

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**September 2008**

**CONFIDENTIAL(FR) Class II FOMC**

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# FRBNY BLACKBOOK

## September 2008

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## 1. Policy Recommendation and Rationale

Our policy recommendation is to maintain the FFR (federal funds rate) target at 2.00% at the September FOMC meeting. After that, we anticipate that the FFR will remain at that level until early 2009 at which time (assuming the risk of a severe recession has receded sufficiently and market conditions have stabilized) we expect the policy renormalization process to begin. In this renormalization process, we expect the FFR to rise to 3.00% by the end of 2009, and then to reach 4.25% by the end of 2010, a shallower path relative to the assumption in the August Blackbook. Over the near term, we recommend that the FOMC signal remain flat around this path; i.e., communicate that there is an equal probability of upward deviations to downward deviations from this path in the near term. Given our outlook, our recommended path for the FFR for the rest of 2008 lies below the rate implied by the Baseline policy rule, although it implies a steeper renormalization path. The rationale for keeping the FFR path below the Baseline policy path in the short-run rests in the protracted stress in financial markets, while we recommend a steeper renormalization path because we believe the FOMC needs to reaffirm its price stability goals as the credit market conditions improve. Relative to financial market expectations, we continue to anticipate an earlier and steeper path for the renormalization of the FFR.

We currently forecast higher core inflation for the second half of 2008 compared to the August Blackbook, in line with data that suggests recent measures of headline and core inflation (for both PCE and CPI) are at elevated levels. Of particular significance, both PCE and CPI core measures are on top of or above our implicit objective ranges. Furthermore, several alternative inflation measures show signs of underlying inflationary pressures. We expect these near-term inflationary pressures to be temporary, and therefore maintain the same inflation forecast for 2009 as in the August Blackbook. Consistent with this projection, medium- and long-term financial market inflation compensation have decreased, commodity prices have declined significantly and the exchange value of the dollar has appreciated. Furthermore, recent labor market and productivity data indicate lower labor cost pressures. All of these developments are

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consistent with more moderate inflationary pressures in the medium term, contingent on monetary policy being appropriately calibrated.

The unexpectedly high reading of inflation according to current indicators and the low expected inflation according to some forward looking indicators have led us to change our risk assessment relative to our previous Blackbook. The conflicting signals have led us to increase overall uncertainty and thus to put a lower weight on our central scenario. Given the low reading of forward looking indicators of inflation, we have reduced the probability of the *Loss of Credibility* scenario and furthermore increased the probability of the *Credit Crunch* scenario (since the reduction in expected inflation may be due to recessionary concerns). The high reading of current inflation indicators, however, has led us to increase the risk of miscalibrated monetary policy, leading to overheating.

Despite robust real GDP growth for 2008Q2 that was well above our expectations earlier this year, we currently forecast lower real growth for 2008H2 and 2009, consistent with lower momentum at the end of the quarter and initial data for Q3, especially for domestic demand. The net exports contribution in the inter-meeting period has been higher than previously anticipated, and it is expected to provide a positive contribution to real activity. However we anticipate a much more modest contribution going forward, because of a deeper global slowdown than previously anticipated.

Recent labor market data especially from the household survey suggest a substantial softening in the labor market. With strong productivity growth, this softness has not been reflected in other measures of real activity. We anticipate, however, that the current softness in the labor market will persist, leading to a significant moderation of domestic demand.

Ongoing concerns about the health of the financial sector contribute to an increase in the already significant downside risks to growth. While the recent announcement of the Treasury conservatorship of Fannie Mae and Freddie Mac may provide some stabilization in the primary conforming mortgage market, concerns about the “solvency”

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of other financial institutions have intensified in the inter-meeting period. However, if financial markets begin to show signs of stabilization and credit spreads narrow, then the FOMC should be ready to start the renormalization of the FFR path earlier than we currently anticipate.

The current scenario of increased inflation in the near term and lower real activity implies a persistent tension for monetary policy. On the one hand, inflation has increased substantially and even though there is reason to believe that the inflationary pressures are temporary, the current reading of inflation indicators indicate that upside risks to the inflation outlook are more substantial than in the August Blackbook. On the other hand, we forecast a significant growth slowdown in 2008Q3 and a modest rebound in 2008Q4, with increased risk that the economic slowdown turns out to be deeper due to a deteriorating outlook for domestic and foreign demand. This tension currently suggests that the two opposite forces roughly balance each other.

Lower medium term inflation expectations make us confident in the shallower recommended path for the FFR renormalization, which can provide more support to the real economy without compromising on inflation. It is important to notice that the recommended path for the nominal FFR implies a lower path for the real FFR in the short run than implied in the August Blackbook due to the increased inflationary pressure. Because current inflation is high, it is important to signal an upward slope in the FFR path to avoid a possible unmooring of long-term inflation expectations. We believe that the inflation risks reside slightly more on the upside than on the downside, and suggest firm language of the FOMC. In particular, it is important that the FOMC signal readiness to increase the FFR target if further price data suggests that current inflationary pressures are more persistent than we currently anticipate. This language will be crucial to prevent a loss of credibility of the FOMC, all the more so considering that it has persistently suggested readiness to increase the FFR target if faced with inflationary pressures. On the other hand, the FOMC may need to maintain the current or an even more accommodative stance should a much steeper and generalized decline in commodity and asset prices signal a greater contraction of worldwide aggregate demand than anticipated.

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## 2. Significant Developments

### 2.1 Economic Developments

Inflation measures remained elevated in July, suggesting that some price pressure may carry through during the second half of the year. GDP growth was stronger than expected in the second quarter, but monthly data suggest a significant slowdown in growth over the medium term due to ongoing stress in financial markets and indications of a global economic slowdown.

**Inflation.** Headline measures of inflation were elevated in July, reflecting high energy and oil prices in that month. Core measures increased as well, reflecting some pressure from import prices. The 12-month change of the core PCE deflator was 2.4%, above the top of the mandate consistent range (1.5% to 2%), while the 12-month change of the core CPI was 2.5%, at the top of its range. Price increases were not confined to specific sectors. Alternative measures of underlying inflation rose sharply during the last two months, and are in general above the associated core measures. Overall, incoming consumer price data suggest some increase in current inflationary pressures and a greater upside risk to our inflation forecast. However, the ongoing reversal of energy and other commodity price as well as the recent appreciation of the dollar should help to mitigate the increase in import prices (which were up 16.0 percent for the year, despite a decline in August) and take some pressure off headline inflation.

Consistent with these more recent developments and in contrast to current indicators, forward measures of inflation indicate a significant degree of moderation. Financial markets measures of inflation expectations declined substantially in the inter-meeting period, partly reflecting the continued decline in energy and commodity prices. One-year ahead household inflation expectations, as measured by the Michigan survey and our own NY Fed survey, moderated as well, while long-term expectations remained stable.

**Real Activity.** Revisions to 2008Q2 data indicated higher than expected real GDP growth (3.3% at annual rate), supported mainly by net exports, which contributed a solid

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3.1 percent. Monthly data, however, suggest that the momentum slowed at the end of the quarter, and that the economy appears to be heading towards a very sluggish third quarter.

Incoming data showed particular weakness in consumer spending. Real PCE fell in July, as durable and nondurable goods expenditure fell and service expenditures were flat. Motor vehicle sales were at their lowest level since the early 1990s, and ex-auto sales rose only weakly. Monthly data suggest that the combination of declining real disposable income (as labor market weakens and the effect of the tax rebate ends), tight credit conditions, and elevated (albeit moderating) energy prices could produce a decline in consumption in 2008Q3.

The housing sector remained extremely weak, and signals of stabilization were mixed. Single-family housing starts and building permits fell again in July and are around the 1991 low, while existing and new home sales showed little change. Inventories of unsold new homes continued to decline in July, but the inventories-sales ratio remained elevated at a 10.1 months' supply. Housing prices continued to decline, but the pace of decline showed signs of slowing. The most recent release for the 20-metro-area composite Case-Shiller home price index implied a 12-month change of -15.9% in June and the OFEHO index was down by 4.8 percent. Production activity remained sluggish, but the July release of advance durable goods signaled a somewhat greater strength in the manufacturing sector.

**Labor market.** Labor market conditions continued to deteriorate in the inter-meeting period. Non-farm payroll declined by 84,000 in August; goods producing jobs continued to fall steadily, and employment in the service-producing sectors had the largest decline since August 2003. The August decline in payroll employment added to a (revised) cumulative loss of 160,000 over the previous two months. While the average monthly decline in 2008 payroll employment of about 75,000 jobs is lower than that typically observed in recessions, the steep increase in the unemployment rate in the recent period, which was 6.1% in August, is similar to the rates of increase typically observed in

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recessions. The apparent disconnect between the signals from the two measures is explained by an increase in labor force participation, especially among prime-age women and the over 55 population (see a more detailed analysis in the special topic *Increasing Unemployment Rate and the Role of Labor Supply*). Aggregate hours worked fell again in August, mostly due to the decrease in payroll employment, while average weekly hours remained constant at 33.7. Labor cost data indicate reduced cost pressures: the 4-quarter change in compensation per hour was 4.0%, within the range of the past four years.

