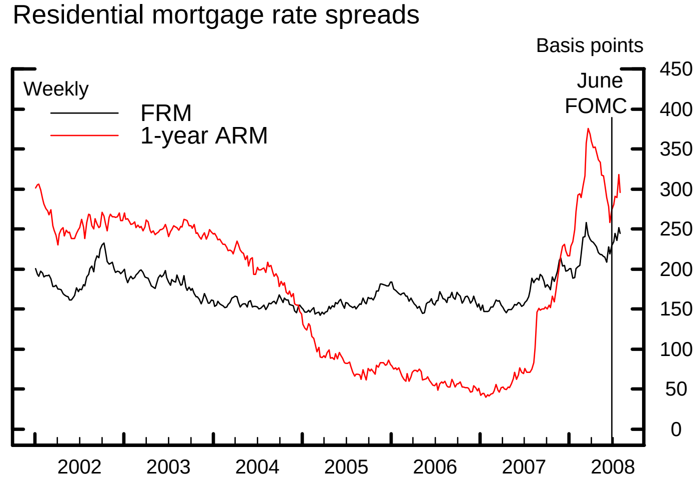
*Loans to large and medium-sized firms.

Pricing in the secondary market for leveraged loans



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

Residential mortgage rate spreads



Note. FRM spread relative to 10-year Treasury. ARM spread relative to 1-year Treasury. Last weekly observation is for July 30, 2008.
Source. Freddie Mac.

this may partly have reflected British banks' borrowing from the Bank of England's special liquidity facility.

(11) Depository institutions' use of both overnight and term primary credit borrowing continued to be strong during the intermeeting period, peaking in late June amid quarter-end pressures. By contrast, extensions of credit through the Primary Dealer Credit Facility (PDCF) were negligible during July. On July 30, the Board of Governors and the FOMC announced enhancements to existing liquidity facilities, including the extension of the PDCF and Term Securities Lending Facility (TSLF) through January 30, 2009, the introduction of auctions on options on draws of the TSLF, and an increase in the maturity of loans available through the TAF to 84 days. The announcement of the initiatives was reportedly received positively by market participants with some bank funding rates moving down in response. Traders in the FX swap market reported that liquidity and volumes improved in that market as a result of the new measures, and implied basis spreads on one- and three-month euro-dollar swaps fell about 5 basis points after the announcement.

(12) In other short-term funding markets, conditions in repo markets were fairly stable, although there was some deterioration of conditions in the market for agency collateral. The overnight Treasury GC repo rate traded relatively close to the federal funds rate during much of the intermeeting period, and haircuts on non-Treasury, non-agency collateral were little changed at elevated levels. The modest increase in repo spreads for agency debt and agency MBS likely contributed to the oversubscription of the TSLF auction held on July 24. The other TSLF auctions held during the intermeeting period were undersubscribed. Demand for 28-day single-tranche repurchase agreements increased moderately in recent weeks. Strains in the functioning of the Treasury bill market were evident just before quarter-end and around the times of heightened investor concern regarding the GSEs, when market participants reported high bid-asked spreads for these securities. In the commercial

paper market, spreads on lower-rated nonfinancial paper and asset-backed commercial paper remained well above historical norms.

Capital Markets

(13) Broad equity price indexes fell about 3 to 4 percent, on balance, over the intermeeting period. Energy sector stocks significantly underperformed the broad indexes, owing to recent declines in oil prices. Financial sector stocks were volatile, buffeted by news about specific institutions and the flow of earnings reports, and ended the period about unchanged. Option-implied volatility on the S&P 500 changed little, on balance, over the intermeeting period. The spread between the twelve-month forward trend earnings-price ratio for S&P 500 firms and the real long-term Treasury yield—a rough gauge of the equity risk premium—climbed to the top of its range since the early 1980s.

(14) Yields on most investment- and speculative-grade corporate bonds rose over the intermeeting period, even though comparable-maturity Treasury yields were little changed, implying a widening of already elevated spreads. According to the July SLOOS, large fractions of banks again reported having tightened lending standards and terms over the past three months for major business loan categories. In the primary market for leveraged loans, spreads to Libor remained elevated. Conditions in the secondary market remained strained, with bid-asked spreads a bit wider and the average bid price modestly lower. Implied spreads on the LCDX indexes rose sharply in late June but have not returned to the peak levels of earlier this year. The ratio of municipal bond yields to comparable-maturity Treasury yields remained above its historical average, but functioning appeared smooth amid fairly strong gross issuance.

(15) Interest rates on fixed-rate conforming mortgages increased over the intermeeting period, leaving spreads over ten-year Treasury securities higher. Offer rates on thirty-year jumbo mortgages also rose and credit for nonconforming

mortgages remained difficult to obtain. Indeed, the July SLOOS indicated that over the last three months, a large fraction of banks again tightened credit standards on all classes of residential mortgage loans. Issuance of agency MBS appears to have slowed in July from its strong second quarter pace, while issuance of private-label RMBS backed by nonconforming loans and of commercial mortgage-backed securities (CMBS) remained negligible. The proportion of banks reporting having tightened standards in recent months on consumer loans, including credit card loans, was at a record high in the July SLOOS, and a majority of respondents reported weaker demand for consumer loans. Issuance of consumer asset-backed securities (ABS) appears to have slowed in recent months. Spreads on consumer ABS remained high by historical standards. Spreads on lower-rated student loan ABS were also elevated and rose further over the period.

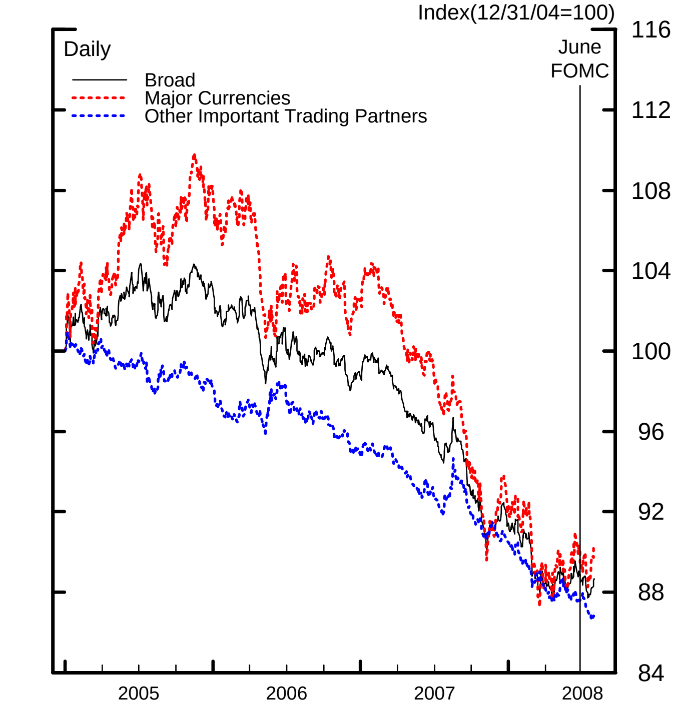
Foreign Developments

(16) Concerns about the GSEs weighed on the dollar and foreign stock markets, but both rebounded in the wake of improved investor sentiment when the rescue plan for the GSEs was announced and U.S. financial-sector earnings reports generally came in above market expectations. The major currencies index depreciated almost 2 percent between July 7 and July 15, when worries about the GSEs were at their height, but recovered as investor sentiment improved and ended the period little changed on net (Chart 4). Major foreign stock markets retraced some of their earlier declines as well but ended the period about 3 to 5 percent lower, on net, amid signs that economic growth is slowing.

