

**FRBNY BLACKBOOK**

**October 2008**

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**October 2008**

**CONFIDENTIAL(FR) Class II FOMC**

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## 1. Policy Recommendation and Rationale

Our policy recommendation is to reduce the FFR (federal funds rate) target to 1.00% at the October FOMC meeting. This recommendation represents an appropriate response to the rapid deterioration of economic conditions in the inter-meeting period and intends to forestall the development of deflationary pressures. We anticipate that the FFR will remain at the 1 percent level until conditions in financial markets renormalize and the risk of a severe recession with a downward threat to price stability has receded sufficiently. We do not expect to start the policy renormalization process before the second half of 2009, consistent with our central forecast of a recession through the first quarter of 2009. The pace of the renormalization will depend on the speed with which economic conditions improve. It is important that the FOMC signal its willingness to continue a low interest rate policy until a normal flow of credit is restored and a significant recovery is under way. This policy recommendation is roughly in line with the market-implied path for the FFR target.

We forecast that inflation peaked in 2008Q3 and will moderate in 2009, at a slightly faster rate than anticipated in the September Blackbook. Recent data suggest that headline inflation (for both PCE and CPI) is declining significantly, due to the drop in energy and other commodity prices. In addition, several alternative inflation measures indicate that underlying inflationary pressures have abated. We expect core measures to recede as well, driven by a significant decline in domestic and global demand. The forecast is consistent with the decline in medium- and long-term financial market inflation compensation, the drop in commodity prices and the recent strength of the dollar. Furthermore, the weakening labor market implies that labor cost pressures are unlikely to develop.

The rapid deterioration of economic conditions in the inter-meeting period has led us to change the risk assessment relative to our previous Blackbook. Our central scenario is a credit crunch scenario. Relative to the September Blackbook we have increased slightly the probability of the *Loss of Credibility* scenario and lowered that of the *Productivity Boom and Effects of Overheating* scenarios. More notably, we introduced a *Global Credit*

*Crunch* scenario, characterized by larger declines in output and lower inflation than the central scenario, reflecting the additional negative impact of the global recession. This scenario is now the one with the highest probability, which highlights an increased level of downside risk to the central forecast. Consistent with the new scenarios configuration, the accommodative stance of monetary policy is calibrated to insure against the risk of an unwelcome fall in inflation.

We currently forecast three quarters of falling output, with a modest rebound starting in the second quarter of 2009. We expect the strains in credit markets to place significant limitations on spending of both households and businesses in the near- to medium-term. Net exports are expected to continue to provide some positive contribution to real activity, but more modestly going forward due to a deeper global slowdown than previously anticipated.

The weakening of the labor market has accelerated and we expect a significant pick up in the unemployment rate by year-end. We anticipate prolonged weakness in the labor market which will significantly moderate domestic demand.

The depth and duration of the economic downturn will depend to a large extent on how fast the financial sector will return to some normal functioning. The strains in financial markets and the significant wealth destruction that has occurred imply that risks remain firmly on the downside for output growth. An additional fiscal stimulus, if approved quickly, could mitigate downward risks and/or accelerate recovery in the real economy.

It is important to start developing an exit strategy with appropriate communication. Specifically, markets should understand that we will quickly adjust policy when financial conditions are normalized and there are no longer downward risks to price stability. We should also be prepared for a scenario in which the FFR target at 1 percent is not enough to prevent an unwelcome fall into deflation territory. In this case, the Federal Reserve can consider preparing the market for two escalation options. First, it is possible to cut the FFR below one percent without causing significant distortions in money markets. The

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Committee can accompany such a cut with a strong signal that would tie policy actions to future economic conditions. An example of such a policy would be to announce that the fed funds rate would be kept at 0.5 percent *at least* until year over year core inflation is above 2 percent for two consecutive quarters. Second, in the event that this action fails to stem deflationary pressures, the Federal Reserve has the option of monetizing the deficit. In practice, this could be done by committing to buy new Treasury issues until year over year core inflation exceeds 2 percent for two consecutive quarters (or some other state contingent commitment).

# Special Topic

The Case for Cutting the Federal Funds target by 25 basis points

*Argia Sbordone, Gauti Eggertsson and Vasco Curdia*

*The rationale for a 50 basis point cut in the FFR target is to provide an “appropriate response to the rapid deterioration of economic conditions and to forestall deflationary pressures.” Here we offer a counterargument for a 25 basis points cut.*

Firstly, the pronounced deterioration of economic conditions that we are now seeing in the data was, in part, anticipated by the FOMC when it implemented a coordinated rate cut of 50 basis points on October 8.

Secondly, the risk of deflationary pressures on core prices is still low. Forward measures of inflation expectations have yet to offer firm signals of price declines.

Finally, there is substantial uncertainty about how deeply the financial crisis will impact the real economy and how much the recent policy interventions, some of which are still not well understood by financial markets, will ameliorate the crisis.

Several measures of financial stress, while still quite elevated compared to their readings at the time of the September FOMC, have started to retreat from their peaks. It is also possible that further fiscal stimulus will be channeled to the economy, supporting real income and spending.

Such considerations suggest that a more cautious approach will allow the FOMC to react to the recent weakness of economic data while taking time to further evaluate the appropriate policy stance.

A cut in the FFR target is appropriate given the poor economic outlook. Not cutting at this time and defying expectations could have a disruptive effect on quite fragile financial markets. A smaller policy cut of only 25 basis points, however, would be consistent with the commitment to counteracting recessionary pressures. It would also communicate that the policy rate should not bear the entire burden of stimulating the economy given that the main drivers of the slowdown are dislocations in the financial markets.

## 2. Significant Developments

### 2.1 Economic Developments

The intensification of the financial crisis and the ongoing slowdown in the global economy led to a significant deterioration of U.S. economic conditions in the third quarter. We now believe that a recession started in that quarter and will likely persist into the first half of 2009. Headline inflation continued to moderate, driven by the decline in energy prices. While core inflation on a 12-month basis remains at the levels of 2008Q2, the most recent data show stronger moderation in response to a decline in domestic and foreign demand, which are also reflected in measures of inflation expectations.

**Inflation.** Data on August PCE inflation and September CPI inflation were released in the inter-meeting period. The overall PCE price index was unchanged in August while the ex-food and energy index was up 0.2%, in line with forecasts. The 12-month increase in the core index moved up from 2.5% in July to 2.6% in August, while the 3-month rate of growth moved up from 3.0% to 3.3%. The 12-month increase in the “market-based” core index moved up from 2.1% to 2.2%.

Given the fast pace at which the economy seems to be evolving, however, September CPI readings provide a better gauge of current inflationary pressures, which appear to be moderating. Total CPI was essentially unchanged in September as energy prices continued to decline. The total energy component fell 1.9% in September on the heels of a 3.1% decline in August. Over the year, total CPI rose 4.9%, down from around 5.25% in July and August. Core CPI rose a moderate 0.14% following a four-month period in which monthly increases averaged 0.26%. Core CPI was up 2.5% in September over the year, a bit below August but still above the 2.3% of 2008Q2 and the 2.2% of mid 2007.

Survey measures of inflation expectations continued to moderate. The Conference Board index of near-term inflation expectations and the NYFed-ALP household survey continued to retreat in September. In particular, the NYFed-ALP survey shows a decline

in the median year-ahead forecast and the median 3-year ahead forecast of 0.4 and 0.3 percentage points, respectively. Median long-term inflation expectations from the Michigan household survey dropped to 2.8% in early October.

**Real activity.** Real activity appears to be deteriorating at a fast pace. Real GDP growth in Q2 was revised down from 3.3% to 2.8% and what we anticipated in the September Blackbook to be a sluggish third quarter is now on track to have been quarter of declining output. This weakness reflects both a substantial retrenching of consumers' spending and a decline in production.

Real PCE was flat in August after a decline in July. A significant drop in retail sales in September suggests that 2008Q3 will most likely be the first quarter of negative consumption growth since 1991. All categories of spending appear affected.

The housing sector continued to be weak. Data for new and existing home sales for July were revised up, but both categories fell in August. The three month moving average of new home sales fell 4% to 493,000 units, but the absolute level of new homes for sale fell sharply in August, down 4% to just over 400,000 units. These inventories are now back to the levels that prevailed in the second half of 2004. Recent data on residential construction suggest that the market is not yet near the bottom. Total housing starts fell sharply again in September, down by 6.3%, while the August level was revised downward. The cumulative contraction in housing starts of 25% since June is the largest three month decline since the second quarter of 1980.

Housing prices continued to decline. Contrary to the easing in the pace of the decline we noted in the September Blackbook, home price declines appear to have re-intensified entering the second half of 2008. The FHFA index (formerly the OFHEO purchase-only national home price index) fell 0.8% (monthly rate) in August following 0.3% and 0.5% declines in June and May, respectively. This index is down 5.9% over the year and down 6.5% from its April 2007 peak. The Case-Shiller composite home price index for 20 metro areas fell 0.88% in July following a 0.52% decline in June. Nonetheless, in the

case of this index there remains some evidence that the rate of home price decline has abated somewhat. While the year-over-year decline of the composite increased to -16.4% from -15.9% in June, the three month decline at an annual rate was -8.6% versus -24.9% in March.

Production activity deteriorated significantly in the inter-meeting period. After a larger than expected drop of 1.1% in August, industrial production fell again in September by 2.8%, although this decline is almost entirely due to the combined effects of hurricanes Gustav and Ike, along with a strike at Boeing. (The Federal Reserve Board estimates that those events reduced output by 2.7%). Still, industrial production has now dropped nearly 4% over the past 3 months, and even adjusting for these one-time events, it would be down by a total of slightly over 1% (estimated) over that period. Output of motor vehicles, which had tumbled more than 10% in August, rose by slightly less than 2% in September, but the increase was offset by a 9.2% drop in production of petroleum (and coal) products -- attributable to the hurricanes -- as well as a 17% drop in aerospace, attributable to the Boeing strike. Capacity utilization is down to 74.5% in September, although the further drop of 2.1 points since August reflects the special events.

September surveys provide further evidence of deteriorating conditions both in manufacturing and non-manufacturing. The ISM (Institute for Supply Management) manufacturing index tumbled 6.4 points to 43.5 in September---its lowest level since October 2001. The Philadelphia Fed's manufacturing survey signals dramatic weakening in the activity in that district, with the index tumbling 41 points to -37.5, its lowest level since the 1990 recession. Consistent with these indicators, consumer sentiment turned down fairly sharply in early October reversing some gain in the prior months.

**Labor market.** The labor market deterioration accelerated in the inter-meeting period. September non-farm payroll employment fell 159,000, the highest decline since March 2003, and roughly twice the average decline of the past nine months. Employment declines were widespread across the industries, with biggest drops in trade and transportation (-58,000), manufacturing (-51,000), retail trade (-40,000), construction (-

35,000) and business services (-27,000). The diffusion index, the fraction of industries increasing employment, decreased from 44.7% to 38.1%, indicating extensive weakness in the economy.

In the household survey, the labor force decreased 121,000 and employment dropped 222,000 leaving the unemployment rate unchanged at 6.1%. It should be noted that there was a significant increase of 0.6% in the prime-age male unemployment rate, partly offset by a decline of 0.4% in prime-age female unemployment rate. The labor force participation rate declined from 66.1% to 66.0%, due to a drop in female labor force participation.

Aggregate hours worked fell considerably, 0.5%, and average weekly hours declined to 33.6 hours. Average hourly earnings rose 0.2% and the year-to-year change in average hourly earnings was 3.4%, in line with recent numbers. Average weekly earnings declined 0.1%, suggesting weakness in private wages and salaries. There was a marked 1.0% drop in aggregate manufacturing hours, pointing to another fall in factory production, as suggested by the ISM index.

**Trade.** The trade deficit continues to narrow, dropping to \$59.1 billion in August from \$61.3 billion in July. Lower prices caused nominal exports of goods to fall by \$3.2 billion in August. Real exports were flat, but still 11 percent above year ago levels. Total imports decreased by \$6.4 billion in August, due to a decline in oil imports. The oil bill of \$43.7 billion in August was down from \$51.0 billion in July, due to both a drop in prices (from \$125 per barrel to \$120) and a decline in volumes. Real imports fell to near the Q2 average and are 3 percent lower than a year ago levels.

We expect the net export contribution to real GDP growth to be 1.3 percentage points in 2008Q3. This is significantly lower than the contribution to real GDP growth of 2.9 percentage points in 2008Q2.

**Foreign economies.** Global data for 2008Q3 have been largely negative. In the euro area, core retail sales in August were down on the year as consumers reacted to higher food and energy prices. This weakness is expected to continue, even with softer commodity prices, as the labor market is deteriorating. Manufacturing is faltering, with production down 1 percent over the year in August. The steep decline in industrial confidence in September suggests continued weakness into Q4. In Japan, production was down 7 percent in August while export growth dropped to near zero. A key source of weakness was the auto sector. The September Tankan survey declined to a level consistent with a recession. China had weaker than expected growth in Q3, but exports were still holding up through September.

## 2.2 Financial Markets

The intensification of the financial crisis in the inter-meeting period together with the expected global slowdown led to significant wealth losses in equity markets. Stock market volatility has been elevated and credit spreads reached record levels. Policymakers worldwide enacted measures to support interbank markets and implemented a coordinated reduction in their policy rates. Expectations of further interest rate cuts have increased.

**U.S. Markets.** This inter-meeting period has been characterized by a weakening economic outlook and intensification of concerns about the current credit crisis. These factors have led to additional expectations of policy easing, beyond the inter-meeting rate cut that brought the target rate to 1.50%.

The option-implied probability of a target rate below 1.50% at the October FOMC meeting has risen to 93% (88% for the December meeting). Consistent with higher downside risk, implied skewness is -1.8. Policy uncertainty has also spiked upward over this period.

The Treasury term structure steepened substantially during the inter-meeting period and then flattened again over the past week. The 10-year note to 3-month bill spread widened to a one-year high of 3.79%, and has since narrowed to 2.80%, which is 13 bps wider

than at the September FOMC meeting. Commentators have attributed much of the movement to flight-to-quality flows. Intraday yields on 3-month bills fell to zero or slightly negative during several days in this period.

At the long end of the curve, the on-the-run 10-year note yield rose to 4.08% before declining to 3.63%, which is 29 bps higher than at the September FOMC. Commentators have suggested that the upward movement was related to an increase in the term premium, expectations of larger Treasury issuance volume to fund the bailout plan and Treasury's re-opening of off-the-run notes.

Consistent with a weaker economic outlook and the substantial reversal in oil prices, 0-5 year inflation compensation has fallen by 146 bps over the inter-meeting period, to a level of -0.13% as of October 23. At the same time, however, 5-10 year inflation compensation has risen by 48 bps to 3.27%. It is possible that this move in long-term inflation compensation is related to a rise in the inflation risk premium rather than long-term inflation expectations. In the past, the inflation risk premium has increased when the VIX has spiked upward.

Furthermore, 0-5 and 5-10 year real rates jumped up by 149 bps and 76 bps to 2.74% and 2.97%, respectively. While these moves are not apparently consistent with expectations of further policy easing, it is possible that these changes are driven instead by flight-to-quality flows pushing investor demand out of TIPS and into nominal Treasuries. These flows would push TIPS prices down and real yields up.

Lending conditions tightened dramatically over the inter-meeting period. For long-term rates, this is partly due to rising Treasury yields but mostly due to widening credit spreads. For example, the BB corporate bond rate rose by more than 500 bps over this period, to a level of 14.2%. This was driven by an equivalent rise in the option-adjusted spread. 30-year fixed-rate mortgages were recently quoted at 6.31%, up 41 bps since the September FOMC meeting.

The S&P 500 equity index has lost 25% of its value over the inter-meeting period, and the VIX volatility index rose from 32% to 68% as of October 23.

Financial market stress has also reached record levels. The New York Fed interbank funding stress index rose from a level of 5.0 at the September FOMC meeting to a high of 10.5 before declining to 8.6 as of October 21. This index measures the deviation of its underlying components from their levels over the pre-crisis period. The bank funding costs sub-index and the Fed lending facilities use sub-index have both risen sharply, but the bank credit risk sub-index remains at a level similar to a month ago.

**Foreign Markets.** Global funding conditions deteriorated significantly over the inter-meeting period. Across the continent, governments had to step in and bail out, either directly or indirectly, banks that were on the brink of becoming insolvent. On September 28, the Belgian-Dutch bank and insurance giant Fortis was split into a Dutch and a Belgian part, with the Dutch branch eventually becoming completely nationalized and the Belgian part initially nationalized and then sold off to BNP Paribas in return for a minority stake in the bank. The next day the U.K. government nationalized a second major mortgage lender, Bradford and Bingley, and the Icelandic government started a rescue operation that eventually resulted in the complete nationalization of its banking sector. One of the world's largest lenders to local governments, the Belgian-French Dexia bank, received on September 30 a 6.4 billion euros capital injection from the Belgian and French governments. And Germany's second largest mortgage lender Hypo Real received a 50 billion euros injection from a group of private banks in a deal brokered by the German Treasury.

All of these events resulted in a complete freezing up of interbank markets across Europe: the 3-month euro LIBOR-OIS spread jumped up 87 basis points over the inter-meeting period to 160 basis points, whereas its sterling equivalent also increased sharply with about 128 basis points to a level around 218 basis points. To counter these developments, the Bank of Canada, Bank of England, Bank of Japan, ECB, Swiss National Bank as well as a number of smaller central banks were heavily involved in coordinated liquidity injection operations. These actions were augmented by different forms of government intervention. Ireland issued on September 30 a complete guarantee, valid for two years, of private deposits held at its main banks. Other EU nations subsequently did the same.

The U.K. announced on October 8 plans under which British banks can lend up to 50 billion pounds from the government in return for an equity stake plus up to 450 billion pounds worth of short-term lending support and government guarantees for loans amongst banks. Other EU governments, including France and Germany, announced similar plans on October 13 under which governments established funds for recapitalization of banks and guaranteeing interbank loans.

Almost immediately after these funds were set up, they were used in dealing with the crisis. On October 19, the Dutch government supplied the financial services giant ING Group with 10 billion euro from their recapitalization fund in return for preferred stocks. Similarly, the French government injected on October 21 10.5 billion euros in the 6 largest French banks, amongst which are BNP Paribas and Société Générale, again in return for a preferred equity stake. The combination of increased liquidity provisions and activist government initiatives to recapitalize banks, led to a modest improvement in LIBOR and FX swap-implied rates across Europe towards the end of the period.

In emerging markets, the intensifying global financial crisis is having an impact on the domestic banking sectors. In Hong Kong and Singapore the HIBOR and SIBOR rates increased sharply over the inter-meeting period, and the willingness to lend in the interbank markets has decreased significantly. The local monetary authorities responded with large scale liquidity injection operations. Due to a heavy reliance on wholesale and foreign currency financing, banking sectors in Russia and Korea also came under a lot of pressure which triggered large scale liquidity operations by the Russian and Korean central banks. Even in the GCC, financial institutions are facing liquidity shortages, as a combination of losses on U.S. sub-prime mortgages and deteriorating local real estate markets start to have its toll. But it is in particular in emerging Europe where the most significant problems arose during the period. Banks in Hungary, Romania, the Baltic and the Ukraine are facing sharply increasing costs for external financing and reduced access to international wholesale funding markets. The bulk of the banking sector in this region is owned by Western European banks, and these parent banks have severely restricted the supply of foreign exchange lending to their subsidiaries in the region. Given the linkages

between banks in established and emerging Europe, any large scale financial meltdown in the latter region could affect financial stability in Western Europe.

European and Japanese equities declined, in very volatile trading, between 22 and 24 percent since the last FOMC meeting on account of concerns about both domestic and global economic growth prospects as well as the deepening financial crisis. In particular, financials were hit hard, (e.g., Barclays was down just over 29 percent and Deutsche Bank around 39 percent). Equity markets rebounded briefly after the announcement of bank recapitalization plans in Europe and the U.S. on October 13, but the gloomy economic outlook pushed them down again. For similar reasons, equities in emerging markets also decreased significantly over the period.

