

**FRBNY BLACKBOOK**  
**December 2008**

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**  
**December 2008**

**CONFIDENTIAL(FR) Class II FOMC**

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## 1. Policy Recommendation and Rationale

Our policy recommendation is to reduce the federal funds target (FFR) to 0.25% at the December FOMC meeting. We do not believe that this cut is sufficient, however, to stem the tide. We recommend that the committee incorporate forward-looking language into its statement committing to keeping the interest rate at this low level for some time. The language we advocate is that the committee “expects to keep the interest rate low at least until conditions in financial markets improve significantly and output and prices show a clear sign of recovery.” Such a commitment about the future path of policy will provide additional monetary stimulus that is clearly needed. We also believe that it may stabilize inflation expectations going forward, helping to stave off an unwelcome fall of prices into deflationary territory.

We forecast that inflation peaked in 2008Q3 and will moderate in 2009 with some probability of a few deflationary readings. Our stance on policy should be interpreted in this light. Recent data have shown headline inflation moving into negative territory, largely driven by a collapse in commodity prices. Several measures of near-term inflation expectations are rapidly moving into negative territory. This raises the specter of real interest rates rising at the same time as the economy deteriorates, thus making the monetary stance more contractionary. If these forces play off each other, it could lead to a deflationary spiral. This danger is real and our proposed forward-looking language reflects this concern.

We currently forecast four consecutive quarters of negative growth and project the unemployment rate to peak at 9.2 percent in 2010. Our baseline forecast is thus projecting one of the worst recessions in the post-war period, with considerable uncertainty and tail risks.

In our scenario analysis we have added a scenario called *Global Deflation*. This scenario portrays the gloomy possibility that the US and the rest of the world will be mired in a long-lasting liquidity trap, associated with negative output growth and a fall in prices. We give this scenario relatively low weight, about 4 percent. The most likely scenario in our

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analysis is still the *Global Credit Crunch*, with a probability over 40 percent. The recession is still quite deep in this scenario, but the economy recovers much faster than under the *Global Deflation* scenario.

We outline below three ways the Federal Reserve can fight the recession and guard against tail events:

- Liquidity and credit policies should be expanded in size and scope as conditions warrant.
- Forward-looking communication about the future path of interest rates should be used to manage inflation expectations.
- The Federal Reserve, through a variety of actions, should support the credibility of the commitment to low short-term nominal interest rate and a recovery in prices and output.

The FOMC should set clear goals in terms of price level growth and communicate its commitment to keep the FFR target at or below 0.25% until that target is achieved. An example of such policy would be to announce that the fed funds rate would be kept at or below 0.25% at least until year-over-year core inflation is above 2% for two consecutive quarters.

The Committee should also be ready to discuss concrete actions it can take, in the event that its communication strategy is not deemed credible, both in term of the future evolution of the short term interest rate and its projection of output and prices.

The Committee has several options to address this. Credit policies initiated by the Federal Reserve could be framed not only as targeting malfunction in individual markets, but also as helping to achieve a recovery in output and prices. This link to the interest rate commitment should be clear, in that these credit actions would effectively entail flooding the market with unsterilized liquidity.

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There has been much discussion of targeting rates on long-term debt. We support actions that directly affect long-term rates relevant for consumer and business borrowing such as the purchase of agency debt and agency MBS. However, we recommend the purchase of long-term government debt only insofar as Treasury yields are too high relative to the level implied by the commitment to very low short rates. Intervening in this market is another example of actions the Fed can take to reconfirm its commitment to low interest rates.

Monetizing the budget deficit is an option if these policies fail to revitalize prices and output. In practice, this could be done by committing, in agreement with the Treasury, to buy new Treasury issues at 0% interest until year-over-year core inflation exceeds 2% for two consecutive quarters or some other state-contingent commitment that could be easily monitored by both the Treasury and the Federal Reserve.

## 2. Significant Developments

### 2.1 Economic Developments

The strain in financial markets and the broad slowdown in the global economy contributed to further deterioration in the economy over the inter-meeting period. The decline in energy prices and the significant contraction in global demand led to moderation in inflation and the emergence of some risk of deflation.

**Inflation.** September and October PCE inflation data were released since the last FOMC. The PCE index was down a record 0.6% in October, while the core index was unchanged. The 12-month increase in the core index was 2.1%, down from 2.4% in September.

Survey measures of inflation expectations continued to decline. The Reuter/Michigan median near-term (1-year) inflation expectations in November fell by a full percentage point from October and now stand at 2.9%, the lowest anticipated inflation rate in nearly

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two years. Inflation expectations remain unchanged (2.9%) at the longer end. Reading inflation expectations from financial data has been challenging in this period. Most indicators, such as inflation expectations derived from TIPS or swaps, suggest that the market is expecting some deflation over the next 1-2 years. Turmoil in the financial market, however, means that it has been exceedingly difficult to determine the reliability of those signals.

**Real activity.** The economy is deteriorating at a fast pace. GDP declined 0.5% in Q3, reflecting a substantial retrenching of consumers' spending and a decline in production. Incoming data point to a much sharper decline in Q4.

Real PCE fell 0.5% in October, marking the fifth straight monthly decline in consumer spending. The last time that happened was September 1990-January 1991, a prior episode where consumer retrenchment appeared to play a primary role in overall economic weakness. The most noteworthy drops were in purchases of motor vehicles and other durable goods. We now expect consumer spending to decline by at least 4% in Q4.

The housing market deteriorated from August through October. For example, sales of new single-family homes averaged just over 500,000 units (seasonally-adjusted annual rate) from May through July, but then fell a cumulative 13% over the next three months. Single-family housing starts have declined even more; the October level was down 21% from the Q2 average.

Home prices have behaved in a similar manner. Monthly declines of the Case-Shiller 20 city composite home price index abated in Q2 but re-intensified in Q3. These developments suggest a further tightening of underwriting standards as well as increased aversion to risk taking.

Industrial activity is faltering. The November ISM manufacturing index registered its lowest reading since 1982. Production rose slightly in October but only because of a

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rebound after the September hurricane disruptions. Excluding this factor, production fell substantially.

**Labor market.** The labor market deterioration has accelerated with indicators in the October and November employment reports consistent with an ongoing deep recession. Payroll employment fell by 320,000 in October and 533,000 in November for a combined loss of 853,000 jobs in the intermeeting period—not quite a record (the losses were a touch higher in late 1974 and early 1975) but close. The diffusion index—roughly, the fraction of private industries expanding employment—stood at 27.6 in November, down about 8 points from September. Additionally, in the first week of December, initial claims jumped to 573,000 and continuing claims rose to 4.43 million. These are the highest readings for both initial and continuing claims since 1982.

The unemployment rate rose to 6.7% in November from 6.5% in October and 6.1% in September. A significant drop of 0.3% in the labor force participation, from 66.1 to 65.8%, largely among adult males and teenagers, helped contain the increase in the unemployment rate, despite the large drop in payrolls. The employment-population ratio, which is a better indicator of the health of the labor market as it does not suffer from the unemployment/non-employment classification, was 61.4 in November, down from 62.0 in September. The last time the employment-population ratio was this low was in 1993, but at this time the female labor force participation rate was still trending up.

Employment declines were widespread across industries. The service-providing sector is now showing signs of significant job loss, having shed 523,000 jobs in September and October alone. This is the largest two-month decline in service-providing sector employment in the post-war period.

Aggregate hours worked fell a record 1% in November, after a fall of 0.3% in October, and average weekly hours declined to 33.5 hours. Average hourly earnings rose 0.4% in November bringing the year-to-year change to 3.7%. This implies that job losses have been disproportionately large in the lower-wage segment of the labor market. Indeed, the

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fraction of employed workers who do not have any college education declined from 38.0% in December 2007 to 37.0% in December 2008.

Initial claims jumped to 573,000 in the first week of December and continuing claims rose to 4.43 million. These are record highs for both initial and continuing claims since 1982.

The employment decline in the first eight months of the current recession has been very mild compared to comparable periods during previous recessions. The average monthly job loss was around 80,000 from January 2008 to August 2008. However, the decline in employment became considerably more severe in the last three months, accelerating to a monthly average of around 418,000 jobs lost. This rate of job loss is comparable to periods of previous recessions, such as May 1980-July 1980 (monthly average of 338,000) or December 1974-January 1975 (monthly average of 446,000). Relative to those periods, however, the sectoral composition of employment has changed significantly. During the recessions of the 70's and 80's a larger fraction of the workforce was employed in goods-producing industries, where temporary lay-offs and recalls caused sharp movements in employment. Currently a much bigger fraction of the labor force is employed in the service-providing sector where temporary lay-offs are less common. Consequently, we do not expect to see a sharp reversal of employment losses. Indeed, the low rates of job-openings and hiring suggest that the unemployment rate will continue to increase and stay high even after job losses moderate, most likely following a similar pattern to the 2001 recession.

**Trade.** The October trade data suggest that exports will be a drag on growth in the near-term. Export volumes fell by 0.8% in October and are only 0.7% above year-ago levels. Exports decreased in all major categories, with the largest declines in vehicles and consumer goods. Import volumes continued to fall, in line with the state of the economy, dropping 3.6% below year-ago levels. The largest falls were in vehicles and capital goods.



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The October data release caused a change in the outlook, with net exports no longer expected to contribute to GDP growth this quarter. Lower imports are expected to boost GDP in an accounting sense in 2008Q4, but almost all of that boost will be offset by lower exports.

**Foreign economies.** Foreign data from all major regions have been strikingly weak over the inter-meeting period. As expected, output fell in the euro area, the U.K., and Japan in Q3, the second quarter of negative growth for all three. Production data show deterioration over the course of Q3 and into October in the major foreign economies. November confidence readings were also very weak across the globe, with sharp declines in these measures in Europe, Canada, and China. Particularly alarming is the collapse seen in November export data for China, Korea, and Taiwan.

## 2.2 Financial Markets

**U.S. Markets.** Treasury yields plunged over the inter-meeting period. Credit conditions were mixed, with some improvement in areas of policy intervention but with many broader credit indices widening. Equity markets declined and market volatility remained unusually high.

The expected path of policy over the next two years has shifted down. Expectations are that the funds rate will remain between 30 and 50 basis points through the first half of 2009, rising to 1% by the first half of 2010 and 1.5% by late 2010. It should be noted that expectations below the current target rate do not necessarily indicate expectations of a target rate decrease because the effective fed funds rate has been well below target for some time.

Near-term policy rate uncertainty, as measured by implied interest rate volatility, declined, whereas longer-term measures were mixed. The decline in the shorter term measures presumably reflects expectations that the policy rate will remain low for some time.

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Treasury yields declined sharply across the curve to multi-decade lows. The 10-year note declined 110 basis points to 2.67%, the 2-year declined 66 basis points to 0.90%, and the 3-month yield declined 70 basis points to 0.06%.

Market-based measures of inflation expectations declined sharply, at both short and longer-terms, with some shorter-term measures suggesting near-term price declines. The Board's carry-adjusted 0-5 year measure declined 59 basis points to -1.41%. The 0-5 year measure from inflation swaps declined 79 basis points to 0.02%. The Board's 5-10 year measure declined 93 basis points, but its current level of 2.66% is within its longer-term range. The 5-10 year measure from inflation swaps is currently almost the same as the Board's 5-10 year measure after having changed little from the last FOMC meeting.

Credit conditions have improved in areas of policy intervention. Direct U.S. dollar lending to depository institutions through the Term Auction Facility (TAF) and by foreign central banks via swap line agreements has effectively brought one-month LIBOR/OIS spreads down 76 basis points since the last FOMC meeting to 153 basis points, and three-month spreads down 24 basis points to 162 basis points. These declines, along with limited demand for funding from the Fed's lending facilities, have brought the interbank funding stress index down.

The announcement that the Fed would buy agency debt and agency mortgage-backed securities led to an immediate narrowing of yields on those securities relative to Treasuries. Moreover, the introduction of the Commercial Paper Funding Facility (CPFF) effectively reversed a sharp decline in commercial paper outstanding. In contrast, the announcement of the Term Asset-Backed Securities Loan Facility (TALF) is not reported to have had any effect on ABS spreads.

Despite the improvements in select credit markets, several broader measures of credit conditions deteriorated, particularly for lower-quality securities. Corporate BB spreads widened 226 basis points to 1423 basis points and single A corporate spreads widened 6 basis points to 646 basis points.

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The deteriorating economic outlook caused equity indices to decline to multi-year lows. The S&P 500 and Wilshire indices have both declined about 9.5% since the last meeting, after having been down even more sharply. Volatility declined modestly, on net, since the last meeting, but rose to new highs between meetings and remains unusually high. The VIX, for example, closed at 67.6 on October 28, 80.9 on November 20, and 63.0 on December 2.

**Foreign Markets.** Global funding conditions remained fragile during the inter-meeting period, with some tentative signs of stabilization. The 3-month euro and sterling LIBOR-OIS spreads decreased by around 50 basis points over this period. Nonetheless, the levels of these LIBOR-OIS spreads remain elevated at 129 basis points and 176 basis points in the euro area and the U.K, respectively. The first ever joint unlimited 84-day dollar swap operation by the ECB, the Bank of England and the Swiss National Bank at a fixed rate of 1.6 percent on November 4 showed a continued high European demand for dollar funding. The Bank of Japan saw the need to intensify its liquidity injection operations aimed at alleviating funding pressures with a decision on October 31 to pay interest on excess reserves. It also announced on December 2 an expansion in the range of collateral it accepts in return for liquidity support.

The impact of the global financial crisis on banking sectors in the emerging world has intensified. This is particularly the case in emerging Asia, where unwinding carry trades are having their toll, and emerging Europe, where Western European banks have a large stake in the domestic bank sectors. By the end of October, the Federal Reserve established temporary dollar swap lines with Brazil, Mexico, South Korea and Singapore. So far, only Korea has engaged in a swap transaction. The IMF set up liquidity facilities to alleviate strained funding conditions in emerging markets. And towards the end of the period Korea also agreed on additional currency swap lines with China and Japan. On top of that monetary authorities in Hong Kong, Korea, India, Russia, Singapore and the UAE attempted to support their respective financial sectors through currency interventions, liquidity injections and relaxation of reserve requirements for local banks. Nonetheless, emerging market funding conditions continue to deteriorate as a number of

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emerging market economies saw their foreign exchange reserves dwindle and their dollar funding dry up. Their capacity to issue external debt is also diminishing.

Equity indices in Europe and Japan fell over the inter-meeting period in very volatile trading, due to negative growth prospects, the outlines of a significant fiscal stimulus package for the U.S. by president-elect Obama as well as the failed bail-out package for U.S. auto manufacturers. Financials continued to be hit hard over the period, with, e.g., Barclays down 22%, UBS down 17% and BNP Paribas down 19%. Emerging markets equities initially declined as a gloomy global economic outlook took its toll, but recovered substantially towards the end of the inter-meeting period.

Energy prices continued to decline over the inter-meeting period, with spot oil prices falling about 33%. As in previous periods, concerns about the depth of the global recession and its impact on global energy demand fed these declines.

Long-term interest rates decreased in the euro area, the U.K. and Japan, between 8 and 80 basis points. These declines were mainly driven by the decrease in energy prices as well as the impact of the recessions in these respective economies. In Asia, long term interest rates are declining due to slowing economic growth.

The U.S. dollar depreciated against the euro and the yen. In trade-weighted terms, the dollar weakened almost 2%. This reflects the expectation of further policy rate reductions towards 0 percent in the U.S. and a lower possibility of further European policy rate declines given the substantial easing that took place over the period. The strengthening of the yen reflects a large scale unwinding of carry trades by investors as risk aversion levels remain elevated. The dollar appreciated slightly against the Chinese yuan since the last FOMC meeting on account of worse-than-expected economic data releases, in particular Chinese exports. One-year forward rates now suggest a further moderate depreciation of the yuan against the dollar going forward.

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### 2.3 Global Economic Policy

During the inter-meeting period a number of central banks in Europe and Asia eased policy. Due to the sharp decline in energy prices over the period and the economic slowdown, consumer price inflation in Europe and Japan is on a downward trajectory. Real activity data releases in this period made it clear that the euro area and Japanese economies are officially in a recession, and the U.K. is virtually in one, serving as motivation for the move towards policy easing. In summary, these moves towards easing entailed the following steps:

- A policy rate cut of 20 basis points by the Policy Board of the Bank of Japan announced on October 31 – the first change in its policy rate since February 2007.
- An unprecedented accumulated rate cut of 250 basis points by the Bank of England during its policy meetings in November and December.
- The ECB simultaneously cut its policy rate by a total of 125 basis points.
- The Swiss National Bank lowered its target level for money market rates by a total of 200 basis points during three meetings in November and December.
- The Swedish Riksbank decided to slash its policy rate by a record 175 basis points at its emergency meeting on December 4.
- Finally, the Bank of Canada reduced its policy rate by 75 basis points to 1.5 percent on December 9.

Higher frequency activity data releases and confidence indicators suggest further deterioration in Europe and Japan, raising the probability of continued monetary easing. In the case of Japan, there is not much more room for large additional rate cuts given the low level of the policy rate, although the Bank of Japan could be forced to revert back to zero interest rates in early 2009. The move to pay interest on reserves held with the Bank of Japan, in combination with more intensified liquidity operations, could signal a switch to some kind of quantitative easing in Japan. European policy rates, on the other hand, are still relatively high compared to the U.S. and Japan. Therefore, markets expect further policy easing in the euro area and the U.K.

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Elsewhere, monetary policies also moved towards a substantial accommodative stance. The People's Bank of China aggressively cut its main policy rate on November 26 by 108 basis points, the largest rate cut since October 1997. Additionally, it announced large reductions in reserve requirements for banks. These measures suggest that the Chinese authorities are becoming anxious about growth prospects from slowing exports and a rapid deterioration of domestic real estate and labor markets. Other central banks, in particular in Australia, India, Korea, New Zealand, Taiwan and Turkey, lowered their respective policy rates. In general, we expect that the gloomy global economic outlook will induce most emerging world central banks to continue to pursue a policy of aggressive monetary easing in the near-term.

### 3. Evolution of Outlook and Risks

#### 3.1 Central Forecast

**Conditioning assumptions.** Virtually all indicators of final demand, production, and prices released since the October FOMC meeting have been weaker than expected. Thus, while we had been anticipating a downturn on the order of magnitude similar to the 1990-91 recession, our current modal forecast anticipates a "severe" recession, with four consecutive quarters of negative growth over which time real GDP falls a cumulative 2.25% and a trough to peak increase of the unemployment rate of about 4.5 percentage points. By these metrics, the projected recession is similar to that of 1973 to 1975. Although we judge this modal forecast to be the most likely near-term outcome, the risk that this recession turns out to be more severe than any in the post-WWII period is high.

In addition to the weaker growth prospects for the US, the foreign growth outlook for 2008 and 2009 has also been downgraded substantially. We now project that foreign growth will slow from 3.4% (Q4/Q4) in 2007 to -0.1% in 2008 (GDP-weighted), down from 0.8% in October, 1.6% in September, and 2.1% in August. The modal forecast for 2009 has been marked down to 0.5% from 1.3% in October and 2.5% in September. The developed economies are expected to follow a growth path similar to our own, while the emerging economies continue to grow at a rate below potential.

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With weaker growth of the global economy, the path of oil prices assumed in the modal forecast has been lowered once again. We expect the price of West Texas Intermediate grade oil to average \$50.50 per barrel in 2009Q1, \$26 lower than in October and \$80 barrel lower than in June. Consistent with futures quotes, we expect a modest rise in oil prices from current levels through the end of 2010, with the 2009Q4 average price at \$62 per barrel and the 2010Q4 average price at \$71. Our assumed path for oil prices is modestly higher than that of the Greenbook.

With sharply lower oil and other commodity prices, a considerably larger output gap, and a somewhat higher exchange value of the dollar, the path of both total and core inflation in the current modal forecast is notably lower than in October. Energy prices are likely to decline between 60% and 70% (annual rate) in 2008Q4 and another 30% to 40% in 2009Q1. Thus, the total PCE deflator is expected to decline at about a 4.5% annual rate in 2008Q4 while the core PCE deflator rises just 1.0%. Aggressive pricing in response to the weakness of final demand will keep downward pressure on prices over the first half of 2009, when we expect the core PCE deflator to rise just 0.75% (annual rate). In this environment, and particularly given the downside risk to growth, the risk of deflation is quite high.

On balance, these developments have resulted in a substantial decline in our assumed path for the FFR, with that rate declining to 0.25% in the very near future, remaining at that level through 2009Q4, and then reaching 1.0% by the end of 2010. [Exhibit B-2]. This additional easing of monetary policy combined with the assumption of a gradual healing of financial markets and additional fiscal stimulus combine to generate a recovery of growth in the second half of 2009.

As is our usual practice, our assumptions for equity prices, the real exchange value of the dollar, and home prices are similar to those of the Greenbook. Equity prices are assumed to increase 12% in both 2009 and 2010, driven primarily by a narrowing of risk spreads. The real exchange value of the dollar is assumed to gradually decline, but on a higher path than in the last cycle.

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In past Greenbooks, the Board has expressed its assumption regarding the projected path of home prices in terms of the Federal Housing Finance Administration (FHFA, formerly the OFHEO) purchase-only home price index. In the October Greenbook, the peak-to-trough decline of that index was assumed to be around 17% by the end of 2010. Now the Board staff is expressing their home price assumptions in terms of the Loan Performance Home Price Index. They regard this index as more representative in that it reflects homes sold with nonconforming mortgages as well as conforming mortgages. The peak-to-trough decline of this index is now assumed to be 32% (from late 2006 through the end of 2010) versus 36% in the October Greenbook. This modestly less severe decline is due to the lower path of long-term interest rates plus their fiscal policy assumptions.