Productivity growth in 2008Q2 was a robust 4.3%, and the four-quarter change was a robust 3.4%. The strong increase in productivity, combined with a softer increase in compensation lead to a slight decline in unit labor costs in the second quarter, and a modest increase of 0.6% in its 4-quarter change, which is at the very low end of that observed in recent years.

**Trade.** The net export contribution to real GDP growth in 2008Q2 was 3.1 percentage points, revised up from 2.4 percentage points. This was the largest net export contribution since 1980, and 2008Q2 represents the fifth consecutive quarter with a positive net export contribution. We expect net exports to continue to contribute positively to real GDP for the rest of this year, but by a smaller amount. The trade deficit widened to \$62.2 billion in July from \$58.8 billion in June. Exports of goods rose by \$3 billion in July and imports of goods rose by \$8 billion, with increases in both oil and non-oil imports. In real terms, exports grew 2 percent in July and are 12 percent above the levels of one year ago, with increases in all major categories except food. Real imports also grew by 2 percent in July with the largest increases in industrial supplies. The real trade balance is down by one fifth over the same period last year.

**Foreign economies.** Foreign growth was expected to slow in Q2, but the data came in even weaker than expected with notable declines in output in both the euro area and Japan. For the most part, recent indicators remain soft. In the euro area, production and orders fell in June. Exports remained solid up to June, but worries about export sales largely contributed to the region's drop in business confidence in August. Exports are



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also a concern in Japan, although there was some rebound in June from very poor May data. July data on production, shipments and retail sales were somewhat encouraging. The growth signals in China are mixed, with soft data for production and credit matched by still strong data on exports and retail sales.

## 2.2 Financial Markets

Concerns about the health of the financial sector continued to affect financial markets and led to modestly higher downside growth risks being priced into many markets. A number of credit spreads remained elevated, and there was a further flattening of the expected FFR path since the last FOMC meeting.

**U.S. Markets.** Consistent with a weaker view of the economic outlook, policy expectations declined over this inter-meeting period. From 2009 forward, the expected Fed Funds rate fell from 30 to 70 basis points. The option implied probabilities of a 2% rate outcome at the September and October FOMC meetings are 81% and 78%, respectively. The implied Fed Funds rates derived from futures contracts show that the market is pricing in 16 basis points of tightening by August 2009, 55 basis points of tightening by February 2010, and 106 basis points of tightening by November 2010.

Though policy expectations were skewed toward the upside over most of the inter-meeting period, they became slightly skewed toward the downside this week. The probability of a rate cut by September or October is now 15% and 18%, respectively, compared to the rate hike probabilities of 4% and 5%. Consistent with this, implied skewness is now negative with a reading of -0.2%. The 0-6 month LIBOR confidence interval was lower for most of the inter-meeting period but has returned to its prior level of 230 basis points.

Forward rates declined, particularly at shorter horizons. Much of the decline reflected a substantial drop in inflation compensation, a likely consequence of the sharp decline in oil prices and increased growth concerns. 0-5 year inflation compensation moved down 49 basis points to 1.60% while 5-10 year inflation compensation fell 5 basis points to

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2.85%. While dealers find the low level of these measures consistent with a decline in inflation expectations, they also note that poor liquidity conditions and other technical factors may have exaggerated the downward movement. Consistent with a weaker long-term growth outlook, the real 5-10 year yield fell 16 basis points to 2.13%. However, over the inter-meeting period, the real 0-5 year yield moved up 5 basis points to 1.25%.

Long-term nominal Treasury yields also declined since the August FOMC meeting with rates on 1 to 10 year maturities falling by 27 to 34 basis points. At the short end, 3 and 6 month bill yields fell by 15 and 20 basis points, resulting in a downward shift and slight flattening of the Treasury yield curve. Recently, the yields for on-the-run 3 month bill and 10 year note were 1.61% and 3.64%.

Credit spreads widened over the inter-meeting period with the AA corporate bond spread increasing 20 basis points to 267 basis points, and the BBB spread increasing 27 basis points to 329 basis points. Broad equity indices were mostly higher over the inter-meeting period and implied volatilities mostly lower, though these trends reversed in the last week. The S&P 500 index is at the same level as immediately prior to the August FOMC meeting, while its implied volatility is 90 basis points higher.

**Foreign Markets.** Global funding conditions remained fragile during the inter-meeting period. Euro LIBOR-OIS spreads remained broadly stable around 60 basis points, whereas their sterling equivalents increased by about 12 basis points to a level just below 80 basis points. The ECB and Swiss National Bank's TAF auctions on August 12 were heavily oversubscribed with bid-to-cover ratios equaling 3.8 and 5 respectively. This reflects a continued demand for dollar funding from European institutions, which is also behind the widening of euro-dollar FX swap spreads.

European and Japanese equities declined between 0 and 7 percent since the last FOMC meeting due to concerns about both domestic and global economic growth prospects. For similar reasons, equities in China also decreased over the period.

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Energy prices decreased further over the inter-meeting period, with spot oil prices declining at a rate around 16 percent. Concerns about a slowdown of the world economy continue to be main driver of these declines. These price developments took place despite supply concerns in the latter half of the period, as tropical storms threatened U.S. oil production in the Gulf of Mexico. Nonetheless, the continuing growing demand from China, the Middle East and Latin American economies is widely perceived to be keeping oil prices at high levels.

Long-term interest rates declined around 30 basis points in Europe and were broadly unchanged in Japan. A comparison with data from inflation-linked bonds reveals that the declines in the euro area mainly coincided with decreasing breakeven inflation rates, whereas in the U.K. bond yield declines seemed more driven by lower real 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 these parts of the world. These same factors were behind the decline in long term interest rates in emerging markets economies.

The dollar appreciated *vis-à-vis* the euro and pound sterling, and remained broadly unchanged relative to the yen. In trade-weighted terms, the dollar appreciated by almost 7 percent. This reflects a broad based strengthening of the dollar, as global economic prospects are deteriorating significantly. As in the previous period, the pace of dollar depreciation against the Chinese yuan has been decreasing further. Chinese monetary authorities seem to be more wary about the impact of slowing external demand than about inflation risks.

### **2.3 Global Economic Policy**

Since the last FOMC meeting, the ECB, the Bank of England and the Bank of Japan have remained on hold. Consumer price inflation reached new highs in the euro area and the United Kingdom, with some tentative signs of increasing risk of a spillover to inflation expectations and wages. However, real activity data releases indicate a significant near-term economic slowdown for all three regions, with contracting GDP in Q2 for the euro

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area and Japan and no growth in the U.K. The Bank of England's latest official projections indicate a sharp decline in GDP growth going forward. Likewise, the Bank of Japan substantially lowered its official growth forecast for 2009 and official ECB projections highlighted the weak growth prospects for the euro area. All of this reinforced the perception that at the very least policy rate hikes are not likely in the near-term, and that these central banks are now focusing on negative growth risks. Therefore, markets now expect broadly unchanged policy rates in the euro area and Japan over the next 12 months. In the U.K. at least one 25 basis point rate reduction is now priced in over the next 12 months, with a significant probability of a second 25 basis point cut over this period.

Elsewhere, the trends in the stance of monetary policy are diverging slightly. Central banks in Latin America, except Argentina and Venezuela, generally are still pursuing tighter monetary policy, with recent rate hikes in Mexico and Columbia in response to increasing inflation expectations. In emerging Europe, however, policy tightening seemed to have come to an end as both domestic and external demand is slowing; policy rates were cut in the Czech Republic and rates remained on hold in other countries. Also in Asia (excluding Japan) we have a mixed picture when it comes to the policy stance. The central bank of Korea increased its policy rate in response to higher inflation expectations and continued to intervene in currency markets to support its currency. In Australia and New Zealand, however, policy rates were cut on growth concerns and this also motivated the central bank of India to keep rates on hold. The Chinese government announced a package aimed at creating a more accommodative stance of macroeconomic policy, which amongst others involves tax relief measures. Also the PBOC is expected to pursue a more accommodative stance, as indicated by the lower pace of dollar depreciation relative to the yuan. In general, a gloomier global economic outlook will induce many emerging world central banks to pursue at least a more modest policy tightening if not a down right policy easing.