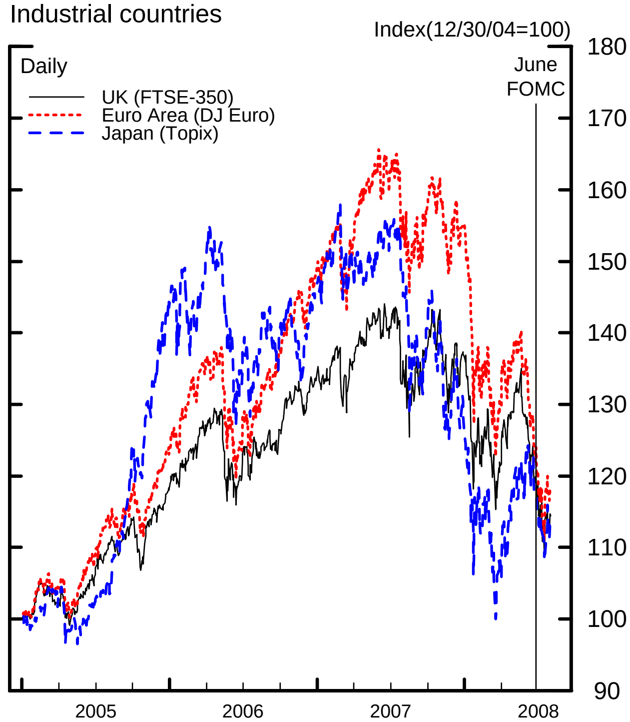
(17) As expected, the ECB raised its policy rate by 25 basis points to 4¼ percent on July 3, after which it indicated that it considered the stance of policy to be neutral. With growth slowing and oil prices down, expectations of further policy tightening in the major foreign economies diminished. Ten-year sovereign bond yields declined

Chart 4
International Financial Indicators

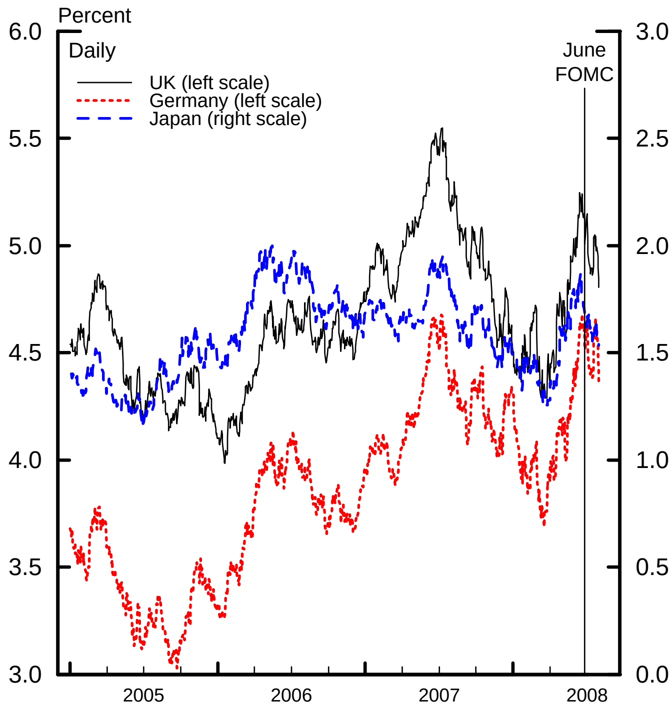
Nominal trade-weighted dollar indexes



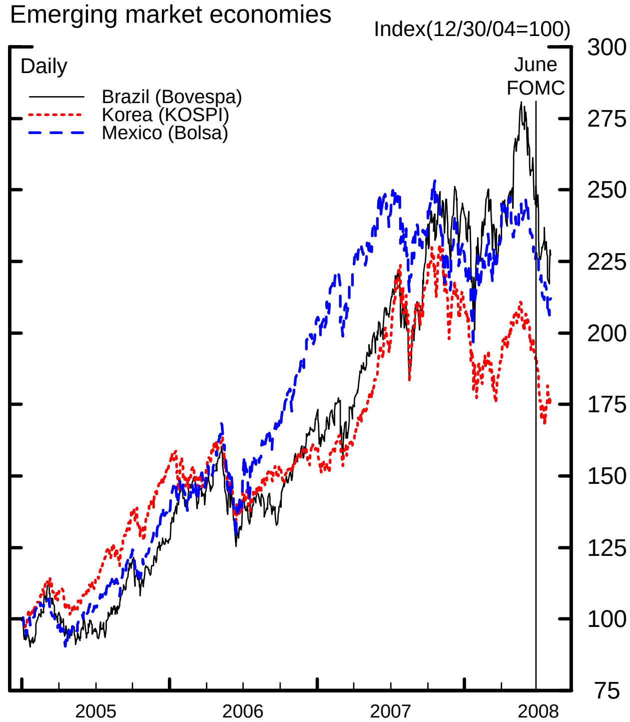
Stock price indexes
Industrial countries



Ten-year government bond yields (nominal)



Stock price indexes
Emerging market economies



Note. Last daily observation is for July 31, 2008.

some 15 to 30 basis points in the euro area, United Kingdom, and Japan, mainly reflecting declines in inflation compensation.

(18) The dollar's value against the currencies of our other important trading partners declined about 1 percent as the Chinese renminbi rose a further ½ percent against the dollar and the Korean won, Mexican peso, and Brazilian *real* all appreciated 2 to 2½ percent against the dollar. Central banks in many emerging market economies continued to tighten policy in response to rising food and energy prices. Emerging stock markets were mixed but generally down, some more than 10 percent, and several Asian countries intervened to prop up falling share prices.

Debt and Money

(19) The debt of the domestic nonfinancial sectors is estimated to have expanded at a 3¾ percent rate in the second quarter, down from the 6 percent pace seen in the first quarter (Chart 5). The slowdown was broad-based across the household and business sectors. Home mortgage debt growth slowed further, reflecting ongoing declines in house prices, slower home sales, and tighter terms and standards on mortgages. Debt growth in the nonfinancial business sector continued to moderate in the second quarter and appears to have stepped down further in July. Issuance of investment-grade bonds and the pace of C&I lending were subdued. Issuance of leveraged loans remained very low in the second quarter and, after rising in May, high-yield bond issuance has fallen back. The decline in leveraged loan issuance over the past year owes in large part to a drop in leveraged buyouts, which have typically been funded by nonbank institutions, including collateralized debt obligations (CLOs). Issuance of CLOs has all but vanished since last August. Commercial bank credit appears to have slowed of late. C&I loans grew at a slower pace in the second quarter than earlier in the year and decelerated further in July. Growth of loans to households also declined, although a sharp contraction in

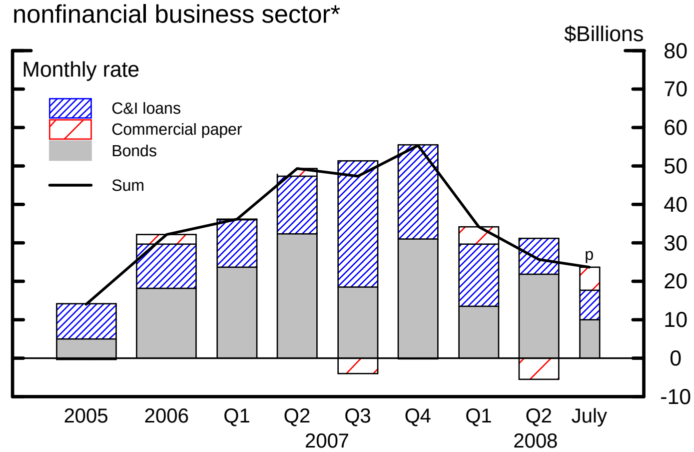
Chart 5
Debt and Money

Growth of debt of nonfinancial sectors

Percent, s.a.a.r.