The decline in energy prices gained momentum over the inter-meeting period, with spot oil prices declining about 36 percent. Concerns about a deep global recession significantly depressing global energy demand fed these declines.

Long-term interest rates in the U.K. and Japan were broadly unchanged and decreased around 30 basis points in the euro area. A comparison with data from inflation-linked bonds reveals that the declines in the euro area mainly coincided with decreasing breakeven inflation rates. These developments reflect the recent decrease in energy prices, which was the main driver of accelerating headline inflation, as well as the significant growth slowdown in Europe. Also in emerging markets, in particular in Asia, long term interest rates have been declining due to easing inflationary pressures and deceleration of economic growth.

The U.S. dollar appreciated *vis-à-vis* the euro and pound sterling, and depreciated relative to the yen. In trade-weighted terms, the dollar appreciated about 8 percent. This reflects a broad based strengthening of the dollar, as global economic prospects are deteriorating significantly. The strengthening of the yen, not only relative the dollar but also against most other currencies, reflected a large scale unwinding of carry trades by investors as risk aversion increased significantly. The pace of dollar depreciation against the Chinese

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yuan grinded to a halt; one-year forward rates now suggest a slight appreciation of the dollar in terms of the yuan going forward.

### **2.3 Global Economic Policy**

On October 8, the ECB, the Federal Reserve, the Bank of England, the Bank of Canada, the Swiss National Bank and the Swedish Riksbank each engaged in a coordinated policy rate cut of 50 basis points. Given the previously low level of its policy rate, the Bank of Japan remained on hold but strongly supported the coordinated rate cut. This coordinated action was meant to address the risk that the deepening financial crisis was about to plunge the global economy into a deep recession. Although consumer price inflation is still at high levels in the euro area and the United Kingdom, there are signs that inflation will subside substantially going forward (e.g., due to the sharp decline in energy prices over the period). Real activity data releases and confidence indicators suggest that the European and Japanese economies are in a recession. All of this reinforced the perception that the aforementioned rate cuts are a first installment in an easing cycle, as central banks in Europe, and possibly Japan, attempt to deal with a global recession. Indeed, on October 23, two weeks after the coordinated rate cut, the Swedish Riksbank cut its policy rate again with 50 basis points. Markets now expect substantial policy easing of around 100 basis points in the euro area and the U.K. over the next 12 months, with a 50 basis points rate reduction or more already priced in over the next month.

Elsewhere, there has also been a move towards an accommodative stance of monetary policy. Around the time of the international coordinated policy easing on October 8 the People's Bank of China also cut its main policy rate, with 27 basis points. It also no longer allows its currency to appreciate against the U.S. dollar in order to support Chinese exports. Central banks in South Korea, Taiwan, Hong Kong and the UAE also lowered their respective policy rates. Brazil, Mexico and Russia intervened to support their currencies, which came under pressure due to a large unwinding of corporate FX carry trade positions. Finally, the Reserve Bank of India substantially eased its reserve requirements for banks and cut its policy rate with 100 basis points. In general, we expect

that a gloomier global economic outlook will induce many emerging world central banks to continue to pursue a policy of monetary easing in the near term.

# Special Topic

## Assessing the Outlook for Deflation: What Do Measures of Expected Inflation Suggest?

*Peter Fielding, Evan LeFlore and Robert Rich*

***In light of recent economic and financial developments, concerns have shifted from inflation to deflation. In particular, the weakening economic outlook, falling asset prices, and tight credit conditions have led some commentators to worry about the onset of a deflationary spiral. While the observed decline in some prices is to be expected, policymakers should respond quickly if evidence were to suggest the possibility of a continuous fall in the general price level.***

Because it is a key determinant of inflation, inflation expectations would be a useful indicator for a discussion of deflationary threats. The forward-looking nature of measures of inflation expectations may offer an early warning of price declines beginning to weigh heavily on the minds of consumers and businesses. In addition, we may be able to look at past movements in inflation expectations to gauge the likelihood of observing an anticipated decline in the general price level. While breakeven rates derived from TIPS might be a natural choice to measure inflation expectations, the marked

illiquidity currently present in the TIPS market makes these data problematic. Therefore, we turn our attention to survey-based measures of inflation expectations.

We propose a simple exercise to assess the validity of deflation concerns stemming from an economic downturn. Specifically, we use the prime age (25-54 years old) male unemployment rate as a proxy for aggregate demand and look at the monthly 1-year and 5-10 year Michigan inflation expectations series as well as the quarterly 10-year SPF CPI inflation expectations series. Using the 1981-82 recession as the benchmark, due to the severity of that economic downturn, we can calculate the increase in the unemployment rate from its trough to peak as well as the corresponding decline in each of the expected inflation series. Given the current FRBNY forecast of the prime-age male unemployment rate, we can then provide a simple calculation of the forecasted decline in expected inflation for each survey.

The calculated changes in each series, the ratios of the change in expected inflation to the change in the unemployment rate, and the selected dates are provided in Table 1, while the unemployment rate and the measures of expected inflation are plotted in Figures 1-3. A quick summary of the results suggests:

- i) As shown by the ratios calculated from the median response, increases in the unemployment rate are associated with larger declines in short-term inflation expectations than long-term inflation expectations;
- ii) Compared to long-term expectations, short-term expectations continue to display a more pronounced response when we look at the mean or various percentiles of the Michigan inflation expectations data;
- iii) Because there was a credit crunch component associated with the 1990-91 recession, we also perform the calculations during this episode as a robustness check. We again observe a greater response of short-term inflation expectations relative to long-term expectations. However, when we compare the 1981-82 recession to the 1990-91 recession, no clear pattern emerges. While the data for short-term inflation expectations suggest the ratio was generally greater during the 1990-91 recession, the evidence from long-term inflation expectations data is mixed.
- iv) The results were largely robust to the selection of alternative dates over which to calculate the decline in the expected inflation series.

The current FRBNY forecast of prime-age male unemployment has the series peaking at 7.1% in 2009Q4, resulting in an estimated increase of 3.5 percentage points from its trough of 3.5% in June 2007. Combining this information with the calculated ratios for the 1981-82 recession reported in Table 1, we can report a range of declines in the two Michigan series using various

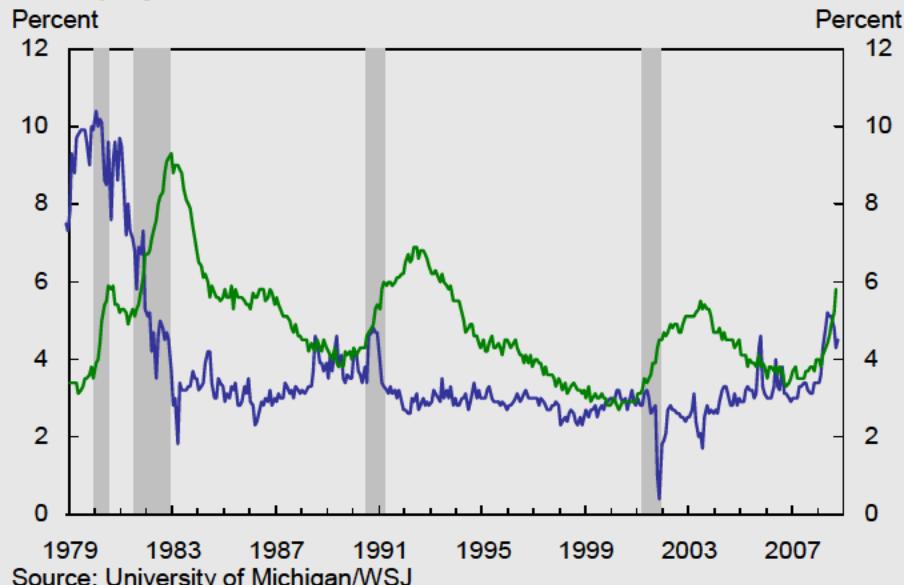
percentiles and the decline in the 10-year CPI using the median. Abstracting for the moment from some issues discussed below, the declines in 1-year expected inflation range from 1.2 % to 4.2%. The declines in 5-10 year expected inflation range 0.7% to 1.2%, with a decline of 1.6% for 10-year expected inflation. Taken together, the evidence suggests the Michigan 1-year expected inflation series could generate some deflation readings using June 2007 as the reference point.

Our analysis is subject to a number of caveats. First, it is unclear how consumers and businesses will react to possible negative readings of headline inflation due to the recent pull-back in energy and commodity prices. There is also the question of whether non-linearities may operate at very low levels of inflation, which would invalidate our approach for calculating the projected declines in expected inflation. In addition, one may need to be more cautious about projecting a decline in long-term inflation expectations given the lack of movement in the series during the 2001 recession. The 1981-82 recession also reflected an intended disinflation in which monetary policy was highly contractionary, whereas the current economic environment reflects the effects of a severe credit crunch. Lastly, one must recognize the increased credibility of the Federal Reserve over the course of the last 25 years, and the opportunity for policy actions to draw upon recent experience with deflation concerns about five years ago.

Table 1: 1981-1982 Recession

	Dates	Median		Mean		25th Percentile		75th Percentile	
		Change	$\Delta(\pi^e)/\Delta(\text{UN})$	Change	$\Delta(\pi^e)/\Delta(\text{UN})$	Change	$\Delta(\pi^e)/\Delta(\text{UN})$	Change	$\Delta(\pi^e)/\Delta(\text{UN})$
<b>Prime-Age Male</b>									
Unemployment Rate	4/1/1981-12/1/1982	4.3		4.3		4.3		4.3	
MI 1-Year	4/1/1981-1/1/1982	-5.2	-1.21	-2.9	-0.67	-1.5	-0.35	-2.1	-0.49
MI 5-10 Yr	3/1/1981-2/1/1983	-1.1	-0.26	-1.0	-0.23	-1.4	-0.33	-0.9	-0.21
10-Yr CPI	3/1/1981-3/1/1983	-2.0	-0.45						

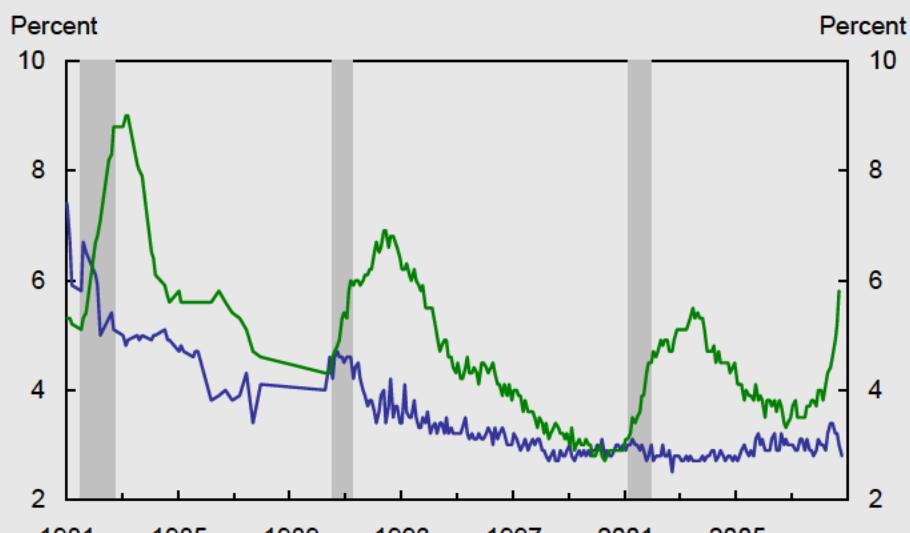
Figure 1: 1-Year Michigan Expectations &amp; Unemployment Rate



Source: University of Michigan/WSJ

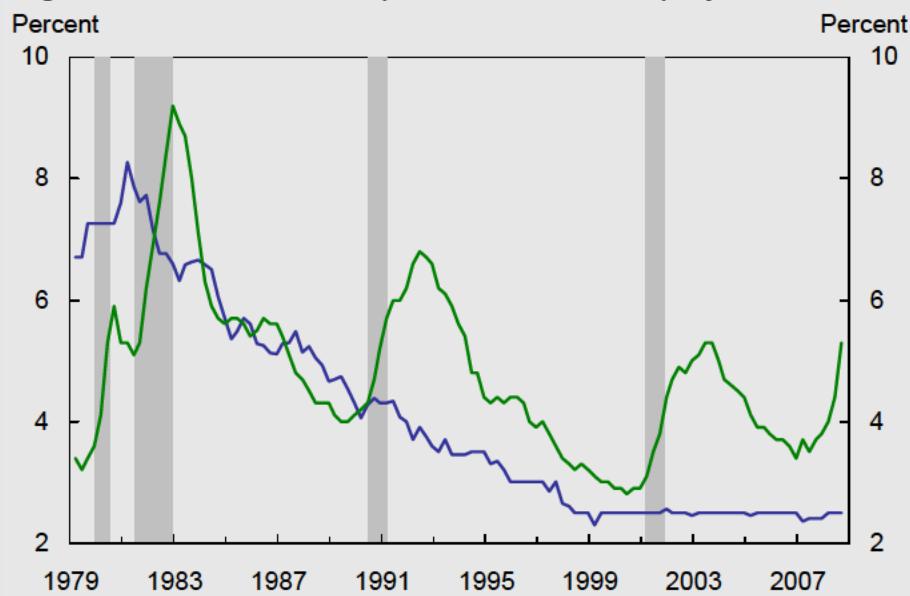
Note: Shading represents NBER recession.

Figure 2: 5-10 Year Michigan Expectations & Unemployment Rate



Source: University of Michigan/WSJ

Figure 3: 10-Year CPI Expectations & Unemployment Rate



Source: SPF/Board of Governors/WSJ

Note: Shading represents NBER recession.

### 3. Evolution of Outlook and Risks

#### 3.1 Central Forecast

**Conditioning assumptions.** After thinking that the US economy might skirt a recession, our updated central projection assumes that the US economy entered recession around mid-2008. Negative growth of real GDP is expected to persist for three quarters, followed by roughly a year of below potential growth. At the trough, the level of real GDP is about 1.25% below the peak. Thus, this projected recession would be similar in depth to the 1990-91 episode but with a longer duration. By the spring of 2009 recovery begins to take hold, aided by the preemptive path of monetary policy, various initiatives to foster financial market stability, and additional fiscal stimulus. Growth returns to slightly above potential by 2010, and strengthens somewhat further in 2011. However, the output gap that opens through 2009 only narrows through 2011 rather than completely closing. Although we judge this moderate recession to be the most likely near-term outcome, the risk that this downturn turns out to be more severe than any in the post-WWII period is relatively high.

Specifically, under this projection, growth of real GDP in 2008 and 2009 has been downgraded to 0.1% and 1.0% (Q4/Q4), from 1.6% and 2.0%, respectively, in the September Blackbook. Accordingly, the path of the unemployment rate is considerably higher. We now expect the unemployment rate to peak at 8.0% in 2009Q4 and decline to a still high 7.5% by the end of 2010.

With a larger expected output gap, as well as lower commodity and import prices, the slowing of core inflation over the forecast horizon that we have been anticipating for some time is somewhat more pronounced in this forecast. From 2.3% (Q4/Q4) in 2008, we now expect core PCE inflation to slow to 1.7% in 2009 and 1.5% in 2010, from 1.9% and 1.8% in the September Blackbook, respectively.

On balance, these developments have resulted in a substantial decline in our assumed path for the FFR, with that rate declining to 1.0% in the very near future, remaining at that level through 2009Q3, and then reaching 3.0% by the end of 2010. [Exhibit B-2].

We continue to believe that over the medium term the neutral FFR lies between 3.75% and 4.75%. However, we suspect that the on-going tightening of credit conditions has temporarily lowered the neutral FFR over the near term, perhaps to between 2.5% and 3.75%. Our forecast presumes that the significant easing of monetary policy, a gradual leveling of the housing market downturn, and a gradual return to more normal financial market functioning will eventually enable the economy to gain more sustainable forward momentum. In that case, policy rates will need to be renormalized at a somewhat faster rate than in 2004-6 to avoid a serious unmooring of inflation expectations.

The assumed path of oil prices over the forecast horizon is substantially lower. Oil prices (WTI) are now expected to average \$77/barrel in 2008Q4, \$36 lower than in the September Blackbook. Consistent with futures quotes, we now expect a modest rise in oil prices from the end of 2008 through the end of 2010, with the 2009Q4 average price at \$83/barrel and the 2010Q4 average price at \$87. For 2010Q4 the current assumed price is \$31 lower than in the September Blackbook. Our assumed path for oil prices is modestly higher than that of the Greenbook forecast.

The foreign growth outlook for 2008 and 2009 has been downgraded substantially while for 2010 it is modestly lower. We now project that foreign growth will slow from 3.4% in 2007 to 0.8% in 2008 (GDP-weighted), down from 1.6% in September and 2.1% in August. The modal forecast for 2009 has been marked down to 1.3% (Q4/Q4) from 2.5% last cycle. The developed economies are expected to follow a growth path similar to our own while the emerging economies continue to grow but at a rate below potential.

As is our usual practice, our assumptions for equity prices and home prices are similar to those of the Greenbook. The assumed path for the FHFA (formerly the OFHEO) purchase-only home price index has been lowered in this forecast cycle. It is now

assumed that this index will decline at a 7.252% annual rate from now through the end of 2009, and then to decline another 2.75% by the end of 2010. This brings the peak to trough decline to around 17.0% by the end of 2010 versus the 12.0% peak to trough decline by the end of 2009 assumed in September. As in the Greenbook, we expect the real-exchange value of the dollar to depreciate over the forecast horizon, and by a similar amount. Our assumptions regarding the stance of fiscal policy are very similar to those incorporated in the Greenbook. While a second round of fiscal stimulus is under active discussion, no specific fiscal actions have been introduced into the Greenbook forecast as yet. We have incorporated into our forecast, in general terms, the features of H.R. 7110 which has passed the House and is now being considered in the Senate. 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 just \$30 billion in 2009 and \$15 billion in 2010. While it is certainly not the only factor, our incorporation of this legislation into our central projection is one reason we expect somewhat faster growth in 2009 and 2010 than in the Greenbook.

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 (GDP basis, which is equivalent to 1.8% on a nonfarm business sector basis). Given our estimate of potential, we expect the output gap to be about 4.0% to 4.5% by the end of 2009 and to narrow by only about 0.5 percentage point in 2010. As always, there is substantial uncertainty around our estimate of potential GDP growth and output gaps. The Board staff has lowered their estimate of potential to 2.4% in 2009 (from 2.5%) and to 2.3% in 2010 (from 2.4%).

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. Financial market inflation compensation at shorter horizons decreased over the inter-meeting period and inflation expectations at longer-term horizons were essentially unchanged. 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.** After rising at a compound annual rate of 10.7% over May, June, and July, the total CPI declined modestly in both August and September due to declining energy prices. Absent a sudden and sharp reversal of recent declines in oil prices, the total CPI is likely to decline for all of 2008Q4 as well. Indeed, the average retail price of regular gasoline, which reached \$4.06/gallon in July, will likely decline to around \$2.00 if oil prices stay near the current level of \$65/barrel. Core CPI inflation also increased over the May to July period, reaching a compound annual rate of 3.5%, but has since slowed. In September the core CPI rose a moderate 0.14% (monthly rate, 1.7% annual rate) as core goods prices fell sharply. Core services price inflation held steady around 3.0%.

A gradual slowing of core inflation over the forecast horizon has been a key feature of our central scenario for some time. As was the case in September, we expect this slowing to be led by weakness in core goods prices as final demand softens and the effect of rising import prices subsides. Beyond the very near term, core services price inflation is also expected to slow due to increasing resource slack. In light of the fact that in this forecast the rate of increase of import prices has been lowered while the path of the unemployment rate has been increased, the slowing of core is now expected to be somewhat more pronounced, with core PCE deflator inflation slowing to 1.5% in 2010, down from 1.8% in the September Blackbook.