# Special Topic

## Increasing Unemployment Rate and the Role of Labor Supply

Ayşegül Şahin

Redacted

*The unemployment rate rose to 6.1% in August, which is up 1.4% from a year prior. Thus far, the increase in the unemployment rate has been coupled with an increase in the labor force participation rate. This special topic discusses the positive comovement of these two indicators and its effect on our outlook for the labor market.*

During economic slowdowns, we typically observe that some of the workers who lose their jobs decide to leave the labor force and that some potential entrants delay their entry into the labor market. Consequently, unemployment rate and labor force participation rate generally move in opposite directions (Figure 1). However, in recent months unemployment rate and labor force participation rate started increasing simultaneously. In particular, the year-over-year change in the unemployment rate and labor force participation rate were 1.4% and 0.3% respectively.

The recent increase in labor force participation rate is concentrated among prime-age females and both males and females aged 55 years and older (Table 1).

These groups are the ones who typically have more elastic labor supply since their supply decisions are more sensitive to changes in wages. However, despite the slowdown in earnings growth (Figure 2), recently more individuals from these demographic groups are willing to enter the labor force and look for work. We interpret this change in their labor supply behavior as the result of a decrease in real family income and a tightening of borrowing conditions. The increase in individuals' willingness to work despite falling wage growth and a weak labor market is an indication of slack in the economy.

### **How does this affect our outlook for the labor market?**

Back in April, after three months of contraction in the payroll employment, we were anticipating a dampened response of the unemployment rate to the economic slowdown, citing two reasons. First, labor market conditions were not very tight during the recent expansion so we were expecting firms to cut fewer jobs than they did in the 2001 recession. Second, during the recent expansion the composition of the labor force shifted towards groups that generally experience less cyclical unemployment.

So far the payroll declines occurred in line with our expectations: the monthly average decline in payroll employment in 2008 has been about 75,000, which is smaller than in previous downturns. For example, the average monthly payroll decline in the first 8 months of the 2001 recession was around 165,000. However, the 2008 decline showed itself significantly in the unemployment rate, which went up from 4.7% to 6.1% in the last 12 months.

Declines in the employment population ratio are much smaller than in the two previous downturns, while increases in the unemployment rate are comparable (Figures 3 and 4). Particularly for females, the unemployment rate increase relative to the employment-population ratio decline has been very large (Figure 4). Based on the employment-population ratio, it seems that the labor market conditions have not been as bad as in the previous two downturns so far. However, what accounts for this phenomenon is that the employment-population ratio does not take into account changes in labor supply behavior.

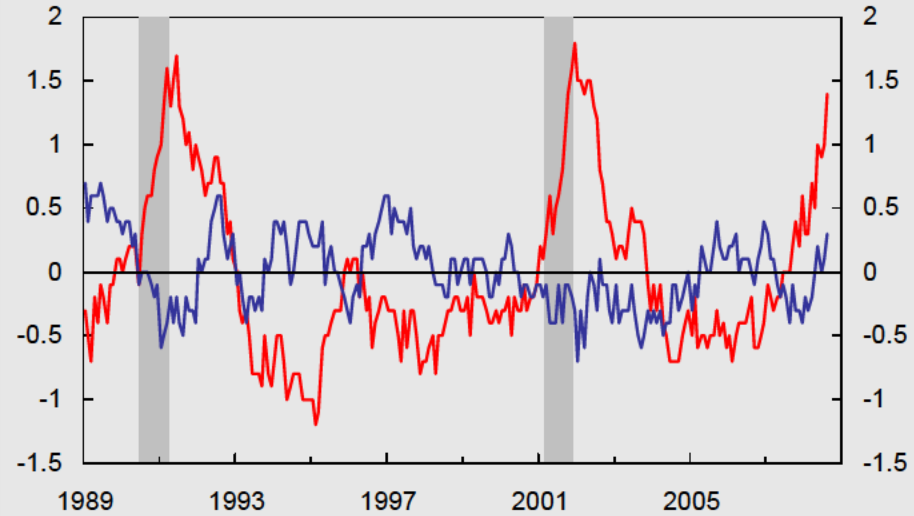
Given the behavior of labor supply, we expect the unemployment rate to continue to increase in the near future. Although the economy has higher potential for growth due to an increase in labor force participation, it is not healthy enough to create enough jobs for all job searchers.

**Figure 1: Unemployment & Participation Rates**

Seasonally Adjusted

Change - Year to Year

Change - Year to Year

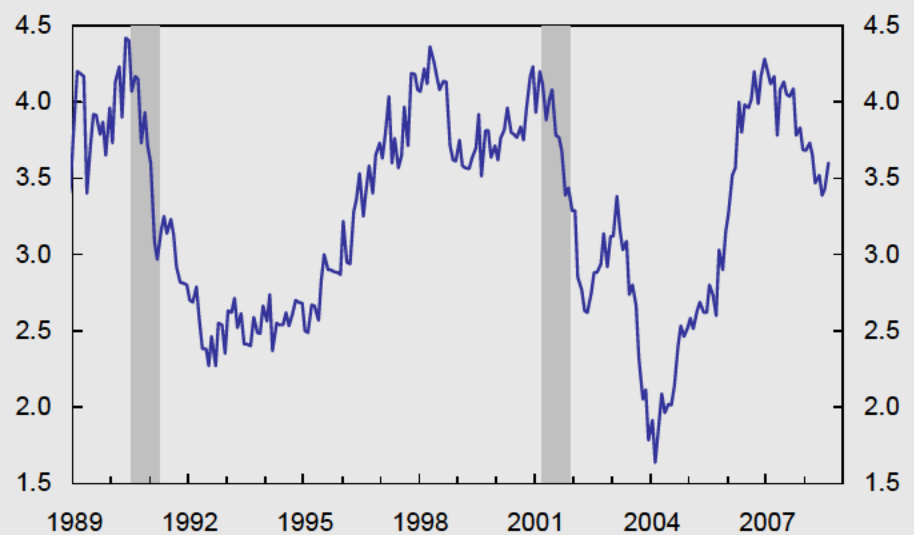


Source: Bureau of Labor Statistics

**Figure 2: Total Private Average Hourly Earnings**

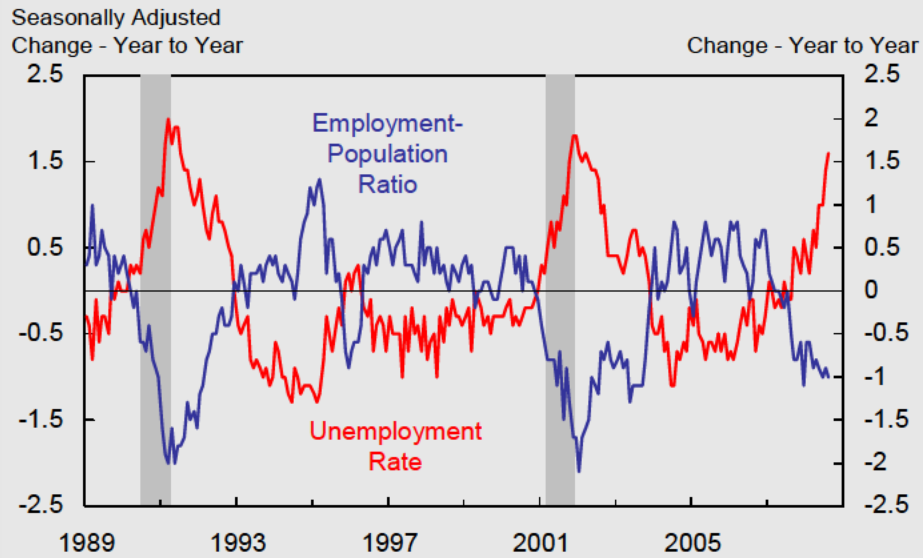
% Change - Year to Year

% Change - Year to Year



Source: Bureau of Labor Statistics

### Figure 3: Male Unemployment & Employment-Population Ratio



### Figure 4: Female Unemployment & Employment-Population Ratio

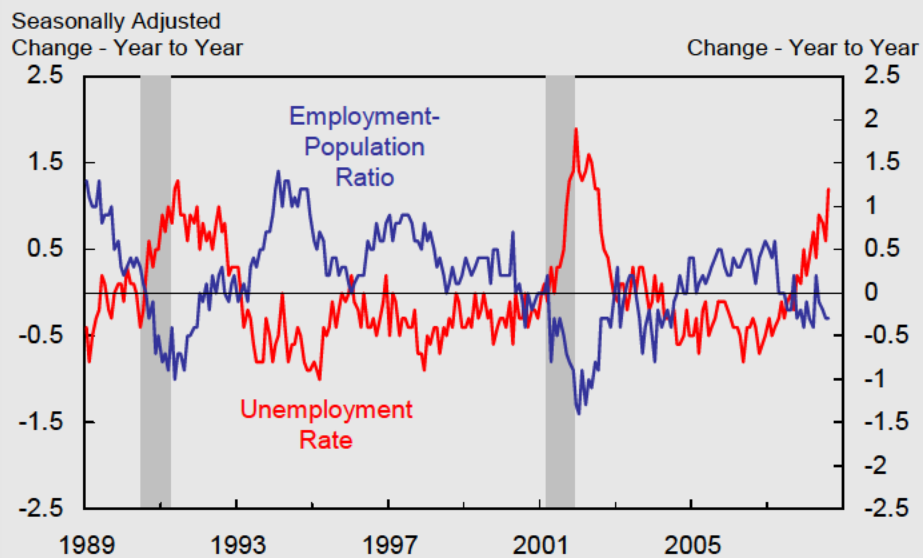




Table 1: Participation Rate  
(year over year change through August 2008)