While a large fiscal stimulus package is under active discussion and is very likely to be enacted early in 2009, the size and composition of such a package are unknown. For this reason, we have not changed our fiscal policy assumptions for this cycle. Our forecast incorporates, in general terms, the features of H.R. 7110 which has been approved by the House. It provides for about \$60 billion of budget authority for infrastructure, increased unemployment compensation and food stamps, and increased transfers to state government for Medicaid. The CBO anticipates that this bill would result in outlays of \$30 billion in 2009 and \$15 billion in 2010.

In contrast, the Board has incorporated a two-year \$500 billion fiscal stimulus package into their current forecast. This package consists of:

- A permanent reduction of income taxes costing \$230 billion over the first two years.
- \$155 billion of federal transfers to states, with \$115 billion targeted toward infrastructure investments.
- Extension of unemployment benefits and increase in food stamps which when combined increase federal transfers to household by \$55 billion over 2009 and 2010.
- A \$50 billion federal program to buy down mortgage interest rates for qualifying home purchased in 2009 by 1 percentage point.



- \$10 billion of additional federal outlays.

In addition, the Board staff assumes that \$50 billion of TARP funds will be used for mortgage loan modifications for homeowners at risk of default.

Comparing our forecast to the Greenbook forecast, the Greenbook's assumed fiscal package has three key effects. First, growth of real PCE is somewhat stronger over the forecast horizon while the path of the personal saving rate is significantly higher. Housing starts are somewhat high in 2010. Spending by state and local government is presumably higher than otherwise would be the case yet is still weaker than in our forecast.

We maintain our estimate of potential GDP growth at 2.7%, composed of 1.2% trend hours growth (although we assume this growth will begin to decline in 2009-2010) and 1.5% trend productivity growth (on a GDP basis, which is equivalent to 1.8% on a nonfarm business sector basis). As always, there is substantial uncertainty around our estimate of potential GDP growth. The Board staff has lowered their estimate of potential to 2.2% in 2009 (from 2.4%) and to 2.2% in 2010 (from 2.3%).

We expect the lower degree of inflation persistence evident since the early 1990s to continue. This assumption is in contrast to the greater degree of inflation persistence assumed in recent Board staff forecasts. In our central scenario, inflation expectations decline as overall inflation slows. This return of inflation expectations to the mandate-consistent range plays an important role in the gradual moderation of inflation toward the midpoint of the FOMC's objective for core PCE inflation of 1.5% to 2.0%. Finally, we expect the recent increase in term premia to persist.

**Inflation.** As mentioned above, energy prices have declined more than expected, recent readings of core inflation have been lower than expected, and the projected downturn of the economy is now expected to be longer and deeper. Combined, these factors produce a lower profile for both total and core inflation over the forecast horizon. From 3.5% (Q4/Q4) in 2007, we expect the total PCE inflation to slow to 2.1% in 2008 and around

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1.0% in 2009 before rising to around 1.75% in 2010. Similarly, core PCE deflator inflation slows from 2.2% in 2007 to 2.0% in 2008 and around 1.25% in 2009 before rising to between 1.50% and 1.75% in 2010. Of course, there is substantial uncertainty around this forecast with substantial risk of deflation. In our model of the inflation process, inflation expectations play a key role. It is not clear what is currently happening to inflation expectations or how they will behave in the very near term. Looking further out, we are assuming that monetary and fiscal policy and the associated communication strategy will be successful in anchoring inflation expectations near the mid-point of the FOMC's inflation objective.

**Real activity.** In this Blackbook we have substantially lowered the path for real output over the forecast horizon. We now expect a severe recession along the lines of that which occurred from late 1973 through early 1975. Nonetheless, the broad contours of the forecast have not changed. With credit more difficult to obtain and household net worth substantially lower, consumer spending retreats sharply in the second half of 2008 and then remains relatively sluggish through 2009 as households attempt to boost saving out of current cash flow. Declining residential investment continues to exert a drag on growth through mid 2009 and then provides only a modest boost as the incentive to add to the housing stock remains weak for some time. Business investment in both equipment and structures weakens significantly in 2009 as capacity utilization rates decline. Export growth slows sharply in 2009 due to the downturn in growth among our trading partners. But imports continue to decline, and because imports are so much larger than exports, net exports continue to provide an arithmetic boost to growth over the next year.

A confluence of forces lead to the resumption of growth in the second half of 2009, and by 2010 the economy is expected to be growing modestly above potential. Monetary and fiscal stimulus both here and abroad clearly play a role, but for the most part traditional market forces generate this recovery. First and foremost, credit spreads begin to narrow and equity prices rise as an appetite for risk taking gradually returns. In addition, the housing correction, which has exerted a substantial drag on the economy for three years, finally runs its course. But in the first year of recovery the unemployment rate declines

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very little if at all as productivity growth and the labor force participation rate rebound. With a relatively large output gap closing at a slow pace, inflation remains quite tame.

### 3.2 Alternative Scenarios and Risks

The risk assessment has changed significantly and consequently a new scenario has been introduced to capture the additional downside risks. The new kid on the block is called the *Global Deflation* scenario. It replaces the *Global High Demand* scenario that received minimal weight in the previous Blackbook: it is a close cousin of the *Global Credit Crunch* scenario in that it entails a decrease in both output and inflation relative to the *Central* scenario but is more vicious and a lot more persistent. The *Global Deflation* scenario reflects the possibility that the US and the rest of the world may get mired in a liquidity trap for a prolonged period. It has been introduced in light of data in the US and other countries which show that core inflation worldwide has declined substantially in a very short span of time.

Currently, this new scenario is not very likely, as the associated probability of ever entering the scenario is less than 5% [Exhibit C-1]. The *Global Credit Crunch* scenario, with an associated probability above 40%, is still the most likely one by far. The probability of the remaining scenarios (*Productivity Boom*, *Effects of Overheating*, and in particular the *Loss of Credibility* scenario), has decreased due to the introduction of the new scenario.

Exhibit C-2 displays the core PCE inflation and GDP growth paths associated with the various scenarios. These paths have changed since the last Blackbook, mainly as a result of a lower PCE inflation and output forecasts in the *Central* scenario. (Recall that the alternative scenarios are defined relative to the *Central* scenario.) For instance, the growth forecast in the *Global Credit Crunch* scenario has a four quarter contraction of 4% in 2009Q2, while in the last Blackbook this figure was “only” 2%. The outlook in the *Global Credit Crunch* scenario is still relatively benign in comparison to that associated with the *Global Deflation* scenario: the latter involves a contraction of almost 6%

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peaking in 2009Q3, and lasting through the end of 2011. This contraction in output is accompanied by inflation below 0.5% through 2011, with a short period of deflation in 2009.

Both the inception of the *Global Deflation* scenario and the changes in the output path associated with each of the pre-existing scenarios result in a fairly dramatic shift in the forecast distribution [Exhibit C-3]. As opposed to recent Blackbooks, the change in the forecast distribution is as notable for core PCE inflation as for output. The 5<sup>th</sup> and 95<sup>th</sup> quintiles of the core PCE inflation forecast distribution for 2009Q2 have decreased from 0% to below -1%, and from 3.5% to 2.5%, respectively. The “Depth of Deflation” chart shows that the probability of low inflation/deflation (defined as average annual inflation lower than 1.5% in the 2009-2011 period) has increased from being negligible in the last Blackbook (around 2%) to 11% currently. Conditional on being in a low inflation/deflation environment, the expected level of deflation is -6.3%, with a roughly 10% probability associated with a drop in prices greater than 10%.

The 5<sup>th</sup> and 95<sup>th</sup> quintiles of the GDP forecast distribution for 2009Q2 are currently 0% and -8%. Due to the *Global Deflation* scenario, the 5<sup>th</sup> quintile of the output distribution has declined by about 2 percentage points all through the forecast horizon. The “Depth of Recession” chart shows that a “severe” recession, defined as a four-quarter drop in output larger than 3%, is now the most likely outcome. The probability of a severe recession is currently 60%, relative to about 25% in the last Blackbook.

## 4. Forecast Comparison

### 4.1 Greenbook Comparison

The path for the FFR has shifted down in both the Blackbook and the Greenbook relative to October. In the Greenbook, the FFR target is expected to fall to 0.25% by 2009Q1 and stay at that level at least through the end of 2010. Similarly, in the Blackbook the FFR is

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projected to drop to 0.25% and stay at that level at least until the end of 2009. However, the Blackbook projects that the FFR will reach 1.00% by the end of 2010.

**Conditioning Assumptions.** The potential growth assumption in the Blackbook is unchanged at 2.7%, while potential growth in the Greenbook is lower than it was in October. In particular, the Greenbook assumption for 2009 is now 2.2% (previously 2.4%) and 2.2% for 2010 (previously 2.3%). The difference stems mainly from assumptions regarding labor force participation and structural productivity. The Greenbook assumes that the labor force participation rate will decline further to 65.3% in 2010, while we assume a rate of 66.1%.

The Greenbook incorporates into its projections the effects of a fiscal stimulus package taking the form of a two-year plan amounting to \$500 billion. As a result, the personal savings rate in the Greenbook is substantially higher than in the Blackbook (5.3% and 1.9%, respectively, in 2009). Furthermore, the Greenbook forecasts a more significant contraction in non-residential structures in 2009.

We largely agree with the Board on the magnitude of the global slowdown. We anticipate no growth in 2008 (Q4/Q4) while the Board forecast is 0.2% growth using our GDP weights. We are slightly more positive about Japan and more negative about the euro area, China and Korea. In 2009, we project 0.5% growth, while the Board has 0.4% growth. There are some differences in the distribution of growth next year with the Board expecting better growth than we do for the U.K., China, and Korea and weaker growth for the euro area, Canada, and Mexico.

The FRBNY forecast for oil prices is very similar in the Blackbook and Greenbook. Our net export contribution to 2008 GDP growth is the same as the Board's forecast, at 1.2 percentage points. The FRBNY forecast for the net export contribution to 2009 GDP growth is 0.5 percentage points, a little higher than the Board's forecast of zero contribution. This difference results from the FRBNY factoring in a faster recovery in export growth and a slower recovery in import growth. The forecasts for 2010 are more

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aligned, with both the Board and the FRBNY projecting a small negative net export contribution.

**Inflation.** The inflation forecast in the Greenbook for 2009 is very similar to the Blackbook, as both predict a decline of around 1.1% in core PCE inflation. However, for 2010 our projection is considerably higher than the Greenbook projection (1.6% and 0.8%, respectively). Total PCE inflation follows a similar pattern, as these projections are similar for 2009 but our forecast for total PCE is higher for 2010.

**Real activity.** Both the Greenbook and the Blackbook expect a significant drop in projected output for 2008Q4, with the Greenbook forecasting real GDP to contract by -4.75% and the Blackbook forecasting -4.0%. The continued contraction is more severe in the Greenbook, where GDP growth is -0.9% in 2009. The Blackbook forecasts a somewhat milder contraction, with GDP falling -0.3% in 2009. These diverging forecasts seem to be at odds with the evolution of unemployment. The Blackbook registers a stronger increase with the unemployment rate reaching 9.0% in 2009, while the Greenbook forecasts a peak of only 8.2% at the beginning of 2010. This discrepancy is mostly due to the different assumptions about the evolution of payroll employment and household employment in the Greenbook. The Greenbook assumes a decline of 1.9 million in payroll employment while the decline in household employment is assumed to be only 900,000 in 2009.

**Uncertainty around forecasts.** Inflation forecast uncertainty in the Greenbook and Blackbook are broadly similar, with slightly larger uncertainty in 2009 in the Blackbook and in 2010 in the Greenbook. On the growth side, the 2008 and 2009 forecasts in the Blackbook incorporate significantly more downside risk than the Greenbook. The lower end of the 70% forecast interval is -2.2% for 2008 and -4.1% for 2009 in the Blackbook, while the corresponding numbers are -0.8% and -2.4% in the Greenbook. For 2009, the Blackbook assigns more probability to higher levels of GDP growth than the Greenbook, as the upper end of the interval is at 1.4% and at 0.6% in the Blackbook and the Greenbook respectively.

**Table 1: Comparison of 70% Intervals around FRBNY and Board Forecasts**

	Core PCE Inflation		Real GDP Growth	
	<i>FRBNY</i>	<i>Board</i>	<i>FRBNY</i>	<i>Board</i>
2008	1.4-2.2 (1.6-2.6)	1.8-2.3 (2.2-2.7)	-2.2-0.4 (-2.0-0.9)	-0.8-0.1 (-0.1-0.8)
2009	-0.2-1.9 (0.7-2.3)	0.6-1.7 (0.9-2.1)	-4.1-1.4 (-1.5-2.5)	-2.4-0.6 (-1.6-1.4)
2010	0.7-2.3 (0.9-2.1)	-0.2-1.7 (0.4-2.3)	-0.1-4.4 (0.8-4.4)	1.1-3.8 (0.9-3.6)
2011	1.1-2.4 (1.3-2.3)	n/a (n/a)	1.2-5.3 (1.5-4.9)	n/a (n/a)

**Table 2: Percentile of Greenbook Forecast in FRBNY Forecast Distribution**

	Core PCE Inflation	Real GDP Growth
2008	61 (67)	60 (69)
2009	57 (52)	52 (37)
2010	18 (38)	51 (44)
2011	7 (10)	82 (76)

To gauge the importance of the differences between our outlook and the Greenbook forecasts, we calculate the percentile of the Greenbook forecasts for inflation and output in our forecast distributions. The results are shown in Table 2, with October values in parentheses. As in October, our forecasts of core inflation are fairly close when we account for our risk assessment, with the exception of 2010, where the gap remains quite wide. The discrepancy between our outlooks for output growth has narrowed with the exception of 2011 which is a reflection of the different assumptions for potential GDP growth.

**Alternative Greenbook forecasting scenarios.** The Greenbook considers several alternative scenarios. The scenarios vary substantially in the way that they incorporate the

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effects of financial turmoil and the potential effects of monetary policy and fiscal stimulus. In all the alternative scenarios, the FFR follows a Taylor Rule with an effective lower bound at 0.25 percent.

The first scenario, *More Financial Stress*, overemphasizes the financial turbulence and considers the case of a more severe global contraction in 2009. In this scenario, the cost of borrowing and risk premium stay at high levels through 2010 and come down more slowly than in the baseline projection. In addition, home prices decline 10% more than the baseline projection. The financial turmoil is intensified by a 1% further decline in global growth which reduces oil prices to \$8 per barrel below the baseline scenario. This scenario is the most pessimistic one in terms of real GDP growth and the unemployment rate. Real GDP growth is only 0.7% in 2010 (as opposed to 2.4% in the baseline) and the unemployment rate is 9.2% (as opposed to 8.2% in the baseline). In this scenario, core PCE inflation drops below zero in 2011 and 2012 and the FFR stays at its lower bound through 2013.

The second scenario, *Faster Recovery*, is the most optimistic alternative scenario in the Greenbook. In this scenario, the monetary and fiscal stimulus work more quickly than the baseline projection to jump-start the economy. Real GDP grows by 4.8% in the second half of 2009 as opposed to 1.3% in the baseline. The unemployment rate peaks at only 7.7% in 2009 and drops to 4.6% in 2011. In this scenario, core PCE inflation stays above 1% almost throughout the forecast horizon. This is the only scenario where the FFR is above 0.25% in 2010.

The third scenario, *Bigger Fiscal Package*, assumes a large fiscal stimulus, with a particularly sizable increase in government purchases and a permanent tax cut twice the size of the baseline stimulus plan, thus costing an additional \$300 billion. The extra stimulus adds 0.75 percentage point to real GDP growth in 2009 and 0.25 percentage point to growth in 2010. The unemployment rate does not increase as much and core PCE inflation remains around 1%. The FFR increases at a faster pace than the baseline.



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The fourth scenario, *Anchored Inflation Expectations*, incorporates anchored long-run inflation expectations. In this scenario, inflation expectations remain around 2%, preventing a decline in actual inflation. As a result, as the real economy recovers, inflation also moderates. The real activity is very similar to the baseline case since real variables are not as affected.

The fifth scenario, *Deflation*, considers the possibility of negative inflation. In this case, core PCE inflation declines to 0.3% by 2010 and falls below zero in 2011. Since the FFR is at its lower bound, the decline in inflation expectations causes the real interest rate to increase. Interestingly, real activity is little changed relative to the baseline. The FFR starts increasing in 2012, similar to the baseline if a Taylor-type rule is used. However, the optimal control approach suggests keeping the FFR at 0.3 percent.

#### 4.2 Comparison with Private Forecasters<sup>1</sup>

The last release of the Survey of Professional Forecasters occurred in mid-November, and thus does not incorporate information from the latest releases, particularly the November labor market report. Subject to this caveat, our GDP growth forecasts fall in the middle of the range of private projections for each forecast period while our forecasts are the lowest for core PCE inflation in each period.

**Real GDP Growth.** The PSI model and the Blue Chip forecasts for GDP growth are very similar to each other for each forecast period. For 2009Q1, both of their growth forecasts are almost 1% higher than the FRBNY forecast. The Macro Advisers forecasts are the most pessimistic at each forecast horizon, as they forecast a more severe contraction than the FRBNY for both 2008Q4 (-6.3% and -4.0%, respectively) and 2009Q1 (-4.2% and -3.2%, respectively).

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<sup>1</sup> Release dates of the private forecasts discussed in this section are in parentheses: Blue Chip consensus (12/10), SPF (11/17), Macro Advisers (12/08), and the PSI Model (12/12).

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**Core PCE Inflation.** Both the FRBNY and Macro Advisor projections for core PCE inflation were revised down significantly. We revised down our core PCE inflation forecast for 2008Q4 from 1.9% to 1.0%, while Macro Advisers revised their forecast down from 2.4% to 1.1%. The FRBNY projection for core PCE is significantly lower than Macro Advisers for 2009Q1 (0.7% and 1.5%, respectively); however, this discrepancy disappears in the medium-run, as the FRBNY projection for 2009 Q4/Q4 is 1.1% and Macro Advisers' is 0.9%.

**CPI Inflation.** Our forecast for headline CPI lies on the upper end of the forecasts for 2008Q4. While we expect the CPI inflation to be -5.1% in 2008Q4, the Blue Chip consensus forecast is -5.7% and Macro Advisers is forecasting -7.2%. For 2009 Q4/Q4, Macro Advisers is expecting a lower level of CPI inflation than the FRBNY forecast (0.2% versus 0.8%, respectively). This discrepancy suggests that private forecasters weight the recent declines in oil and food price more heavily than we do.

**Core CPI Inflation.** In terms of core CPI inflation, both the FRBNY and Macro Advisers projections were revised down significantly. We revised down our core CPI inflation forecast for 2008Q4 from 2.1% to 0.4%, while Macro Advisers revised their forecast down from 2.7% to 0.7%. For 2009 Q4/Q4, our core CPI inflation forecast is 1.5%, which is 0.3% higher than the Macro Advisers projection.

## 5. Robustness of Policy Recommendation

### 5.1 Sensitivity to Alternative Scenarios and Policy Rules

Our current policy recommendation is to lower the target federal funds rate to 0.25% and leave it there for at least one year. Most of our policy rules prescribe a target rate broadly consistent with this recommendation. Note that the near-term estimate of the neutral policy rate has been lowered to 2-3.5% to reflect the unprecedented spreads of private liabilities over risk free rates. Further, the lower bound for the rules, previously at 1.00%, has now been lowered to 0.25% to reflect the analysis from the zero lower bound project.

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Finally, the *Opportunistic Disinflation* rule has been replaced by the *Asymmetric Price Targeting* rule. In the presence of deflation risks, the *Opportunistic Disinflation* rule is highly suboptimal since it sends agents the signal that policy makers welcome deflation. The *Asymmetric Price Targeting* rule combats deflation by instituting price level targeting. This rule reacts to the cumulative gap between a 1.5% price level path and the actual path on the downside. The rule is asymmetric because the price level targeting is implemented on the downside only: if the actual price level path entails cumulated inflation above 1.5% per year, then the policy reverts to targeting the gap between four quarter changes in inflation and the inflation objective.

The downward adjustments in the output and inflation forecasts along with a further lowering of the neutral rate have a significant impact on the nominal federal funds rate target path implied by the different rules, both in the short- and the medium- term. The prescription stemming from the Baseline under the *Central* scenario is about 100 basis points lower than in October across the forecast horizon, including the very short-term, gradualism notwithstanding [Exhibit D-1]. This prescription entails lowering the FFR to 0.75% in December and to roughly 0.25% by middle 2009. The prescription under all other scenarios is very similar, with the exception of the *Loss of Credibility* scenario, since the latter implies that core PCE inflation is above 3% in 2009. This scenario is assessed to be less likely than in October based on recent price data.

The prescription from the other rules based on the expected value of the forecast distribution is very similar to that from the *Baseline* rule [Exhibit D-2]. The only exception is the *Outcome-based* rule, where we do not maintain the zero lower bound on the nominal FFR. This rule therefore has the nominal FFR reaching -6% by 2010, a path that is infeasible but captures how tightly the lower bound constraint is binding.