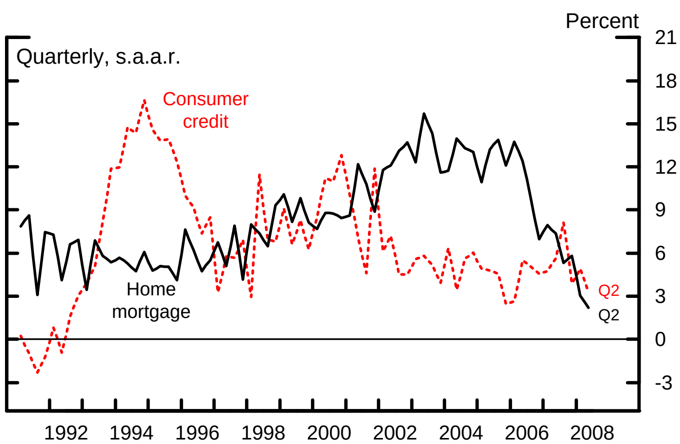
		Total	Business	Household
2006		8.8	9.7	10.2
2007		8.2	11.7	6.8
	Q1	8.0	9.4	7.0
	Q2	7.1	11.0	7.2
	Q3	9.1	13.7	6.4
	Q4	7.5	10.6	6.1
2008	Q1	6.1	8.1	3.3
	Q2	3.8	5.8	2.6

Changes in selected components of debt of nonfinancial business sector*

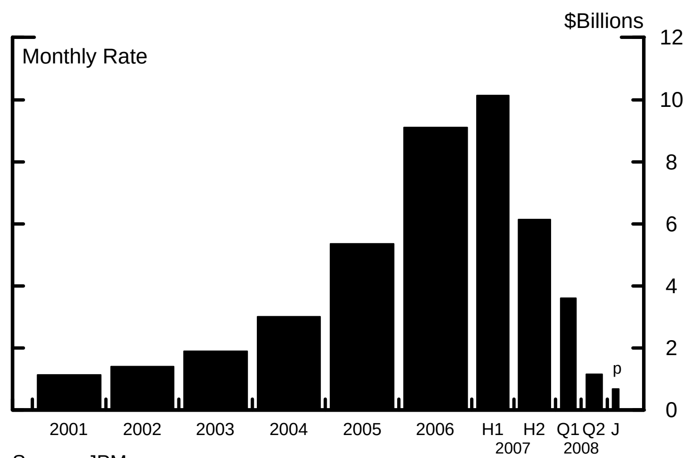


*Commercial paper and C&I loans are seasonally adjusted, bonds are not.
p Preliminary.

Growth of debt of household sector

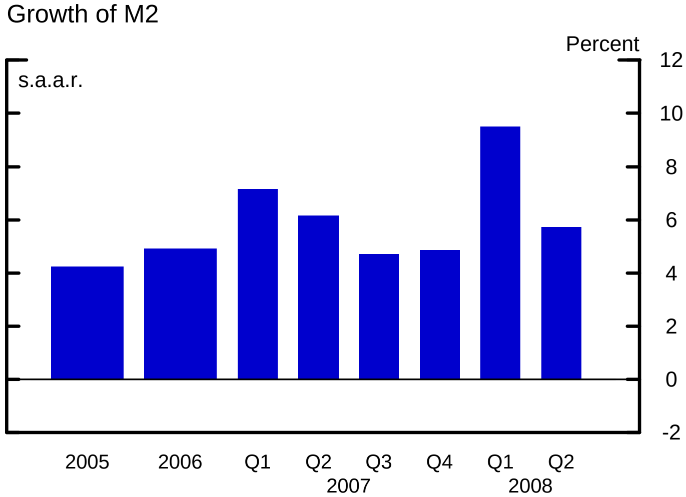


Funded CLO issuance

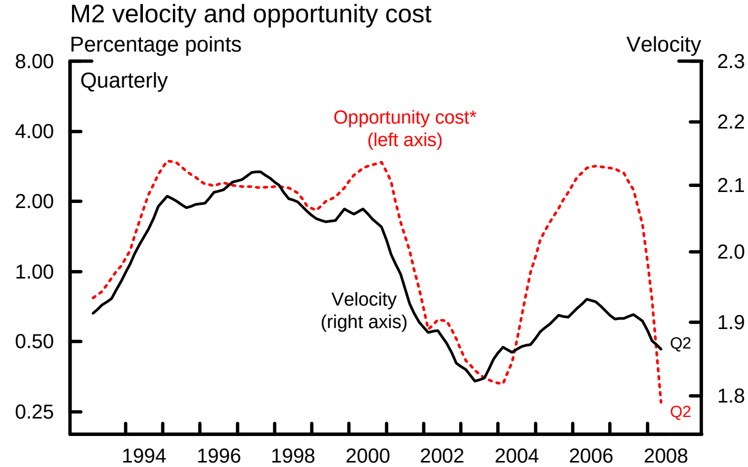


Source. JPMorgan.

Growth of M2



M2 velocity and opportunity cost



*Two-quarter moving average.

residential mortgage loans in June reflected a few domestic banks moving conforming loans off their balance sheets and to the GSEs. Although the quarterly pattern of Federal debt growth has been volatile this year, Federal borrowing has picked up in recent months, in part to fund the fiscal stimulus plan and because of slower growth of tax revenues.[3]

(20) M2 expanded at a moderate pace in July, reversing the deceleration in May and June. The expansion was broad based, reflecting acceleration in liquid deposits as well as renewed inflows to retail money market mutual funds (MMMFs) and small time deposits. The pickup in growth of small time deposits was largely attributable to a single institution that offered substantially higher rates, and the growth of MMMFs may have owed to safe-haven flows away from equity mutual funds and other non-monetary assets. Currency expanded strongly in June and July, in contrast to the subdued pace earlier in the year. The stronger growth of currency appears to have mainly reflected greater domestic demand, but some indicators suggest that foreign demand for dollars may also have picked up from its recent sluggish pace.

[3] In conjunction with the housing bill, the federal debt limit ceiling was raised by $800 billion. The Treasury's August quarterly refunding statement indicated larger issuance of ten- and thirty-year debt to meet the higher anticipated funding needs of the federal government.