**Real activity.** As mentioned above, in this Blackbook we have substantially lowered the path for real output over the forecast horizon. We now believe that the economy entered recession in mid-2008, and that we are likely to experience three quarter of negative growth before a gradual recovery begins in the spring of 2009. Within the central projection, consumer spending remains relatively sluggish through 2009 as households respond to the decline in their net worth by boosting saving out of current cash flow. The

housing correction is expected to be largely completed by mid-2009, with housing starts only modestly above replacement levels. At that point the large drag that residential investment has exerted on growth for the past three years will be over. Thereafter, housing is likely to be a modest plus for growth, but the surge of residential investment experienced in the early stages of past recoveries is not anticipated due to the continued high levels of homes coming onto the market through the foreclosure process. Indeed, the correction in house prices is expected to continue through the end of 2009 with a cumulative 18% peak- to-trough decline in the FHFA (formerly the OFHEO) purchase-only home price index. With the downgrading of foreign growth prospects, the rate of growth of exports is expected to slow from its recent robust pace. Nonetheless, in the near-term net exports remains a plus for growth from an accounting sense as import growth remains very sluggish due to the weakness of domestic demand. By the second half of 2009 and into 2010 that growth contribution subsides as the gradual recovery of domestic demand induces an increase in the rate of growth of imports. Lastly, as financial market functioning returns to more normal conditions and economic prospects begin to improve, business confidence is restored and investment spending starts to provide some support to the economy.

### **3.2 Alternative Scenarios and Risks**

The risk assessment has changed significantly since last Blackbook. A new scenario has been introduced, the *Global Credit Crunch* scenario, which replaces the *Credit Crunch* scenario. This change in the name reflects three features: First, the events since the last FOMC show that the credit crunch is not only a U.S. phenomenon, but a worldwide one. Second, the severity of the output contraction associated with this scenario has increased dramatically, partly as a consequence of the global nature of the crisis. Finally, the scenario now assumes a strong bounce back in growth as global credit conditions improve.

The *Global Credit Crunch* scenario is by far the most likely one, with an associated probability of almost 50% [Exhibit C-1]. The probability of the *Global Credit Crunch* scenario is higher than that of the old *Credit Crunch* scenario. The probability of the

remaining scenarios (*Productivity Boom, Effects of Overheating, Loss of Credibility, et cetera*) has decreased.

Exhibit C-2 documents the core PCE inflation and real GDP growth paths associated with the various scenarios. These paths have changed since the last Blackbook, mainly as a result of a substantially weaker output forecast in the *Central* scenario (recall that the alternative scenarios are defined relative to the *Central* scenario). The growth forecast in the *Global Credit Crunch* scenario has a four quarter contraction of more than 2%, peaking in 2009Q2. Both the increase in the probability of the *Global Credit Crunch* scenario and the changes in the output path associated with each of the scenarios result in a fairly dramatic shift in our forecast distribution [Exhibit C-3]. Uncertainty about output forecasts has also increased: The 5<sup>th</sup> quintile of the distribution for 2009Q2 is below -6%, 300 bps lower than it was in September. The probability of recession has increased to 93% compared with 56% in September, and the likelihood of a severe recession (contraction greater than 3%) is just shy of 30%.

Inflation forecasts have also changed substantially. The increase in slack in the *Global Credit Crunch* brings about a decline in core PCE inflation. Although the *Central* scenario forecast is somewhat lower than in September, the 5<sup>th</sup> percentile of the distribution is much lower than in the last Blackbook, with about a 5% probability of deflation in 2009. At the same time, some of the upside risks to inflation have increased, reflecting the chance that the economy proves resilient and too much policy accommodation is in place.

## 4. Forecast Comparison

### 4.1 Greenbook Comparison

The path for the FFR has shifted down substantially in both the Blackbook and the Greenbook relative to September. In the Greenbook, the FFR target is expected to fall to 0.5% by the first quarter of 2009 (a 200 basis points reduction relative to the September path) and stay at that level through the middle of 2010. The Blackbook forecasts the FFR

target falling immediately to 1.0% (100 basis points reduction relative to September) and remain at that level through the second half of 2009, when we expect to begin the renormalization of the FFR target. In both cases the main arguments for such an aggressive change in the policy assumption are the significant deterioration in economic activity and worsening financial conditions. We also express some concern about a possible deflation scenario. The lower Greenbook path for the FFR target reflects the Board staff's forecast of a prolonged contraction in real activity, while we forecast a more severe but shorter contraction. Both the Greenbook and the Blackbook expect real growth to be near their assumed potential in 2010.

**Conditioning Assumptions.** Potential growth assumptions in both the Blackbook and the Greenbook are similar to those in September, with the FRBNY's stable at 2.7%, and the Greenbook's set at 2.4% and 2.5% for 2009 and 2010, respectively. As before, the difference stems mainly from different assumptions regarding labor force participation and structural productivity.

The conditioning assumptions for asset prices and financial market conditions are similar. However the Greenbook incorporates more severe wealth effects from the recent financial turmoil, leading to a higher savings rate (2.1% in 2008 and 2.8% in 2009) relative to the Blackbook assumptions (0.5% for 2008 and -1.1% for 2009). Furthermore, the Greenbook forecasts a more significant contraction in investment in 2009.

The assumptions for oil prices and net exports are very similar in the Blackbook and Greenbook. Net exports' contribution to GDP growth for 2008 and 2009 is assumed to be respectively of 1.3% and 0.2% in the Greenbook and of 1.5% and 0.4% in the Blackbook, scaled back to reflect weaker world real activity. Both foreign growth forecasts were reduced considerably, with the Board staff projecting slightly better foreign GDP growth in the second half of 2008 than we do. Our forecast is for foreign growth to slow from 3.4% (Q4/Q4) in 2007 to 0.8% in 2008 (down from 1.5% in September), while the Board has 0.9% growth for 2008 using our GDP weights. The difference is due to the Board's more favorable outlooks for Canada and Korea. For 2009, we forecast 1.3% growth

(down from 2.5%), while the Board has 1.1% growth (down from 2.5%). The difference is largely due to the outlook for the euro area. We have negative growth in H1 and a modest recovery in the second half of 2009, resulting in 0.4% (Q4/Q4) growth. The Board has a steeper decline in H1 with a recovery in H2 that only brings the economy back to where it was at the start of the year.

**Inflation.** The inflation forecast in the Greenbook is very similar to the Blackbook, both implying some moderation in core PCE inflation for 2009 (1.5 and 1.7%, respectively) and 2010 (1.3 and 1.5%, respectively). Total PCE inflation follows a similar pattern.

**Real activity.** Both the Greenbook and the Blackbook expect significant drops in projected output for 2008, with the Greenbook forecasting real growth of 0.3% and the Blackbook forecasting 0.1%. The contraction is more prolonged in the Greenbook, where GDP growth is negative in 2009 (-0.1% annual growth rate). The Blackbook, on the other hand, forecasts a faster recovery, starting in the second quarter of 2009, leading the forecast for the year to be slightly positive, at 1.0%. These diverging forecasts for growth seem to be at odds with the evolution of unemployment, with the Blackbook registering a stronger increase, peaking at 8.0% in 2009, while the Greenbook forecasts a peak of only 7.3% and only at the beginning of 2010. Given the assumptions for productivity and real growth this suggests that the Greenbook forecasts a more significant drop in hours worked than the Blackbook.

**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 forecast in the Blackbook incorporates significantly more downside risk than the Greenbook, with the lower end of the interval at -2.0% and -0.1% respectively. For 2009 both assign similar downside risks, but the Blackbook assigns more probability of higher levels of GDP growth, consistent with the different pattern of recession in the two forecasts.

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

	Core PCE Inflation		Real GDP Growth	
	FRBNY	Board	FRBNY	Board
2008	1.6-2.6 (1.9-2.7)	2.2-2.7 (2.1-2.8)	-2.0-0.9 (-0.1-2.3)	-0.1-0.8 (0.7-2.3)
2009	0.7-2.3 (1.1-2.6)	0.9-2.1 (1.5-2.8)	-1.5-2.5 (-0.6-3.2)	-1.6-1.4 (0.5-3.7)
2010	0.9-2.1 (1.2-2.4)	0.4-2.3 (0.8-3.0)	0.8-4.4 (0.8-4.3)	0.9-3.6 (1.3-4.1)
2011	1.3-2.3 (1.3-2.3)	n/a (n/a)	1.5-4.9 (0.6-4.1)	n/a (n/a)

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

	Core PCE Inflation	Real GDP Growth
2008	67 (61)	69 (64)
2009	52 (62)	37 (67)
2010	38 (60)	44 (53)
2011	10 (50)	76 (71)

**Alternative Greenbook forecasting scenarios.** The Greenbook considers several scenarios. The first two reflect the uncertainty about the contraction in activity generated by the financial turbulence, considering the case of a more severe contraction in 2009 and the opposite case of a faster recovery, relative to the baseline case. These entail outcomes of, respectively, lower and higher growth paths. The next two scenarios reflect the uncertainty concerning any additional fiscal stimulus (one scenario has a more substantial stimulus than the other), which is currently being discussed, both scenarios would have their positive impact on activity mostly in the second half of 2009. The last scenario considers the case in which price pressures are not as sensitive to the slack in real activity

assumed in the baseline projections and monetary policy easing increases inflation expectations. In this scenario the inflation path is higher than in the baseline projection.

One key departure from the usual scenario analysis is the way the policy rate path is determined. In this analysis, the Taylor rule is replaced by a version of optimal control policy setting in which equal weights are assigned to the objectives of keeping core inflation close to its target, keeping the unemployment rate close to the NAIRU and avoiding changes in the FFR target. This approach allows faster movements in the interest rate in response to the current conditions in the economy, which can be viewed as more realistic than the more rigid Taylor rule. In addition, a lower bound of 0.5% for the FFR target is imposed for technical reasons.

The only scenario in which the FFR target is significantly higher than the Greenbook assumption is that of a *more rapid financial recovery*. This is the only scenario with a lower path for the unemployment rate and GDP growth peaking in 2010. In all other scenarios the FFR target remains very close to 0.5% and unemployment is above 7% in 2009. The strongest contraction in activity is associated with the *more financial fallout* scenario, in which GDP grows at a rate of -2.0% in 2009, and the unemployment rate reaches 8.4% in 2010. In all scenarios, GDP would grow above 2.0% by 2010, except for the *more financial fallout* case, in which the growth rate for 2010 would be only 1.0%. The high inflation scenario considers a fairly high level for core PCE inflation in the second half of 2008, reaching 2.8% but the levels moving forward are not too high, with values between 2 and 2.4% from 2009 onwards.

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

The significant shift in the growth outlook makes a comparison of our near term forecast to that of the Survey of Professional Forecasters, which was released on August 12, uninformative.

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<sup>1</sup> Release dates of the private forecasts discussed in this section are in parentheses: Blue Chip consensus (10/10), SPF (8/12), and Macro Advisors (10/8)/(10/22), PSI Model (10/22).

The PSI model offers the most up to date forecast for growth and is aligned with the FRBNY for 2008Q3; however, the PSI forecast is significantly more optimistic about 2008Q4, predicting almost no change in real GDP (-0.1% annual), diverging sharply with our forecast of a 2.8% decline. The Blue Chip and Macro Advisers forecasts, both released earlier in the month (October 10<sup>th</sup> and 20<sup>th</sup>, respectively), are less pessimistic regarding 2008Q4 and 2009Q4/Q4. This can be explained in part by the poor data released after those private forecasts were announced. Interestingly, Macro Advisers forecast a contraction only slightly less severe than the FRBNY for 2008Q4 (-2.2% and -2.8%, respectively) but a much stronger recovery in 2009 (2.1% and 1.0%, respectively).

We revised down our PCE inflation forecast for 2008Q4 from 2.1% to 1.9%, while Macro Advisers revised their forecast up, from 2.3% to 2.4%. Similarly, Macro Advisers revised their core CPI forecast for 2009Q4/Q4 up, from 2.2% to 2.3%, while we reduced ours from 2.1% to 1.8%. These divergences in core measures can be partly explained by the earlier release of the Macro Advisers forecast, which does not reflect the recent marked slowdown in real activity.

Our forecast for headline CPI was roughly aligned with that of private forecasters at the time of the September Blackbook. Private forecasts have now revised down their outlooks for 2008Q4, with Blue Chip expecting a CPI inflation rate of 0.7% (annual) and Macro Advisers forecasting 0.3%, while we anticipate 2.4%. This discrepancy suggests that private forecasters weigh the recent declines in oil and food price more heavily than we do.

## 5. Robustness of Policy Recommendation

### 5.1 Sensitivity to Alternative Scenarios and Policy Rules

Our current policy recommendation is to lower the target to 1% and leave it at this low level for at least 12 months. Many of our policy rules put some weight on this

recommendation but not as soon as the October meeting. Note that none of the rules incorporate the intra-meeting cut of 50bps, and hence start with the nominal FFR level at 2%.

Before considering the various rules, note that near-term estimate of the neutral policy rate has been lowered to reflect the unprecedented spreads over risk free rates.

As expected, changes in the output forecasts have a significant impact on the nominal Fed Funds Rate target path implied by the different rules, but mainly in the medium term. In the very short term, changes in the output and inflation forecasts have a fairly limited impact as a consequence of the gradualism implicit in these rules. Further, since we impose a lower bound of 1% on the Fed Funds target it is impossible for the expected value to reach 1%.

The expected value under the *Baseline* rule does not have the FFR close to 1% before well into 2010 under any of the scenarios, including the *Global Credit Crunch* [Exhibit D-1]. The same applies to the *Opportunistic Disinflation* and *Dove* rules [Exhibit D-2]. In fact, the former implies an increase of the FFR above 2% in the short run because of the high inflation figure in 2008Q3 [Exhibits D-3]. The latter implies an expected nominal FFR at 1% until the end of the forecast horizon for most scenarios, but this target is achieved only gradually. The only exception is the *Outcome-based* rules, which predict a sharp drop of the FFR to close to 1% in 2008Q4 under most scenarios, including the *Central Scenario*.

The *Baseline*, *Dove*, and *Outcome-Based* rules, under almost all scenarios, predict the nominal FFR to stay low – well below 2% -- until the end of 2011 (the *Productivity Boom* scenario under the *Dove* rule being the only exception). The *Opportunistic Disinflation* rule predicts a somewhat higher nominal FFR in the long run – between 2% and 3% -- but even then the renormalization does not occur before 2012. This feature stands in marked contrast with the market implied path and our policy recommendation, according to which the renormalization begins in late 2009.

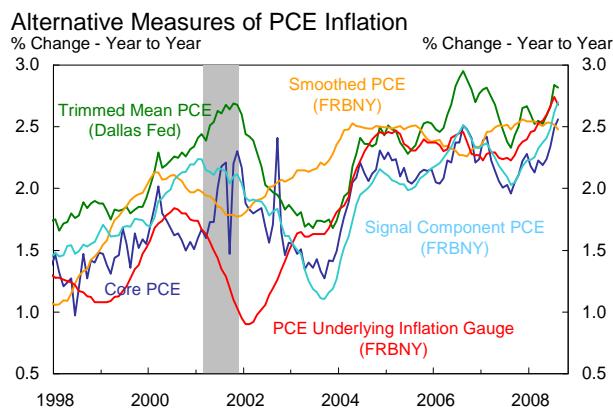
We used the DSGE-VAR to assess the current stance of monetary policy. The degree of accommodation implied by the DSGE-VAR model under the *Central Scenario* is now below 100 bps, compared to 150bps in the September Blackbook. Running the DSGE-VAR conditioned on the *Global Credit Crunch* path for 2008H2 produces a drop in the Fed Funds target to the zero bound.

## 5.2 Comparison to Market Expectations

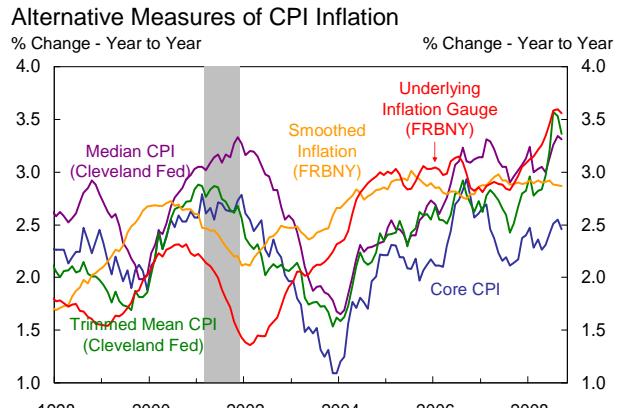
Our policy recommendation is very similar to the path currently priced into markets and also to the forecasts of the primary dealers in the desk survey. However, in current circumstances there is tremendous uncertainty around all these paths. Furthermore, because of the zero nominal bound on the FFR, using expected values can be misleading with regard to the most likely path priced into markets.

## A. Significant Developments

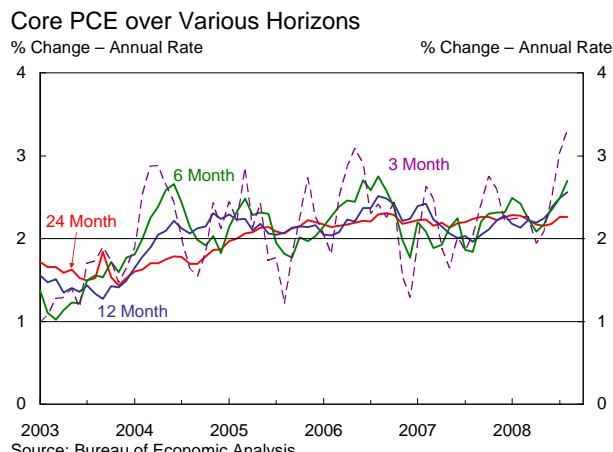
### Exhibit A-1: Measures of Trend Inflation



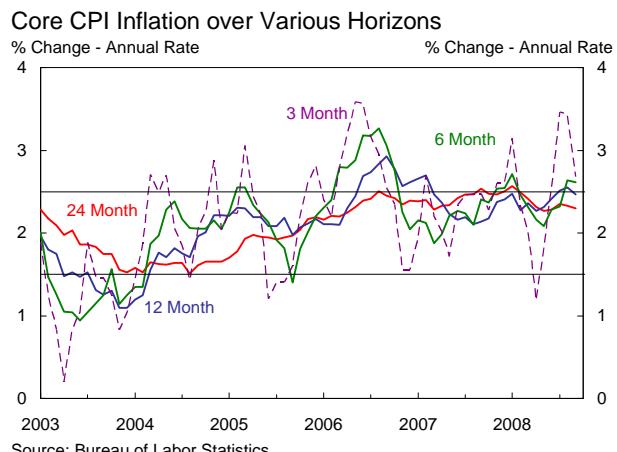
Source: Bureau of Economic Analysis, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank



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

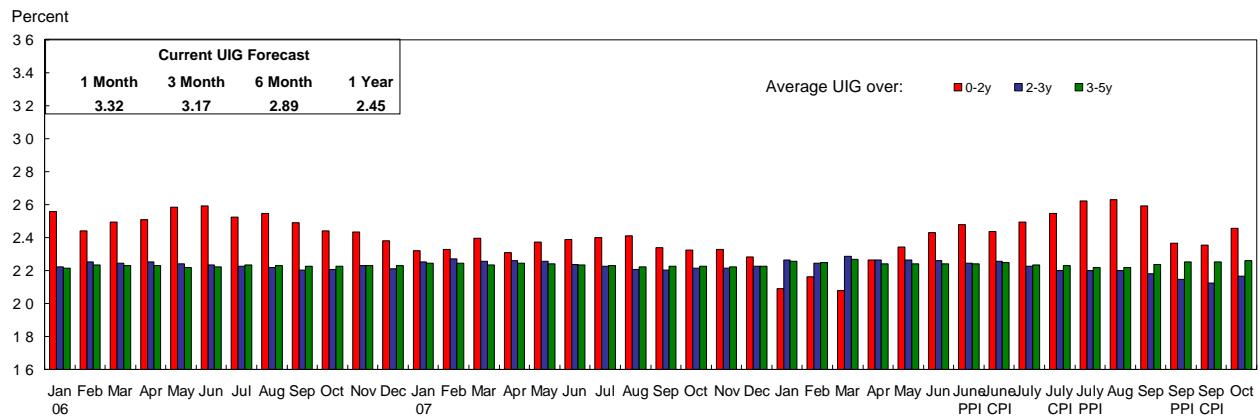


Source: Bureau of Economic Analysis



Source: Bureau of Labor Statistics

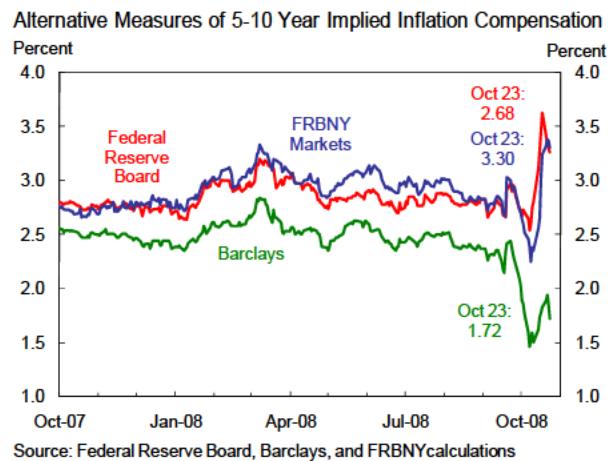
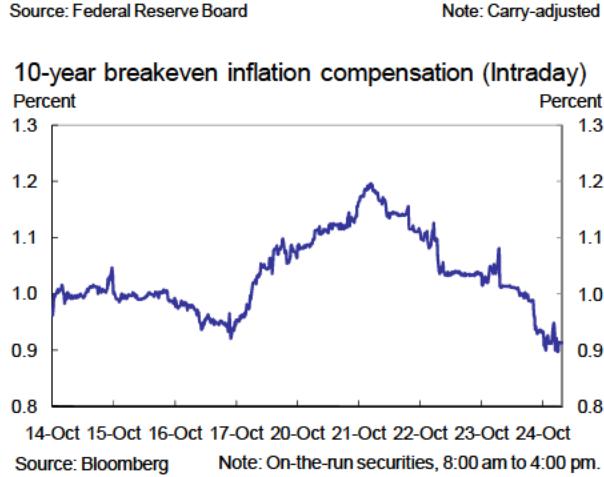
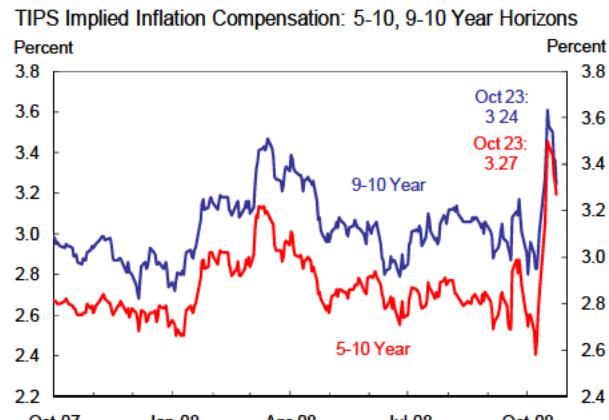
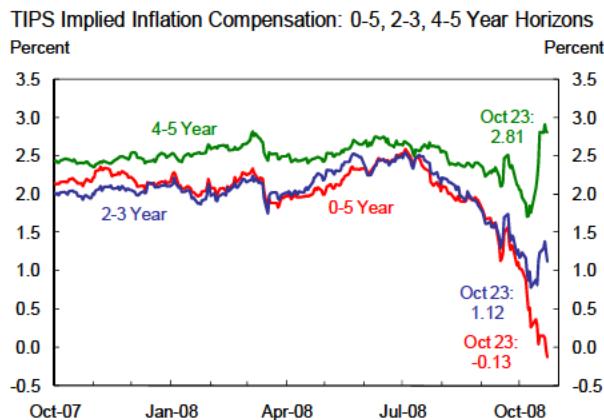
### Exhibit A-2: Underlying Inflation Gauge (UIG)



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

## A. Significant Developments

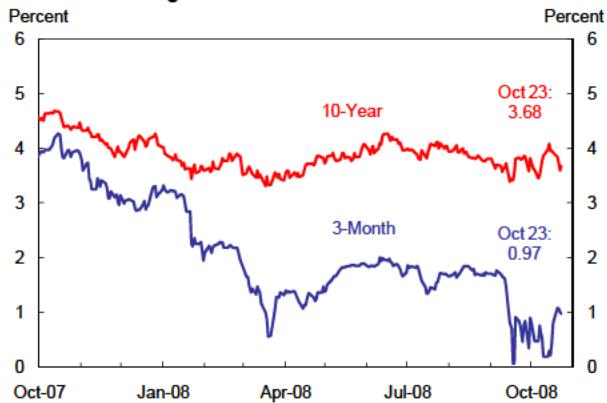
### Exhibit A-3: Implied Inflation Compensation



## A. Significant Developments

**Exhibit A-4:**  
**Treasury Yields**

### Short- and Long-Term Rates



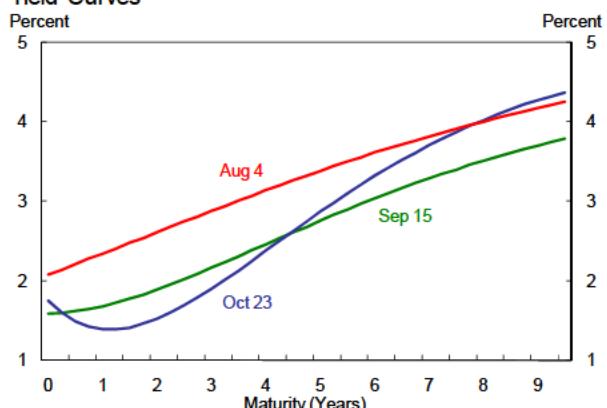
Source: Bloomberg

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



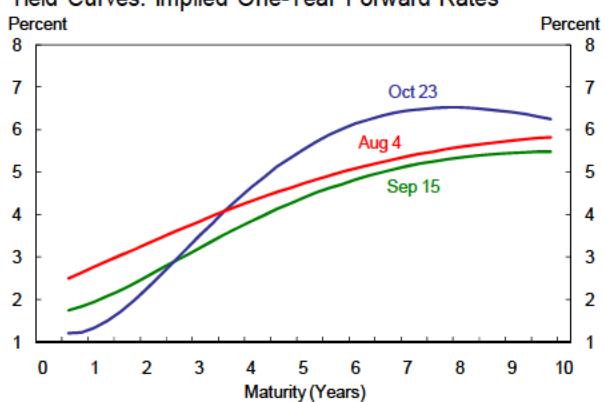
Source: Bloomberg

### Yield Curves



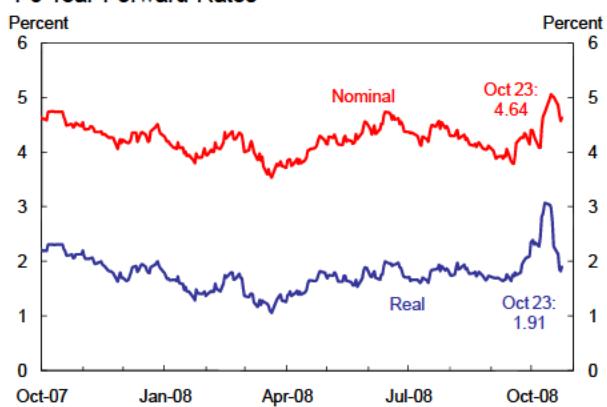
Source: Federal Reserve Board

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



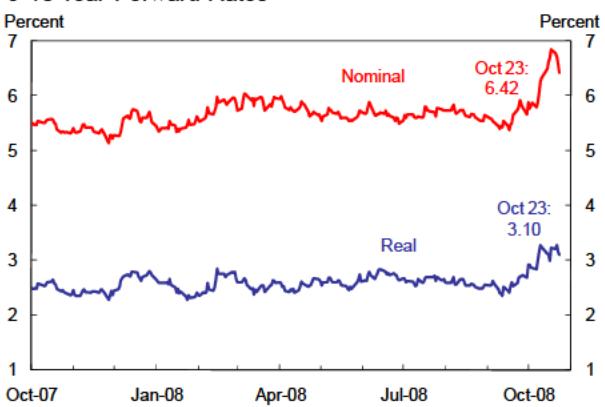
Source: Federal Reserve Board

### 4-5 Year Forward Rates



Source: Federal Reserve Board

### 9-10 Year Forward Rates

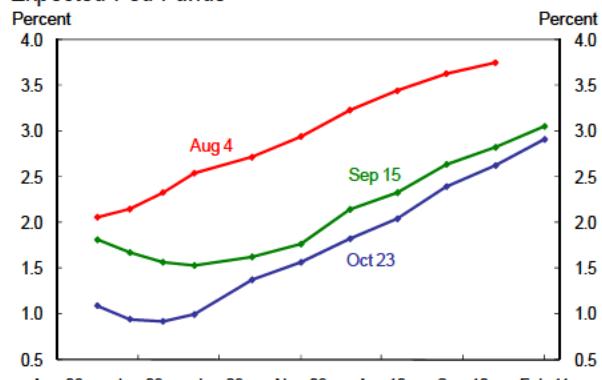


Source: Federal Reserve Board

## A. Significant Developments

### Exhibit A-5: Policy Expectations

Expected Fed Funds



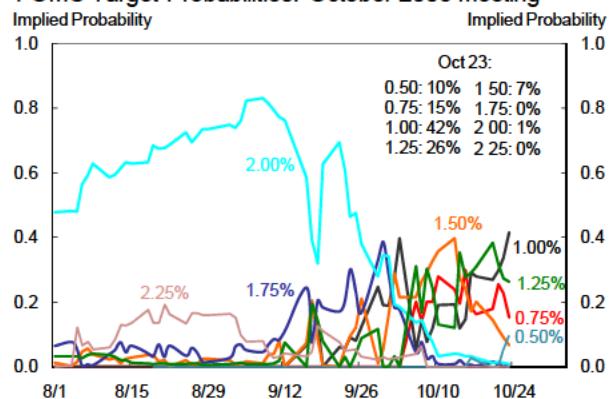
Source: Federal Reserve Board

Implied Fed Funds and Eurodollar rates (Intraday)



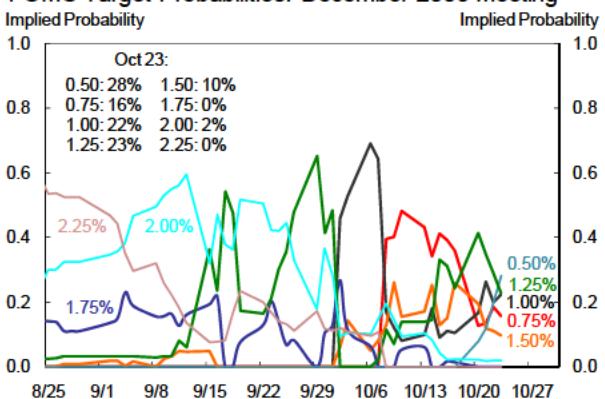
Source: Bloomberg

FOMC Target Probabilities: October 2008 Meeting



Source: Cleveland FRB

FOMC Target Probabilities: December 2008 Meeting

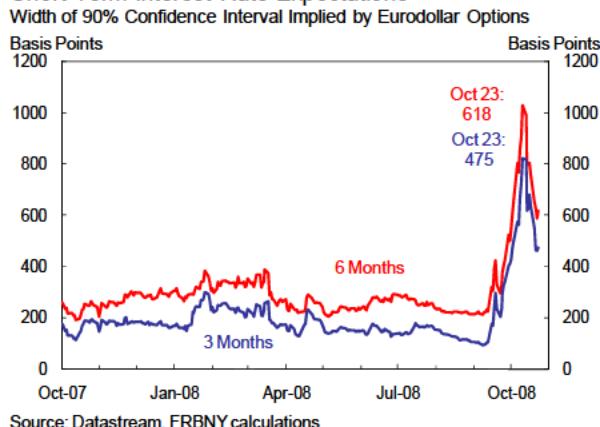


Source: Cleveland FRB

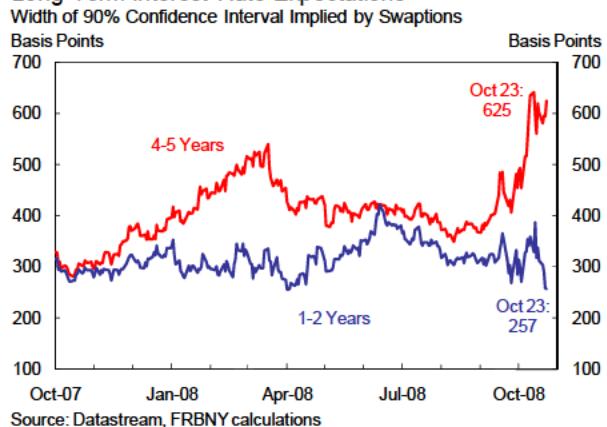
## A. Significant Developments

### Exhibit A-6: Policy Uncertainty

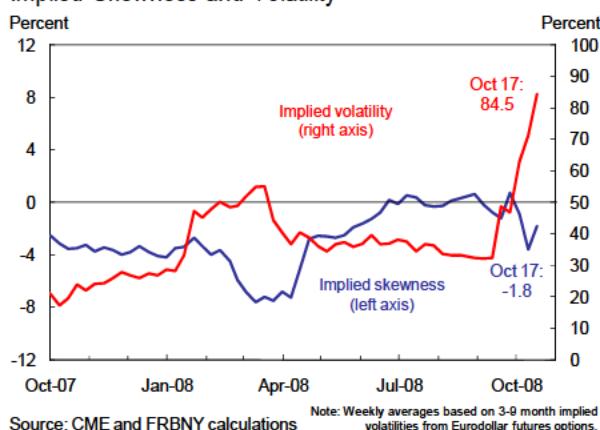
#### Short-Term Interest Rate Expectations



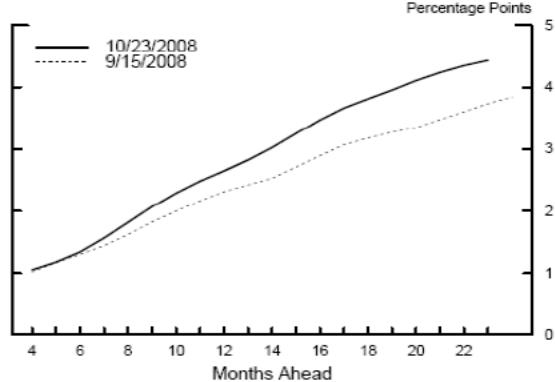
#### Long-Term Interest Rate Expectations



#### Implied Skewness and Volatility



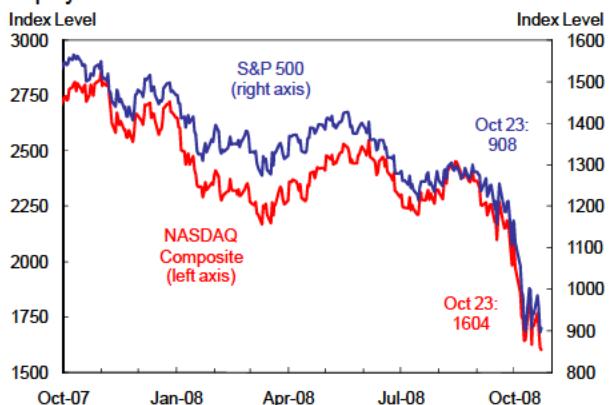
#### Eurodollar Implied Volatility Term Structure\*



## A. Significant Developments

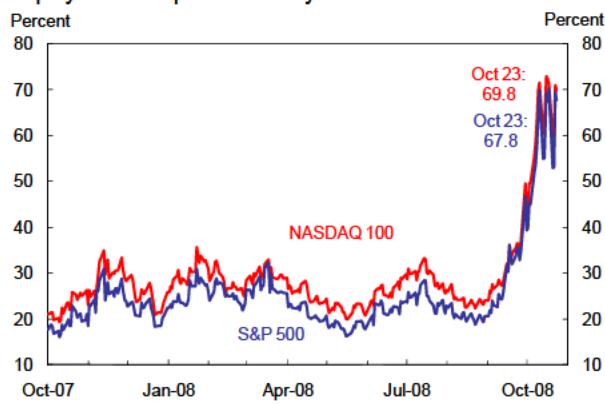
### Exhibit A-7: Equity Markets and Corporate Credit Risk

Equity Index Levels



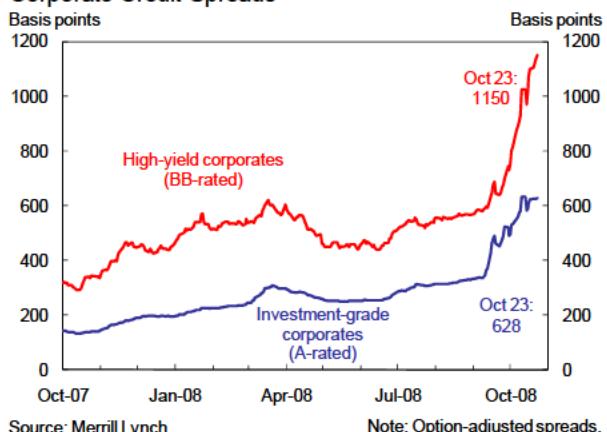
Source: Datastream

Equity Index Implied Volatility: 1-Month



Source: Datastream

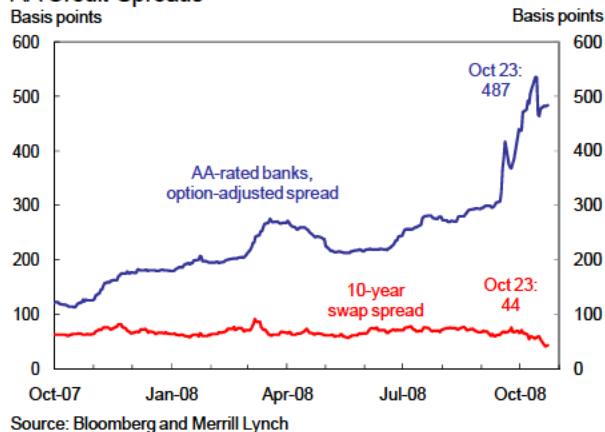
Corporate Credit Spreads



Source: Merrill Lynch

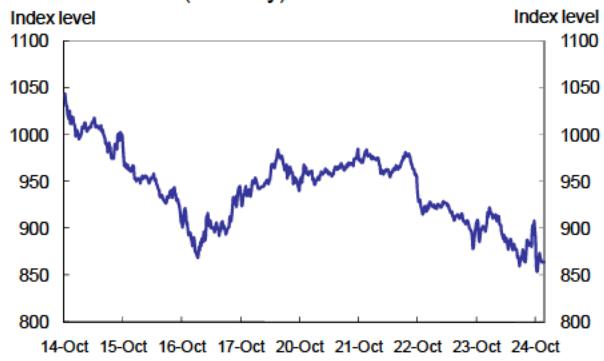
Note: Option-adjusted spreads.