The *Asymmetric Price Targeting* and *Dove* rules, under almost all scenarios, predict the nominal FFR to stay at the 0.25% lower bound until the end of 2011 (the *Loss of Credibility* scenario under the *Dove* rule being the only exception). Note that the real FFR plots under the *Asymmetric Price Targeting* and *Dove* rules do not represent the actual

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real FFR obtained by following the rule, but rather a “shadow” real FFR – that is, the real FFR that would be achieved were the nominal FFR allowed to go below zero. Clearly under both rules the shadow real FFR is very low, reaching -16% for the *Asymmetric Price Targeting* rule under the *Global Deflation* scenario. As discussed above, we do not impose the zero bound on the *Outcome-based* rule. Therefore this rule entails negative nominal FFR under all scenarios, reaching -17% under the *Global Deflation* scenario. The associated real FFR reaches -12% under the *Global Deflation* scenario, which is above the shadow real rate for the *Asymmetric Price Targeting* rule. This indicates that the latter would prescribe more stimulus from monetary policy than the *Outcome-based* rule in absence of the zero bound.

We also use the DSGE-VAR to assess the current stance of monetary policy. When we run the counterfactual forecasts eliminating past policy shocks, we find that the DSGE-VAR predicts a zero FFR by 2009Q2. Because of the gradualism implicit in the estimated policy rule, in 2008Q4 the counterfactual FFR is at 1.5%.

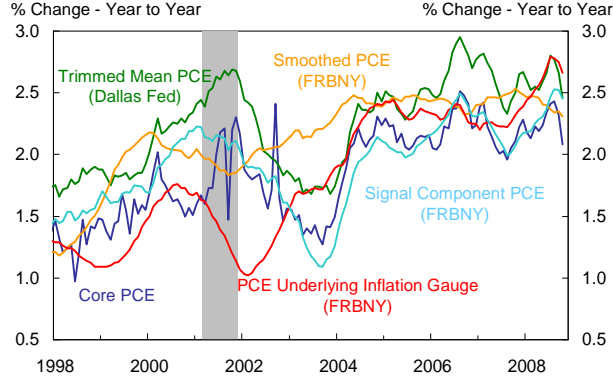
## **5.2 Comparison to Market Expectations**

Our policy recommendation is very similar in the short run to the path currently priced into markets and to the forecast of the primary dealers in the desk survey. In the medium run, the expected market-implied FFR in 2009Q4 is about 50 basis points higher than our forecast while the primary dealer forecast for is 25 basis points higher.

# A. Significant Developments

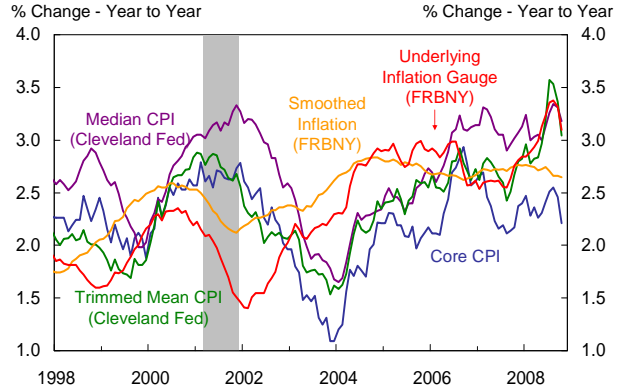
## Exhibit A-1: Measures of Trend Inflation

Alternative Measures of PCE Inflation



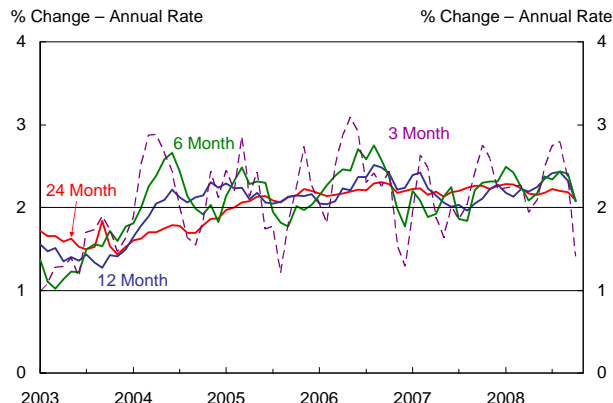
Source: Bureau of Economic Analysis, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Alternative Measures of CPI Inflation



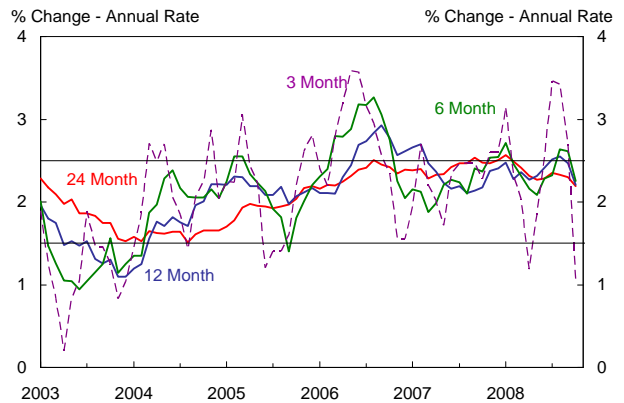
Source: Bureau of Labor Statistics, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Core PCE over Various Horizons



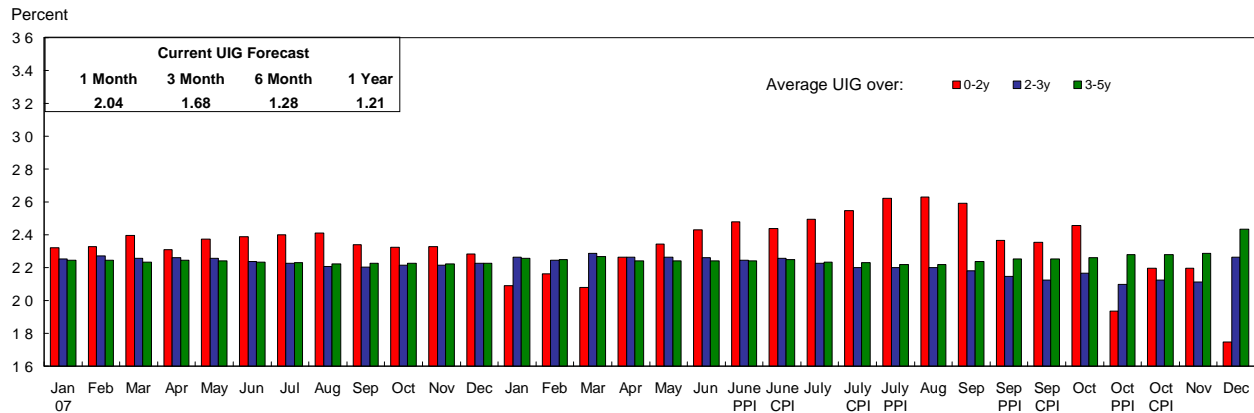
Source: Bureau of Economic Analysis

Core CPI Inflation over Various Horizons



Source: Bureau of Labor Statistics

## Exhibit A-2: Underlying Inflation Gauge (UIG)

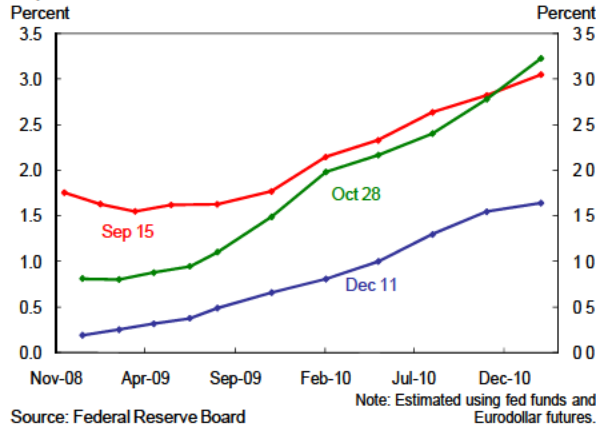


Source: MMS Function (FRBNY), Federal Reserve Board, and Swiss National Bank

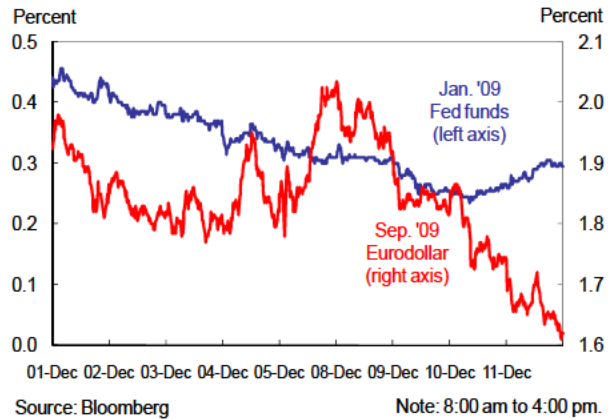
# A. Significant Developments

## Exhibit A-3: Policy Expectations and Uncertainty

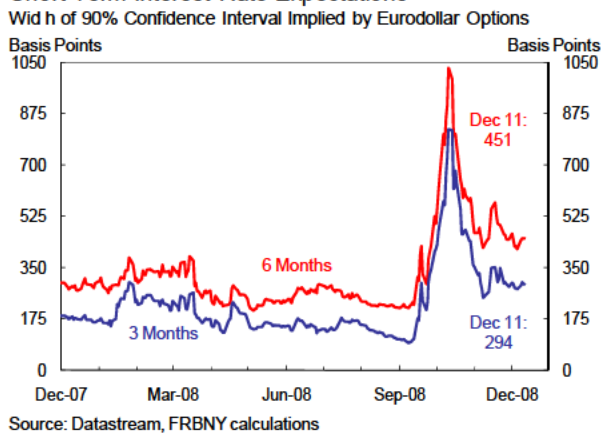
**Expected Fed Funds**



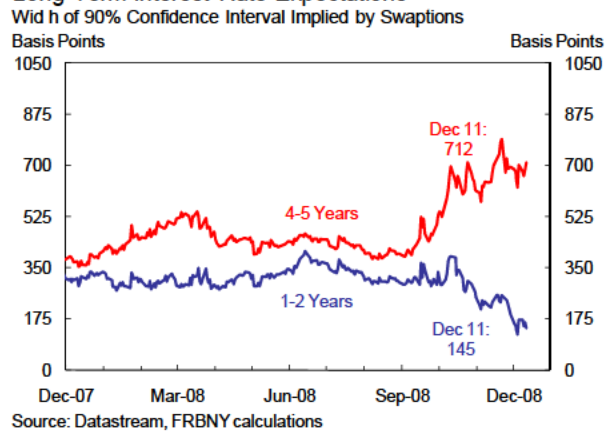
**Implied Fed Funds and Eurodollar rates (Intraday)**



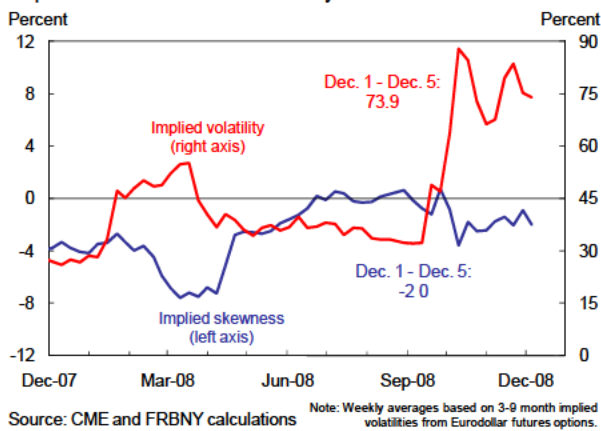
**Short-Term Interest Rate Expectations**



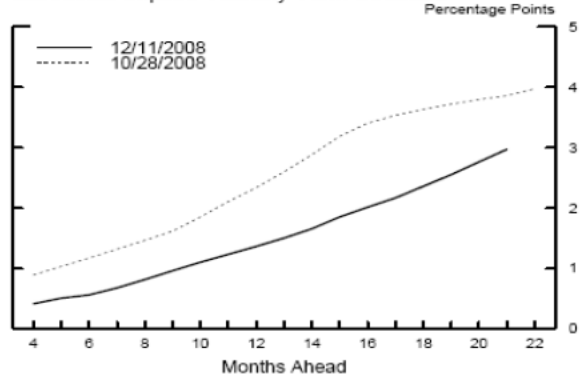
**Long-Term Interest Rate Expectations**



**Implied Skewness and Volatility**



**Eurodollar Implied Volatility Term Structure\***

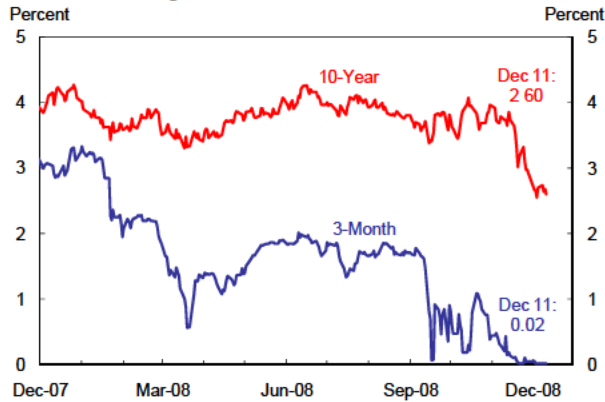


\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

# A. Significant Developments

**Exhibit A-4:  
Treasury Yields**

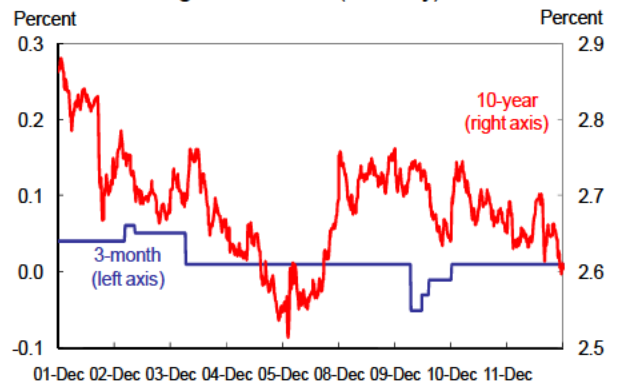
**Short- and Long-Term Rates**



Source: Bloomberg

Note: Yields of on-the-run securities

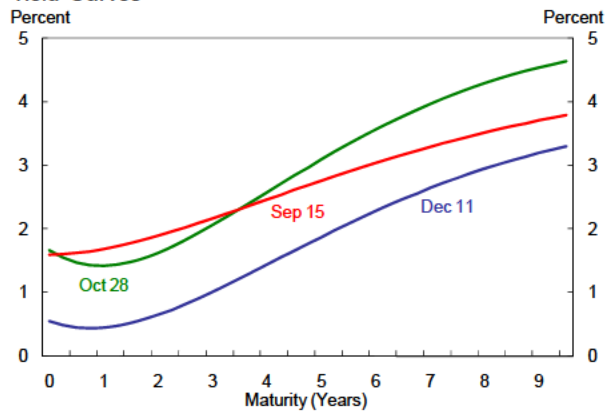
**Short- and Long-Term Rates (Intraday)**



Source: Bloomberg

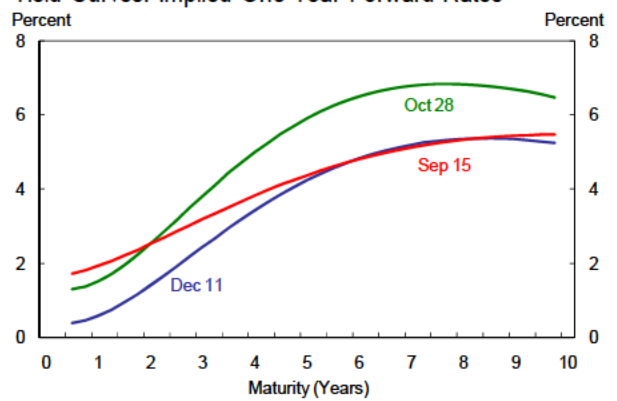
Note: On-the-run securities, 8:00 am to 4:00 pm.

**Yield Curves**



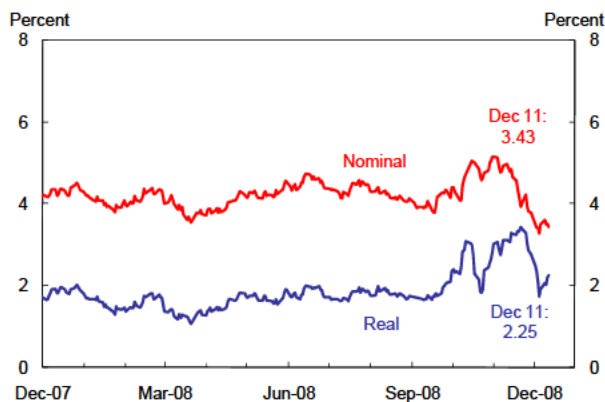
Source: Federal Reserve Board

**Yield Curves: Implied One-Year Forward Rates**



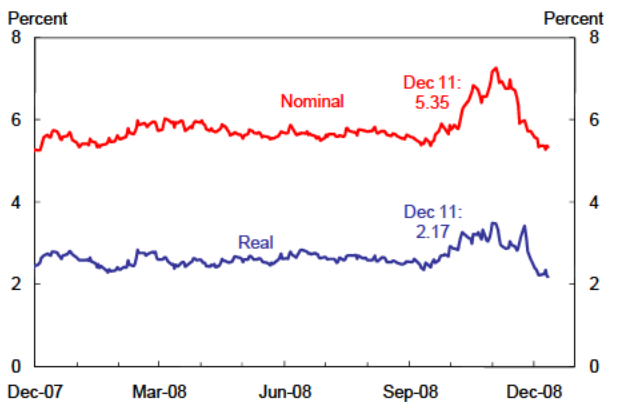
Source: Federal Reserve Board

**4-5 Year Forward Rates**



Source: Federal Reserve Board

**9-10 Year Forward Rates**

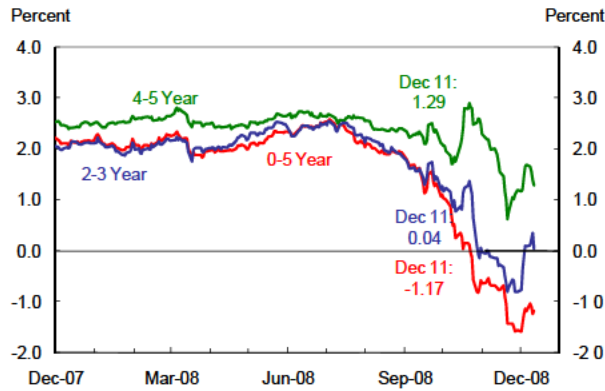


Source: Federal Reserve Board

## A. Significant Developments

### Exhibit A-5: Implied Inflation Compensation

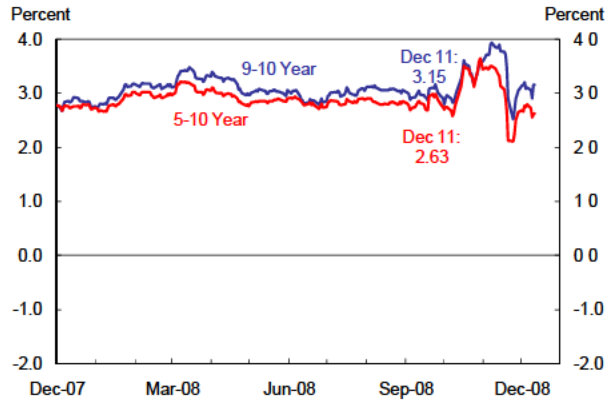
TIPS Implied Inflation Compensation: 0-5, 2-3, 4-5 Year Horizons



Source: Federal Reserve Board

Note: Carry-adjusted

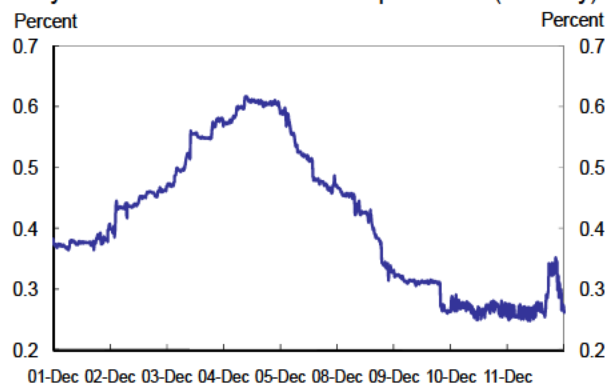
TIPS Implied Inflation Compensation: 5-10, 9-10 Year Horizons



Source: Federal Reserve Board

Note: Carry-adjusted

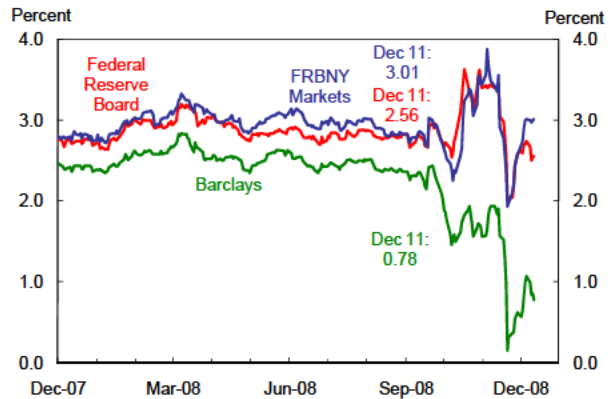
10-year Breakeven Inflation Compensation (Intraday)



Source: Bloomberg

Note: On-the-run securities, 8:00 am to 4:00 pm.