Economic Outlook

(21) The staff has not appreciably altered the outlook for real activity and inflation. The Greenbook projection for economic growth has been marked down a bit and shows a slightly more gradual acceleration of the economy relative to the June forecast. The projection for headline inflation this round is slightly lower this year and slightly higher next. The forecast continues to be conditioned on an assumption that the target federal funds rate is held at 2 percent this year and that policy will then be firmed by a total of 75 basis points over 2009. Long-term Treasury yields are projected to remain steady this year and next. Stock prices again are expected to increase at an annual rate of about 7 percent over the remainder of this year and 12 percent next year, as the equity risk premium slowly falls towards its long-run mean. The real foreign exchange value of the dollar is assumed to depreciate at an annual rate of 2½ percent, while the price of West Texas intermediate crude oil is expected to remain around its current level of $124 per barrel over the projection period. In the forecast, falling home prices, the increase in oil prices over the past several quarters, and financial stress continue to restrain economic activity in the medium term. All told, real GDP is projected to expand at about a ½ percent annual rate over the second half of the year and to pick up to 2¼ percent next year, a bit below the staff's estimate of the growth rate of potential output. The unemployment rate is projected to be somewhat higher than in the previous forecast, owing in part to the temporary effects of the recent extension of unemployment benefits, which are assumed to induce some unemployed individuals to extend their job search. Because the development is assumed to lead to a commensurate temporary increase in the NAIRU, staff anticipates that it will have no significant effect on inflation. With the price of oil remaining near its current level, total PCE inflation is projected to slow from over 3½ percent over the second half of 2008 to about 2¼ percent in 2009. The projection for 2009 is ¼ percentage point higher than in the June Greenbook,

partially reflecting an upward revision to expected food prices. The staff forecast for core PCE inflation steps down from about 2½ percent over the second half of this year to 2¼ percent next year as import prices flatten out, energy cost pass-through effects diminish, and economic slack reduces price pressures.

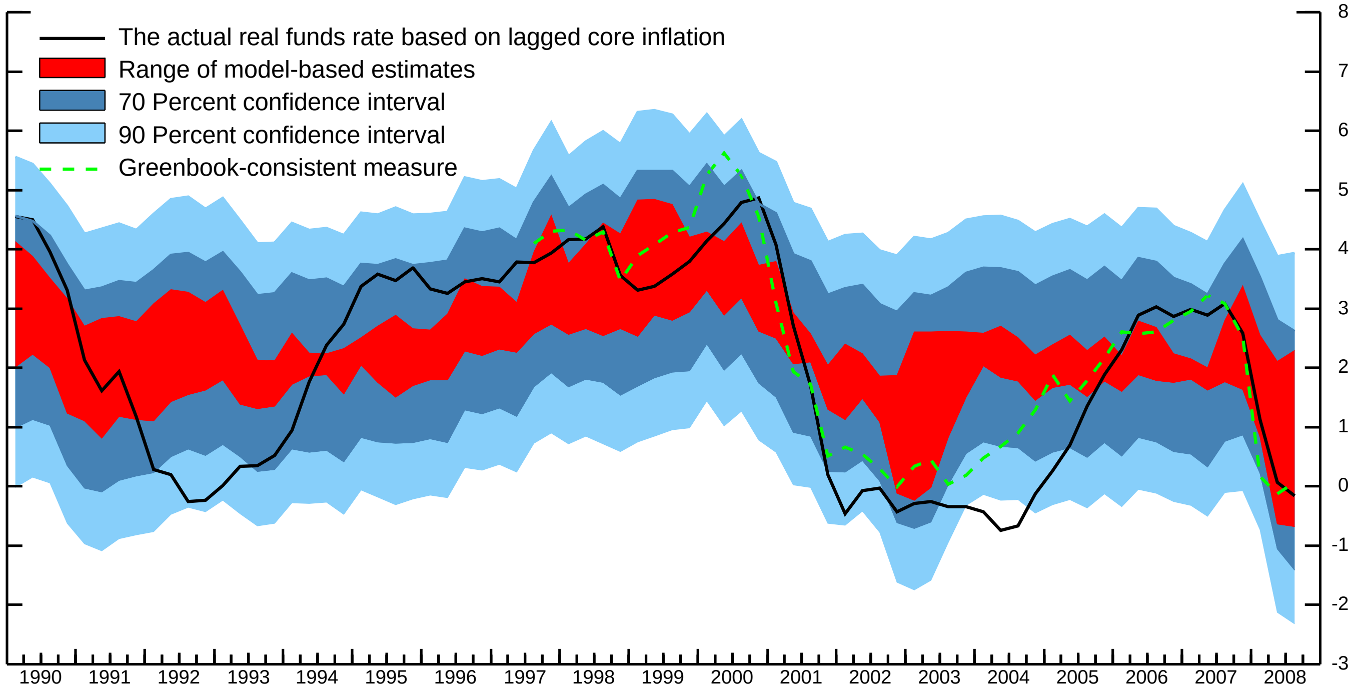
(22) The staff forecast has been extended beyond 2009 using the FRB/US model with adjustments to ensure consistency with the staff's assessment of longer-run trends. The extended forecast embeds several key assumptions: Monetary policy aims to stabilize PCE inflation in the long run at a level of 1¾ percent; trend multifactor productivity grows a bit above 1 percent per year; after 2009, the real value of the dollar depreciates at about 1¼ percent per year; fiscal policy is essentially neutral; and energy prices remain roughly constant, but at a lower level than in the June projection. As with the near-term outlook, the extended projection is largely unchanged from the June forecast. Real GDP increases about 3 percent per year from 2010 through 2012, about ½ percentage point above the growth rate of potential. The unemployment rate declines to about 4¾ percent only at the end of the projection period, to a level about in line with the staff's view of the NAIRU after the temporary effects of the extended unemployment compensation have ceased. Given the persistence of slack over most of the period, PCE inflation declines to 1¾ percent by 2011.

Update on Monetary Policy Strategies

(23) As shown in Chart 6, estimates of the equilibrium real federal funds rate are changed from those presented in the June Bluebook. The Greenbook-consistent estimate of short-run r^* is 0.1 percent, only slightly higher than in June, as the real effects of a higher starting level of output and lower oil prices are judged to have been largely offset by more restrictive financial conditions. This measure of r^* is fairly close to the actual real federal funds rate, which is currently -0.2 percent when

Chart 6
Equilibrium Real Federal Funds Rate

Short-Run Estimates with Confidence Intervals



Short-Run and Medium-Run Measures

	Current Estimate	*Previous Bluebook*
Short-Run Measures		
Single-equation model	2.3	*2.2*
Small structural model	-0.7	*-0.6*
Large model (FRB/US)	-0.1	*0.4*
Confidence intervals for three model-based estimates		
70 percent confidence interval	-1.4 - 2.6	
90 percent confidence interval	-2.3 - 3.9	
Greenbook-consistent measure	0.1	*-0.1*
Medium-Run Measures		
Single-equation model	2.2	*2.2*
Small structural model	1.7	*1.8*
Confidence intervals for two model-based estimates		
70 percent confidence interval	1.1 - 3.0	
90 percent confidence interval	0.5 - 3.7	
TIPS-based factor model	2.0	*2.0*
Measures of Actual Real Federal Funds Rate		
Based on lagged core inflation	-0.2	*-0.2*
Based on lagged headline inflation	-1.3	*-1.3*
Based on Greenbook projection of headline inflation	-1.1	*-1.3*

Note: Appendix A provides background information regarding the construction of these measures and confidence intervals.

expected inflation is measured on the same basis used for the various *r** estimates—that is, by realized core PCE inflation over the past four quarters.[4] The FRB/US model-based estimate of short-run *r** has fallen 50 basis points, to -0.1 percent. However, this revision mainly reflects a modification in the model's structure that has altered its assessment of the strength of aggregate demand, not the model's interpretation of the news received since late June. Estimates of short-run *r** from the small structural model and the single-equation model are little changed from the last Bluebook.