	25-54	55+	Total
Total	0.20%	0.90%	0.30%
Female	0.40%	0.90%	0.40%
Male	0.10%	0.90%	0.20%

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## 3. Evolution of Outlook and Risks

### 3.1 Central Forecast

**Conditioning assumptions.** Inter-meeting developments have led us to once again lower our central forecast for real GDP growth in 2008H2 and 2009 while increasing the downside risks to that projection. For 2009, the reduction of expected growth has been relatively large—1/2 percentage point—resulting in a significant change in the path of the unemployment rate. Rather than peaking in late 2008/early 2009 around 6 1/4%, we now envision the unemployment rate peaking in the second half of 2009 around 6 3/4%. We continue to expect a pronounced slowing of core inflation over the forecast horizon, despite the fact that many measures of underlying inflation moved higher over the inter-meeting period. Updated analysis has reconfirmed our view that recent high readings on core are most likely due to the temporary pass-through of higher prices for imported commodities and finished goods. This impulse is expected to fade over the forecast horizon, allowing the effects of increased slack to become more visible. Indeed, inflation compensation has declined notably over the inter-meeting period with only part of the decline attributable to the decline of oil prices. On balance, these developments have resulted in a decline in our assumed path for the FFR, with that rate remaining at 2% until early 2009 and then reaching 3% (rather than 3.75%) by the end of 2009 and 4.25% (rather than 4.5%) 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 2.75% and 3.75%. Our forecast presumes that the significant easing of monetary policy in 2008H1, a gradual leveling of the housing market downturn, and a gradual return of 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 relatively quickly to avoid a serious unmooring of inflation expectations.

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The assumed path of oil prices over the forecast horizon has been lowered once again. Oil prices are now expected to average nearly \$113/barrel in 2008Q4, \$14 lower than in the August Blackbook. Consistent with futures quotes, we now expect a modest rise of oil prices from the end of 2008 through the end of 2009, with the 2009Q4 average price about \$10/barrel lower than in the last Blackbook. Our assumed path for oil prices is \$8/barrel and \$11/barrel above that of the Greenbook forecast for 2008Q4 and 2009Q4, respectively.

The foreign growth outlook for the remainder of this year has been downgraded substantially. We now project that foreign growth will slow from 3.4% in 2007 to 1.6% in 2008 (GDP-weighted), down from 2.1% in the August Blackbook. The modal forecast for 2009 is down only slightly, to 2.6% (Q4/Q4) from 2.7% last cycle, but downside risks have increased.

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 OFHEO purchase-only home price index is essentially unchanged with about a 12% peak to trough decline by the end of 2009 before leveling off in 2010. 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.

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 an output gap somewhat above 1% of GDP to emerge over the course of 2008, with another ½% to ¾% opening up in 2009. As always, there is substantial uncertainty around our estimate of potential GDP growth and estimates of output gaps. The Board staff has maintained the estimate of potential at 2.5% through 2009, then declining to 2.4% in 2010.

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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%. Finally, we expect the term premia to remain relatively low. As measured by the Board staff's three-factor model, term premia rose modestly relative to the increase in long-term rates and remained at fairly low levels.

**Inflation.** As noted above, the increases in the core CPI in June and July were elevated—0.32% and 0.33%, respectively. The bulk of this increase was in the core goods category, although in June core services prices did rise 0.41% due in part to a 1.1% monthly increase in transportation services prices. Other measures of core inflation, such as the median and trimmed-mean CPI and our own Underlying Inflation Gauge (UIG) have increased sharply over this period, reflecting the broad-based nature of more rapid price gains. We now expect the core PCE deflator to increase 2.8% (annual rate) in 2008Q3, up from 2.1% in Q2. For all of 2008, the projected increase of the core PCE deflator is now 2.3% (Q4/Q4), up from 2.1% last cycle.

While these more rapid increases in core are certainly a source of concern which increases the upside risk to the inflation outlook, we continue to project that core PCE deflator inflation will slow to just under 2% in 2009 and then slow somewhat further in 2010. The development of more slack over the forecast horizon, as represented by the ½ percentage point increase in the peak unemployment rate, certainly strengthens the case for this slowing. But the most important contributor is the pronounced slowing of the rate of increase of import prices which increased 15% over the year ending in 2008Q2. Indeed, nonpetroleum import prices fell in August, with considerably smaller price increases for consumer goods ex autos and for capital goods.

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**Real activity.** Projected growth for 2008 is essentially unchanged from the August Blackbook at 1 ½% (Q4/Q4), although growth in the second half of the year is now expected to be somewhat weaker than previously thought due mainly to the fact that real consumer spending is expected to decline in 2008Q3. To some extent this decline represents payback for the fact that growth of real PCE was boosted by the rebate checks. However, third quarter labor market conditions have deteriorated more than previously expected, which is also no doubt depressing both the willingness and the ability to spend. The recent decline of energy prices should provide a modest boost to real PCE in the fourth quarter.

In contrast, projected growth for 2009 has been reduced by ½ percentage point to 2%. Projected growth of real PCE in 2009 has been lowered, reflecting the higher path of the unemployment rate and weaker growth of real personal income. Even with this slower growth of real PCE, we now think it unlikely that there will be much if any increase of the personal saving rate until 2010. Prospects for housing are essentially unchanged from the August Blackbook. We expect housing starts to stabilize over the first half of 2009 and then increase modestly in 2010.

The bulk of the downward revision to projected growth in 2009 reflects a nearly ½ percentage point decline in the growth contribution from net exports. While the decline in foreign growth prospects reduces the expected growth of exports, most of the decline in the net export growth contribution reflects a reassessment of the likely path of imports. Growth of imports has been surprisingly weak in 2008. Past work suggests that the very steep decline of residential investment may have played an important role in this downside surprise. As we enter 2009 the housing production correction is expected to be largely over, while the level of inventories in the US is expected to be quite low relative to the improving sales pace. We now suspect that this will be an environment likely to produce faster growth of imports than we had been assuming.

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### 3.2 Alternative Scenarios and Risks

The most notable change in the risk assessment since the last Blackbook is in the increase of the probability associated with the *Credit Crunch* scenario [Exhibit C-1]. This increase reflects two phenomena: One is the deterioration in domestic financial conditions associated with the precarious health of various large financial institutions. The other is the slump in economic activity abroad, in large part due to a spreading of financial distress to foreign economies. While these two phenomena are somewhat different in nature, their effect on output growth and inflation is similar. Therefore we use the *Credit Crunch* scenario to capture both of these effects. (An alternative would have been to lower the probability of the *Global High Demand* scenario to capture the second phenomenon.) The *Credit Crunch* scenario continues to be by far the most likely alternative scenario, with an associated probability of nearly 40%.

Changes in the probability assigned to the other scenarios over the inter-meeting period were minor. The probability of the *Loss of Credibility* scenario is only modestly lower, reflecting the fact that while current inflation is still elevated, breakeven spreads have decreased substantially. The probability of both the *Productivity Boom* and *Effects of Overheating* scenarios has increased modestly.

The Core PCE inflation forecasts associated with the different scenarios have not changed meaningfully except in the very short run. However, the real output growth paths for the *Credit Crunch*, *Effects of Overheating*, and *Loss of Credibility* scenarios are lower than in the last Blackbook, particularly in 2009 [Exhibit C-2]. Much of this change simply reflects changes in the *Central* scenario, which is now more pessimistic in terms of growth for 2009 (recall that the alternative scenarios are defined relative to the Central scenario).

The effect of changes in the probabilities and the paths associated with the different scenarios on the FRBNY forecast distribution is twofold [Exhibit C-3]. In terms of core inflation, the 90% bands are somewhat higher in the short run than following the last change in the central scenario forecast. This implies that the probability that core inflation

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will remain below 2% in 2008 has decreased since August. In terms of real GDP growth, the 5<sup>th</sup> percentile band is somewhat lower than in August, reaching -3% (year-to-year) growth in 2009Q2. In sum, our forecast now views the risks to real activity associated with financial distress as likely to materialize later in the forecast horizon.