Alternative Measures of 5-10 Year Implied Inflation Compensation



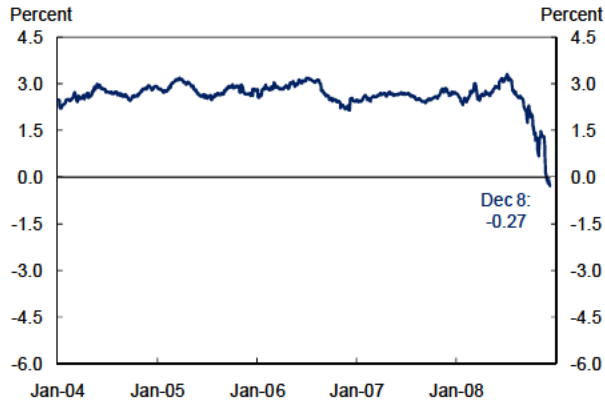
Source: Federal Reserve Board, Barclays, and FRBNY calculations



## A. Significant Developments

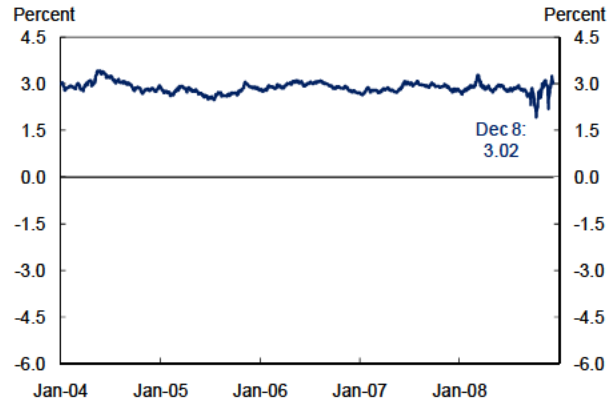
Exhibit A-6:  
Implied Inflation from Inflation Swaps

Implied Inflation from Inflation Swaps: 0-5 Year Horizon



Source: Barclays

Implied Inflation from Inflation Swaps: 5-10 Year Horizon



Source: Barclays

Implied Inflation from Inflation Swaps: 0-1, 1-2, 2-3 Year Horizons

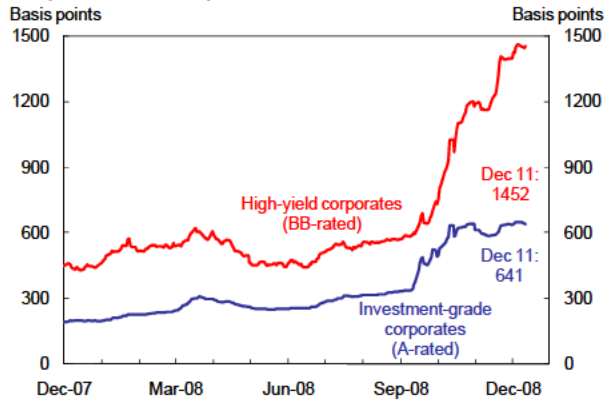


Source: Barclays

## A. Significant Developments

**Exhibit A-7:  
Credit Conditions**

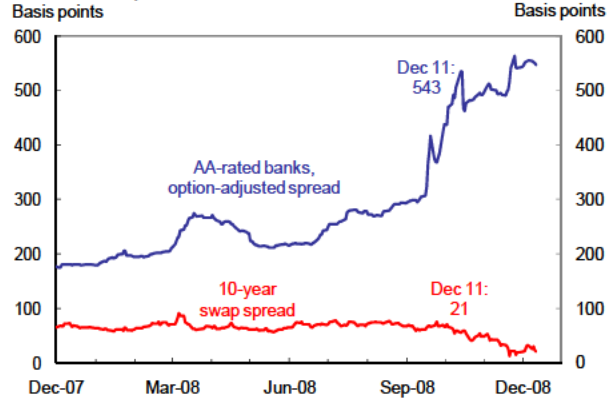
**Corporate Credit Spreads**



Source: Merrill Lynch

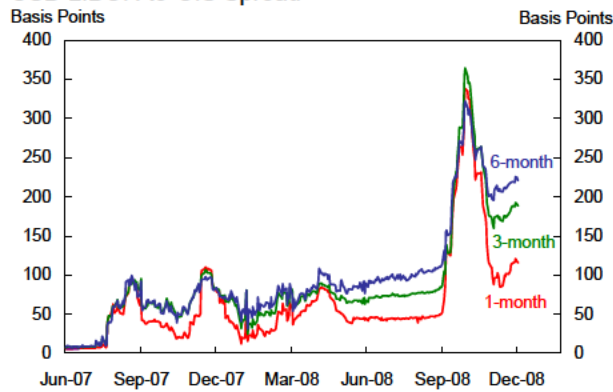
Note: Option-adjusted spreads.

**AA Credit Spreads**



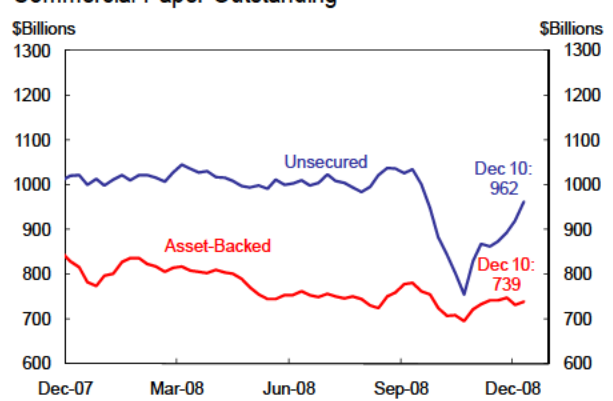
Source: Bloomberg and Merrill Lynch

**USD LIBOR-to-OIS Spread**



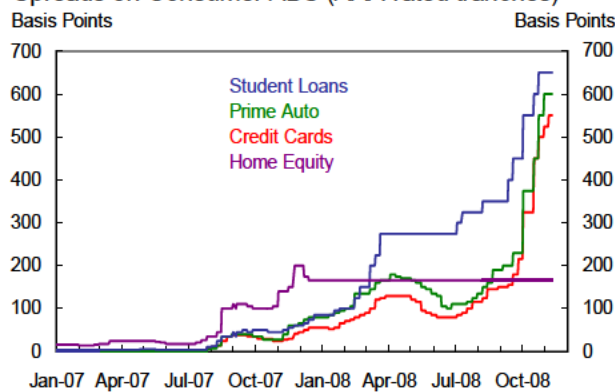
Source: Bloomberg

**Commercial Paper Outstanding**



Source: Federal Reserve Board

**Spreads on Consumer ABS (AAA-rated tranches)**

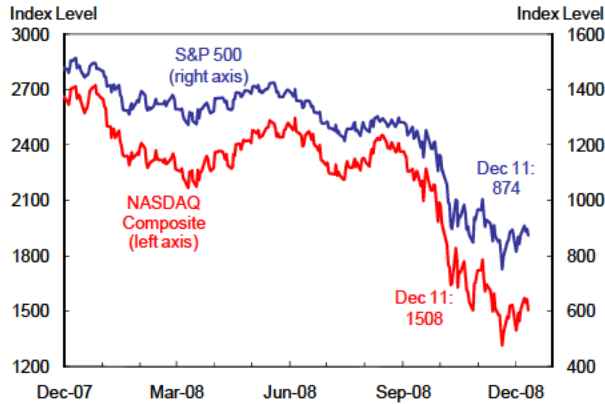


Source: JPMorgan

# A. Significant Developments

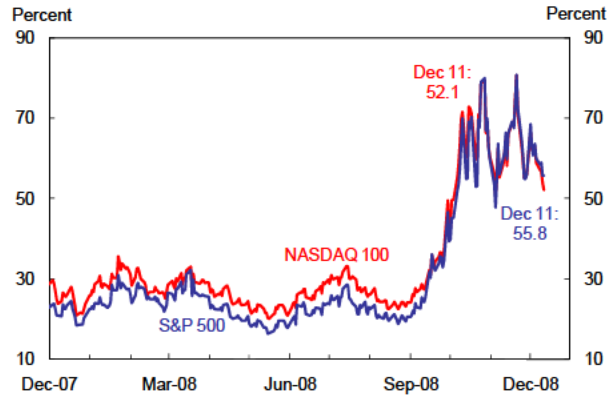
Exhibit A-8:  
Equity Markets

Equity Index Levels



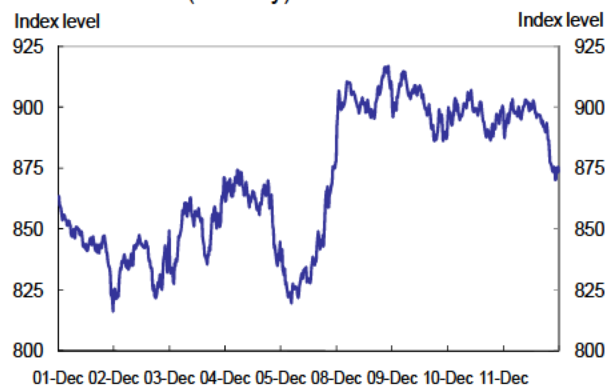
Source: Datastream

Equity Index Implied Volatility: 1-Month



Source: Datastream

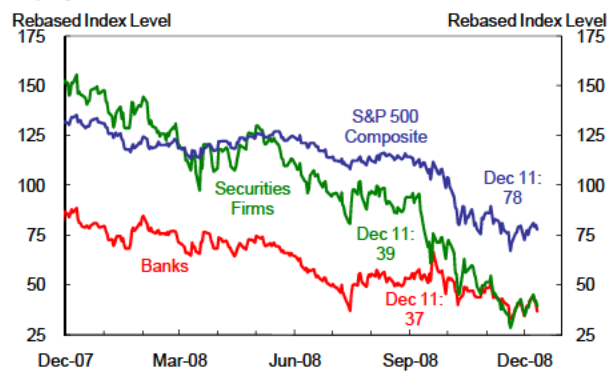
S&P 500 Index (Intraday)



Source: Bloomberg

Note: 9:30 am to 4:00 pm.

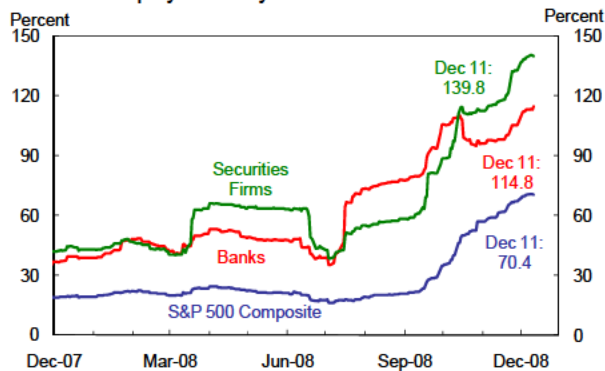
Equity Performance



Source: Datastream

Note: Rebased to equal 100 on June 1, 2004. Banks series is S&P 500 Banks index. Securities Firms series is S&P 500 Investment Banks and Brokerages index.

Historical Equity Volatility



Source: Datastream

Note: Annualized rolling 3-month standard deviation of daily returns. Banks series is S&P 500 Banks index. Securities Firms series is S&P 500

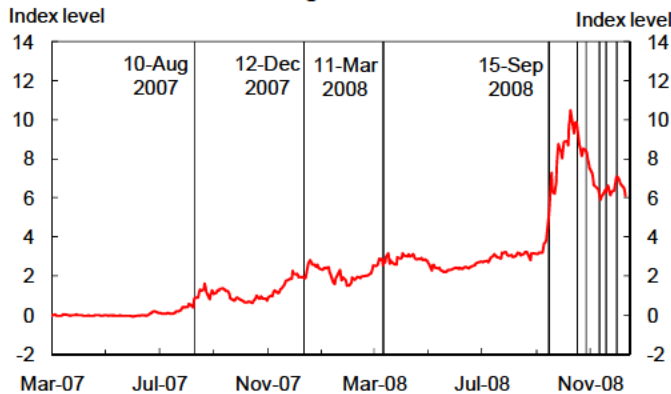
## A. Significant Developments

Exhibit A-9:  
Interbank Funding Stress Index

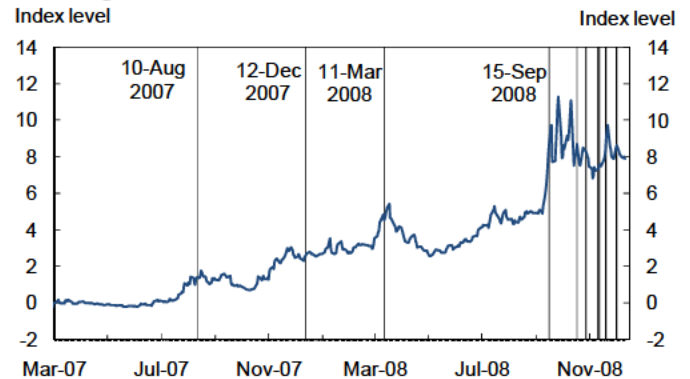
	Current level (Dec 11)	Change since Oct FOMC (Oct 28)	Change since Sep FOMC (Sep 15)	1-year low	1-year high
<b>Interbank funding stress index</b>					
<b>Overall index</b>	<b>6.08</b>	<b>-2.22</b>	<b>1.10</b>	<b>1.51</b>	<b>10.49</b>
Banking sector credit risk*	7.92	0.26	-0.38	2.57	11.31
Fed lending facilities use	5.60	-2.42	2.58	0.12	8.80
Cost of funds in the interbank market	4.73	-3.99	1.11	0.72	12.75

\*Due to recent data unavailability, the Dec 11 value may be revised.

Overall interbank funding stress index

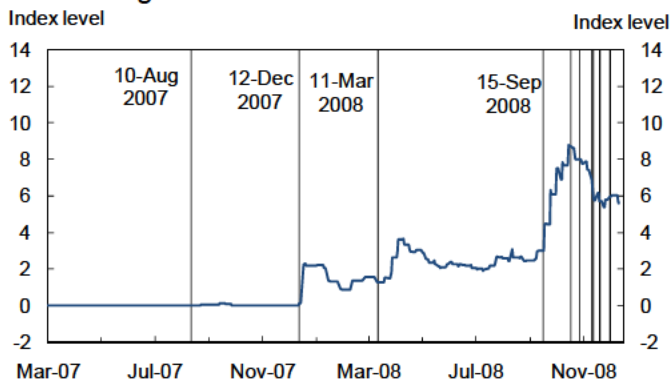


Banking sector credit risk



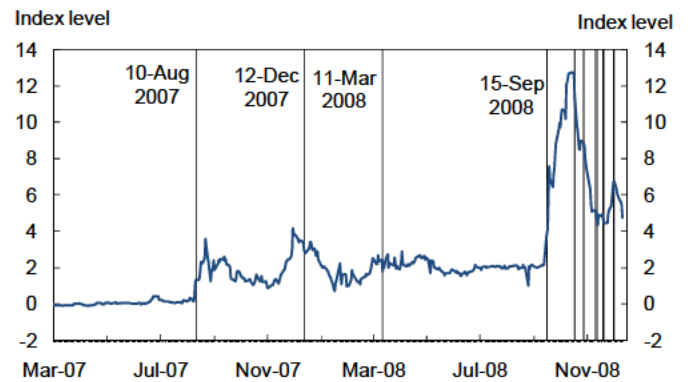
Source: New York Fed calculations

Fed lending facilities use



Source: New York Fed calculations

Cost of funds in the interbank market

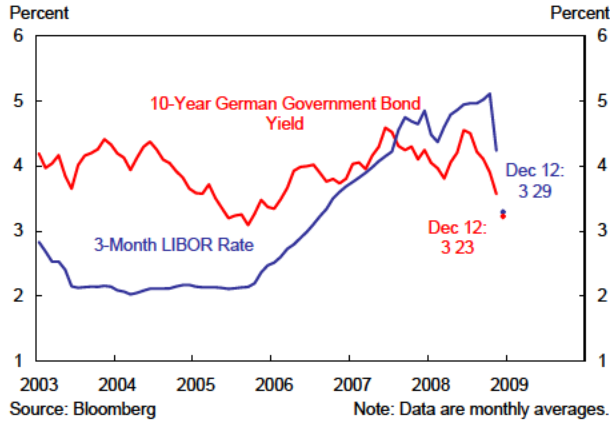


Source: New York Fed calculations

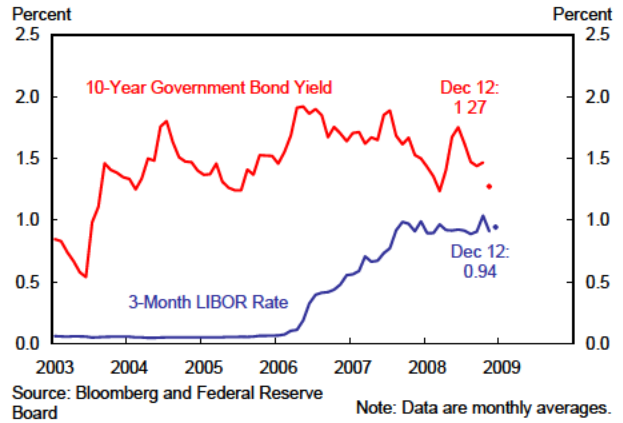
# A. Significant Developments

**Exhibit A-10:  
Global Interest Rates and Equity Markets**

**Euro Area Short- and Long-Term Interest Rates**

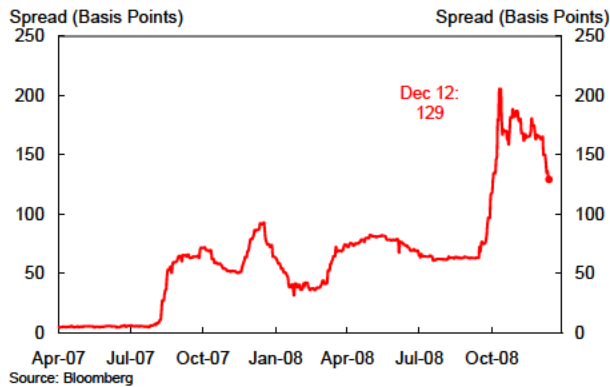


**Japan Short- and Long-Term Interest Rates**



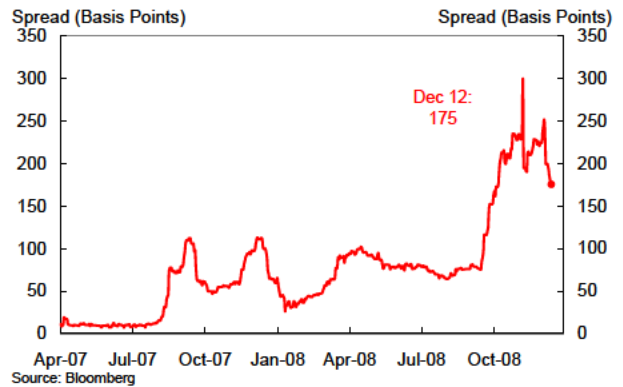
**Euro Area**

LIBOR Rate - OIS Swap Rate (3-month)

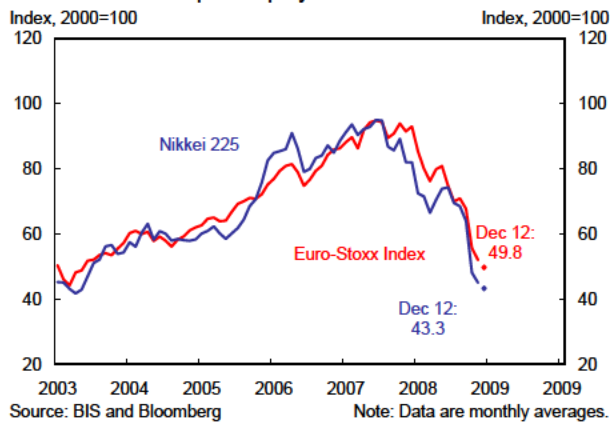


**United Kingdom**

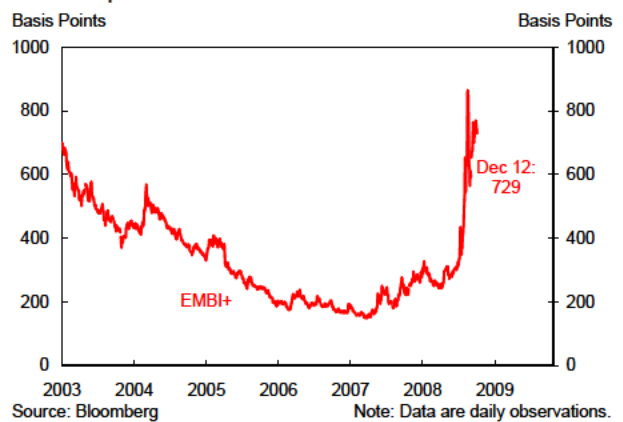
LIBOR Rate - OIS Swap Rate (3-month)