AA Credit Spreads



Source: Bloomberg and Merrill Lynch

S&amp;P 500 Index (Intraday)



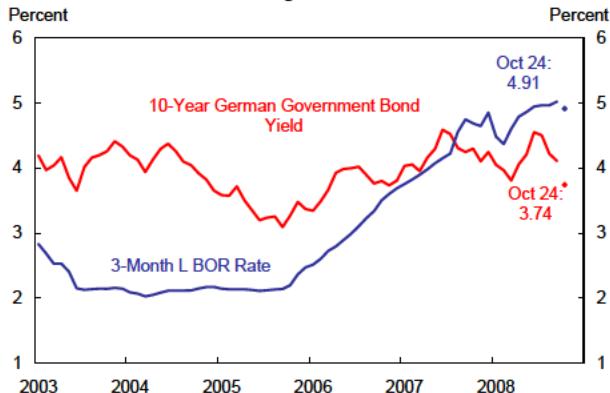
Source: Bloomberg

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

## A. Significant Developments

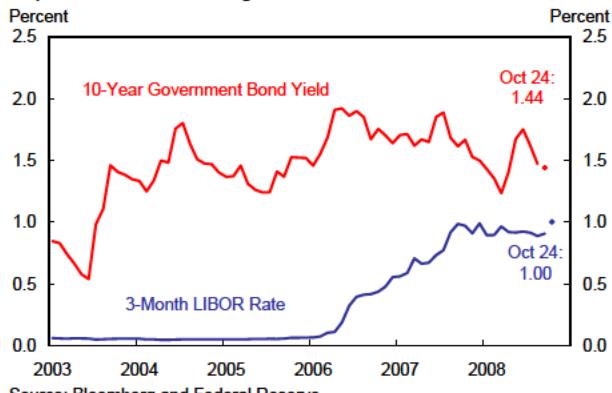
### Exhibit A-8: Global Interest Rates and Equity Markets

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



Source: Bloomberg

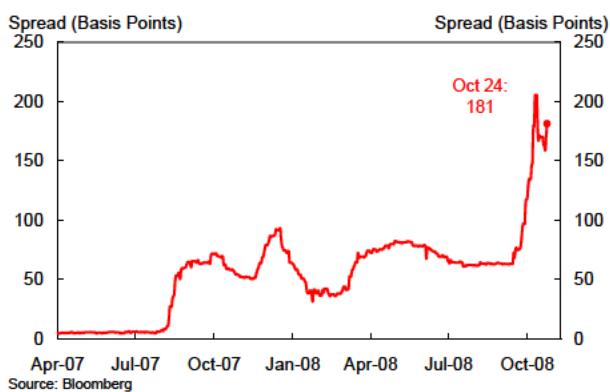
#### Japan Short- and Long-Term Interest Rates



Source: Bloomberg and Federal Reserve Board

#### Euro Area

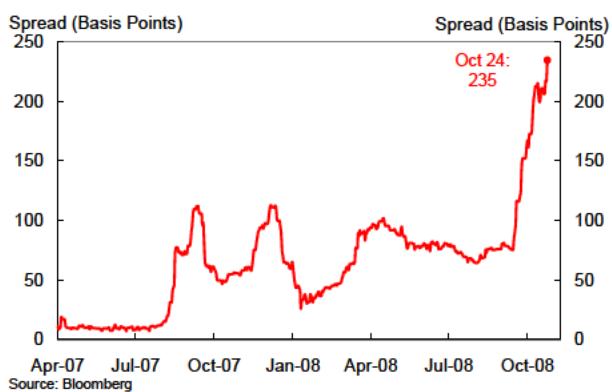
##### LIBOR Rate - OIS Swap Rate (3-month)



Source: Bloomberg

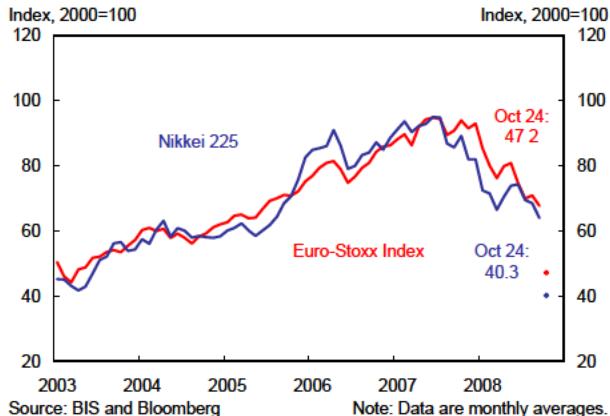
#### United Kingdom

##### LIBOR Rate - OIS Swap Rate (3-month)



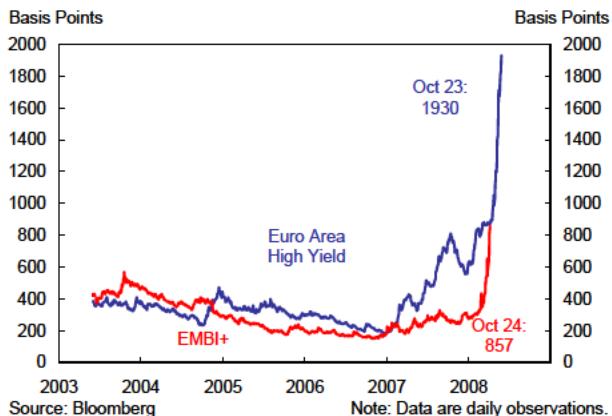
Source: Bloomberg

#### Euro Area and Japan Equity Indices



Source: BIS and Bloomberg

#### EMBI+ and Euro Area Spreads

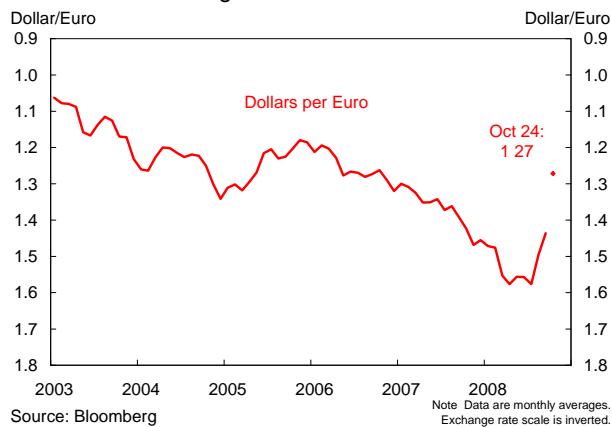


Source: Bloomberg

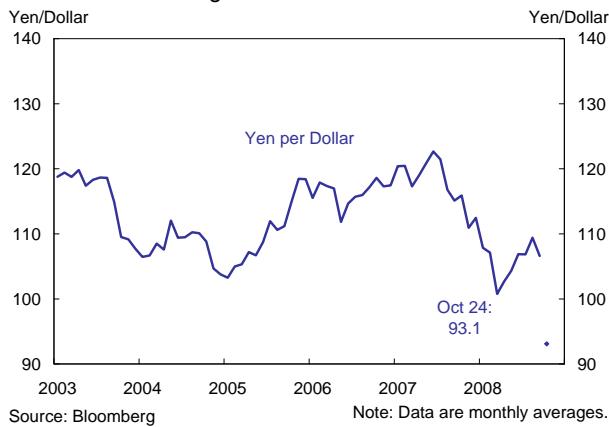
## A. Significant Developments

### Exhibit A-9: Exchange Rates

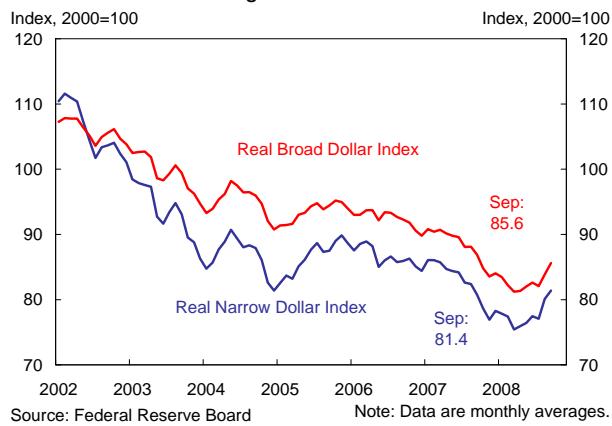
Dollar-Euro Exchange Rate



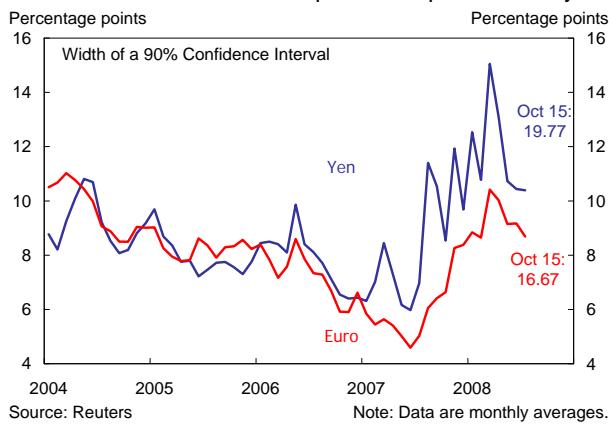
Yen-Dollar Exchange Rate



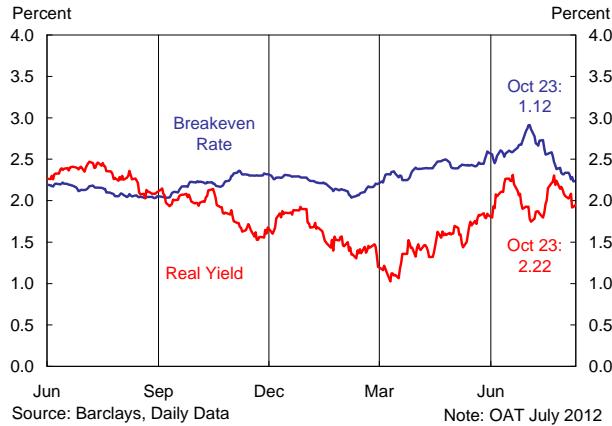
Real Effective Exchange Rates



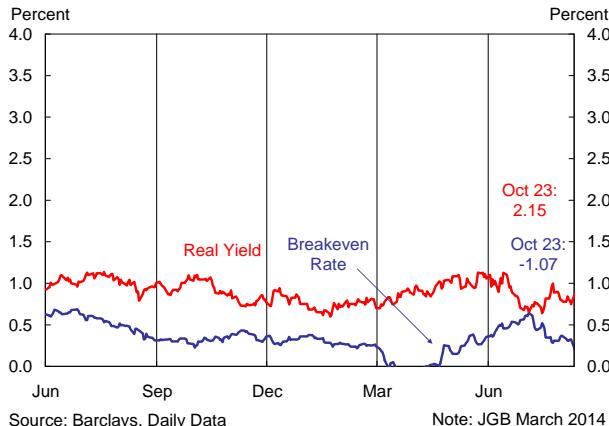
Euro and Yen One-Month Implied FX Option Volatility



Euro Area Inflation-Linked Bonds (Past Year)



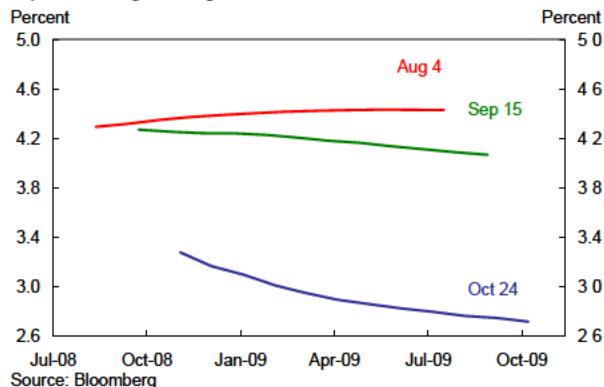
Japan Inflation-Linked Bonds (Past Year)



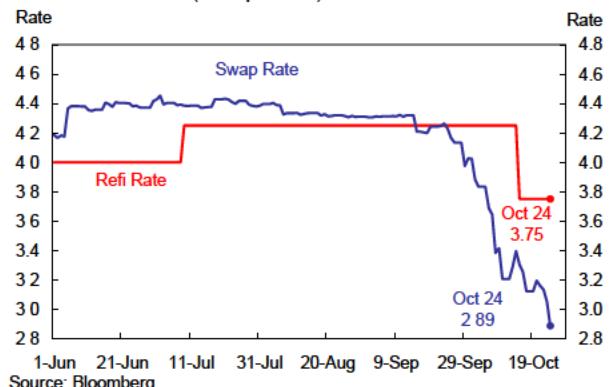
## A. Significant Developments

**Exhibit A-10: Euro Area  
and Japan Swap Curves**

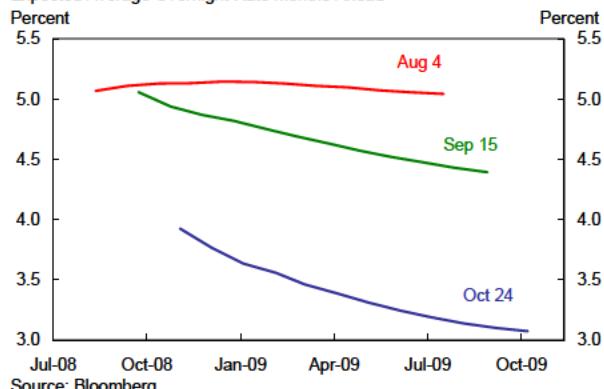
**Euro Area Swap Curve**  
Expected Average Overnight Rate Months Ahead



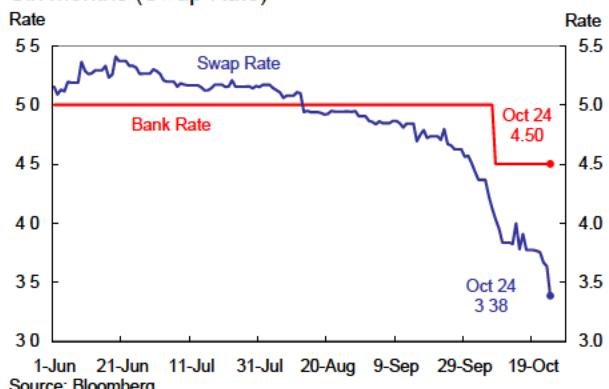
**Euro Area: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)**



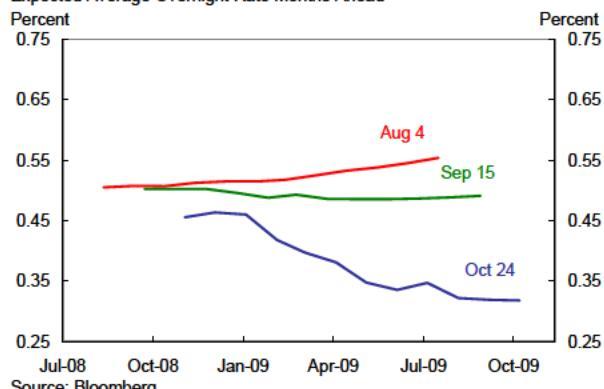
**UK Swap Curve**  
Expected Average Overnight Rate Months Ahead



**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)**

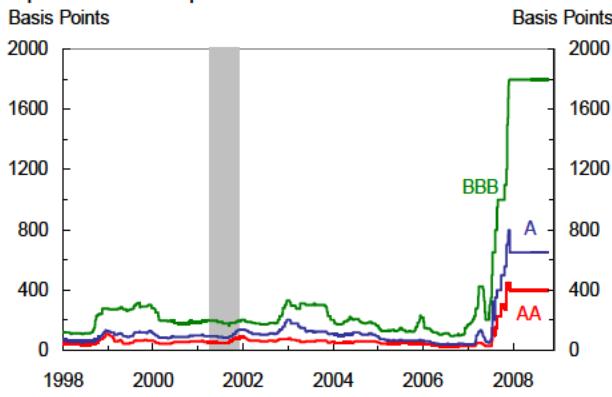


Note: Shading represents NBER recessions.

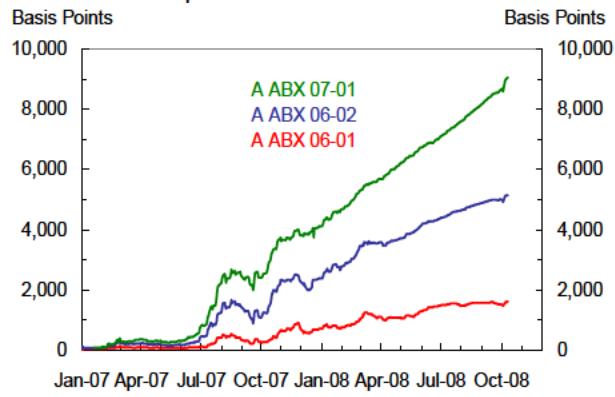
## A. Significant Developments

### Exhibit A-11: Financial Market Indicators of Subprime Spillovers

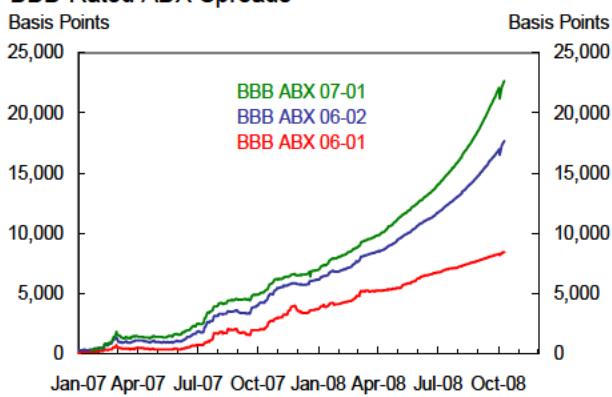
Spreads on Subprime MBS Tranches



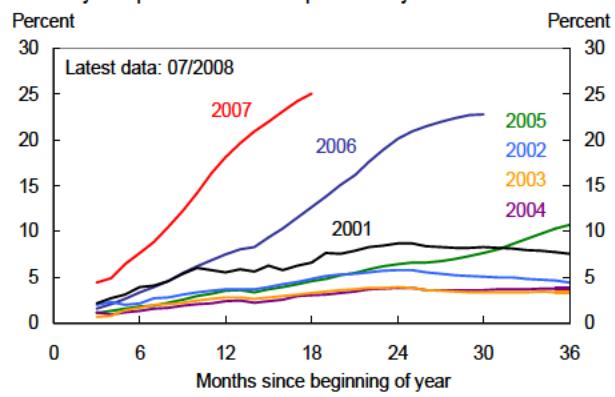
A-Rated ABX Spreads



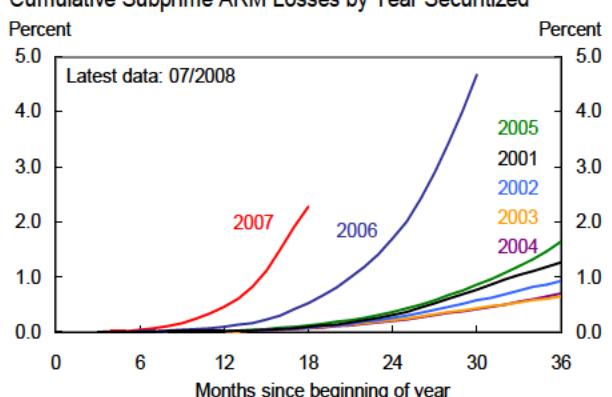
BBB-Rated ABX Spreads



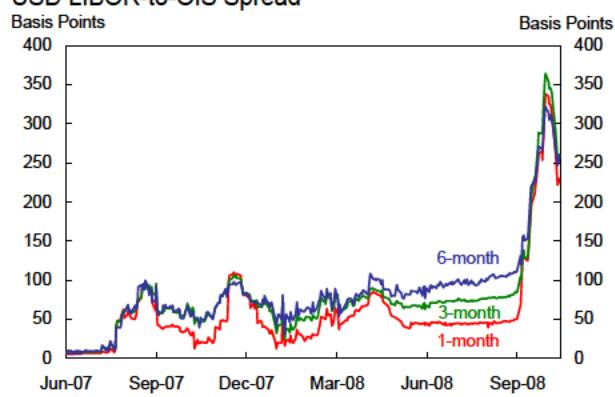
60+ Day Subprime ARM Delinquencies by Year Securitized