## 4. Forecast Comparison

### 4.1 Greenbook Comparison

The path for the FFR has shifted down in both the Blackbook and the Greenbook relative to August. The Blackbook projection was revised downward due to the negative unemployment data as well as forward looking indicators in financial markets suggesting lower expected inflation, thus giving monetary policy more room to respond. The Greenbook's argument for revising its path relies less on forward looking indicators, and instead emphasizes the weaker economic activity than expected. The main difference between the assumed FFR path in the Blackbook and the Greenbook is that the Blackbook projects that a steeper increase towards normal levels is required in 2009 and 2010 than implied by the Greenbook. The Blackbook emphasizes that by raising the FFR faster as the economy recovers, the FOMC is reconfirming its commitment to stabilize inflation as economic condition normalize, as our baseline scenario projects in 2009 and 2010.

**Conditioning Assumptions.** The outlooks for potential growth are also unchanged for both the Blackbook and the Greenbook. We continue to assume potential GDP growth of 2.7% (annual rate), whereas the Board staff assumes a rate of 2.5%. As before, the difference stems from alternative assumptions regarding structural productivity growth and labor force participation.

With regard to fiscal policy, the conditioning assumption in the Blackbook and the Greenbook remain essentially the same as in August.

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As for asset prices and financial market conditions, our conditioning assumption is essentially the same as in the Greenbook. In addition, the Board staff projects essentially the same foreign GDP growth in 2008 as we do. Our forecast is for foreign growth to slow from 3.4% (Q4/Q4) in 2007 to 1.6% in 2008 (down from 2.1% in June). The Board also has 1.6% growth using our GDP weights (down from 2.2%). Both forecasts have lowered outlooks for all major countries in response to weak data, with the largest mark downs for Japan and Mexico. There are differences in the outlooks for individual countries, with the Board more optimistic about Japan, China, and Korea and more pessimistic about Canada and Mexico. Both sets of forecast assume a modest recovery to 2.5% growth in 2009.

**Inflation.** Both the Blackbook and the Greenbook have revised the projected inflation rate slightly upward for 2008. The projected inflation rate in 2009 and 2010, however, has not changed much. As before, our projection for inflation is lower than the one in the Greenbook for 2009 and 2010. This is consistent with the steeper FFR path in the Blackbook versus the Greenbook.

**Real activity.** Both the Blackbook and the Greenbook have kept projected output in 2008 virtually the same. The projected output according to both, however, has been marked down slightly in 2009, with the revision being sharper in the Blackbook.

**Uncertainty around forecasts.** Table 1 report the 70% uncertainty band around the forecasts. While the Greenbook has not changed its risk assessment, we have changed our risk assessment and slightly increased our uncertainty about 2009. The net effect of these changes is to make the Greenbook forecast for both output and core PCE move further up than our forecast.



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

	Core PCE Inflation		Real GDP Growth	
	<i>FRBNY</i>	<i>Board</i>	<i>FRBNY</i>	<i>Board</i>
<i>2008</i>	1.9-2.7 (1.7-2.6)	2.1-2.8 (2.0-2.7)	0.0-2.4 (-0.1-2.4)	0.7-2.3 (0.4-1.9)
<i>2009</i>	1.1-2.6 (1.2-2.6)	1.5-2.8 (1.5-2.9)	-0.6-3.2 (0.1-3.7)	0.5-3.7 (0.6-3.8)
<i>2010</i>	1.3-2.5 (1.3-2.5)	0.8-3.0 (0.9-3.1)	0.8-4.3 (0.6-4.1)	1.3-4.1 (1.7-4.5)

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

	Core PCE Inflation	Real GDP Growth
<i>2008</i>	51 (64)	49 (53)
<i>2009</i>	67 (65)	69 (57)
<i>2010</i>	60 (58)	62 (66)

**Alternative Greenbook forecasting scenarios.** The Greenbook considers several alternative scenarios. Most of the outcomes, in terms of inflation and output, look relatively similar across the different scenarios. This is because the FRBUS model assumes that the Fed reacts to each contingency by adjusting the interest rate according to the outcome based rule. The scenarios of most interest are those labeled “loss of credibility” and the “typical recession” because it is possible that they could turn out to be considerably worse than that suggested by the simulation in the Greenbook.

As the table on page I-21 in the Greenbook shows, output and inflation respond relatively little to a loss of credibility of the Federal Reserve implied by an increase in inflation expectations of a half of percent. It is important to keep in mind, however, that underlying this conclusion are special features of the FRB/US that are not widely

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accepted in the literature. In particular, the FRB/US assumes there is a very limited effect of a change in expectation on output. In contrast, several other more recent vintages of macro models, such as the FRBNY DSGE model, suggest that a loss of credibility can have a much larger negative effect due to the greater importance of expectations. In those models, a loss in credibility implies higher future inflation expectations that can only be countered by high current interest rates to prevent inflation. The FRBNY alternative scenario *Loss of Credibility* also assumes larger effects, and this is one reason for our recommendation for a steeper FFR path in the Blackbook than is found in the Greenbook.

Turning to the path of the key variables in the “typical recession” scenario, a scenario defined as “an exogenous decline in spending by households and businesses in a way typical for previous recessions”, we observe that output declines modestly in latter half of 2008 and then starts recovering. As for inflation, it turns out to be a bit lower than in the baseline projection. An interesting feature of this “typical recession” scenario is that it requires the FFR to decline 0.4% in 2009, close to the zero bound on the short-term nominal interest rate. This is an issue of concern. In this case it would not require major additional shocks in order to hit the zero bound, a very bad outcome, absent preemptive policy actions. Consider, for example, the possibility that commodity prices continue to decline due to falling global demand as they have done in recent months, putting downward pressures on the CPI and core inflation, and thus making real interest rate higher. In this case it may be necessary to take some non-standard policy actions to create further stimulus, as for example those implemented in 2003.

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

Given the significant shift of perspective on growth in the recent weeks, it is not worthwhile to compare our near term forecast to that of the Survey of Professional Forecasters, which was released on August 12. A more interesting comparison is with Macroeconomic Advisors’ forecasted path for growth and inflation. In terms of real GDP,

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<sup>1</sup> Release dates of the private forecasts discussed in this section are in parentheses: Blue Chip consensus (9/10), SPF (8/12), and Macro Advisors (9/12), PSI Model (9/10).

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MacroAdvisors projects a negative growth in 2008Q4, which brings the 2008Q4/Q4 growth rate to a level lower than our projection. The MacroAdvisors' inflation forecasts are more in line with FRBNY in the core indices. Headline inflation peaks in 2008 and is more moderate in 2009 than we anticipate. The Blue Chip survey projections are in line with the FRBNY forecast, except for a more pronounced decline in real growth in 2008Q4.

## 5. Robustness of Policy Recommendation

### 5.1 Sensitivity to Alternative Scenarios and Policy Rules

The most significant change since August is in the decline in the policy path implied by the *Baseline* rule under the *Central* scenario. This decline is due to the more pessimistic assessment of medium run growth prospects under this scenario. The decline mirrors qualitatively the adjustment that occurred in the market-implied path, although quantitatively it is not as large.

None of the policy paths implied by the different scenarios under the *Baseline* rule are fully consistent with the current policy recommendations [Exhibit D-1]. Under all scenarios except the *Credit Crunch*, the *Baseline* rule implies a renormalization starting in 2008Q4. While the renormalization begins earlier, it is not nearly as rapid as that in the policy recommendation: Under the *Central* scenario, the nominal FFR rate is still at 3% by the end of 2011. An exception is the *Productivity Boom* scenario, which implies an increase as rapid as that in the recommended renormalization. Under the *Credit Crunch* scenario, the nominal FFR is projected to stay at or below 2% for the entire forecast horizon.

It is also hard to find a policy rule that is consistent with the policy recommendation under the expected value of the forecast distribution [Exhibit D-2]. The *Baseline*, *Outcome-based*, and *Dove* rules all imply an essentially flat path for the FFR. The *Opportunist Disinflation* rule implies an increase of the FFR to nearly 3% by early 2009, but even under this rule the path is almost flat thereafter. The only case where the implied

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path is consistent with our recommendation is the one implied by the *Dove* rule under the *Productivity Boom* scenario [Exhibit D-3]. This is partly because under the *Productivity Boom* scenario real output growth is a lot more robust in 2010 and 2011 than under the other scenarios.

We used the DSGE-VAR as well as a newly developed DSGE model (an expanded version of FRBNY-DSGE) to assess the current stance of monetary policy. Both models suggest that policy is about 150 basis points looser than the nominal FFR implied by the estimated Volcker-Greenspan rule.

## 5.2 Comparison to Market Expectations

The FFR path priced into financial markets has moved down since the August Blackbook, and the market's medium-term uncertainty around that path also has decreased. The market path remains below our policy recommendation, as the market response to economic and financial developments as well as to FOMC communications have led market participants to expect a further slowing of the renormalization of the FFR over the medium term. As in August, the average forecast for the FFR from the Primary Dealer Survey is below our policy recommendation but it is now close to the market-implied path.