**Euro Area and Japan Equity Indices**



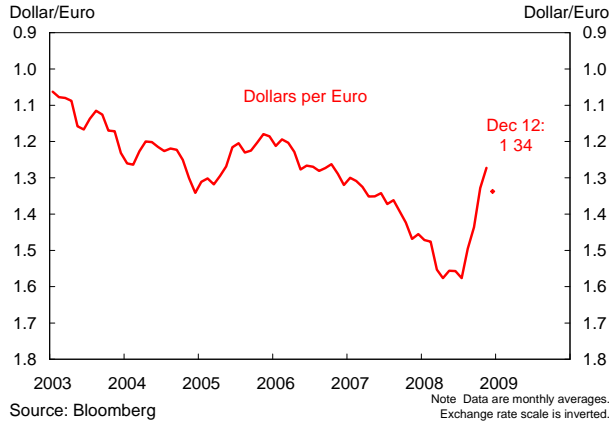
**EMBI+ Spread**



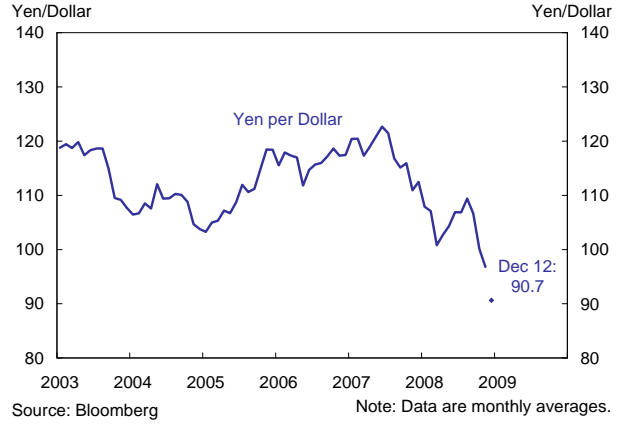
# A. Significant Developments

## Exhibit A-11: Exchange Rates

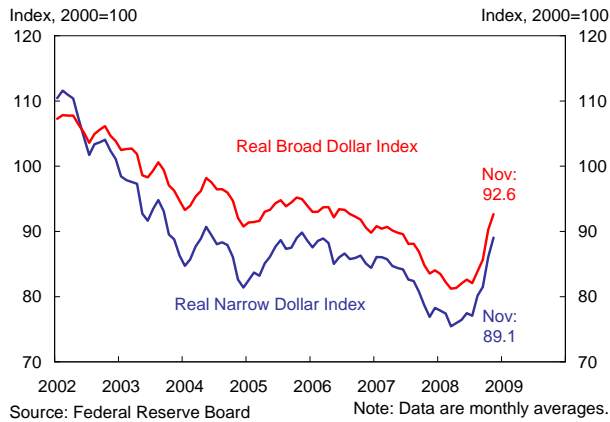
### Dollar-Euro Exchange Rate



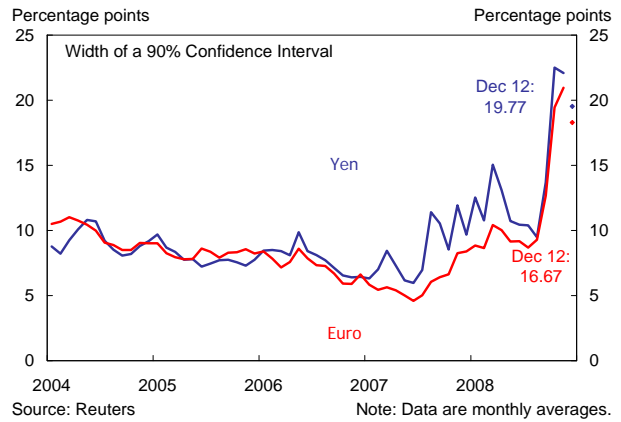
### Yen-Dollar Exchange Rate



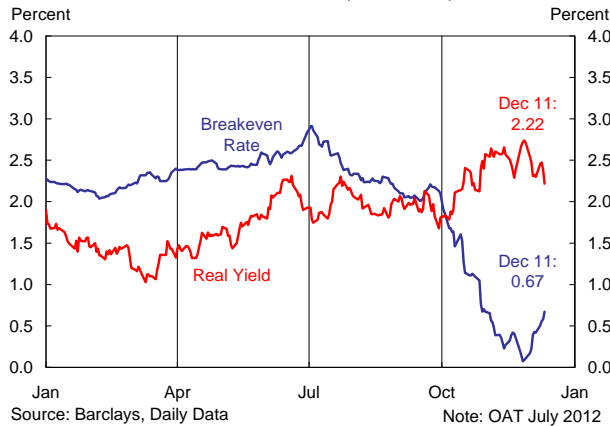
### Real Effective Exchange Rates



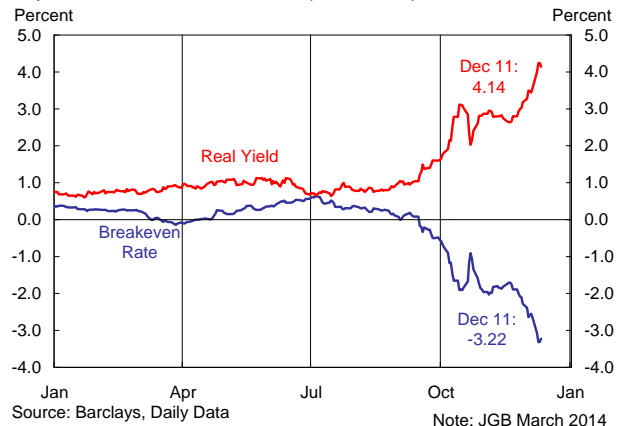
### Euro and Yen One-Month Implied FX Option Volatility



### Euro Area Inflation-Linked Bonds (Past Year)



### Japan Inflation-Linked Bonds (Past Year)

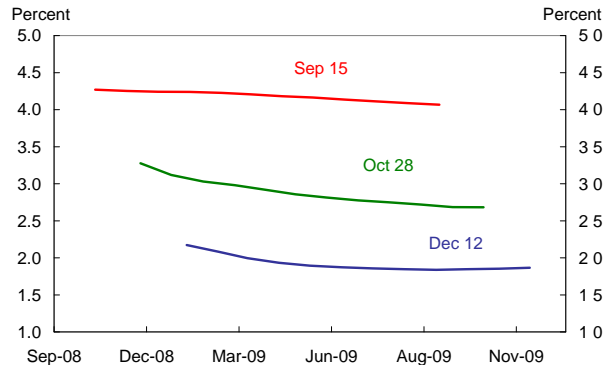


# A. Significant Developments

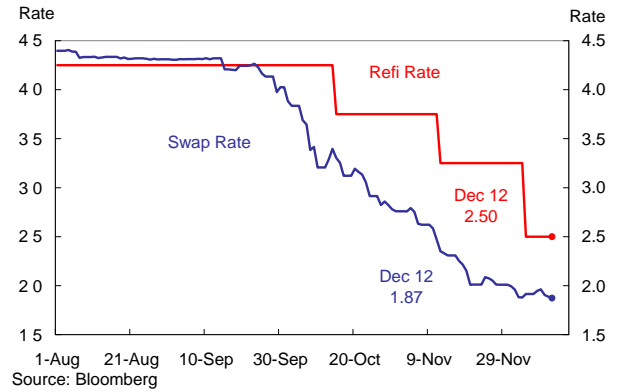
## Exhibit A-12: Euro Area and Japan Swap Curves

### Euro Area Swap Curve

Expected Average Overnight Rate Months Ahead

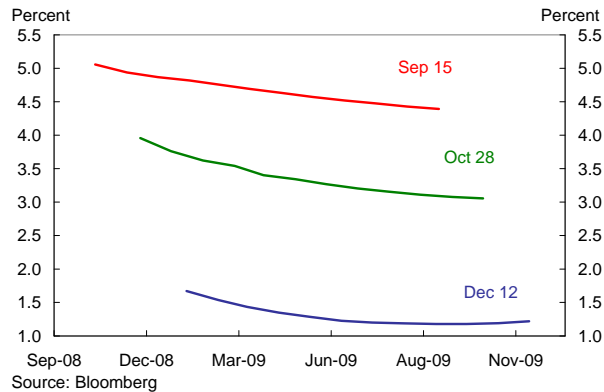


### Euro Area: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)

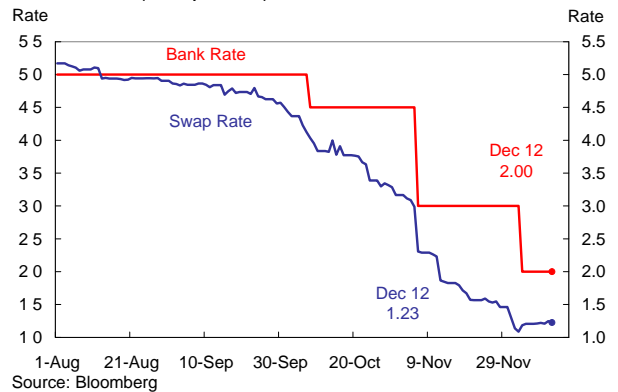


### UK Swap Curve

Expected Average Overnight Rate Months Ahead

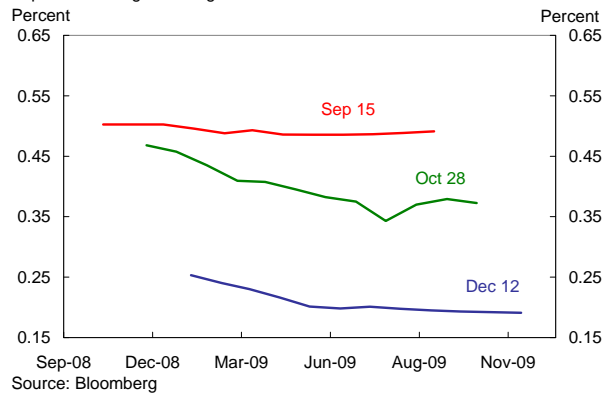


### UK: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)

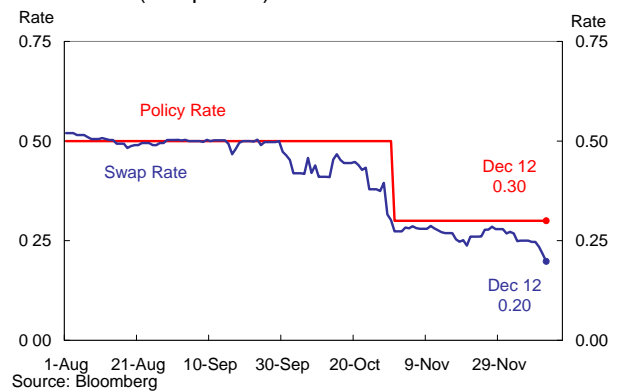


### Japan Swap Curve

Expected Average Overnight Rate Months Ahead



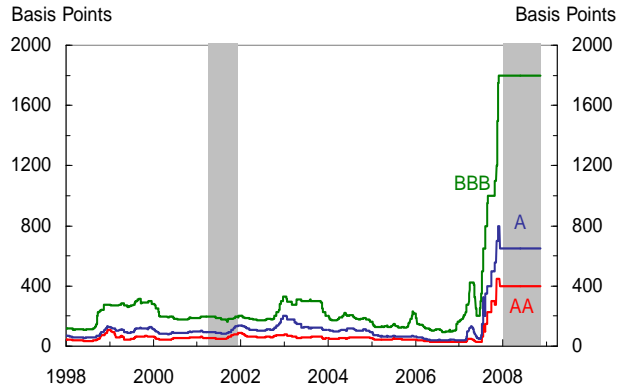
### Japan: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)



# A. Significant Developments

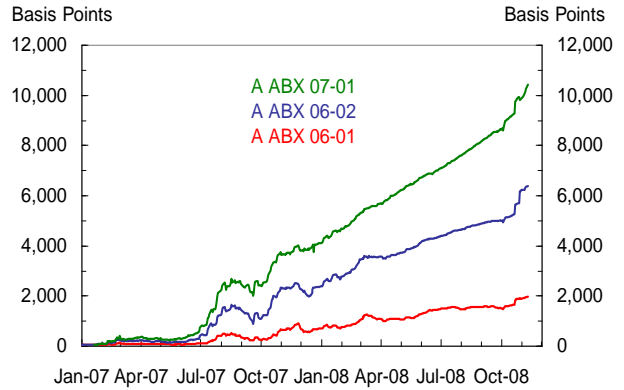
**Exhibit A-13:  
Subprime Spillovers**

**Spreads on Subprime MBS Tranches**



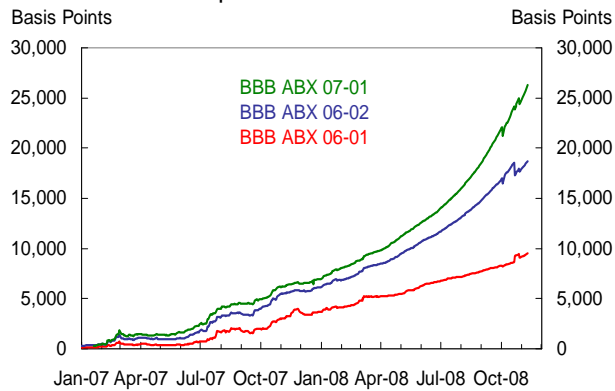
Source: JPMorgan

**A-Rated ABX Spreads**



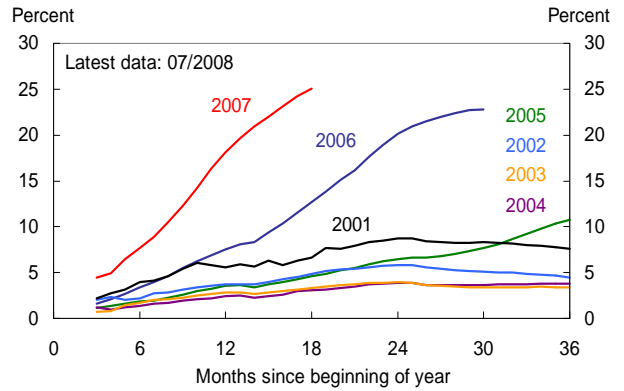
Source: JPMorgan

**BBB-Rated ABX Spreads**



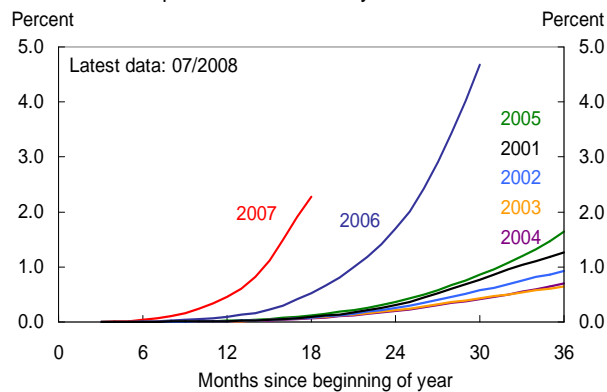
Source: JPMorgan

**60+ Day Subprime ARM Delinquencies by Year Securitized**



Source: Moody's Investors Service Note: Percent of original balance.

**Cumulative Subprime ARM Losses by Year Securitized**



Source: Moody's Investors Service Note: Percent of original balance.



## B. FRBNY Forecast Details

### Exhibit B-1: Quarterly and Annual Projections of Key Variables

	Core PCE Inflation			Real GDP Growth			Unemployment Rate*			Fed Funds Rate**		
	Sep	Oct	Dec	Sep	Oct	Dec	Sep	Oct	Dec	Sep	Oct	Dec
<b>2008</b>												
Q1	2.2	2.2	2.2	0.9	0.9	0.9	4.9	4.9	4.9	2.3	2.3	2.3
Q2	2.1	2.1	2.1	3.3	2.8	2.8	5.3	5.3	5.3	2.0	2.0	2.0
Q3	2.8	3.0	2.6	0.5	-0.3	-0.5	5.9	6.0	6.0	2.0	2.0	2.0
Q4	2.1	1.9	1.0	1.7	-2.8	-4.0	6.3	6.6	6.7	2.0	1.0	0.3
<b>2009</b>												
Q1	2.0	1.8	0.7	1.6	-1.5	-3.2	6.4	7.2	7.1	2.3	1.0	0.3
Q2	1.9	1.7	1.0	2.0	2.2	-0.9	6.5	7.6	7.8	2.5	1.0	0.3
Q3	1.8	1.6	1.4	2.1	1.5	1.2	6.7	7.9	8.3	2.8	1.0	0.3
Q4	1.7	1.5	1.5	2.5	1.8	2.0	6.7	8.0	9.0	3.0	1.3	0.3
<b>2010</b>												
Q1	1.7	1.5	1.5	3.3	2.3	2.3	6.5	7.9	9.0	3.3	1.5	0.3
Q2	1.7	1.5	1.5	3.3	3.1	2.8	6.3	7.8	9.1	3.5	2.0	0.5
Q3	1.7	1.5	1.8	2.7	3.3	3.3	6.1	7.7	9.1	3.8	2.5	0.8
Q4	1.7	1.5	1.8	2.7	3.2	3.5	6.0	7.5	9.1	4.3	3.0	1.0
<b>Q4/Q4</b>												
2007	2.2	2.2	2.2	2.3	2.3	2.3	0.4	0.4	0.4	-1.0	-1.0	-1.0
2008	2.3	2.3	2.0	1.6	0.1	-0.2	1.5	1.8	1.9	-2.3	-3.3	-4.0
2009	1.8	1.6	1.1	2.0	1.0	-0.3	0.4	1.4	2.3	1.0	0.3	0.0
2010	1.7	1.5	1.6	3.0	3.0	3.0	-0.7	-0.5	0.1	1.3	1.8	0.8

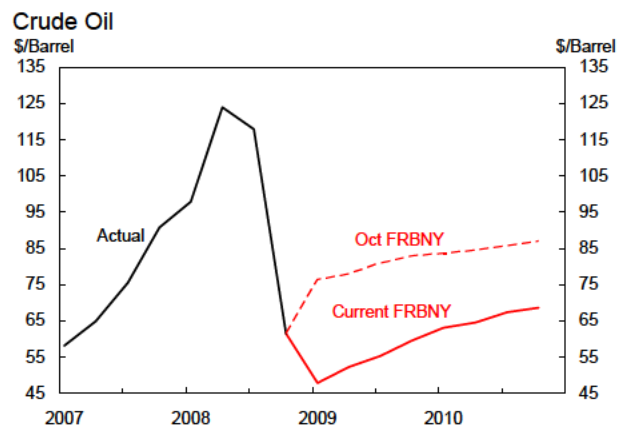
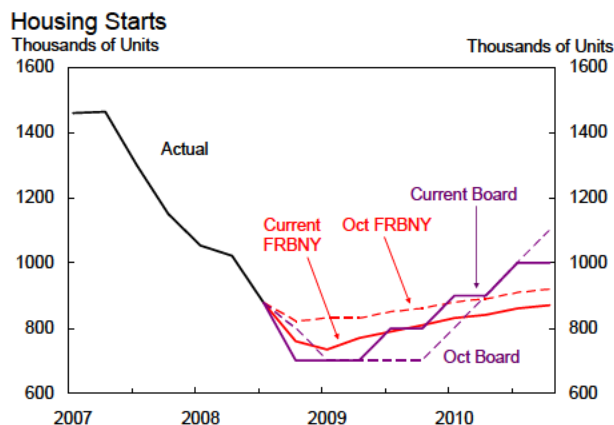
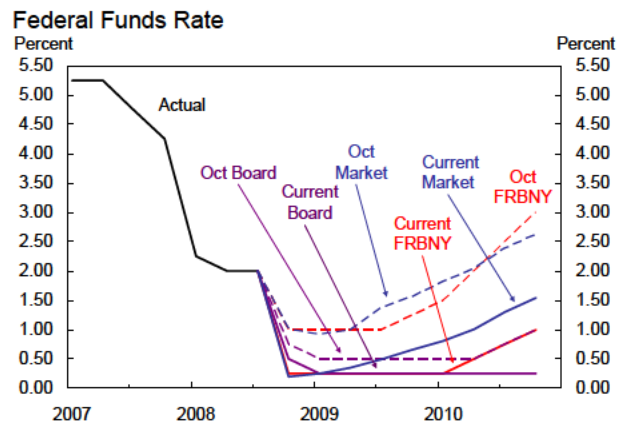
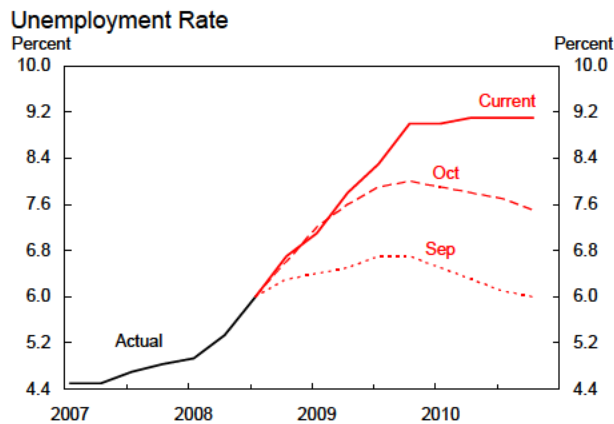
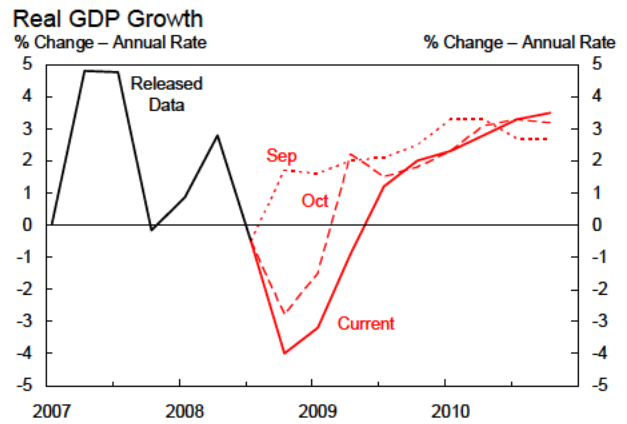
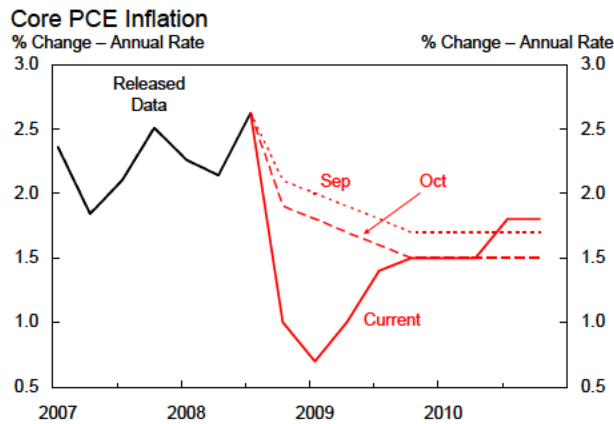
Note: Columns reflect the forecast dates. Numbers in gray are from previous Blackbooks, and numbers in italics are released data.