(24) Chart 7 depicts optimal control simulations of the FRB/US model using the long-run Greenbook forecast beyond 2009. In these simulations, policymakers place equal weight on keeping core PCE inflation close to a specified goal, on keeping unemployment close to the NAIRU, and on avoiding changes in the nominal federal funds rate.[5] For an inflation goal of 1½ percent (the left-hand set of charts), the

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[4] As shown in the lower panel of the table, alternative measures of the real funds rate that use headline inflation rather than core inflation are about unchanged relative to the previous Bluebook. Care should be taken in comparing these alternative measures of the actual real federal funds rate to the *r** values shown. Such a comparison would require that the same measure of expected inflation be used to calculate both rates and comparing the value of *r** to an average value of the real federal funds rate over 12 quarters (the period used in the calculation of the *r** measures). Using lagged core inflation as a proxy for inflation expectations, as has generally been the case in the Bluebook, and the staff assumption for the path of policy, the Greebook-consistent *r** is 0.1 percent and the average value for the real funds rate over the next twelve quarters is 0.5 percent. In contrast, if one uses lagged headline inflation to approximate expected inflation, the Greenbook-consistent rate is -0.4 percent and the average real funds rate over the next twelve quarters is 0.1 percent. Finally, if projected headline inflation is used as a proxy for inflation expectations, the Greenbook-consistent *r** is 0.3 percent and the average real funds rate over the next twelve quarters is 0.7 percent. Note that in all three cases the difference between the Greenbook-consistent *r** and the average real funds rate on the same basis is about ½ percentage point.

[5] Consistent with the staff assumptions in the Greenbook, the effective value of the NAIRU used in the loss function is boosted 20 basis points over the second half of 2008 and in 2009 to control for the temporary effects of increased extended unemployment insurance benefits. In these projections, policymakers and participants in financial markets are assumed to understand fully the forces shaping the economic outlook (as summarized by the

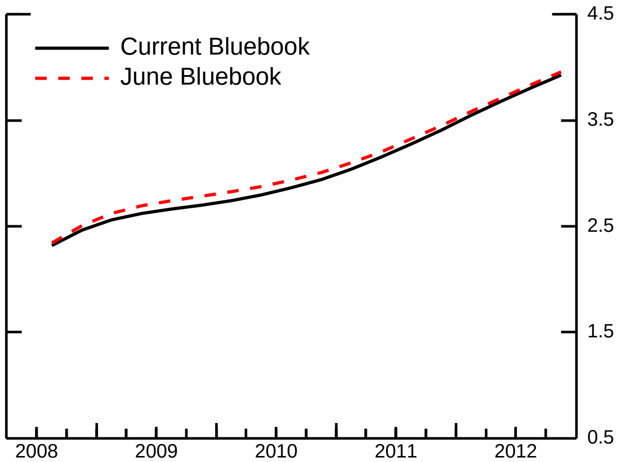
Chart 7

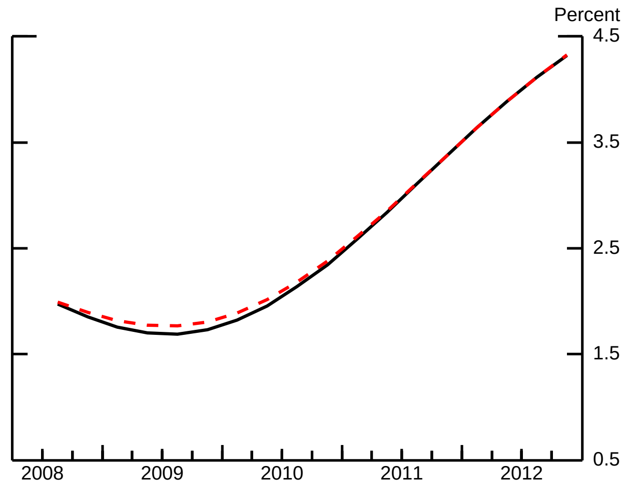
Optimal Policy Under Alternative Inflation Goals