The FFR path implied by most of our rules, including the *Baseline*, is similar to the market-implied path through the end of 2009. The main divergence is in the short-run where the *Baseline* rule prescribes a small increase. However, the differences are more substantial in 2010-11. In particular, since all rules have a strong built-in gradualism and place weight on the persistent output gap, they all are at odds with the increase over the medium term suggested by the market-implied path. The main difference is with the *Opportunistic Disinflation* rule which has the FFR increasing to 3.00% by early 2009.

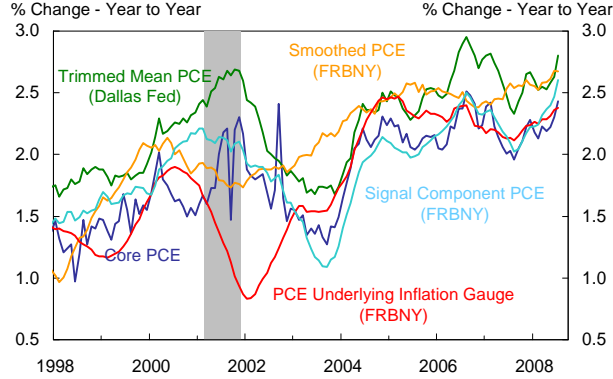
As noted earlier, market uncertainty about the FFR path has decreased at intermediate horizons. Consequently, the uncertainty around the market-implied path is less than that for our rules as measured by inter-quartile ranges again with the exception of the *Opportunistic Disinflation* rule [Exhibit D-5]. The market is placing less on lower values

of the FFR than most of our rules with very limited skewness in option implied distributions.

# A. Significant Developments

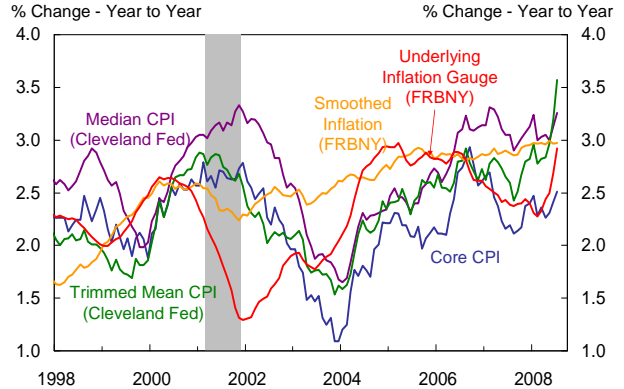
## Exhibit A-1: Measures of Trend Inflation

### Alternative Measures of PCE Inflation



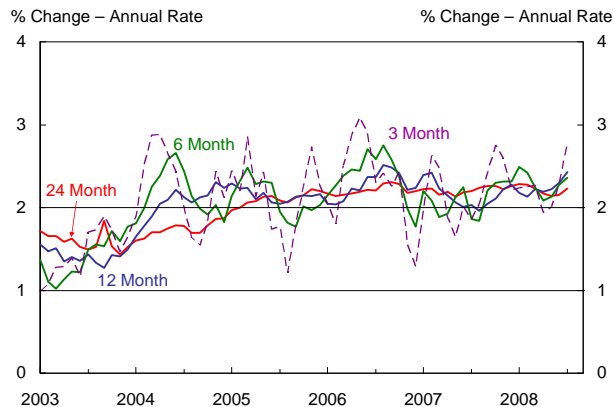
Source: Bureau of Economic Analysis, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

### Alternative Measures of CPI Inflation



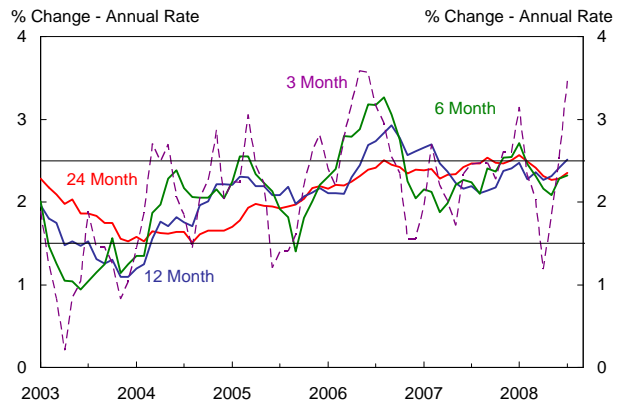
Source: Bureau of Labor Statistics, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

### Core PCE over Various Horizons



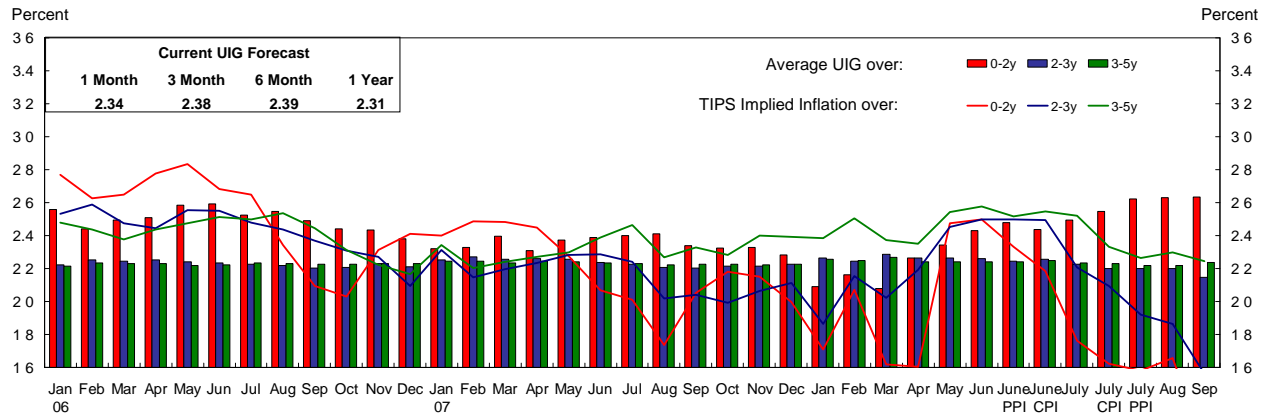
Source: Bureau of Economic Analysis

### Core CPI Inflation over Various Horizons



Source: Bureau of Labor Statistics

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

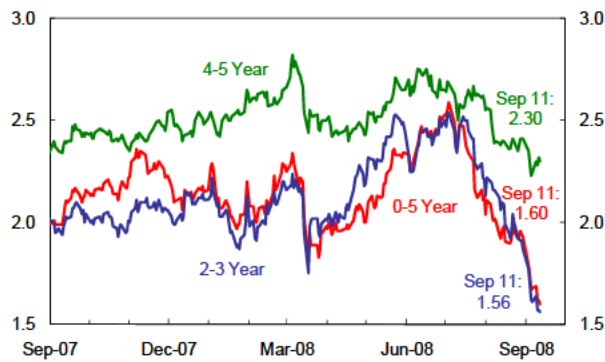


Source: MMS Function (FRBNY), Federal Reserve Board, and Swiss National Bank

## A. Significant Developments

### Exhibit A-3: Implied Inflation Compensation

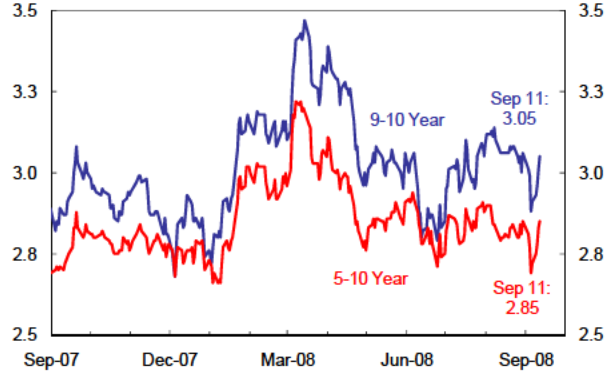
TIPS Implied Inflation Compensation: 0-5, 2-3, 4-5 Year Horizons  
Percent



Source: Federal Reserve Board

Note: Carry-adjusted

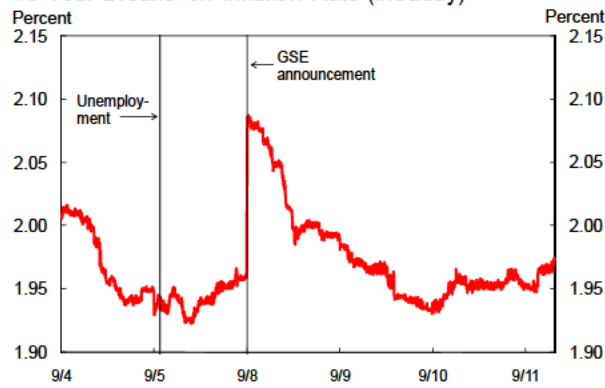
TIPS Implied Inflation Compensation: 5-10, 9-10 Year Horizons  
Percent



Source: Federal Reserve Board

Note: Carry-adjusted

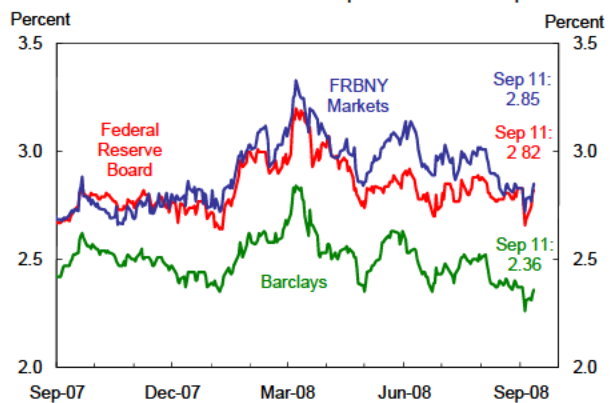
10-Year Breakeven Inflation Rate (Intraday)



Source: Bloomberg

Note: Calculated as difference between on-the-run 10-year Treasury and 10-year TIPS yield, 8 am to 4 pm.