\*Quarterly values are the average rate for the quarter. Yearly values are the difference between Q4 of the previous year and Q4 of the listed year.

\*\*Quarterly values are the end-of-quarter value. Yearly values are the difference between the end-of-year value in the previous year and the end-of-year value in the listed year.

## B. FRBNY Forecast Details

### Exhibit B-2: Evolution of Projected Quarterly Paths of Key Indicators and Forecast Assumptions



Source: MMS and IR Functions (FRBNY) and Federal Reserve Board

## B. FRBNY Forecast Details

### Exhibit B-3: Near-Term Projections

	Quarterly Growth Rates (AR)		Quarterly Growth Contributions (AR)	
	2008Q4	2009Q1	2008Q4	2009Q1
<b>OUTPUT</b>				
<b>Real GDP</b>	-4.0 (-2.8)	-3.2 (-1.5)	-4.0 (-2.8)	-3.2 (-1.5)
<b>Final Sales to Domestic Purchasers</b>	-3.0 (-2.0)	-2.9 (-1.3)	-3.1 (-2.1)	-3.0 (-1.4)
<b>Consumption</b>	-3.1 (-1.0)	-0.8 (-0.5)	-2.1 (-0.7)	-0.5 (-0.4)
<b>BFI: Equipment and Software</b>	-5.0 (-5.0)	-15.0 (-5.0)	-0.4 (-0.4)	-1.1 (-0.4)
<b>BFI: Nonresidential Structures</b>	0.0 (-8.0)	-8.0 (-10.0)	0.0 (-0.3)	-0.3 (-0.4)
<b>Residential Investment</b>	-18.0 (-25.0)	-33.0 (-15.0)	-0.6 (-0.9)	-1.2 (-0.5)
<b>Government: Federal</b>	1.0 (1.5)	1.5 (1.5)	0.1 (0.1)	0.1 (0.1)
<b>Government: State and Local</b>	-0.5 (1.0)	0.0 (1.0)	-0.1 (0.1)	0.0 (0.1)
<b>Inventory Investment</b>	-- --	-- --	-1.1 (-1.7)	-1.1 (-0.8)
<b>Net Exports</b>	-- --	-- --	0.2 (1.0)	0.9 (0.6)
<b>INFLATION</b>				
<b>Total PCE Deflator</b>	-4.4 (-0.5)	-0.5 (1.5)		
<b>Core PCE Deflator</b>	1.0 (1.9)	0.7 (1.8)		
<b>PRODUCTIVITY AND LABOR COSTS*</b>				
<b>Output per Hour</b>	0.8 (-1.0)	0.5 (-1.0)		
<b>Compensation per Hour</b>	2.6 (3.5)	3.0 (3.3)		
<b>Unit Labor Costs</b>	1.8 (4.5)	2.5 (4.3)		

Note: Numbers in parentheses are from the previous Blackbook.

\*Nonfarm business sector.

## B. FRBNY Forecast Details

### Exhibit B-4: Real GDP and Inflation Projections

	Q4/Q4 Growth Rates			Q4/Q4 Growth Contributions		
	2008	2009	2010	2008	2009	2010
<b>OUTPUT</b>						
<b>Real GDP</b>	-0.2 (0.1)	-0.3 (1.0)	3.0 (3.0)	-0.2 (0.1)	-0.3 (1.0)	3.0 (3.0)
<b>Final Sales to Domestic Purchasers</b>	-1.0 (-0.8)	-1.0 (0.2)	2.9 (2.9)	-1.0 (-0.8)	-1.0 (0.2)	3.0 (3.0)
<b>Consumption</b>	-1.2 (-0.7)	0.4 (0.5)	2.3 (2.3)	-0.8 (-0.5)	0.3 (0.4)	1.6 (1.6)
<b>BFI: Equipment and Software</b>	-4.1 (-4.4)	-11.3 (0.2)	7.1 (9.0)	-0.3 (-0.3)	-0.8 (0.0)	0.4 (0.6)
<b>BFI: Nonresidential Structures</b>	8.2 (5.3)	-8.8 (-8.8)	6.5 (3.2)	0.3 (0.2)	-0.4 (-0.3)	0.2 (0.1)
<b>Residential Investment</b>	-18.6 (-20.0)	-14.1 (-3.8)	5.0 (5.0)	-0.7 (-0.8)	-0.4 (-0.1)	0.1 (0.1)
<b>Government: Federal</b>	6.7 (5.0)	1.5 (1.5)	1.5 (1.5)	0.5 (0.4)	0.1 (0.1)	0.1 (0.1)
<b>Government: State and Local</b>	0.6 (1.5)	1.2 (1.7)	3.7 (3.0)	0.1 (0.2)	0.2 (0.2)	0.5 (0.4)
<b>Inventory Investment</b>	-- --	-- --	-- --	-0.5 (-0.5)	0.2 (0.3)	0.2 (0.0)
<b>Net Exports</b>	-- --	-- --	-- --	1.2 (1.5)	0.5 (0.4)	-0.2 (-0.1)
<b>INFLATION</b>						
<b>Total PCE Deflator</b>	2.1 (3.2)	0.8 (1.5)	1.8 (1.7)			
<b>Core PCE Deflator</b>	2.0 (2.3)	1.1 (1.6)	1.6 (1.5)			
<b>Total CPI Inflation</b>	2.6 (4.7)	0.8 (1.8)	2.1 (2.0)			
<b>Core CPI Inflation</b>	2.0 (2.4)	1.5 (1.8)	2.0 (1.9)			
<b>GDP Deflator</b>	2.9 (2.0)	0.9 (1.4)	1.7 (1.9)			

Note: Numbers in parentheses are from the previous Blackbook.

## B. FRBNY Forecast Details

### Exhibit B-5: Projections of Other Key Economic Variables

	Q4/Q4 Growth Rates		
	2008	2009	2010
<b>INTEREST RATE ASSUMPTIONS</b>			
Federal Funds Rate (End-of-Year)	0.25 (1.00)	0.25 (1.25)	1.00 (3.00)
10-Year Treasury Yield (Avg. Q4 Level)	3.3 (3.7)	2.6 (4.0)	3.0 (4.40)
<b>PRODUCTIVITY AND LABOR COSTS*</b>			
Output	-1.0 (-0.2)	-0.8 (0.8)	3.4 (3.4)
Hours	-3.0 (-1.9)	-1.8 (-0.5)	1.7 (1.6)
Output per Hour	2.1 (1.8)	0.9 (1.3)	1.6 (1.8)
Compensation per Hour	2.9 (4.1)	2.6 (2.9)	1.7 (1.9)
Unit Labor Costs	0.8 (2.3)	1.7 (1.5)	0.0 (0.1)
<b>LABOR MARKET</b>			
Unemployment Rate (Avg. Q4 Level)	6.7 (6.6)	9.0 (8.0)	9.1 (7.5)
Participation Rate (Avg. Q4 Level)	65.9 (66.1)	65.9 (66.1)	66.1 (66.1)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-145 (-93)	-194 (-39)	112 (89)
<b>INCOME</b>			
Personal Income	2.7 (2.1)	-0.1 (1.4)	4.5 (4.8)
Real Disposable Personal Income	1.1 (-0.8)	-0.8 (0.3)	2.9 (3.4)
Corporate Profits Before Taxes	-8.5 (-4.6)	-1.7 (-0.2)	4.5 (4.5)

Note: Numbers in parentheses are from the previous Blackbook.

\*Nonfarm business sector.

## B. FRBNY Forecast Details

### Exhibit B-6: FRBNY and Greenbook Forecast Comparison

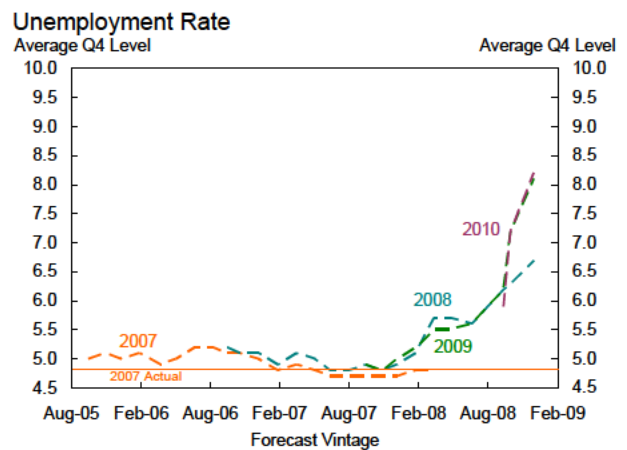
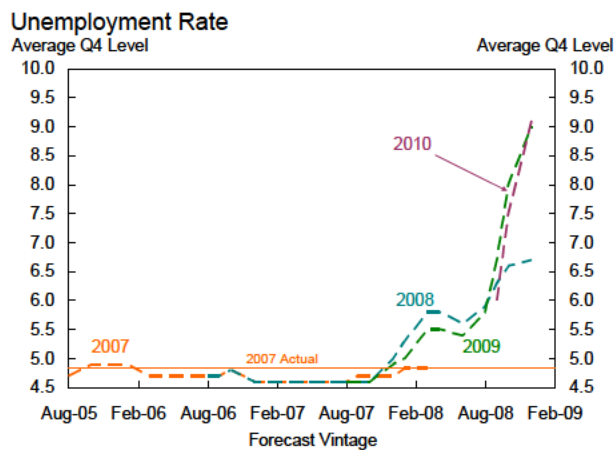
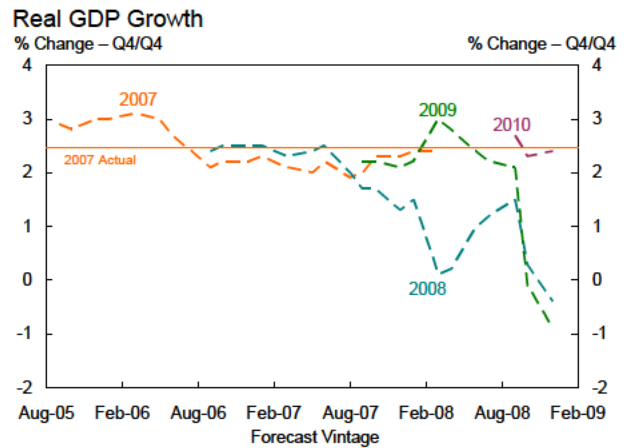
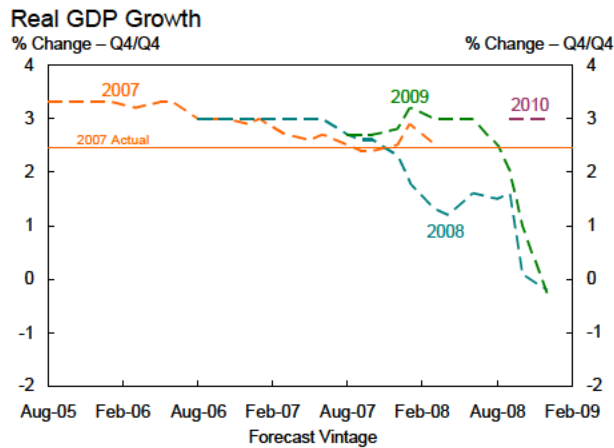
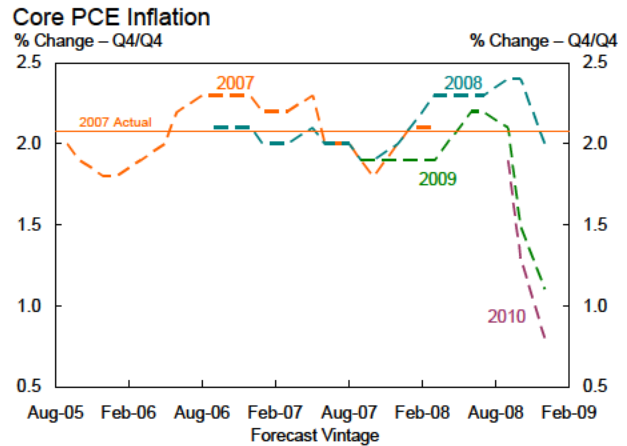
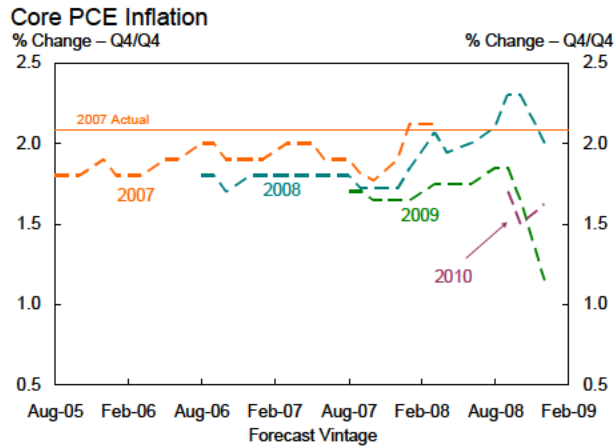
	FRBNY			Board		
	2008	2009	2010	2008	2009	2010
<b>OUTPUT</b>						
Real GDP	-0.2 (0.1)	-0.3 (1.0)	3.0 (3.0)	-0.4 (0.3)	-0.9 (-0.1)	2.4 (2.3)
<b>GDP Growth Contributions</b>						
Final Sales to Domestic Purchasers	-1.0 (-0.8)	-1.0 (0.2)	3.0 (3.0)	-1.6 (-1.1)	-1.3 (-0.8)	2.7 (2.5)
Consumption	-0.8 (-0.5)	0.3 (0.4)	1.6 (1.6)	-1.1 (-0.7)	0.5 (0.7)	1.9 (1.7)
BFI	0.0 (-0.1)	-1.1 (-0.3)	0.7 (0.7)	-0.3 (-0.1)	-1.8 (-1.2)	0.4 (0.4)
Residential Investment	-0.7 (-0.8)	-0.4 (-0.1)	0.1 (0.1)	-0.8 (-0.8)	-0.3 (-0.5)	0.2 (0.3)
Government	0.6 (0.5)	0.3 (0.3)	0.6 (0.5)	0.6 (0.5)	0.3 (0.2)	0.2 (0.1)
Inventory Investment	-0.5 (-0.5)	0.2 (0.3)	0.2 (0.0)	-0.1 (0.1)	0.4 (0.4)	0.0 (0.0)
Net Exports	1.2 (1.5)	0.5 (0.4)	-0.2 (-0.1)	1.2 (1.3)	0.0 (0.2)	-0.4 (-0.2)
<b>INFLATION</b>						
Total PCE Deflator	2.1 (3.2)	0.8 (1.5)	1.8 (1.7)	1.9 (2.8)	0.7 (1.4)	1.0 (1.4)
Core PCE Deflator	2.0 (2.3)	1.1 (1.6)	1.6 (1.5)	2.0 (2.4)	1.1 (1.5)	0.8 (1.3)
<b>INTEREST RATE ASSUMPTION</b>						
Fed Funds Rate (End-of-Year)	0.25 (1.00)	0.25 (1.25)	1.00 (3.00)	0.50 (0.75)	0.25 (0.50)	0.25 (1.00)
<b>PRODUCTIVITY AND LABOR COSTS*</b>						
Output per Hour	2.1 (1.8)	0.9 (1.3)	1.6 (1.8)	2.0 (1.7)	0.8 (1.7)	2.4 (2.2)
Compensation per Hour	2.9 (4.1)	2.6 (2.9)	1.7 (1.9)	3.2 (4.0)	2.4 (3.1)	1.6 (2.1)
Unit Labor Costs	0.8 (2.3)	1.7 (1.5)	0.0 (0.1)	1.2 (2.2)	1.6 (1.4)	-0.8 (-0.1)
<b>LABOR MARKET</b>						
Unemployment Rate (Avg. Q4 Level)	6.7 (6.6)	9.0 (8.0)	9.1 (7.5)	6.7 (6.3)	8.1 (7.2)	8.2 (7.2)
Participation Rate (Avg. Q4 Level)	65.9 (66.1)	65.9 (66.1)	66.1 (66.1)	65.9 (66.0)	65.5 (65.6)	65.3 (65.4)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-145 (-93)	-194 (-39)	112 (89)	-158 (-92)	-175 (-133)	42 (67)
<b>HOUSING</b>						
Housing Starts (Avg. Q4 Level, Thous.)	760 (820)	810 (860)	870 (920)	700 (800)	800 (700)	1000 (1100)

## B. FRBNY Forecast Details

**Exhibit B-7: Evolution of FRBNY  
and Board Forecasts since Mid-2005**

### FRBNY

### Board



Note: Forecast vintage is the date the forecast was produced.

## B. FRBNY Forecast Details

### Exhibit B-8: Alternative GDP and Inflation Forecasts

		Real GDP Growth			
	Release Date	2008Q4	2009Q1	2008 Q4/Q4	2009 Q4/Q4
FRBNY	12/12/2008	-4.0 (-2.8)	-3.2 (-1.5)	-0.2 (0.1)	-0.3 (1.0)
PSI Model	12/12/2008	-3.9 (-0.1)	-2.5 --	-- --	-- --
Blue Chip	12/10/2008	-4.1 (-1.1)	-2.4 (-0.1)	-0.3 (0.6)	0.1 (1.4)
Median SPF	11/17/2008	-2.9 (0.7)	-1.1 (1.6)	1.4 (1.7)	-0.2 (1.5)
Macro Advisers	12/12/2008	-6.3 (-2.2)	-4.2 (0.4)	-0.7 (0.4)	0.1 (2.1)

		Core PCE Inflation			
	Release Date	2008Q4	2009Q1	2008 Q4/Q4	2009 Q4/Q4
FRBNY	12/12/2008	1.0 (1.9)	0.7 (1.8)	2.0 (2.3)	1.1 (1.6)
Median SPF	11/17/2008	2.0 (2.1)	1.6 (2.1)	2.3 (2.2)	1.7 (2.0)
Macro Advisers	12/8/2008	1.1 (2.4)	1.5 (2.1)	2.0 (2.5)	0.9 (1.9)

		CPI Inflation			
	Release Date	2008Q4	2009Q1	2008 Q4/Q4	2009 Q4/Q4
FRBNY	12/12/2008	-5.1 (2.4)	-2.2 (1.8)	2.6 (4.7)	0.8 (1.8)
Blue Chip	12/10/2008	-5.7 (0.7)	-0.3 (1.9)	2.5 (4.1)	1.3 (2.0)
Median SPF	11/17/2008	-2.6 (2.5)	0.8 (2.6)	3.4 (4.3)	1.7 (2.4)
Macro Advisers	12/8/2008	-7.2 (0.3)	-1.7 (1.4)	2.1 (4.2)	0.2 (2.0)

		Core CPI Inflation			
	Release Date	2008Q4	2009Q1	2008 Q4/Q4	2009 Q4/Q4
FRBNY	12/12/2008	0.4 (2.1)	0.8 (1.8)	2.0 (2.4)	1.5 (1.8)
Median SPF	11/17/2008	2.1 (2.3)	2.0 (2.3)	2.4 (2.3)	2.0 (2.2)
Macro Advisers	12/8/2008	0.7 (2.7)	1.8 (2.1)	2.1 (2.6)	1.2 (2.3)

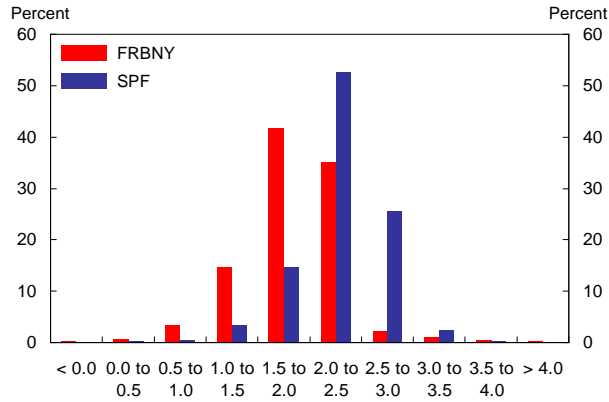
Note: Numbers in parentheses are from the August release for SPF, and the October release for all other forecasts. All values are quarterly percent changes at an annual rate.