1½ Percent Inflation Goal

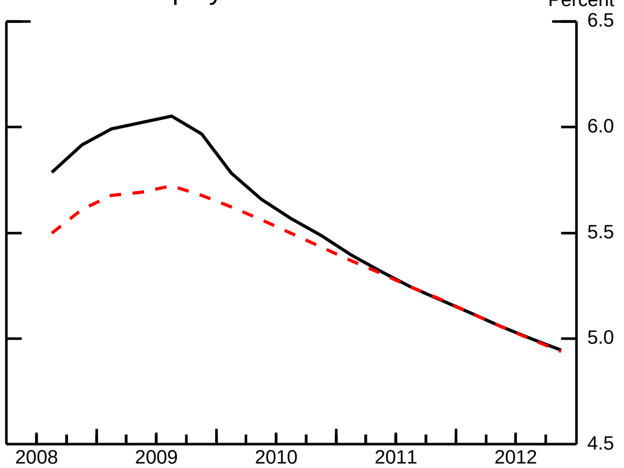
2 Percent Inflation Goal

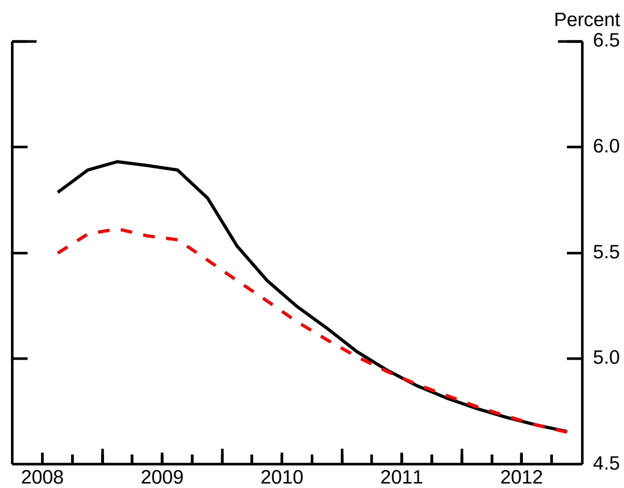
Federal funds rate



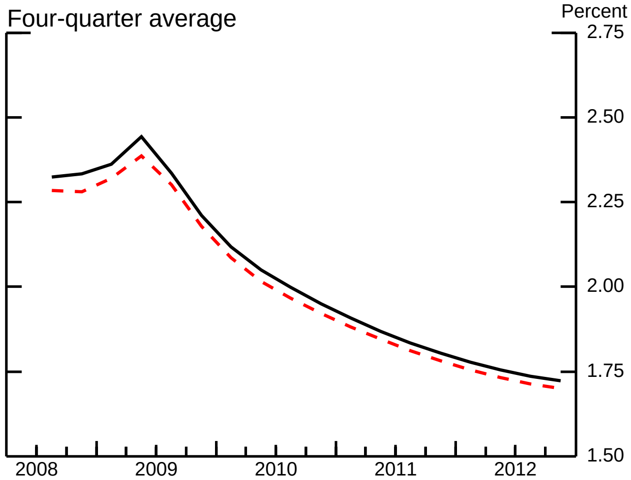


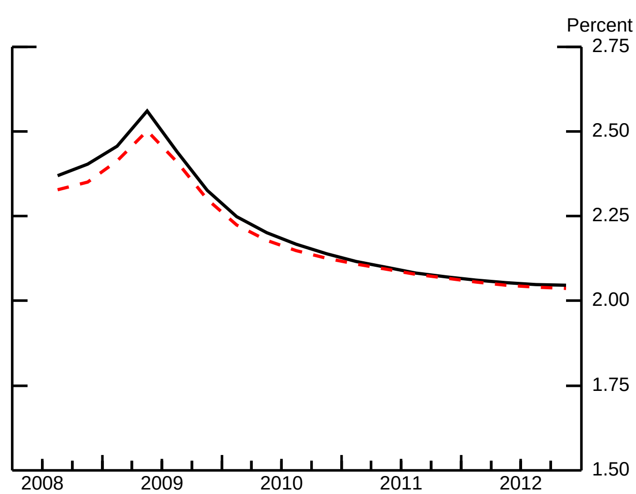
Civilian unemployment rate





Core PCE inflation
Four-quarter average





optimal funds rate climbs from just above 2¼ percent to about 4 percent by the end of 2012. With an inflation goal of 2 percent (the right-hand set of charts), the funds rate remains close to its current value through mid 2010 and then rises to about 4½ percent. In both cases, these prescriptions are essentially the same as in the June Bluebook because the projected trajectories of core PCE inflation and resource utilization have changed little, once allowance is made for the temporary effects of increased unemployment insurance benefits on the effective value of the NAIRU.

(25) As depicted in Chart 8, the outcome-based monetary policy rule prescribes a funds rate path nearly identical to that in the previous Bluebook; the federal funds rate remains near 2 percent through the fourth quarter of this year, rises gradually to 3¼ percent by the fourth quarter of 2009, and then stays between 3½ and 3¾ percent through the end of 2012. Stochastic simulations of the FRB/US model indicate a 70 percent probability that the prescriptions of the outcome-based rule will fall in the range of 2 to 4½ percent at the end of 2009. Financial market quotes imply that the funds rate will remain at 2 percent in the current quarter but rise steadily from around 3 percent at the end of 2009 to around 4¼ percent by the end of 2012. This path is between 25 and 70 basis points lower than at the time of the previous Bluebook. The confidence intervals implied by interest rate caps indicate a decreased probability of tightening between now and 2012, and the probability distribution remains skewed to the downside. Reflecting spending data for the second quarter that were stronger than anticipated, the prescriptions from the two Taylor rules are a notch higher than those shown in the previous Bluebook. Those from the first difference rule are essentially the same for the third quarter but slightly lower for the fourth quarter.

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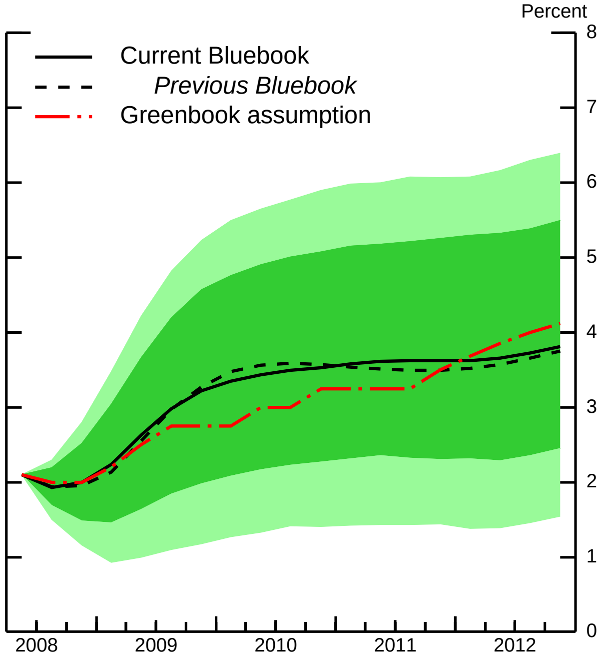
extended Greenbook projection), whereas households and firms are assumed to form their expectations using more limited information.

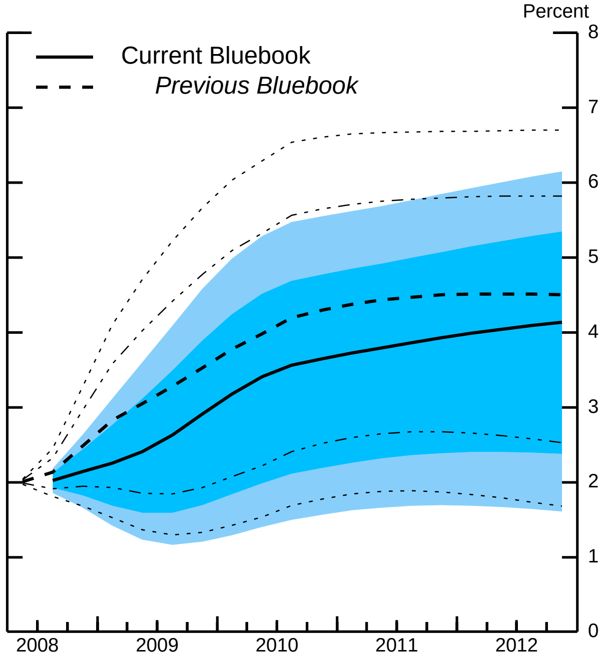
Chart 8

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. In the right hand panel, the thin dotted lines represent the confidence intervals shown in the previous Bluebook.

Near-Term Prescriptions of Simple Policy Rules

	1½ Percent Inflation Objective		2 Percent Inflation Objective	
	2008Q3	2008Q4	2008Q3	2008Q4
Taylor (1993) rule	**4.4**	**4.2**	**4.1**	**3.9**
Previous Bluebook	*4.2*	*4.0*	*4.0*	*3.8*
Taylor (1999) rule	**4.0**	**3.5**	**3.8**	**3.3**
Previous Bluebook	*3.8*	*3.3*	*3.6*	*3.1*
First-difference rule	**1.9**	**2.0**	**1.7**	**1.5**
Previous Bluebook	*2.0*	*2.1*	*1.7*	*1.6*

Memo

	2008Q3	2008Q4
Estimated outcome-based rule	1.9	2.1
Estimated forecast-based rule	1.8	1.9
Greenbook assumption	2.0	2.0
Fed funds futures	2.0	2.1
Median expectation of primary dealers	2.0	2.0

Note: Appendix B provides background information regarding the specification of each rule and the methodology used in constructing confidence intervals and near-term prescriptions.

Short-Run Policy Alternatives

(26) This Bluebook presents two alternatives for the Committee's consideration, summarized by the draft statements in Table 1. Under Alternative B, the target federal funds rate would be maintained at 2 percent at this meeting, while Alternative C involves a 25 basis point tightening to 2¼ percent. The statements for both alternatives note that inflation has been high. Alternative B leaves the stance of policy unchanged, but the statement places somewhat greater emphasis on inflation risks than the Committee's statement in June. Alternative C, after noting the possibility that inflation may not moderate as the Committee anticipates, states that the policy action was intended to better balance the risks to its goals.