Alternative Measures of 5-10 Year Implied Inflation Compensation

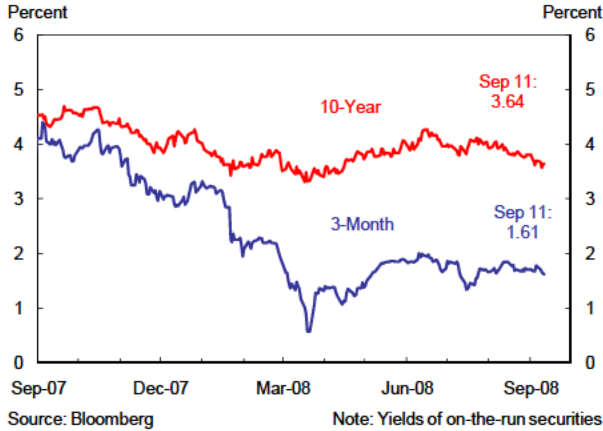


Source: Federal Reserve Board, Barclays, and FRBNY calculations

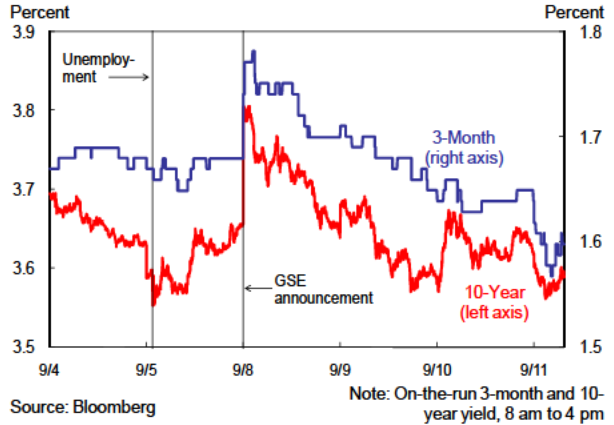
# A. Significant Developments

**Exhibit A-4:  
Treasury Yields**

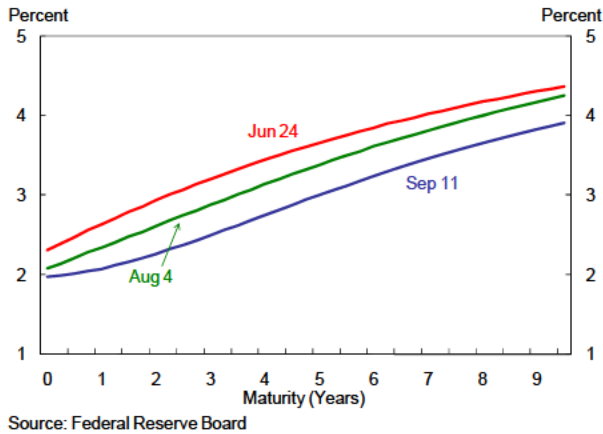
**Short- and Long-Term Rates**



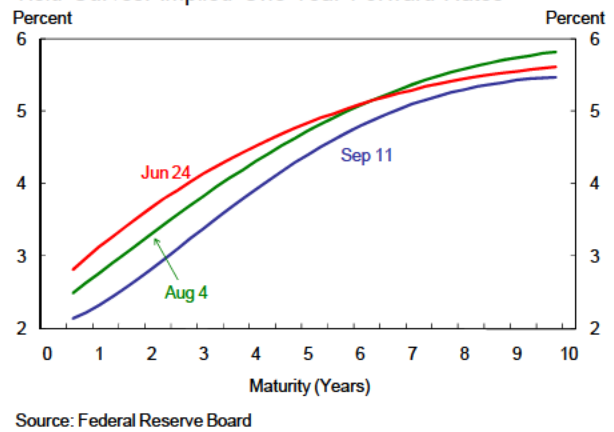
**Short- and Long-Term Rates (Intraday)**



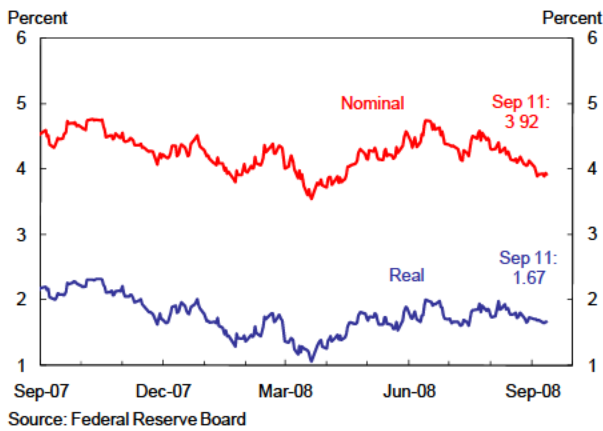
**Yield Curves**



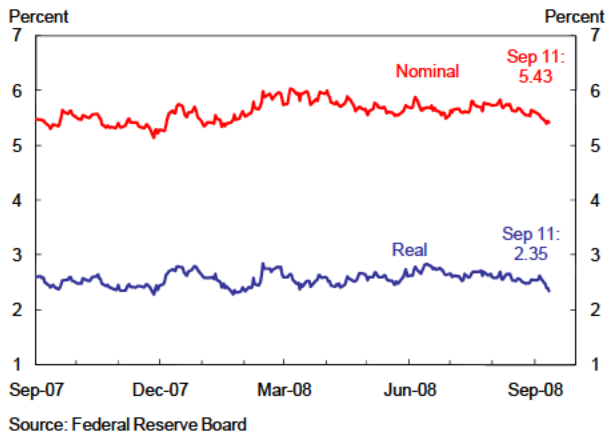
**Yield Curves: Implied One-Year Forward Rates**



**4-5 Year Forward Rates**



**9-10 Year Forward Rates**

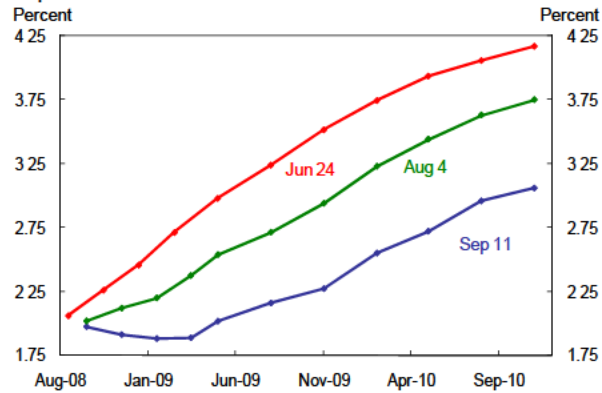




# A. Significant Developments

Exhibit A-5:  
Policy Expectations

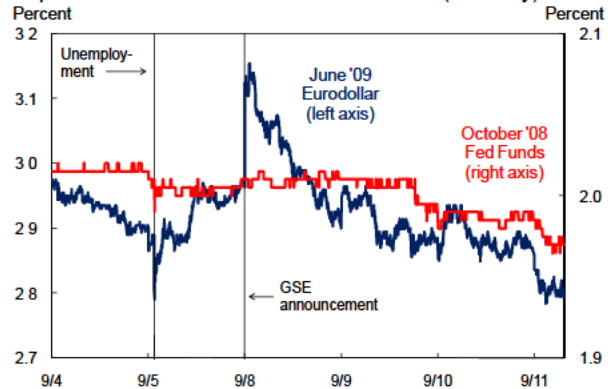
Expected Fed Funds



Source: Federal Reserve Board

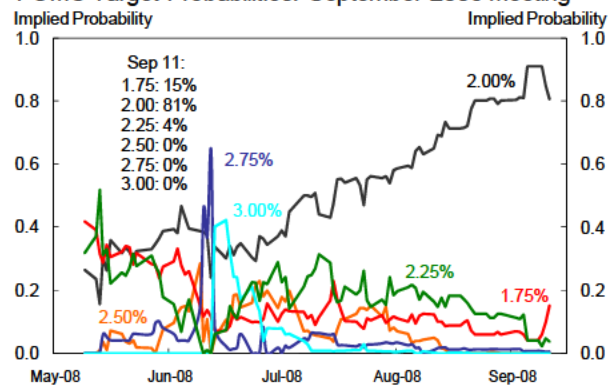
Note: Estimated using fed funds and Eurodollar futures.