Cumulative Subprime ARM Losses by Year Securitized



USD LIBOR-to-OIS Spread



## 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**		
	Aug	Sep	Oct	Aug	Sep	Oct	Aug	Sep	Oct	Aug	Sep	Oct
<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	1.9	3.3	2.8	5.3	5.3	5.3	2.0	2.0	2.0
Q3	2.2	2.8	3.0	2.2	0.5	-0.3	5.7	5.9	6.0	2.0	2.0	2.0
Q4	2.0	2.1	1.9	1.0	1.7	-2.8	5.9	6.3	6.6	2.3	2.0	1.0
<b>2009</b>												
Q1	2.0	2.0	1.8	2.0	1.6	-1.5	5.9	6.4	7.2	2.5	2.3	1.0
Q2	1.9	1.9	1.7	2.4	2.0	2.2	5.9	6.5	7.6	3.0	2.5	1.0
Q3	1.8	1.8	1.6	3.0	2.1	1.5	5.8	6.7	7.9	3.5	2.8	1.0
Q4	1.7	1.7	1.5	2.5	2.5	1.8	5.8	6.7	8.0	3.8	3.0	1.3
<b>2010</b>												
Q1	--	1.7	1.5	--	3.3	2.3	--	6.5	7.9	--	3.3	1.5
Q2	--	1.7	1.5	--	3.3	3.1	--	6.3	7.8	--	3.5	2.0
Q3	--	1.7	1.5	--	2.7	3.3	--	6.1	7.7	--	3.8	2.5
Q4	--	1.7	1.5	--	2.7	3.2	--	6.0	7.5	--	4.3	3.0
<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	2.1	2.3	2.3	1.5	1.6	0.1	1.1	1.5	1.8	-2.0	-2.3	-3.3
2009	1.8	1.8	1.6	2.5	2.0	1.0	-0.1	0.4	1.4	1.5	1.0	0.3
2010	--	1.7	1.5	--	3.0	3.0	--	-0.7	-0.5	--	1.3	1.8

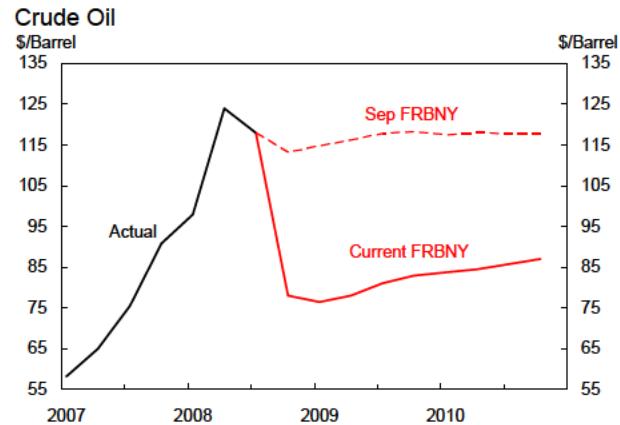
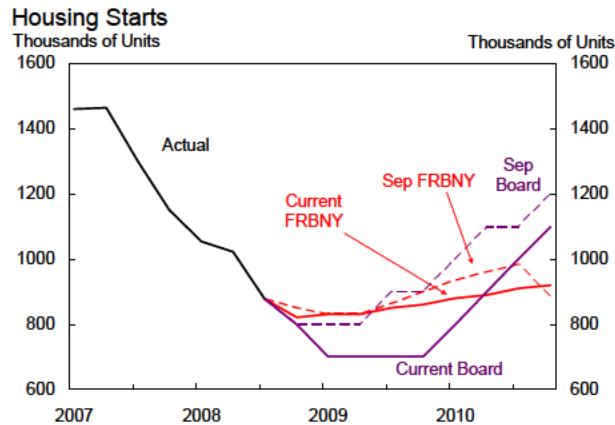
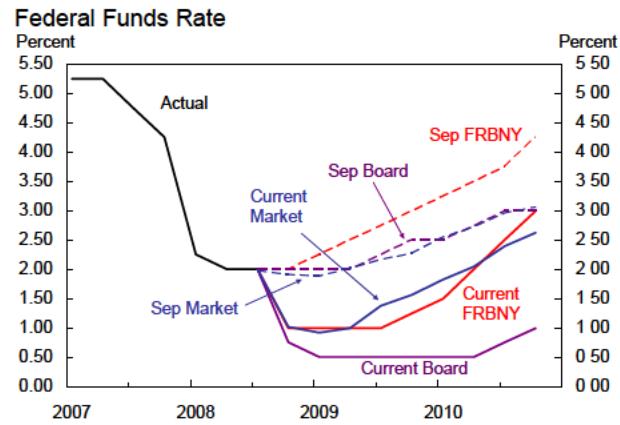
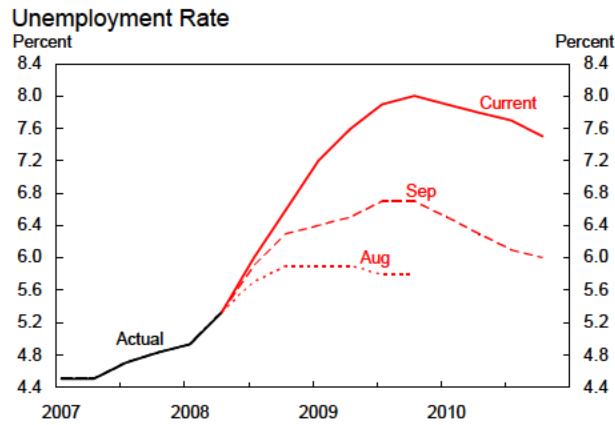
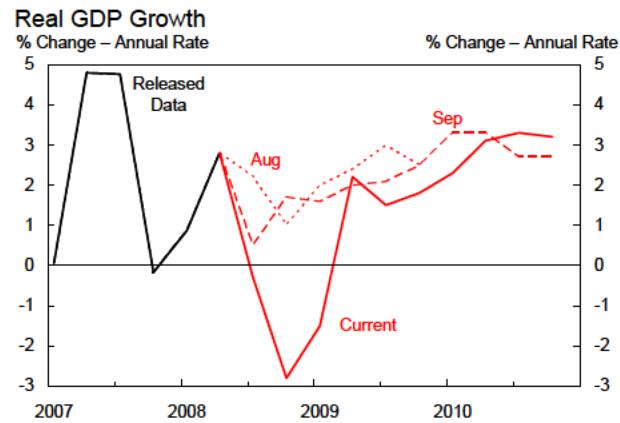
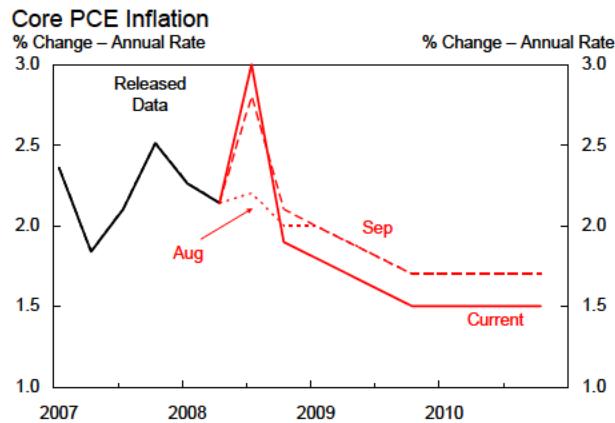
Note: Columns reflect the forecast dates. Numbers in gray are from previous Blackbooks, and numbers in italics are released data.

\*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)	
	2008Q3	2008Q4	2008Q3	2008Q4
<b>OUTPUT</b>				
<b>Real GDP</b>	-0.3 (0.5)	-2.8 (1.7)	-0.3 (0.5)	-2.8 (1.7)
<b>Final Sales to Domestic Purchasers</b>	-2.6 (-0.5)	-2.0 (0.3)	-2.8 (-0.5)	-2.1 (0.3)
<b>Consumption</b>	-3.6 (-0.5)	-1.0 (0.2)	-2.6 (-0.4)	-0.7 (0.2)
<b>BFI: Equipment and Software</b>	-7.0 (-1.0)	-5.0 (5.0)	-0.5 (-0.1)	-0.4 (0.3)
<b>BFI: Nonresidential Structures</b>	4.0 (8.0)	-8.0 (5.0)	0.2 (0.3)	-0.3 (0.2)
<b>Residential Investment</b>	-16.0 (-20.0)	-25.0 (-20.0)	-0.6 (-0.8)	-0.9 (-0.7)
<b>Government: Federal</b>	6.0 (1.0)	1.5 (1.5)	0.4 (0.1)	0.1 (0.1)
<b>Government: State and Local</b>	3.0 (2.2)	1.0 (1.5)	0.4 (0.3)	0.1 (0.2)
<b>Inventory Investment</b>	-- --	-- --	1.2 (0.2)	-1.7 (0.4)
<b>Net Exports</b>	-- --	-- --	1.3 (0.9)	1.0 (1.0)
<b>INFLATION</b>				
<b>Total PCE Deflator</b>	5.6 (5.6)	-0.5 (2.1)		
<b>Core PCE Deflator</b>	3.0 (2.8)	1.9 (2.1)		
<b>PRODUCTIVITY AND LABOR COSTS*</b>				
<b>Output per Hour</b>	1.2 (1.3)	-1.0 (2.0)		
<b>Compensation per Hour</b>	5.4 (3.8)	3.5 (4.0)		
<b>Unit Labor Costs</b>	4.2 (2.5)	4.5 (2.0)		

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>	0.1	1.0	3.0	0.1	1.0	3.0
	(1.6)	(2.0)	(3.0)	(1.6)	(2.0)	(3.0)
<b>Final Sales to Domestic Purchasers</b>	-0.8	0.2	2.9	-0.8	0.2	3.0
	(0.4)	(1.6)	(2.2)	(0.4)	(1.6)	(2.3)
<b>Consumption</b>	-0.7	0.5	2.3	-0.5	0.4	1.6
	(0.6)	(1.4)	(2.0)	(0.4)	(1.0)	(1.4)
<b>BFI: Equipment and Software</b>	-4.4	0.2	9.0	-0.3	0.0	0.6
	(0.0)	(3.5)	(5.0)	(0.0)	(0.2)	(0.3)
<b>BFI: Nonresidential Structures</b>	5.3	-8.8	3.2	0.2	-0.3	0.1
	(8.8)	(3.0)	(3.0)	(0.3)	(0.1)	(0.1)
<b>Residential Investment</b>	-20.0	-3.8	5.0	-0.8	-0.1	0.1
	(-20.3)	(-2.4)	(3.0)	(-0.8)	(-0.1)	(0.1)
<b>Government: Federal</b>	5.0	1.5	1.5	0.4	0.1	0.1
	(3.8)	(1.5)	(1.5)	(0.3)	(0.1)	(0.1)
<b>Government: State and Local</b>	1.5	1.7	3.0	0.2	0.2	0.4
	(1.4)	(1.7)	(1.8)	(0.2)	(0.2)	(0.2)
<b>Inventory Investment</b>	--	--	--	-0.5	0.3	0.0
	--	--	--	(-0.2)	(-0.0)	(0.3)
<b>Net Exports</b>	--	--	--	1.5	0.4	-0.1
	--	--	--	(1.4)	(0.4)	(0.4)
<b>INFLATION</b>						
<b>Total PCE Deflator</b>	3.2	1.5	1.7			
	(3.9)	(1.7)	(1.7)			
<b>Core PCE Deflator</b>	2.3	1.6	1.5			
	(2.3)	(1.8)	(1.7)			
<b>Total CPI Inflation</b>	4.7	1.8	2.0			
	(3.4)	(3.8)	(1.9)			
<b>Core CPI Inflation</b>	2.4	1.8	1.9			
	(2.1)	(2.1)	(2.7)			
<b>GDP Deflator</b>	2.0	1.4	1.9			
	(2.4)	(1.8)	(1.8)			

Note: Numbers in parentheses are from the previous Blackbook.

## B. FRBNY Forecast Details

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

	<b>Q4/Q4 Growth Rates</b>		
	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>INTEREST RATE ASSUMPTIONS</b>			
<b>Federal Funds Rate (End-of-Year)</b>	1.00 (2.00)	1.25 (3.00)	3.00 (4.25)
<b>10-Year Treasury Yield (Avg. Q4 Level)</b>	3.7 (3.6)	4.0 (4.3)	4.4 (5.00)
<b>PRODUCTIVITY AND LABOR COSTS*</b>			
<b>Output</b>	-0.2 (1.6)	0.8 (2.2)	3.4 (3.5)
<b>Hours</b>	-1.9 (-1.0)	-0.5 (0.4)	1.6 (1.7)
<b>Output per Hour</b>	1.8 (2.5)	1.3 (1.8)	1.8 (1.8)
<b>Compensation per Hour</b>	4.1 (3.8)	2.9 (3.9)	1.9 (4.0)
<b>Unit Labor Costs</b>	2.3 (1.3)	1.5 (2.1)	0.1 (2.2)
<b>LABOR MARKET</b>			
<b>Unemployment Rate (Avg. Q4 Level)</b>	6.6 (6.3)	8.0 (6.7)	7.5 (6.0)
<b>Participation Rate (Avg. Q4 Level)</b>	66.1 (66.1)	66.1 (66.1)	66.1 (66.1)
<b>Avg. Monthly Nonfarm Payroll Growth (Thous.)</b>	-93 (-56)	-39 (15)	89 (137)
<b>INCOME</b>			
<b>Personal Income</b>	2.1 (3.4)	1.4 (3.2)	4.8 (5.0)
<b>Real Disposable Personal Income</b>	-0.8 (-0.5)	0.3 (1.5)	3.4 (3.2)
<b>Corporate Profits Before Taxes</b>	-4.6 (-3.9)	-0.2 (2.6)	4.5 (5.2)

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>						
<b>Real GDP</b>	0.1	1.0	3.0	0.3	-0.1	2.3
	(1.6)	(2.0)	(3.0)	(1.5)	(2.1)	(2.7)
<b>GDP Growth Contributions</b>						
<b>Final Sales to Domestic Purchasers</b>	-0.8	0.2	3.0	-1.1	-0.8	2.5
	(0.4)	(1.6)	(2.3)	(0.0)	(1.4)	(3.0)
<b>Consumption</b>	-0.5	0.4	1.6	-0.7	0.7	1.7
	(0.4)	(1.0)	(1.4)	(0.1)	(1.3)	(1.8)
<b>BFI</b>	-0.1	-0.3	0.7	-0.1	-1.2	0.4
	(0.3)	(0.4)	(0.5)	(0.2)	(0.0)	(0.5)
<b>Residential Investment</b>	-0.8	-0.1	0.1	-0.8	-0.5	0.3
	(-0.8)	(-0.1)	(0.1)	(-0.8)	(-0.2)	(0.5)
<b>Government</b>	0.5	0.3	0.5	0.5	0.2	0.1
	(0.4)	(0.3)	(0.3)	(0.5)	(0.3)	(0.2)
<b>Inventory Investment</b>	-0.5	0.3	0.0	0.1	0.4	0.0
	(-0.2)	(-0.0)	(0.3)	(0.1)	(0.4)	(-0.1)
<b>Net Exports</b>	1.5	0.4	-0.1	1.3	0.2	-0.2
	(1.4)	(0.4)	(0.4)	(1.4)	(0.3)	(-0.1)
<b>INFLATION</b>						
<b>Total PCE Deflator</b>	3.2	1.5	1.7	2.8	1.4	1.4
	(3.9)	(1.7)	(1.7)	(3.5)	(2.2)	(1.9)
<b>Core PCE Deflator</b>	2.3	1.6	1.5	2.4	1.5	1.3
	(2.3)	(1.8)	(1.7)	(2.4)	(2.1)	(1.9)
<b>INTREST RATE ASSUMPTION</b>						
<b>Fed Funds Rate (End-of-Year)</b>	1.00	1.25	3.00	0.75	0.50	1.00
	(2.00)	(3.00)	(4.25)	(2.00)	(2.50)	(3.00)
<b>PRODUCTIVITY AND LABOR COSTS*</b>						
<b>Output per Hour</b>	1.8	1.3	1.8	1.7	1.7	2.2
	(2.5)	(1.8)	(1.8)	(2.4)	(1.8)	(2.1)
<b>Compensation per Hour</b>	4.1	2.9	1.9	4.0	3.1	2.1
	(3.8)	(3.9)	(4.0)	(4.1)	(3.9)	(3.6)
<b>Unit Labor Costs</b>	2.3	1.5	0.1	2.2	1.4	-0.1
	(1.3)	(2.1)	(2.2)	(1.6)	(2.1)	(1.5)
<b>LABOR MARKET</b>						
<b>Unemployment Rate (Avg. Q4 Level)</b>	6.6	8.0	7.5	6.3	7.2	7.2
	(6.3)	(6.7)	(6.0)	(6.2)	(6.2)	(5.9)
<b>Participation Rate (Avg. Q4 Level)</b>	66.1	66.1	66.1	66.0	65.6	65.4
	(66.1)	(66.1)	(66.1)	(66.0)	(65.7)	(65.5)
<b>Avg. Monthly Nonfarm Payroll Growth (Thous.)</b>	-93	-39	89	-92	-133	67
	(-56)	(15)	(137)	(-75)	(75)	(100)
<b>HOUSING</b>						
<b>Housing Starts (Avg. Q4 Level, Thous.)</b>	820	860	920	800	700	1100
	(850)	(900)	(885)	(800)	(900)	(1200)

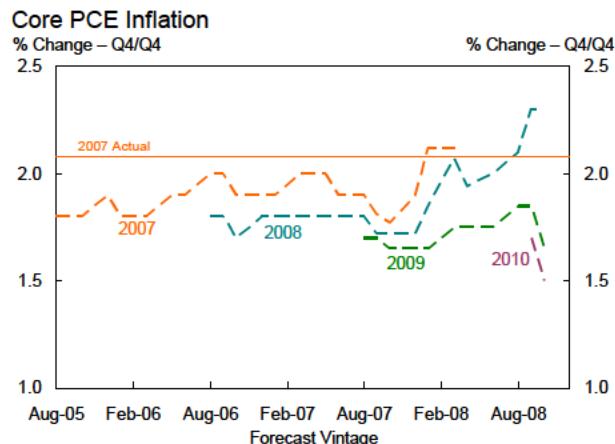
Note: All values are Q4/Q4 percent change, unless indicated otherwise. Numbers in parentheses are from the previous Blackbook or Greenbook.