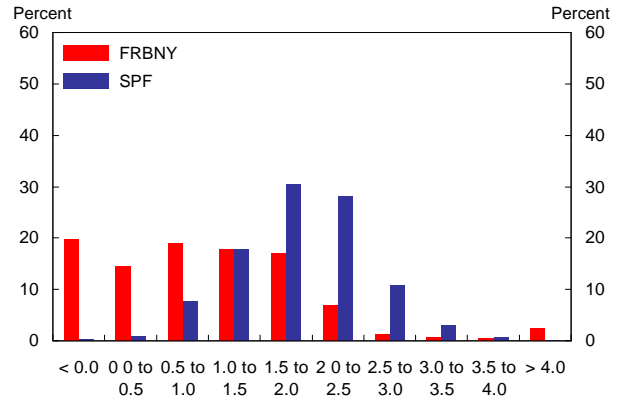
## B. FRBNY Forecast Details

### Exhibit B-9: FRBNY, SPF, and Board Forecast Comparison

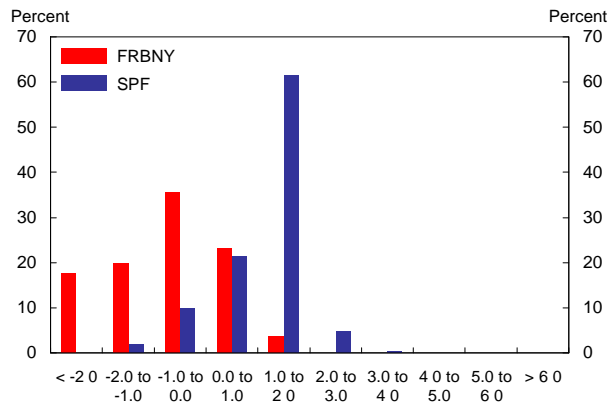
2008Q4/Q4 Core PCE Inflation Probabilities



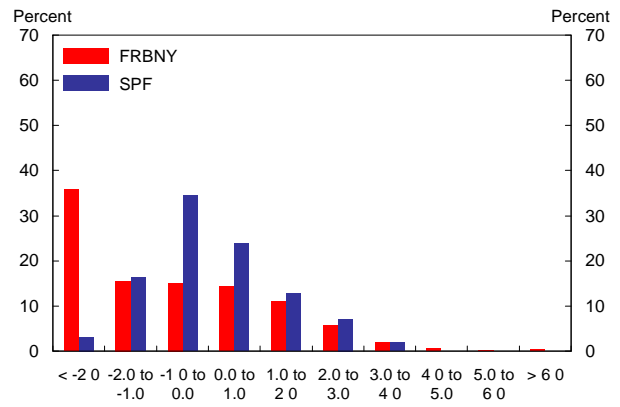
2009Q4/Q4 Core PCE Inflation Probabilities



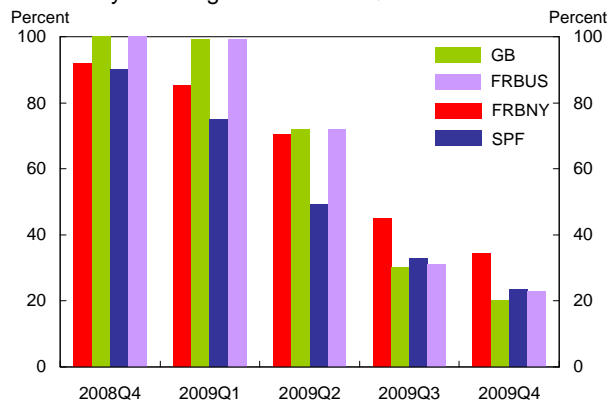
2008/2007 Real GDP Growth Probabilities



2009/2008 Real GDP Growth Probabilities

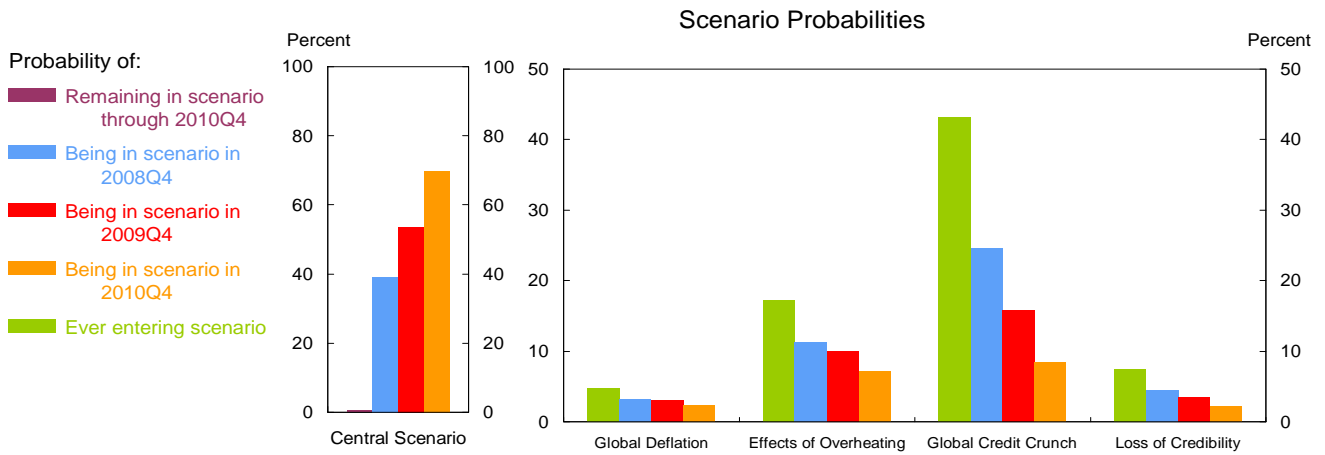


Probability of a Negative-Growth Quarter

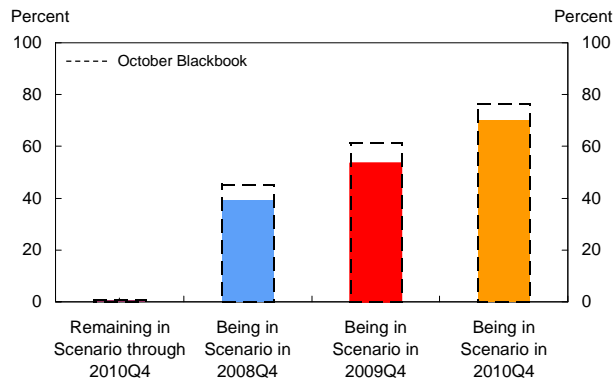


## C. FRBNY Forecast Distributions

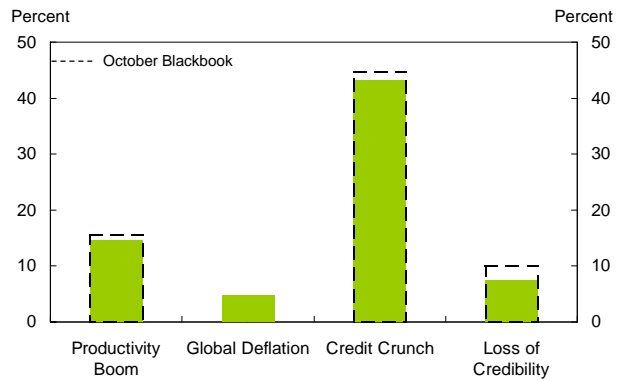
### Exhibit C-1: Risks



#### Change in Central Scenario Probabilities



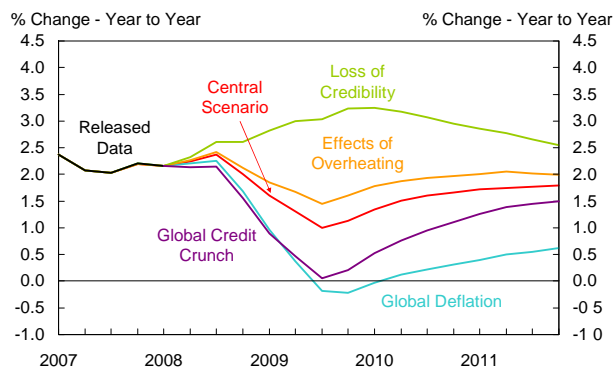
#### Change in Alternative Scenario Probabilities\*



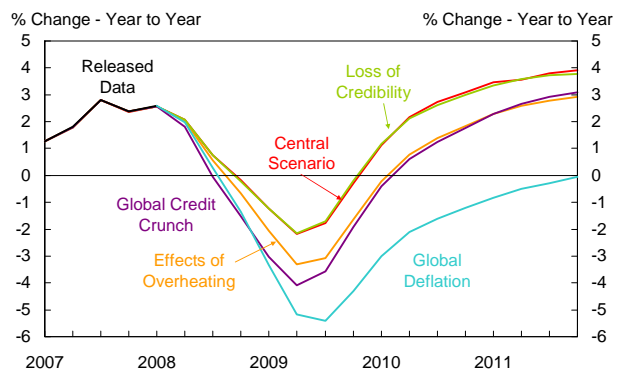
\*Probability of ever reaching scenario

### Exhibit C-2: Projections under Alternative Scenarios

#### Core PCE Inflation under Alternative Scenarios



#### Real GDP Growth under Alternative Scenarios

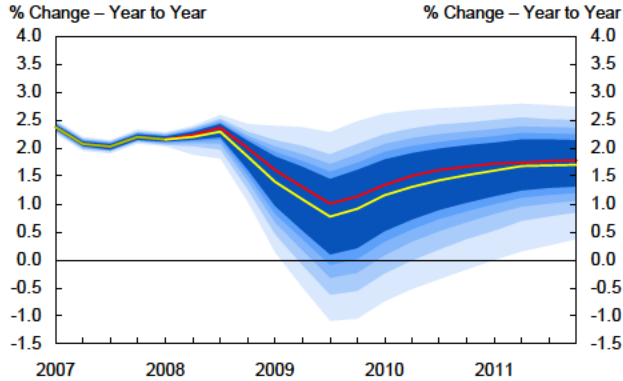


Source: MMS Function (FRBNY)

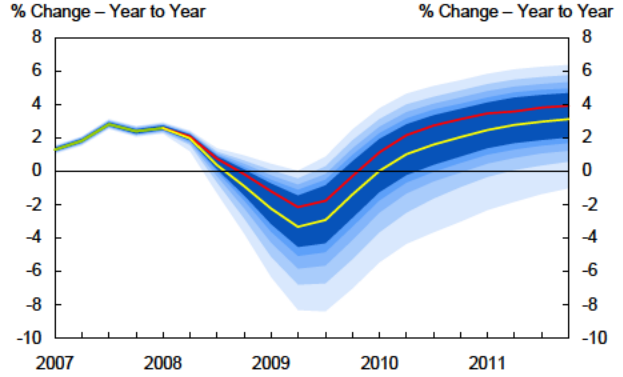
## C. FRBNY Forecast Distributions

### Exhibit C-3: Inflation and Output Forecast Distributions

**Core PCE Inflation Forecast Distribution**

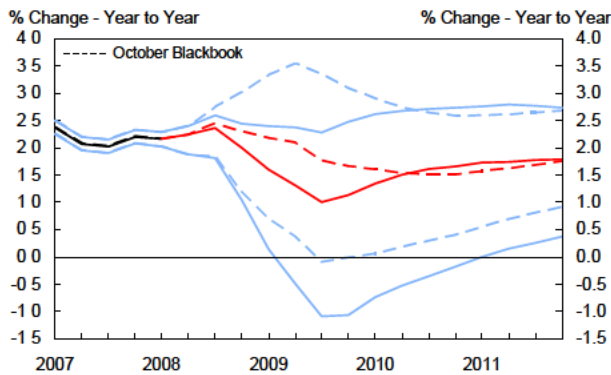


**Real GDP Growth Forecast Distribution**

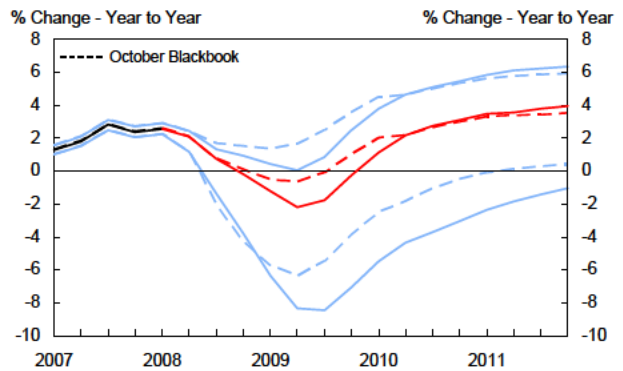


The yellow line is the expected value of the forecast distribution, the red line is the central scenario projection, and the green line is released data. The shading represents the 50, 60, 70, 80, and 90 percent chance that the four-quarter change will be within the respective range.

**Change in Core PCE Inflation Forecast Distribution**

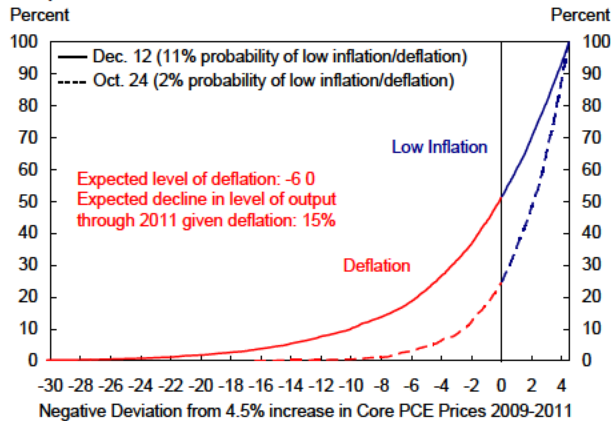


**Change in Real GDP Growth Forecast Distribution**

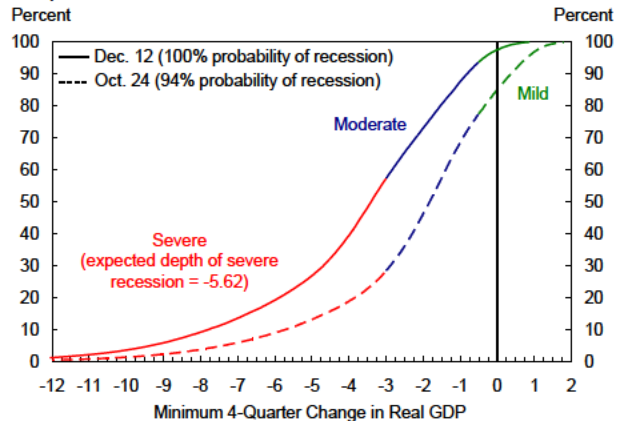


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from previous Blackbook.

**Depth of Deflation**



**Depth of Recession**

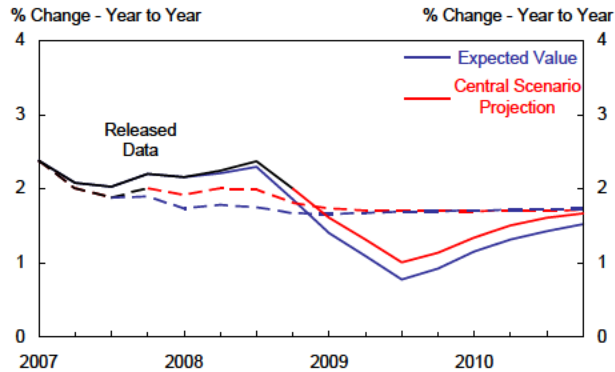


Source: MMS Function (FRBNY)

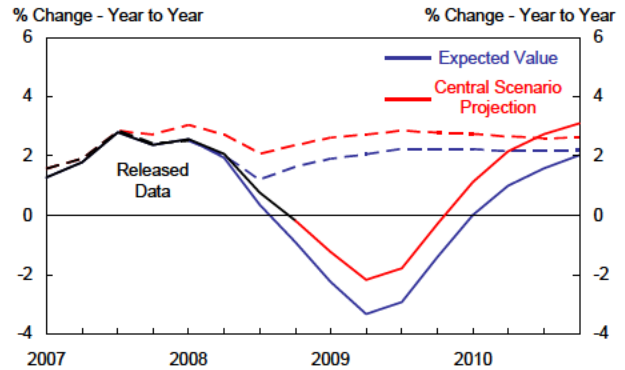
## C. FRBNY Forecast Distributions

### Exhibit C-4: Evolution and Performance of Inflation and Output Forecast Distributions

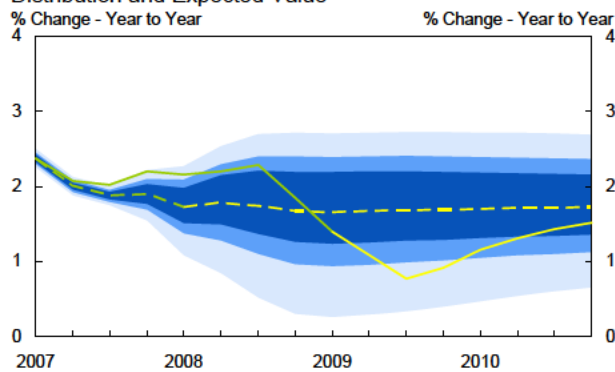
One-Year Comparison of Core PCE Inflation Forecast



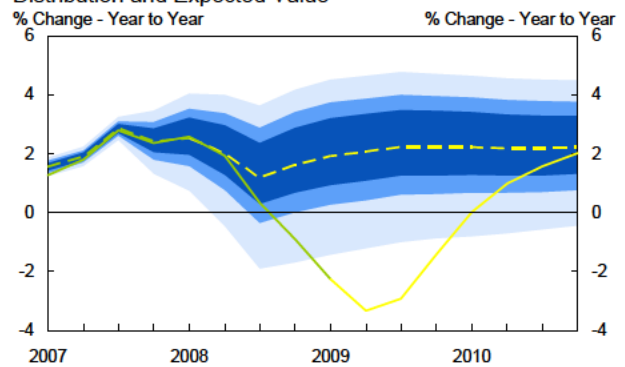
One-Year Comparison of Real GDP Growth Forecast



One-Year Comparison of Core PCE Inflation Forecast Distribution and Expected Value



One-Year Comparison of Real GDP Growth Forecast Distribution and Expected Value



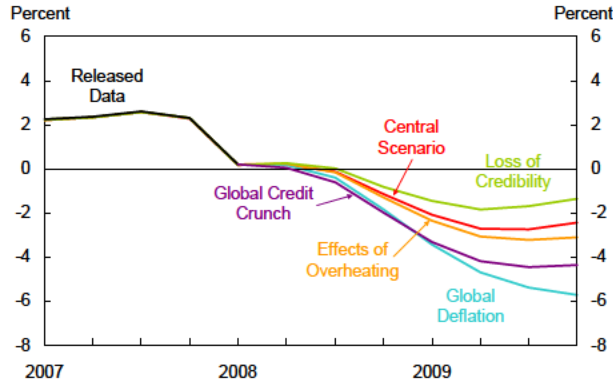
The solid yellow line is the **current** expected value of the forecast distribution, while the dashed yellow line is the **December 2007** expected value. The shading represents the 50, 70 and 90 percent probability intervals from the **December 2007** forecast. The green lines are released data.

Source: MMS Function (FRBNY)

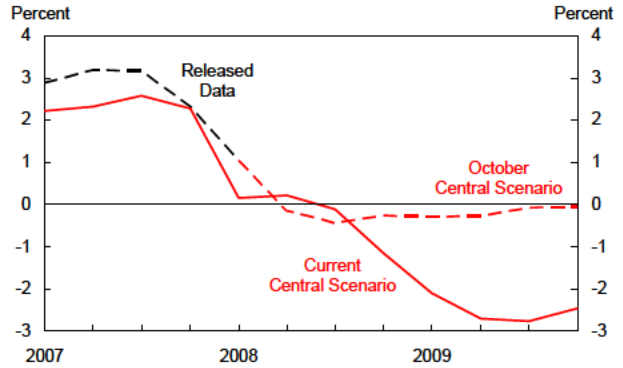
## D. FRBNY Fed Funds Rate Projections

### Exhibit D-1: *Baseline* Policy Rule Analysis

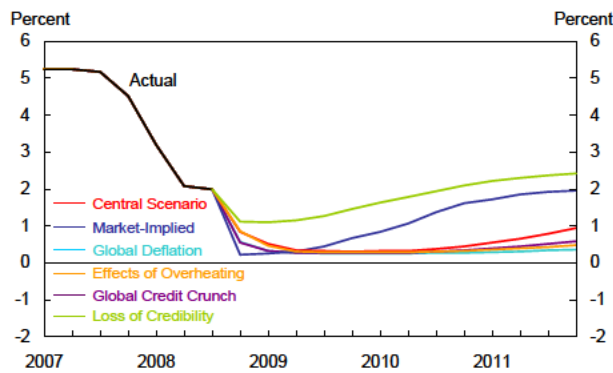
Real FFR under Alternative Scenarios



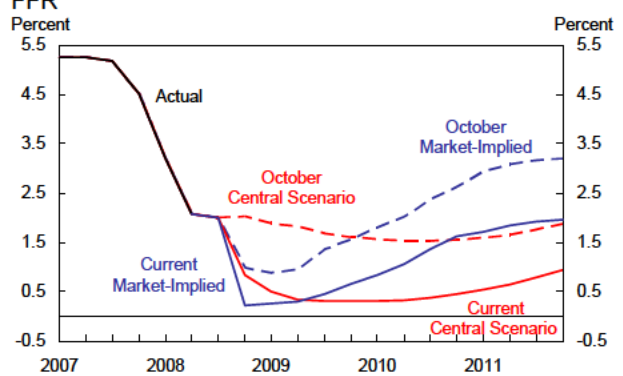
Change in Central Scenario Real FFR



Nominal FFR under Alternative Scenarios

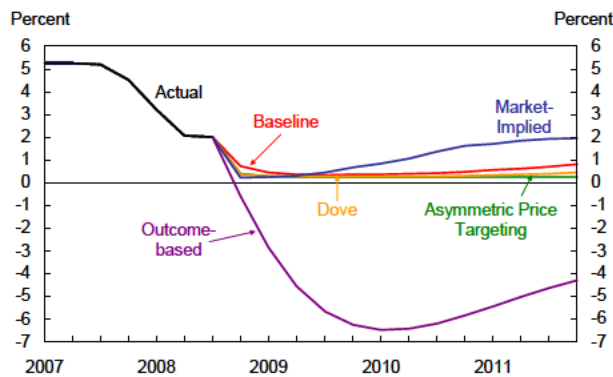


Change in Central Scenario and Market-Implied Nominal FFR



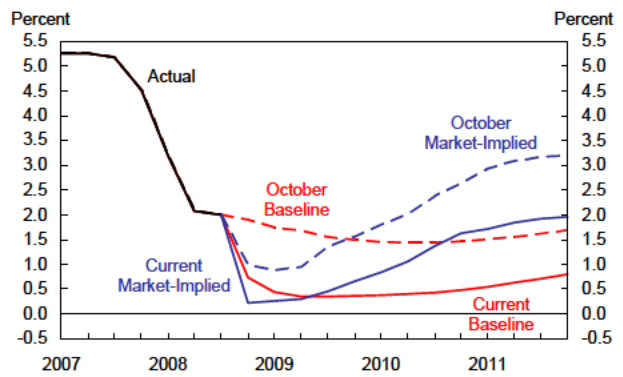
### Exhibit D-2: Alternative Policy Rules under Expected Value of Forecast Distribution