(27) If the Committee views the staff forecast, which is conditioned on an unchanged target federal funds rate through the end of the year, as reasonable and sees the outcome as acceptable in the circumstances, it may wish to leave the policy rate unchanged at this meeting, as in **Alternative B.** The Committee, like the staff, may expect financial conditions and the sharp contraction in the housing market to exert considerable restraint on aggregate spending over the next year or so, and thus may view a relatively low real federal funds rate as necessary to promote moderate economic growth. At the same time, the resilience to date in consumer spending may provide some assurance to policy makers that overall economic activity, though sluggish, is continuing to expand and is likely to accelerate gradually in coming quarters as the contraction in the housing sector begins to fade and financial market conditions begin to improve. The actual real federal funds rate based on lagged four-quarter core PCE inflation is roughly in line with its Greenbook-consistent equilibrium value (Chart 6), a setting consistent with output moving back toward potential over the next few years. Of course, headline inflation has been elevated, and is likely to jump this quarter, reflecting the earlier surge in crude oil prices. But, with oil prices having stepped back down in recent weeks and with economic slack likely to

Table 1: Alternative Language for the August 2008 FOMC Announcement

	June FOMC	Alternative B	Alternative C
Policy Decision	1. The Federal Open Market Committee decided today to keep its target for the federal funds rate at 2 percent.	The Federal Open Market Committee decided today to keep its target for the federal funds rate at 2 percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate 25 basis points to 2¼ percent.
Rationale	2. Recent information indicates that overall economic activity continues to expand, partly reflecting some firming in household spending. However, labor markets have softened further and financial markets remain under considerable stress. Tight credit conditions, the ongoing housing contraction, and the rise in energy prices are likely to weigh on economic growth over the next few quarters.	Overall economic activity continues to expand, partly reflecting growth in consumer spending and exports. However, labor markets have softened further and financial markets remain under considerable stress. Tight credit conditions, the ongoing housing contraction, and elevated energy prices are likely to weigh on economic growth over the next few quarters. Over time, the substantial easing of monetary policy, combined with ongoing measures to foster market liquidity, should help to promote moderate economic growth.	Overall economic activity continues to expand, partly reflecting growth in consumer spending and exports. However, labor markets have softened further and financial markets remain under considerable stress. Tight credit conditions, the ongoing housing contraction, and elevated energy prices are likely to weigh on economic growth over the next few quarters. Nevertheless, the accommodative stance of monetary policy, combined with ongoing measures to foster market liquidity, should help to promote moderate economic growth.
	3. The Committee expects inflation to moderate later this year and next year. However, in light of the continued increases in the prices of energy and some other commodities and the elevated state of some indicators of inflation expectations, uncertainty about the inflation outlook remains high.	Inflation has been high, spurred by the earlier increases in the prices of energy and some other commodities, and some indicators of inflation expectations have been elevated. The Committee expects inflation to moderate later this year and next year, but uncertainty about the inflation outlook remains high.	Inflation has been high, spurred by the earlier increases in the prices of energy and some other commodities, and some indicators of inflation expectations have been elevated. Although the Committee expects inflation to moderate later this year and next year, the possibility that inflation may fail to decline as anticipated is of significant concern.
Assessment of Risk	4. The substantial easing of monetary policy to date, combined with ongoing measures to foster market liquidity, should help to promote moderate growth over time. Although downside risks to growth remain, they appear to have diminished somewhat, and the upside risks to inflation and inflation expectations have increased. The Committee will continue to monitor economic and financial developments and will act as needed to promote sustainable economic growth and price stability.	Although downside risks to growth remain, the upside risks to inflation are also of significant concern to the Committee. The Committee will continue to monitor economic and financial developments and will act as needed to promote sustainable economic growth and price stability.	The Committee took this action to better balance the upside risks to inflation and the downside risks to growth. The Committee will continue to monitor economic and financial developments and will act as needed to promote sustainable economic growth and price stability.

increase in coming months, the Committee may anticipate that inflation pressures will moderate later this year and through next year. With such an outlook, the Committee may judge that holding the funds rate constant at this meeting is appropriate given its dual objectives. Indeed, the optimal-control simulation with an inflation goal of 2 percent, shown in Chart 7, prescribes a target funds rate that remains at roughly its current level through the end of 2009 before beginning to firm thereafter. The Committee may also see risk considerations as arguing for an unchanged stance of policy at this meeting. Surely, the downside risks to growth remain significant: Consumer spending could weaken substantially, given the low level of consumer confidence, the weakening labor market, and diminishing credit availability; fiscal policy may provide less impetus than currently anticipated; and financial markets remain under considerable stress and may impose more restraint on growth than currently anticipated. At the same time, the persistent tendency of energy prices to increase in recent years—and importantly, the resulting upward pressure on inflation and inflation expectations—may cause the Committee to feel that the upside risks to inflation are also substantial. Overall, the Committee may still see considerable uncertainty about the outlook for both growth and inflation. In these circumstances, the Committee may wish to leave the target funds rate unchanged and await further economic and financial information before adjusting the stance of policy.

(28) In the statement under Alternative B, most of the discussion of the outlook for growth is little changed from June. The statement notes that economic activity has continued to expand, "partly reflecting growth in consumer spending and exports." This characterization has been changed from "some firming in household spending" because consumer spending slowed a bit in the second quarter and increases in exports have been contributing significantly to output growth and are expected to continue to do so. The statement again notes that "labor markets have softened further and financial markets remain under considerable stress." The

language refers to "elevated energy prices" instead of "the rise in energy prices" because oil and natural gas prices have moved down, on net, since the last meeting, but remain high. The statement under Alternative B would differ from the one in June by moving the sentence stating that past policy easing and Federal Reserve liquidity facilities should "promote moderate economic growth" from the assessment of risks paragraph to the economic rationale paragraph. In so doing, the factors that explain the outlook for economic activity are consolidated in the same paragraph, making the treatment parallel to that of the outlook for inflation. The rationale section makes the frank observation that "inflation has been high," and attributes this situation to the previous increases in energy and other commodity prices. While the statement continues to note that the Committee expects inflation to moderate through time, it also indicates that "uncertainty about the inflation outlook remains high." The assessment goes on to state that "although downside risks to growth remain, the upside risks to inflation are also of significant concern to the Committee." Although it does not explicitly make a judgment as to the relative weight of these risks, on the whole the statement gives a bit more emphasis to the upside risks to inflation than the June statement. The statement uses the same language as in June to note that the Committee will monitor developments and will "act as needed" to achieve its dual objectives.

(29) Futures and options quotes suggest that investors do not expect any change in policy until the end of this year. Moreover, market participants have taken particular note of monetary policy communications over the intermeeting period that seemed to stress the significant downside risks to economic growth, and most respondents to the Desk's survey do not expect the statement to suggest increased inflation concerns. As a result, the language envisioned under Alternative B might lead investors to conclude that policy tightening may commence sooner than currently thought. Short-term interest rates would probably increase a bit following such an

announcement. Longer-term interest rates would likely also move higher, but inflation compensation might tick down if investors surmised that policymakers were a little less tolerant of inflation than currently perceived. Equity prices would probably decline some, while the exchange value of the dollar might increase.

(30) If the Committee sees the economy as growing more robustly than the staff does and has fairly high confidence in the resilience of financial markets, it may prefer to tighten policy by 25 basis points at this meeting as in **Alternative C.** Members may view the current stance of policy as too accommodative, providing substantial impetus to aggregate demand at a time when the economy apparently retains an unexpected degree of momentum and when inflation expectations may be less tightly moored than previously. If the Committee is more upbeat about the underlying strength of the economy than the staff, along the lines of the "Resilient spending" Greenbook alternative scenario, members may believe that the time is right to reduce the current degree of policy accommodation so as to foster the desired moderation in inflation. Although financial market conditions remain strained, and downside risks to growth persist, members may see those risks as having diminished considerably over recent months and believe that some of the policy accommodation that served as insurance against an extremely adverse outcome for economic growth should be removed. This view may be strengthened by the expectation that the various measures that the Federal Reserve has put in place to bolster market liquidity, including the new steps announced on July 30, will help to mitigate the risk that policy tightening could have an outsized impact on financial market functioning. Moreover, high readings on inflation have persisted for some time and could be causing inflation expectations to move higher, as illustrated in the Greenbook's "Inflation spiral" scenario. Finally, members may wish to bring inflation down more rapidly than in the Greenbook projection and thus wish to begin tightening policy at this meeting, perhaps along the lines of the optimal control simulation with an inflation target of 1½ percent.