\*Nonfarm business sector

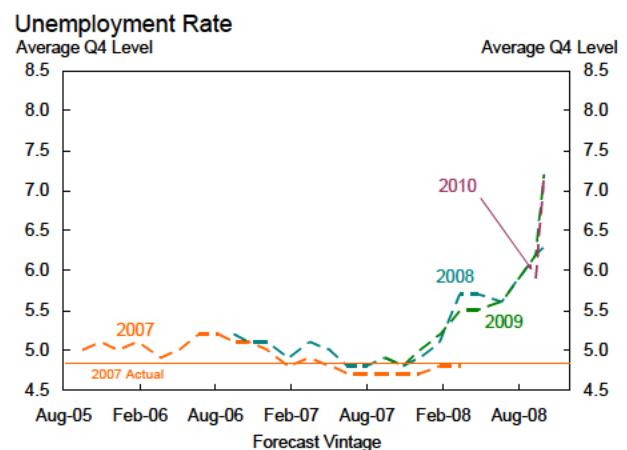
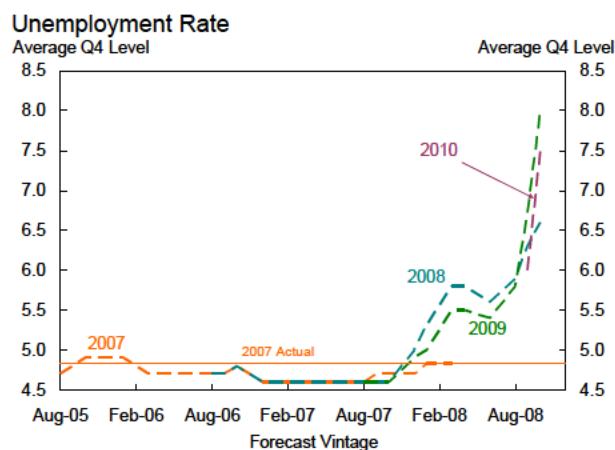
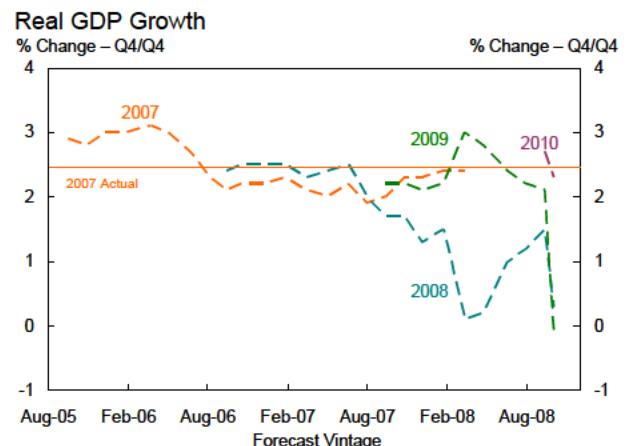
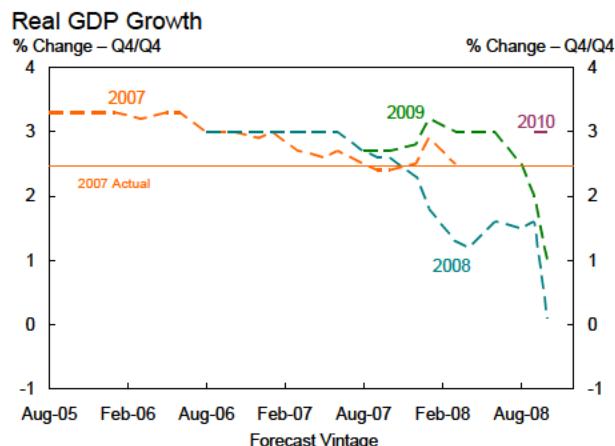
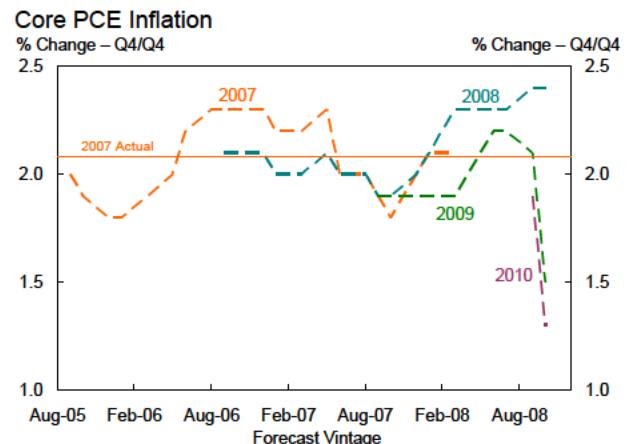
## B. FRBNY Forecast Details

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

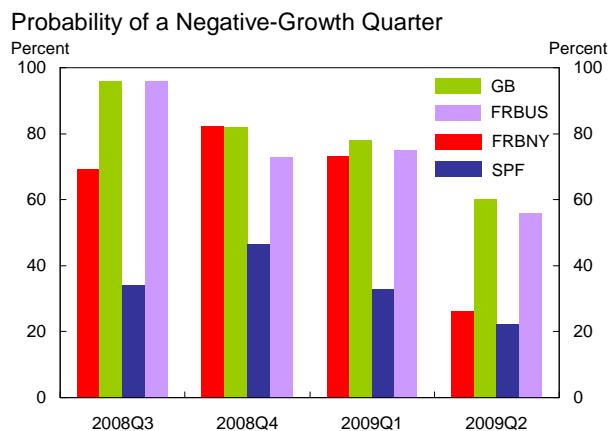
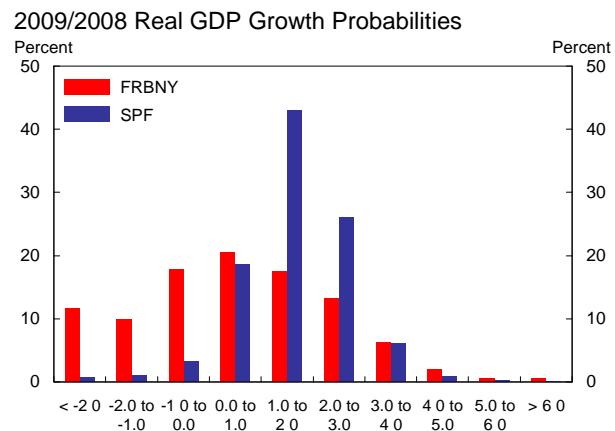
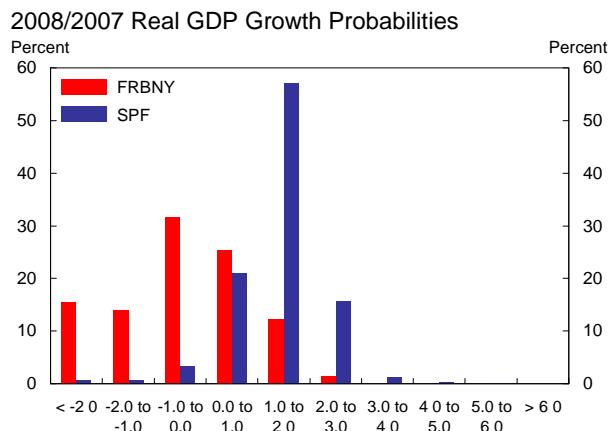
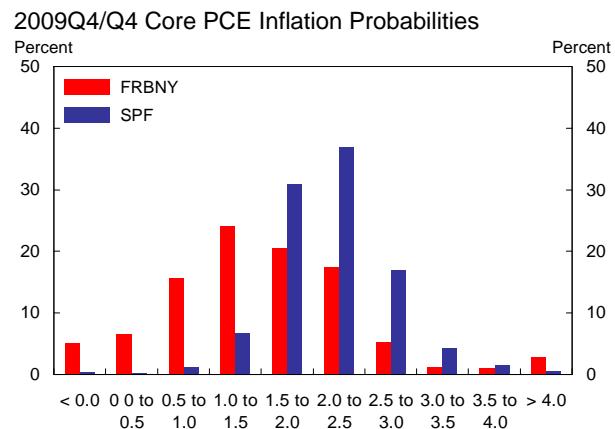
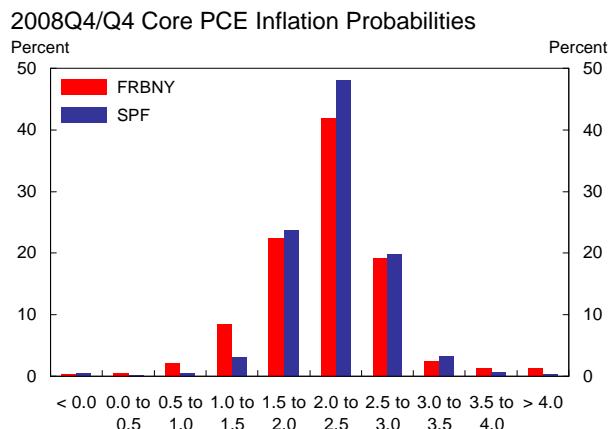
### Exhibit B-8: Alternative GDP and Inflation Forecasts

Real GDP Growth					
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
<b>FRBNY</b>	10/24/2008	-0.3 (0.5)	-2.8 (1.7)	0.1 (1.6)	1.0 (2.0)
<b>PSI Model</b>	10/22/2008	-0.3 (-0.2)	-0.1 (0.8)	-- --	-- --
<b>Blue Chip</b>	10/10/2008	-0.3 (1.0)	-1.1 (0.2)	0.6 (1.3)	1.4 (2.1)
<b>Median SPF</b>	8/12/2008	1.2 (1.7)	0.7 (1.8)	1.7 (1.5)	1.5 (2.2)
<b>Macro Advisers</b>	10/20/2008	-0.6 (1.7)	-2.2 (-1.0)	0.4 (1.1)	2.1 (2.8)
Core PCE Inflation					
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
<b>FRBNY</b>	10/24/2008	3.0 (2.8)	1.9 (2.1)	2.3 (2.3)	1.6 (1.8)
<b>Median SPF</b>	8/12/2008	2.2 (2.1)	2.1 (2.1)	2.2 (2.1)	2.0 (2.1)
<b>Macro Advisers</b>	10/8/2008	3.1 (2.7)	2.4 (2.3)	2.5 (2.3)	1.9 (2.0)
CPI Inflation					
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
<b>FRBNY</b>	10/24/2008	7.1 (8.4)	2.4 (2.5)	4.7 (3.4)	1.8 (3.8)
<b>Blue Chip</b>	10/10/2008	6.5 (6.3)	0.7 (2.2)	4.1 (4.5)	2.0 (2.3)
<b>Median SPF</b>	8/12/2008	5.3 (3.2)	2.9 (2.5)	4.3 (3.3)	2.4 (2.4)
<b>Macro Advisers</b>	10/8/2008	7.1 (7.3)	0.3 (2.1)	4.2 (4.7)	2.0 (2.2)
Core CPI Inflation					
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
<b>FRBNY</b>	10/24/2008	3.2 (3.1)	2.1 (2.2)	2.4 (2.1)	1.8 (2.1)
<b>Median SPF</b>	8/12/2008	2.5 (2.3)	2.3 (2.3)	2.3 (2.3)	2.2 (2.3)
<b>Macro Advisers</b>	10/8/2008	3.3 (3.2)	2.7 (2.7)	2.6 (2.6)	2.3 (2.2)

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

## B. FRBNY Forecast Details

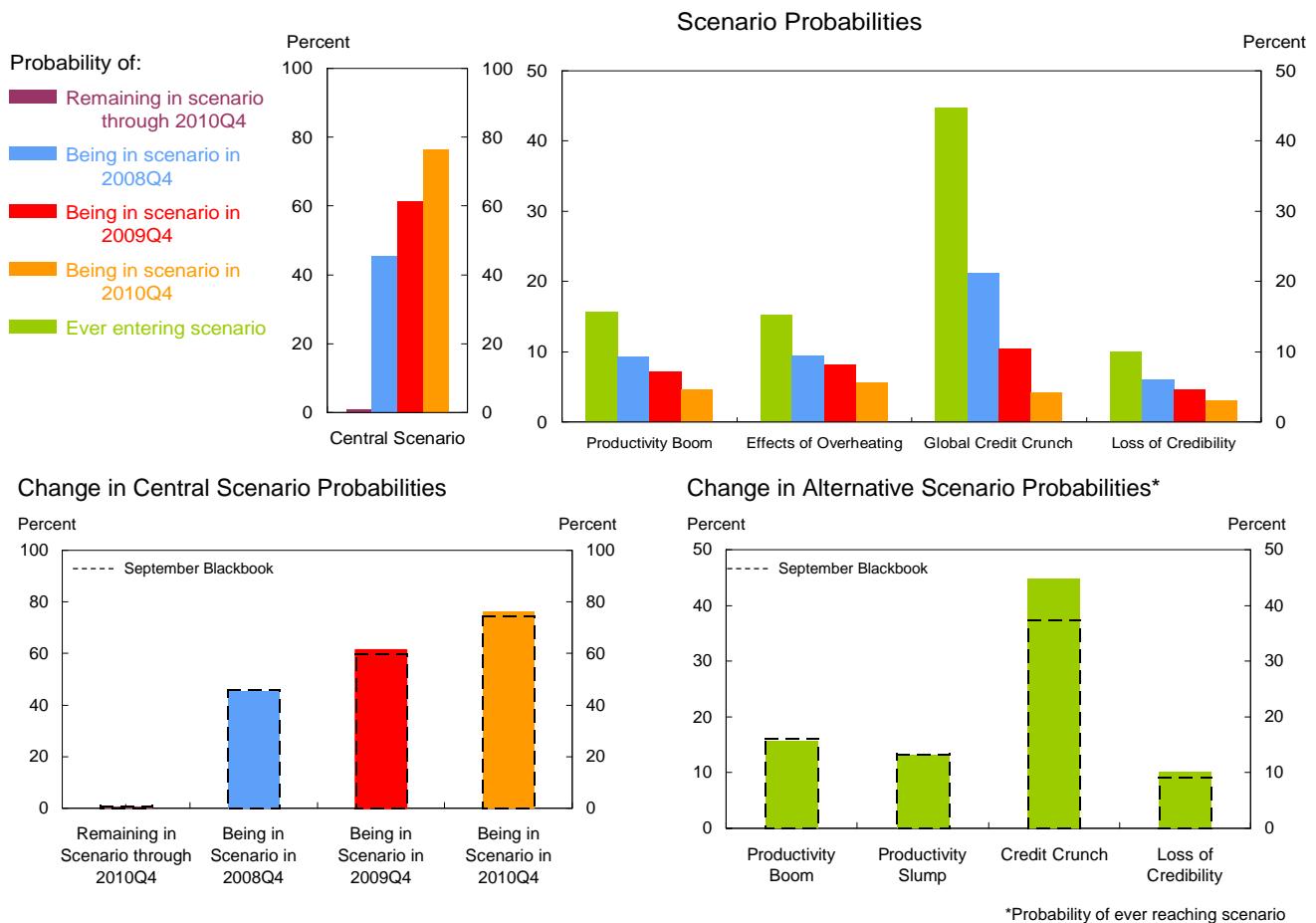
### Exhibit B-9: FRBNY, SPF, and Board Forecast Comparison



Source: MMS Function (FRBNY), FRB Philadelphia Survey of Professional Forecasters, and Federal Reserve Board  
Note: SPF forecast was released August 12, 2008. Board forecasts are from the September Greenbook.

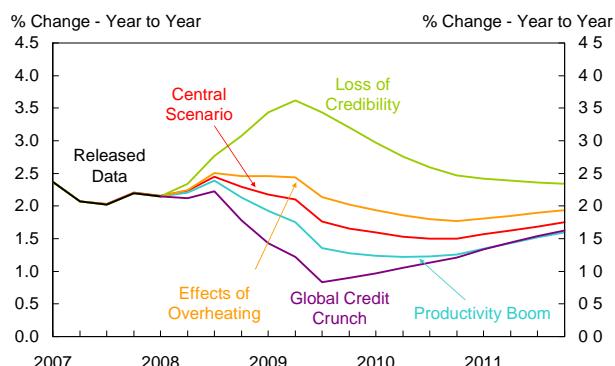
## C. FRBNY Forecast Distributions

**Exhibit C-1:**  
**Risks**

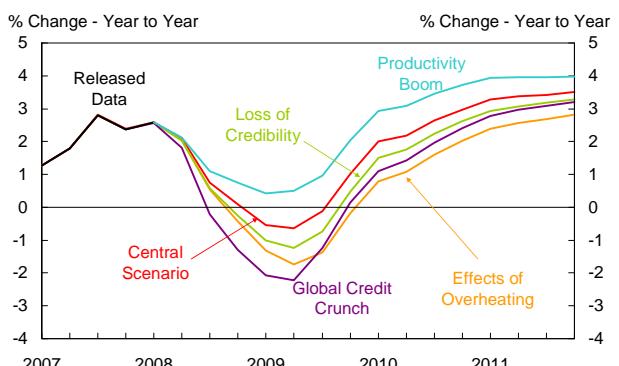


**Exhibit C-2: Projections  
under Alternative Scenarios**

Core PCE Inflation under Alternative Scenarios



Real GDP Growth under Alternative Scenarios

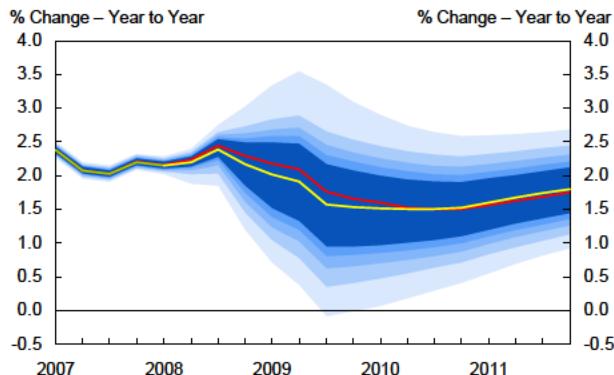


Source: MMS Function (FRBNY)

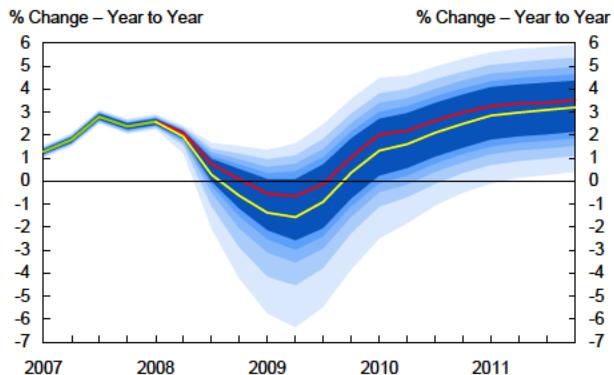
## C. FRBNY Forecast Distributions

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

#### Core PCE Inflation Forecast Distribution

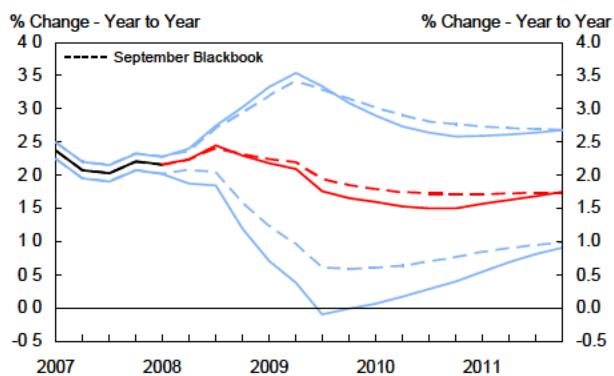


#### Real GDP Growth Forecast Distribution

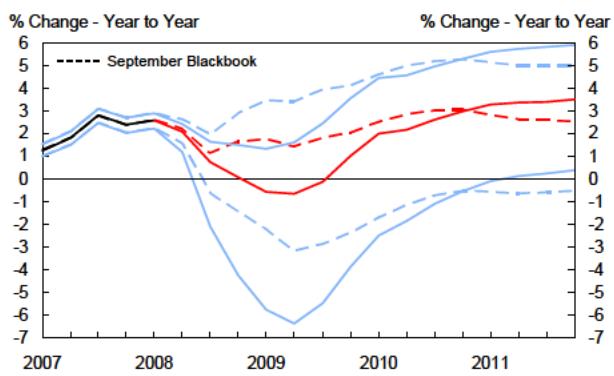


The yellow line is the expected value of the forecast distribution, the red line is the central scenario projection, and the green line is released data. The shading represents the 50, 60, 70, 80, and 90 percent chance that the four-quarter change will be within the respective range.

#### Change in Core PCE Inflation Forecast Distribution

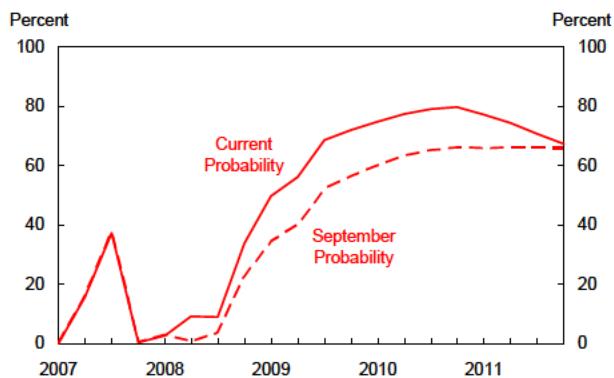


#### Change in Real GDP Growth Forecast Distribution

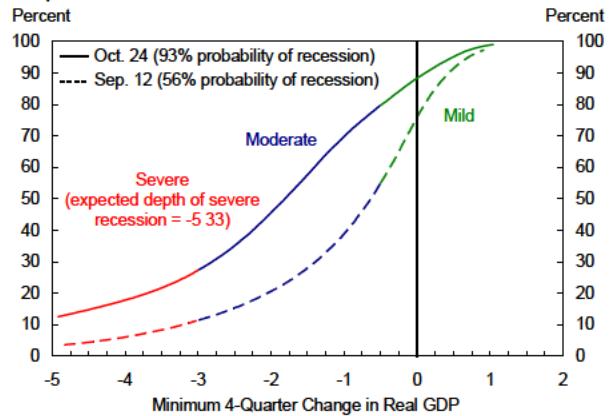


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from previous Blackbook.