Nominal FFR using Alternative Policy Rules\*



\*Evaluated using yellow line from C-3

Change in *Baseline*\* and Market-Implied Nominal FFR



\*Evaluated using yellow line from C-3

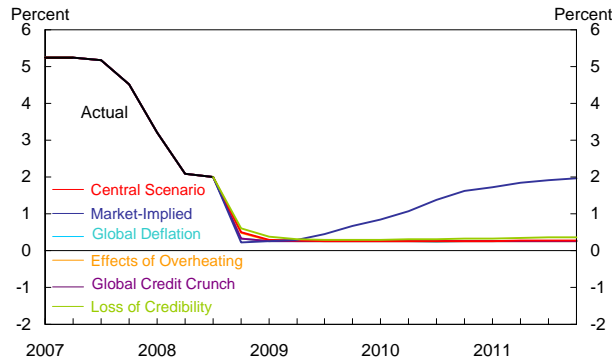
Source: MMS Function (FRBNY)

## D. FRBNY Fed Funds Rate Projections

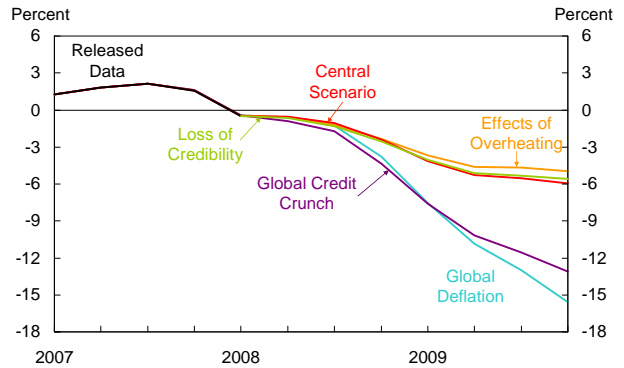
### Exhibit D-3: Alternative Policy Rule Analysis

#### Policy Rule: *Asymmetric Price Targeting*

Nominal FFR under Alternative Scenarios

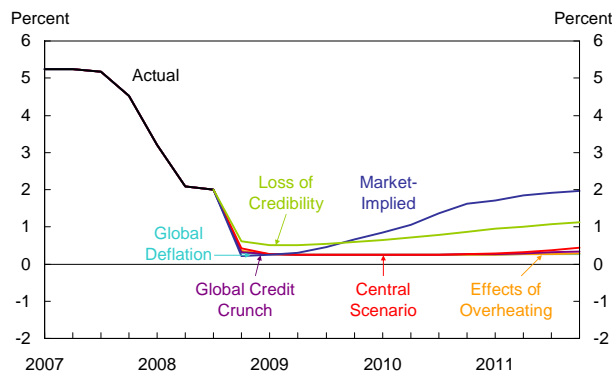


Real FFR under Alternative Scenarios

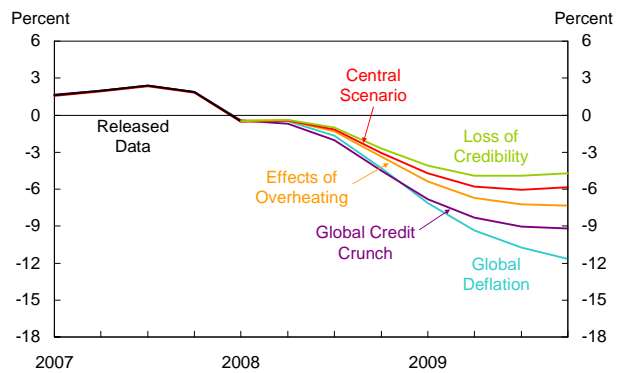


#### Policy Rule: *Dove*

Nominal FFR under Alternative Scenarios

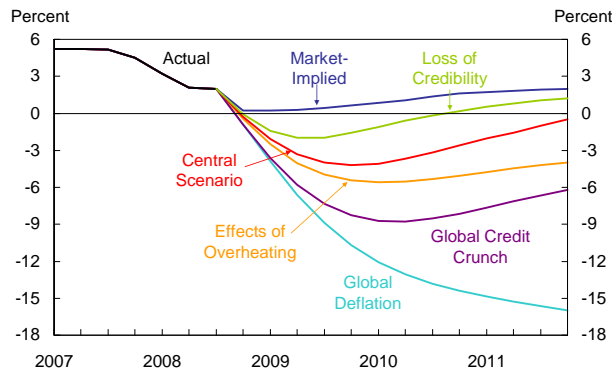


Real FFR under Alternative Scenarios

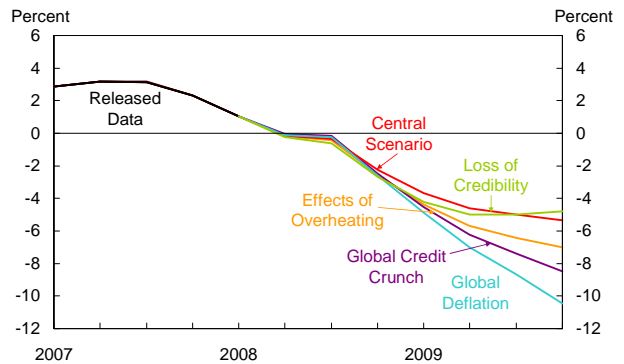


#### Policy Rule: *Outcome-based*

Nominal FFR under Alternative Scenarios



Real FFR under Alternative Scenarios



Source: MMS Function (FRBNY)

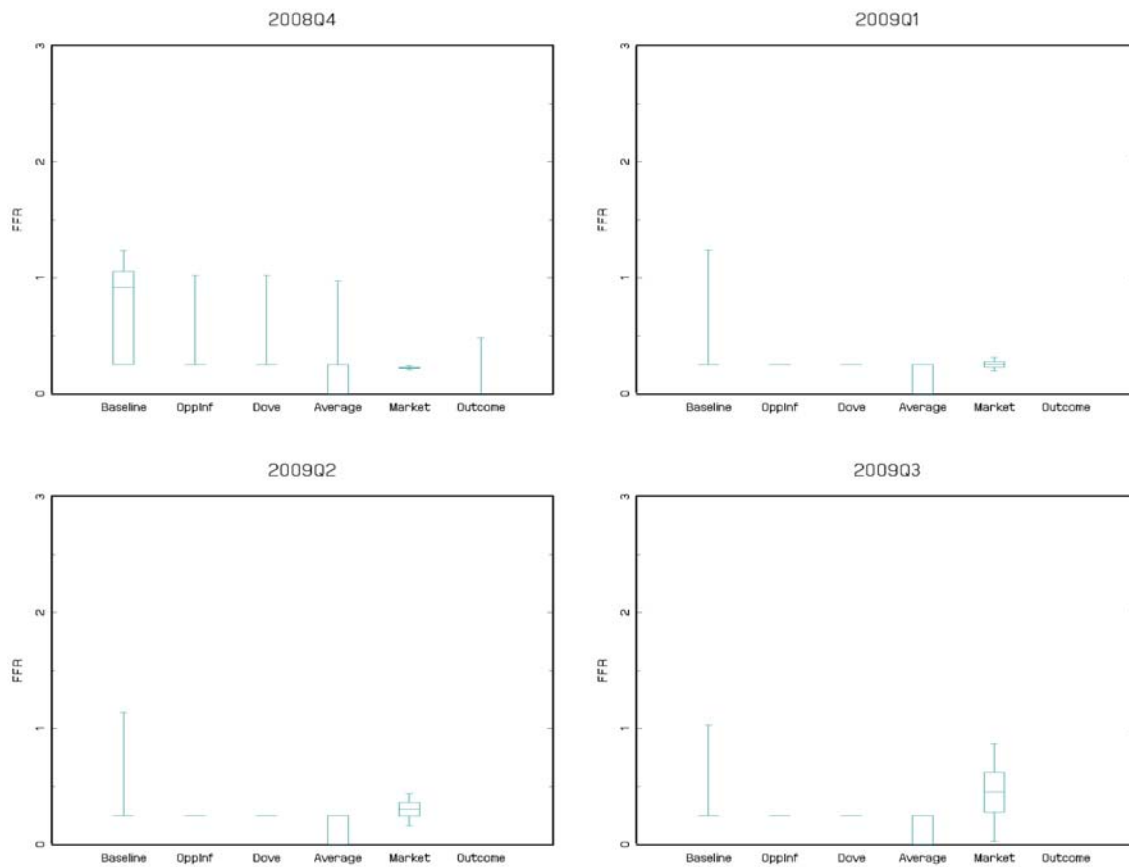
## D. FRBNY Fed Funds Rate Projections

### Exhibit D-4: Comparison between Market and Policy Rule FFR Expectations: 2009Q1

“Average” Weights:

Rule	Current	Oct Blackbook
<i>Baseline</i>	0.32	<b>0.32</b>
<i>Opportunistic Disinflation</i>	0.02	<b>0.02</b>
<i>Dove</i>	0.66	<b>0.66</b>

### Exhibit D-5: FFR Distributions



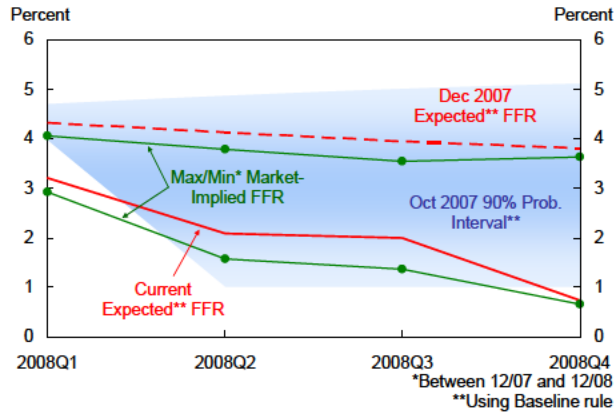
Note: The box represents the 50% probability interval, the line in the box the median, and the tails the 90% probability interval.

Source: MMS Function (FRBNY)

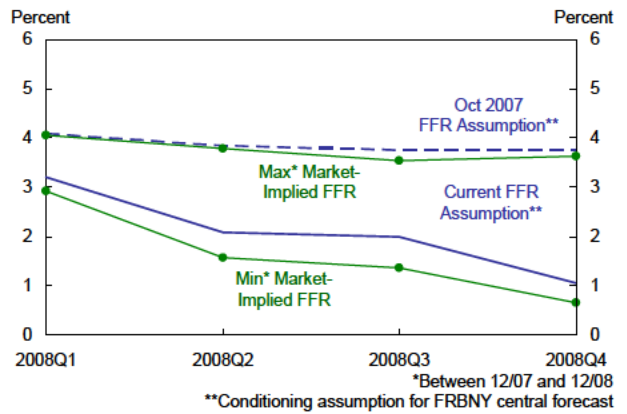
## D. FRBNY Fed Funds Rate Projections

### Exhibit D-6: Evolution of FFR Expectations and Assumption

**FFR Forecast Distribution and Market-Implied FFR**



**FFR Conditioning Assumption and Market-Implied FFR**



Source: MMS Function (FRBNY)



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## Alternative Scenario Descriptions

In this abbreviated version of the Exhibit C documentation, we include brief descriptions of the alternative scenarios used in this Blackbook. Full documentation, including a description of the methodology, is included in the Appendix.

Our first two alternative scenarios consider the impact of above- and below-trend productivity growth, respectively. In the post-war era, the United States has experienced three productivity epochs (pre-1973, High I; 1973 to mid-1990s, Low I; and mid-1990s to 2004, High II). The NIPA revisions in July 2006 and 2007 prompted us to reduce our estimate of potential output growth; thus our current central projection for medium- and long-term productivity growth is somewhat lower than that of the pre-1973 epoch.

### **Alternative 1:** *Productivity Boom*

After a lull from 2004 through early 2007, productivity growth since has been robust and above our current estimate of trend productivity growth. Our projections for 2008Q2 productivity indicate that this pattern should continue. These patterns raise the possibility that the lull in productivity growth in mid-decade was a cyclical development and that medium- and long-term productivity growth will be closer to that of the High II epoch, with some mixture of IT-driven production and applications leading the way. Support for this view comes from Moore's law on the doubling of computing power every 18 months. As such, we could see persistent productivity growth above our assumed trend, implying a higher potential growth rate and thus expected real growth that is higher than our current estimate (as well as a possible development of a larger output gap in 2008). Strong productivity growth would also limit labor cost pressures and thereby help to subdue inflation.

### **Alternative 2:** *Productivity Slump*

The recent surge in productivity growth may reflect a new cyclical pattern whereby firms protective of their profit margins reduce labor input in anticipation of slower profit growth. Furthermore, it is possible that the longer-term upswing in productivity that

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began in the mid-1990s has ended as the IT-driven surge has run its course. If so, there could be an extended period of productivity growth below the trend in our central forecast. In addition, the increase in the level and volatility of energy and commodity prices could continue and lead to lower productivity growth, as occurred in the 1970s. Below-trend growth would not only imply a lower estimate of potential growth, but would also push inflation above the level projected in our central forecast.

We also consider four additional scenarios. Three are related to the impact of monetary policy on the economy and financial markets as well as possible FOMC misperceptions of its past and current policy stances. The other is related to the impact of developments in the global economy.

**Alternative 3:** *Effects of Overheating*

Motivated principally by concerns over the prospect of deflation, the FOMC adopted a deliberately accommodative policy stance in the aftermath of the global slowdown of 2000-2003. It is possible the FOMC markedly underestimated the equilibrium real interest rate (i.e. overestimated the degree of slack in the real resources) during this period. In this case, their accommodative policy would have stimulated aggregate demand growth in excess of potential and, ultimately, triggered inflation. The above-potential output growth from 2004 through mid-2006 and the persistent above-target inflation are consistent with such a scenario, as is the abrupt slowdown in real output growth that began in mid-2006. If this overheating episode occurred, it has likely passed already in the U.S.; however, there is a risk its effects will linger in the form of slightly above-forecast inflation and slightly below-forecast output growth.

Developments in the global economy during this period may have contributed to the economic conditions that motivated the initial policy and may also have made it more difficult for the FOMC to identify the overheating in real time. For example, one likely factor contributing to the deflation scare in the early part of this decade was the downward pressure on global goods prices triggered largely by growth in emerging economies' labor forces. Another critical factor may have been the exchange rate

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policies that a number of emerging market central banks adopted over this period. These policies and the associated dollar reserve accumulation, which were aimed at maintaining the dollar strong relative to their domestic currency, may have put significant downward pressure on long-term interest rates both in the U.S. and around the world, and in doing so, may have made it more difficult to correctly assess the equilibrium real interest rate during this period.

**Alternative 4:** *Global Credit Crunch*

The financial turmoil that started in the summer of 2007 has continued to put a significant strain on the availability of credit. In the U.S., financial conditions have tightened significantly and financial market stress has reached record high levels in recent months. 30-year fixed rate mortgage rates remain near their one-year high. In addition, global data for 2003Q3 have been largely negative. The intensification of the financial crisis together with global slowing of economic growth has led to significant wealth losses and increased volatility in equity markets. Policy-makers worldwide have enacted measures to address the freezing of interbank markets and implemented a coordinated cut in policy rates. This combination of factors suggests the neutral rate is lower than before the financial turmoil began (we estimate it to be between 3.00% and 3.75% over the near-term). Even though the current FFR is below our lower estimate of the neutral rate, tighter credit conditions and continued stresses in global financial markets, along with increased risk of a further deterioration in global economic conditions, create a risk that output growth will slow significantly below the level projected in the central forecast; this would likely be accompanied by inflation below the level in the central forecast.

**Alternative 5:** *Loss of Credibility*

One interpretation of recent higher inflation, higher financial market inflation compensation, higher commodity prices, and dollar depreciation is that inflation expectations have risen despite the FOMC continuing to state its price stability mandate, raising concern that the FOMC has started to lose its credibility on inflation. Although some FOMC communications have placed more emphasis on the upside inflation risks, the FOMC also has communicated continued concern about growth risks, thus providing

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signals that the FFR may remain low that have further fueled such concerns. It is possible that these statements and actions of the FOMC may lead to further increases in inflation and inflation expectations, such that firms and households begin to see the FOMC as not credible in regard to inflation. Such developments are likely to cause further rises in inflation and inflation expectations above forecast.

**Alternative 6: *Global Deflation***

Recent price level indicators point to slowing or decreasing inflation in many regions of the world. Domestic measures of implied inflation have fallen sharply, suggesting that inflation expectations are also declining. These signals, coupled with falling global output as a result of financial market turmoil, suggest that there is an increased risk of global deflation going forward. This possibility is further exacerbated as central banks around the world cut interest rates and target rates approach their lower bounds. The *Global Deflation* scenario reflects the possibility that the U.S. and the rest of the world may get mired in a liquidity trap for a prolonged period of time. These factors would result in both inflation and output growth far below the levels projected in the central forecast. Although the onset of this slowdown would be later compared to other scenarios, global factors would cause these conditions to be more persistent.

The implications for inflation and output of the various scenarios can be summarized as follows:

1. *Productivity Boom*: inflation below central forecast, output above central forecast.
2. *Productivity Slump*: inflation above central forecast, output below central forecast.
3. *Effects of Overheating*: inflation slightly above central forecast, output slightly below central forecast.
4. *Global Credit Crunch*: inflation below central forecast, output significantly below central forecast.
5. *Loss of Credibility*: inflation far above central forecast, output slightly below central forecast.
6. *Global Deflation*: inflation far below central forecast, output far below central forecast.

## Policy Rule Descriptions

In this abbreviated version of the Exhibit D documentation, we include a description of policy rules used in this Blackbook. Full documentation, including the methodology description, is included in the Appendix.

In both our *Baseline* and alternative policy rule specifications, the policy rate responds to deviations of inflation from target and of output from potential, while incorporating some degree of inertia. For each of the FFR paths and each of the policy rules, we determine these deviations using the corresponding inflation and output paths.

*Policy Rule – Baseline Specification:*

$$i_t = \rho i_{t-1} + (1 - \rho) [i^* + \varphi_\pi (\pi_t - \pi^*) + \varphi_x x_t]$$

$\rho = 0.8$  (interest rate smoothing parameter)

$i^* = 2.00 - 3.00$  in short - term, moving to 4.25 (neutral FFR)

$\pi^* = 1.75$  (core PCE inflation target)

$\varphi_\pi = 1.5$  (weight on inflation deviations)

$\varphi_x = 0.5$  (weight on output gap)

$\pi_t$  : core PCE, 4 - quarter average

$x_t$  : output gap, using 2.7% potential growth rate, moving to 2.6%

$i_{t-1}$  : interest rate in previous quarter

The two variants of the *Baseline* rule that we use are the *Asymmetric Price Targeting* and *Dove* rules. The *Asymmetric Price Targeting* rule is designed to combat deflation by instituting price-level targeting. This rule reacts more slowly than the *Baseline* rule to initial increases in inflation, maintaining a lower policy rate for a longer period of time.<sup>2</sup> In each quarter over the forecast horizon, the rule reacts to the cumulative gap between a 1.5% price level path and the actual path on the downside; the rule is asymmetric because

<sup>2</sup> All of the policy rules are subject to an effective lower bound of 0.25%.

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price-level targeting is only implemented on the downside. When the cumulative gap in inflation is greater than 1.5% per year, the policy rule reverts to targeting the gap between four-quarter changes in inflation and the inflation objective, just as in the *Baseline* rule.

The Dove rule reacts more strongly than the Baseline rule to a negative output gap. When the output gap is negative, the Dove rule increases the weight on deviations of output from potential ( $\varphi_x = 1$  instead of 0.5). When the output gap is positive, however, the Dove rule offers the same prescription as the Baseline rule ( $\varphi_x = 0.5$ , as usual).

In addition to the Baseline rule and the two variants, we also consider the FFR paths generated by the Board staff's Outcome-based rule. The most significant difference between the three FRBNY rules and the Outcome-based rule is that the FRBNY rules offer a prescription for future behavior based on policymaker preferences and views of the economy, whereas the Outcome-based rule is a statistical description of the average of past FOMC behavior. Specifically, the Outcome-based rule calculates an FFR for a given quarter as a function of the FFR in the previous two quarters, the current quarter's four-quarter core PCE inflation, and the output gap for the current and the previous quarter using parameters estimated from real-time historical data (1988-2006)<sup>3</sup>.

We also want to compare the policy paths and distributions calculated using these rules with the market-implied path and distribution. In these charts, we use the standard path of market policy expectations derived from fed funds and Eurodollar futures contracts that is pictured in Exhibit A-5. For Exhibits D-4 and D-5, we construct a distribution for the market-implied path by assuming it has a normal distribution centered at the standard, market-implied path, with a standard deviation derived from options markets (pictured in Exhibit A-6).

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<sup>3</sup> *Outcome-based* rule:  $i_t = 1.20*i_{t-1} - 0.39*i_{t-2} + 0.19*(1.17 + 1.73*\pi_t + 3.66*x_t - 2.72*x_{t-1})$