(31) The discussion of economic activity in the statement proposed in Alternative C is similar to that in Alternative B. This cautious view of the prospects for economic growth might suggest to markets that adoption of this alternative did not necessarily represent the beginning of an aggressive policy tightening episode. However, unlike Alternative B, Alternative C cites the "accommodative stance of monetary policy" rather than just the past policy easings as a factor that should support growth in the future. The inflation paragraph in Alternative C, like that in Alternative B, notes that "inflation has been high." The statement goes on to emphasize that "the possibility that inflation may fail to decline as anticipated is of significant concern" to the Committee and then notes that the policy firming at this meeting was intended to "better balance" the risks to growth and inflation. This language does not claim that the risks after the move would be completely balanced, thus leaving the door open to subsequent policy firming, but the statement does not suggest that such firming would necessarily be imminent.

(32) Investors marked down their expected policy path over the intermeeting period and now place very low odds on a rate hike at this meeting, or indeed before the end of the year. Accordingly, they would be quite surprised by the adoption of Alternative C. The expected trajectory for the federal funds rate would be marked up, perhaps substantially. Short-term rates would rise accordingly, as the new, higher path for policy was built into asset prices. Longer-term rates would probably increase as well, but inflation compensation would likely decline a bit, as investors concluded that the Committee was taking a more aggressive stance toward inflation. Equity prices would fall on the news, while the exchange value of the dollar would probably appreciate. If market participants interpreted this action as implying that policy would be tightened fairly rapidly in the near term, strains in financial markets could worsen, and perhaps significantly so if a tighter path for policy was seen as likely to depress house prices further or more rapidly than currently expected. In response to the

emphasis given to inflation developments in the statement, investors might respond more sharply to incoming news bearing directly on consumer prices over subsequent weeks.

Money and Debt Forecasts

(33) Under the Greenbook forecast, M2 is projected to expand 6¼ percent this year, up ½ percentage point from the June forecast. That shift reflects an upward revision to the staff's outlook for nominal GDP growth for the year and a downward revision to the opportunity cost of holding money, given the recent drop in market interest rates. M2 is projected to expand 4¼ percent in 2009, the same as in the June forecast but more slowly than nominal GDP, as the opportunity cost of holding M2 assets is projected to begin rising in the third quarter of this year.

(34) Growth of domestic nonfinancial sector debt is projected to slow to 4¾ percent in 2008 and to just under 4½ percent in 2009, down significantly from the rapid 8¼ percent advance posted last year. Household borrowing is forecast to decelerate, reflecting falling house prices and tighter lending standards and terms on consumer loans. Business borrowing is projected to slow as a result of diminished net equity retirements, relatively high corporate bond spreads, and tight bank lending standards. In contrast, federal government debt is expected to accelerate this year and next as a variety of factors, including the fiscal stimulus payments and slower growth in tax receipts, contribute to wider federal deficits.

Table 2
Alternative Growth Rates for M2
(percent, annual rate)

		25 bp Easing	No Change	25 bp Tightening	Greenbook Forecast*
Monthly Growth Rates					
	Jan-08	8.0	8.0	8.0	8.0
	Feb-08	17.0	17.0	17.0	17.0
	Mar-08	12.4	12.4	12.4	12.4
	Apr-08	2.4	2.4	2.4	2.4
	May-08	1.3	1.3	1.3	1.3
	Jun-08	-0.2	-0.2	-0.2	-0.2
	Jul-08	7.5	7.5	7.5	7.5
	Aug-08	7.1	6.9	6.7	6.9
	Sep-08	5.8	5.2	4.6	5.2
	Oct-08	5.6	4.8	4.0	4.8
	Nov-08	5.3	4.5	3.8	4.5
	Dec-08	5.0	4.4	3.8	4.4
Quarterly Growth Rates					
	2007 Q4	4.8	4.8	4.8	4.8
	2008 Q1	9.5	9.5	9.5	9.5
	2008 Q2	5.7	5.7	5.7	5.7
	2008 Q3	4.8	4.7	4.6	4.7
	2008 Q4	5.7	5.0	4.4	5.0
Annual Growth Rates					
	2007	5.8	5.8	5.8	5.8
	2008	6.6	6.4	6.2	6.4
	2009	5.5	5.3	5.1	4.2
Growth From	To				
Aug-08	Dec-08	5.5	4.8	4.1	4.8
2008 Q2	Dec-08	5.3	4.9	4.4	4.9

* This forecast is consistent with nominal GDP and interest rates in the Greenbook forecast.

Directive and Balance of Risks Statement

(35) Draft language for the directive is provided below.

Directive Wording

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 in the immediate future seeks conditions in reserve markets consistent with maintaining/INCREASING/REDUCING the federal funds rate at/TO an average of around ________ ~~2~~ percent.

Appendix A: Measures of the Equilibrium Real Rate

The equilibrium real rate—i.e., the nominal rate adjusted for expected inflation—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. Both concepts of the equilibrium real rate approximate expected inflation using trailing four-quarter core PCE inflation. The TIPS-based factor model measure provides an estimate of market expectations for the real federal funds rate seven years ahead.

In calculating the actual real funds rate, the nominal rate is measured as the quarterly average of the observed federal funds rate. Expected inflation is approximated in three ways: using four-quarter lagged core inflation, as was done to define the equilibrium real rate; using lagged four-quarter headline PCE inflation; and using projected four-quarter headline PCE inflation beginning with the next quarter.

For the current quarter, the nominal rate is specified as the target federal funds rate on the Bluebook publication date. Moreover, if the upcoming FOMC meeting falls early in the quarter, the lagged inflation measure ends in the last quarter and the projected inflation measure starts in the current quarter.

Confidence intervals reflect uncertainties about model specification, coefficients, and the level of potential output. The final column of the table indicates the values published in the previous Bluebook.

Measure	Description
Single-equation Model	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.
Small Structural Model	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.
Large Model (FRB/US)	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.
Greenbook-consistent	The FRB/US model is used in conjunction with an extended version of the Greenbook forecast to derive a Greenbook-consistent measure. FRB/US is first add-factored so that its simulation matches the extended Greenbook forecast, and then a second simulation is run off this baseline to determine the value of the real federal funds rate that closes the output gap.
TIPS-based Factor Model	Yields on TIPS (Treasury Inflation-Protected Securities) reflect investors' expectations of the future path of real interest rates, but also include term and liquidity premiums. 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. Because TIPS indexation is based on the total CPI, this measure is also adjusted for the medium-term difference—projected at 40 basis points—between total CPI inflation and core PCE inflation.

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 (π_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 π^* 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 r^* or the level of the output gap; see Orphanides (2003).

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

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 1986-2005.

Information from Financial Markets: The expected funds rate path is based on forward rate agreements, 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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