#### Probability of Four-Quarter Core PCE Inflation below 2%



#### Depth of Recession

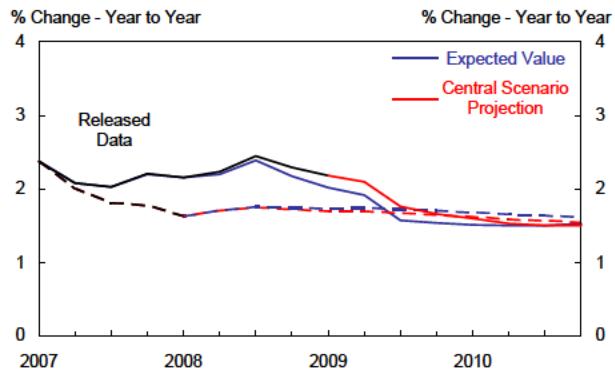


Source: MMS Function (FRBNY)

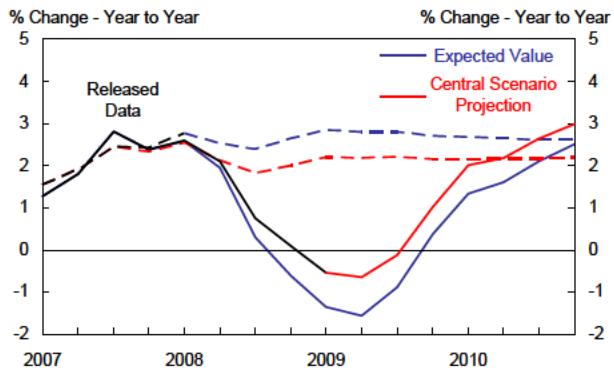
## C. FRBNY Forecast Distributions

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

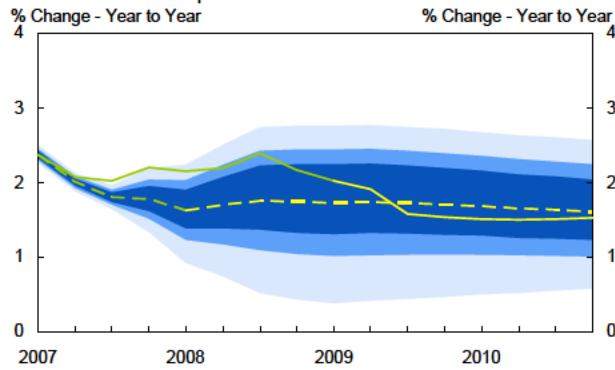
One-Year Comparison of Core PCE Inflation Forecast



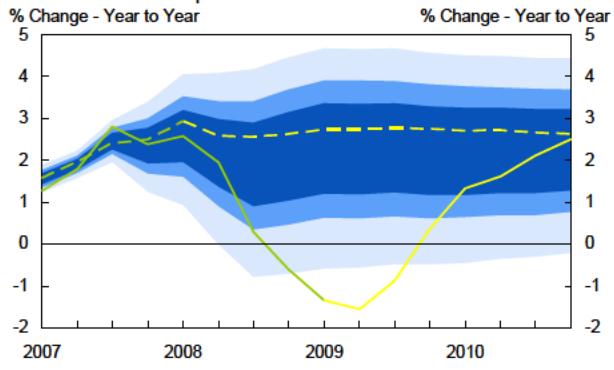
One-Year Comparison of Real GDP Growth Forecast



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



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

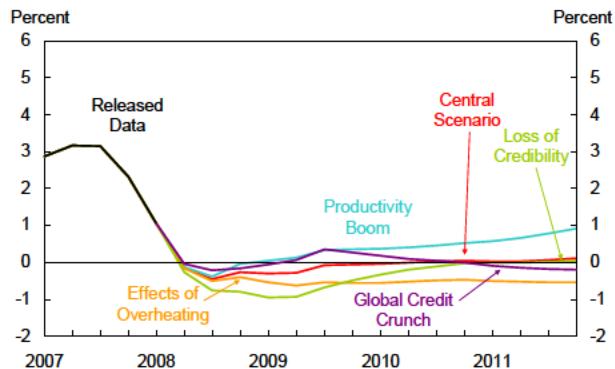


The solid yellow line is the **current** expected value of the forecast distribution, while the dashed yellow line is the **October 2007** expected value. The shading represents the 50, 70 and 90 percent probability intervals from the **October 2007** forecast. The green lines are released data.

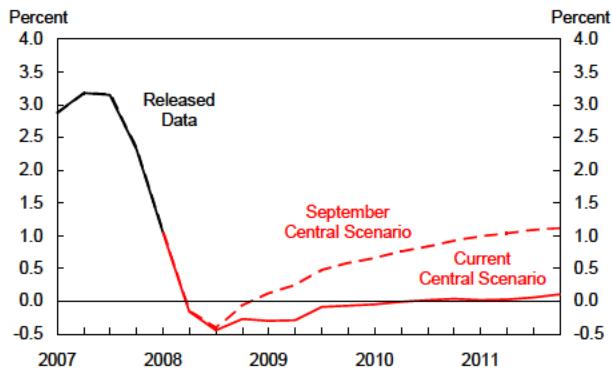
## D. FRBNY Fed Funds Rate Projections

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

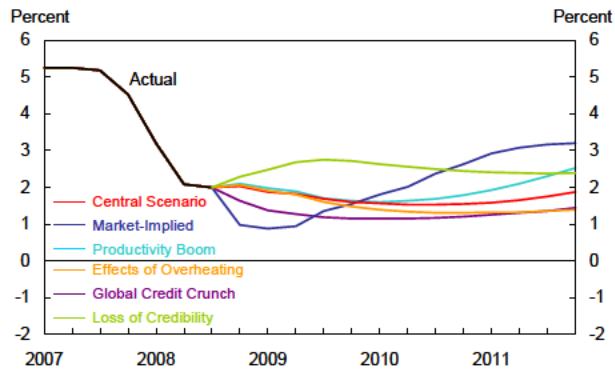
**Real FFR under Alternative Scenarios**



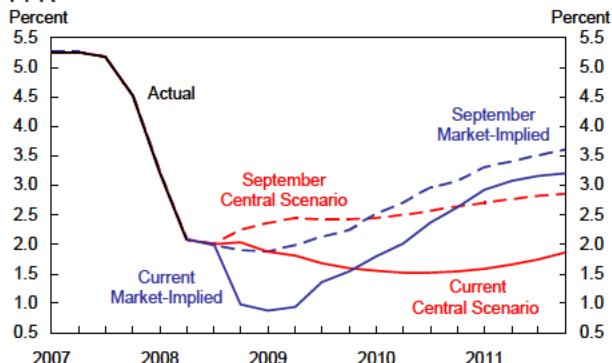
**Change in Central Scenario Real FFR**



**Nominal FFR under Alternative Scenarios**

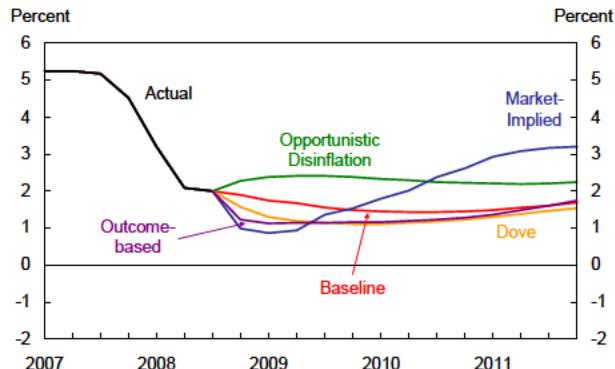


**Change in Central Scenario and Market-Implied Nominal FFR**

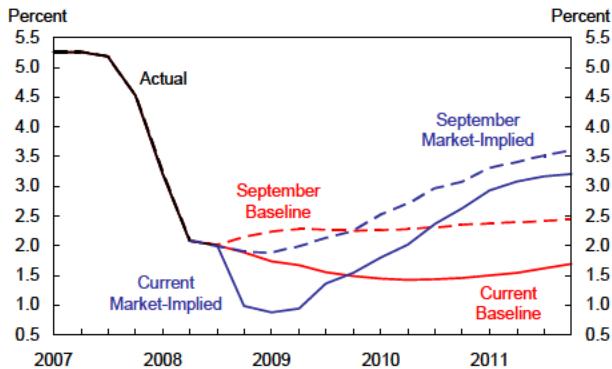


**Exhibit D-2: Alternative Policy Rules under  
Expected Value of Forecast Distribution**

**Nominal FFR using Alternative Policy Rules\***



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



\*Evaluated using yellow line from C-3

\*Evaluated using yellow line from C-3

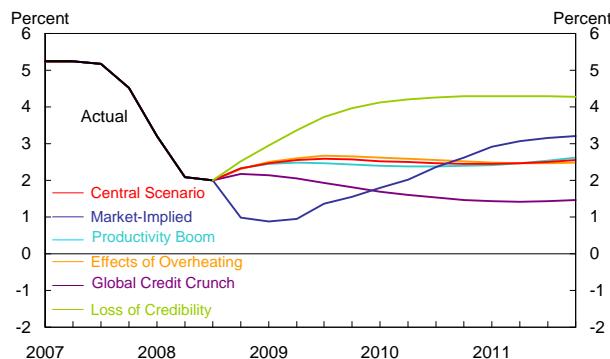
Source: MMS Function (FRBNY)

## D. FRBNY Fed Funds Rate Projections

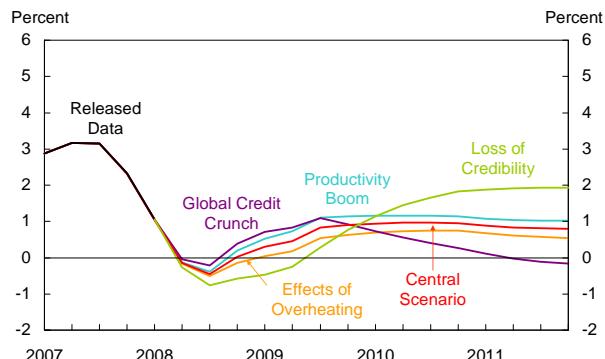
### Exhibit D-3: Alternative Policy Rule Analysis

#### **Policy Rule: Opportunistic Disinflation**

Nominal FFR under Alternative Scenarios

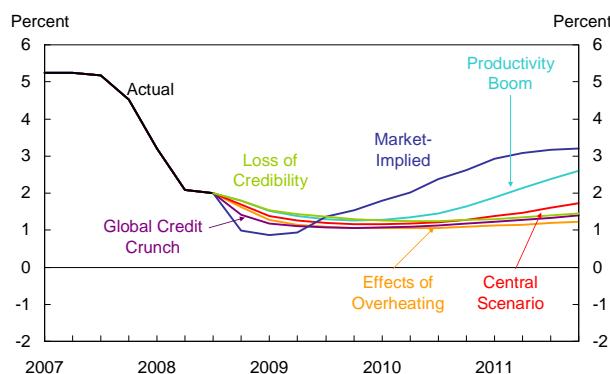


Real FFR under Alternative Scenarios

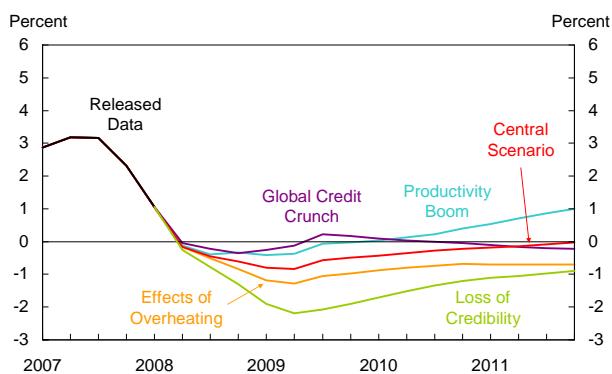


#### **Policy Rule: Dove**

Nominal FFR under Alternative Scenarios

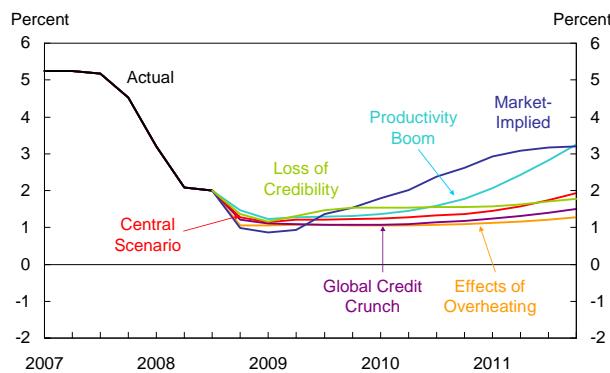


Real FFR under Alternative Scenarios

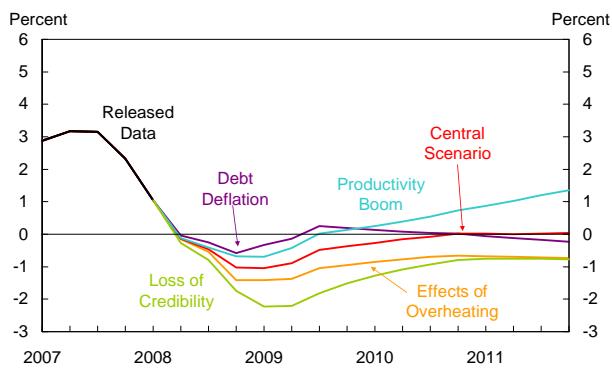


#### **Policy Rule: Outcome-based**

Nominal FFR under Alternative Scenarios



Real FFR under Alternative Scenarios



Source: MMS Function (FRBNY)

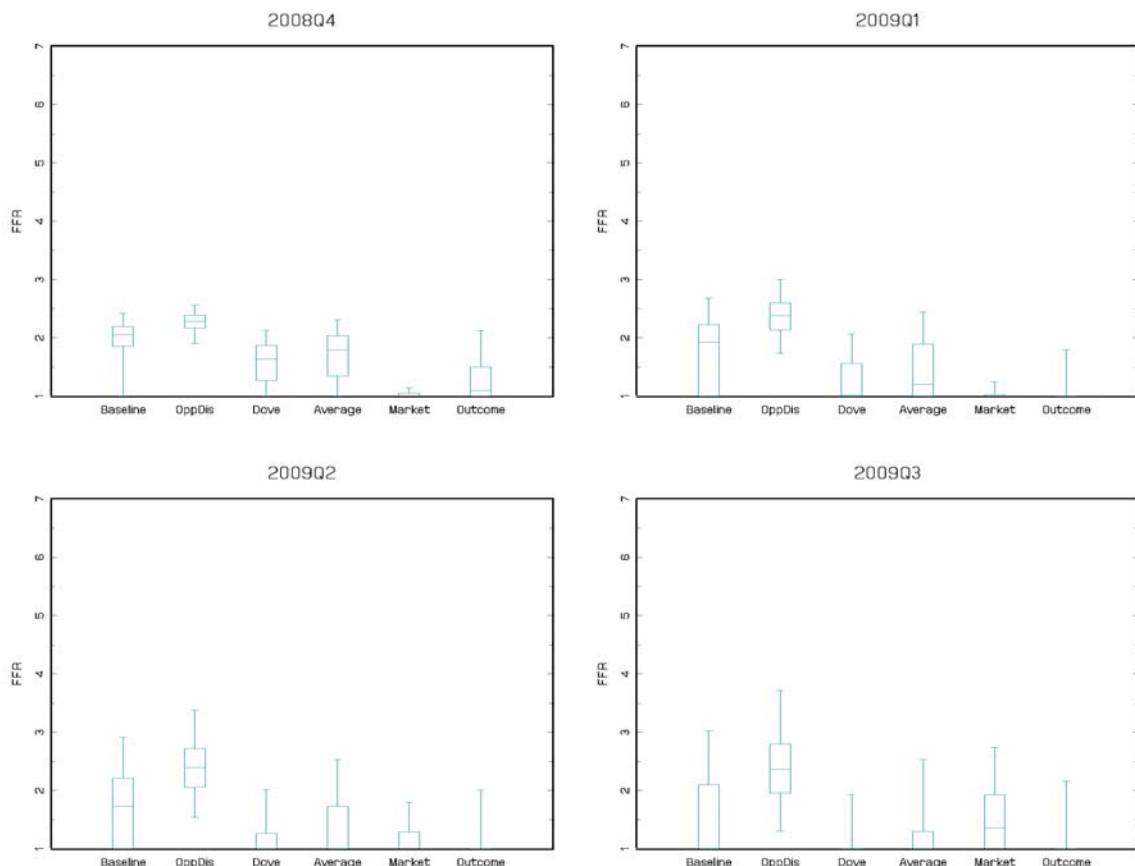
## D. FRBNY Fed Funds Rate Projections

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

“Average” Weights:

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

### Exhibit D-5: FFR Distributions



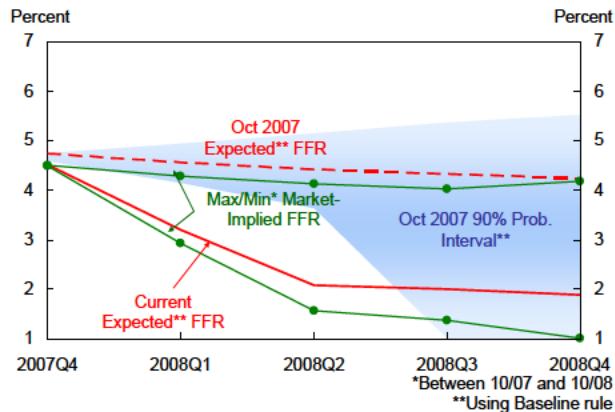
Note: The box represents the 50% probability interval, the line in the box the median, and the tails the 90% probability interval.

Source: MMS Function (FRBNY)

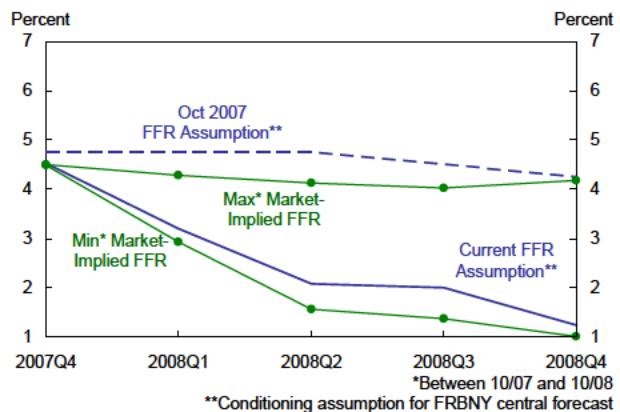
## D. FRBNY Fed Funds Rate Projections

**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)

## 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

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

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 lead 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

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: High Global Demand**

Recent global growth, most notably in China and other emerging markets, has been robust; at the same time, low unemployment rates and relatively high capacity utilization rates in advanced economies outside the U.S. indicate there is little slack in the global economy. If these developments continue, there is a risk that high demand for U.S. exports will raise output growth above the level in the central forecast. At the same time, the strength in global demand could cause it to outpace supply, further pushing up commodity prices (including energy prices) and beginning to push up the price of imported manufactured goods. These increases would likely cause above-forecast inflation in the U.S.

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

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 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. *High Global Demand*: inflation above central forecast, output above 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)

$i^* = 3.75$  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 this cycle are the *Opportunistic Disinflation* and *Dove* rules. The *Opportunistic Disinflation* rule reacts more strongly than the *Baseline* rule to deviations of inflation from target when inflation is above the upper bound of the implicit target range (taken to be 2%) and falling. In such circumstances, it tends to raise the policy rate higher, then lower it more slowly than the *Baseline* rule. Specifically, in each quarter over the forecast horizon, if the four-quarter average of core PCE inflation in the prior quarter is above 2% and higher than the current quarter value, we substitute the prior quarter's core PCE inflation value for the current

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quarter's value in the *Baseline* policy rule specification (i.e. set  $\pi_t = \pi_{t-1}$ ). In all other cases we follow the *Baseline* rule prescription. Thus, if the four-quarter average of inflation in the last quarter is below the value for the current quarter or simply below 2%, the *Opportunistic Disinflation* rule offers the same prescription as 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>2</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>2</sup> *Outcome-based* rule:  $i_t = 1.20*i_{t-1} - 0.39*i_{t-2} + 0.19*(1.17 + 1.73*\pi_t + 3.66*x_t - 2.72*x_{t-1})$