Implied Fed Funds and Eurodollar Rates (Intraday)



Source: Bloomberg

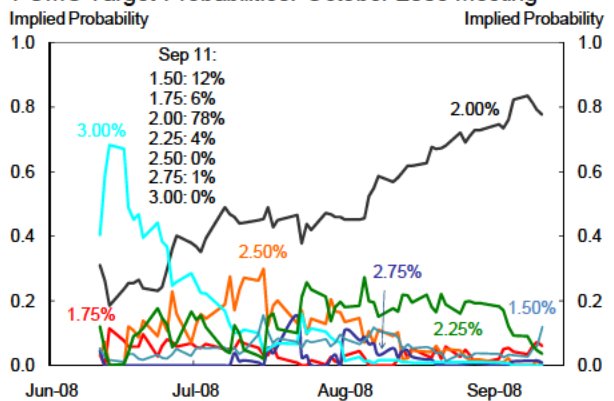
FOMC Target Probabilities: September 2008 Meeting



Source: Cleveland FRB

Note: Estimated using options on fed funds futures.

FOMC Target Probabilities: October 2008 Meeting



Source: Cleveland FRB

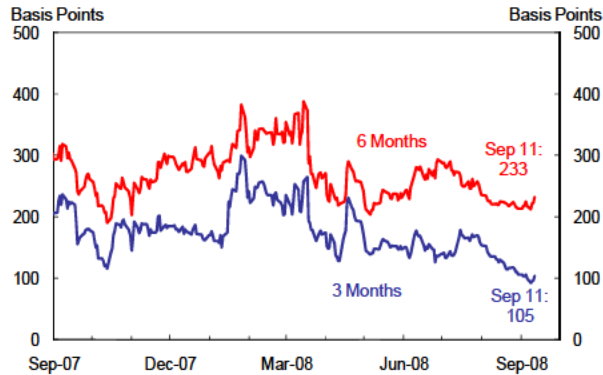
Note: Estimated using options on fed funds futures.

## A. Significant Developments

**Exhibit A-6:  
Policy Uncertainty**

### Short-Term Interest Rate Expectations

Width of 90% Confidence Interval Implied by Eurodollar Options



Source: Datastream, FRBNY calculations

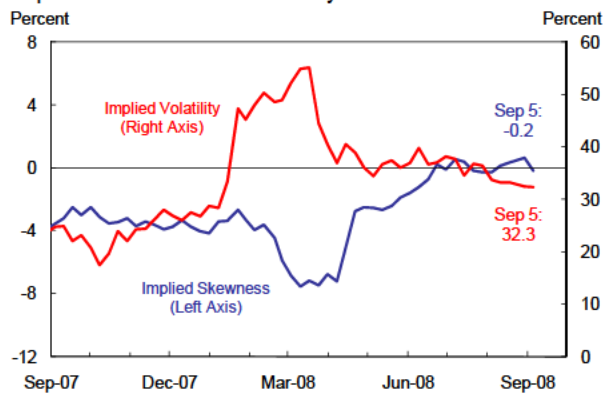
### Long-Term Interest Rate Expectations

Width of 90% Confidence Interval Implied by Swaptions



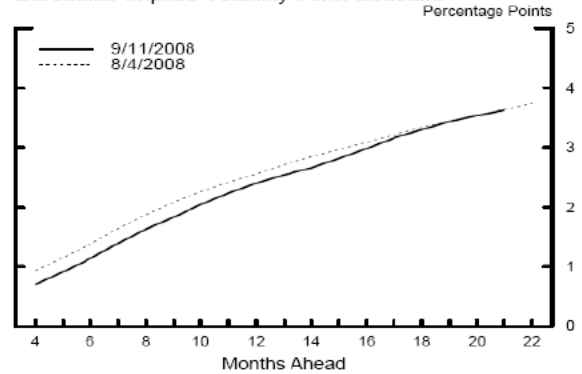
Source: Datastream, FRBNY calculations

### Implied Skewness and Volatility



Source: CME and FRBNY calculations  
Note: Weekly averages based on 3-9 month implied volatilities from Eurodollar futures options.

### Eurodollar Implied Volatility Term Structure\*

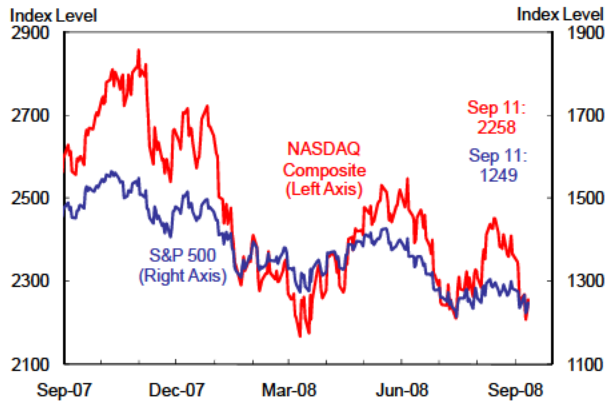


\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

## A. Significant Developments

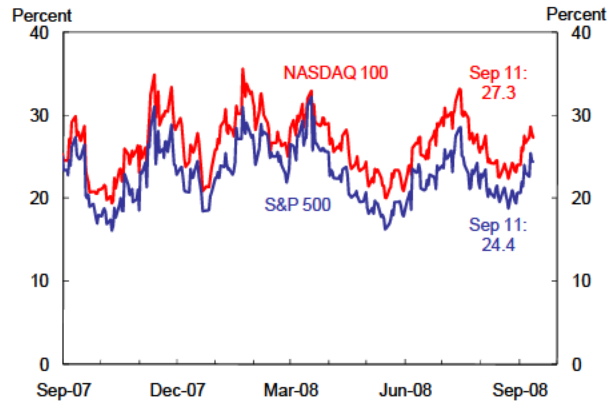
### Exhibit A-7: Equity Markets and Corporate Credit Risk

**Performance**



Source: Bloomberg

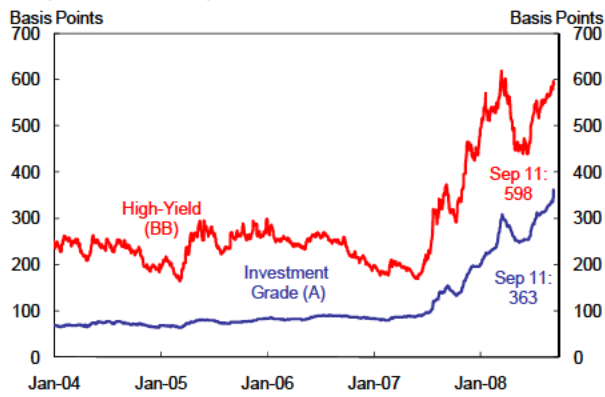
**Implied Volatility: 1-Month**



Source: CBOE

Note: Annualized

**Corporate Credit Spreads**



Source: Merrill Lynch

Note: Option-adjusted spreads

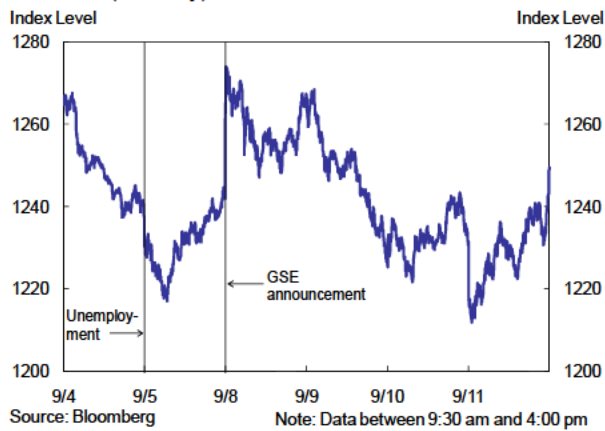
**AA Credit Spreads**



Source: Bloomberg & Merrill Lynch

Note: Swap spread is 10-year swap rate minus 10-year Treasury yield and spread for banks is option-adjusted.

**S&P 500 (Intraday)**



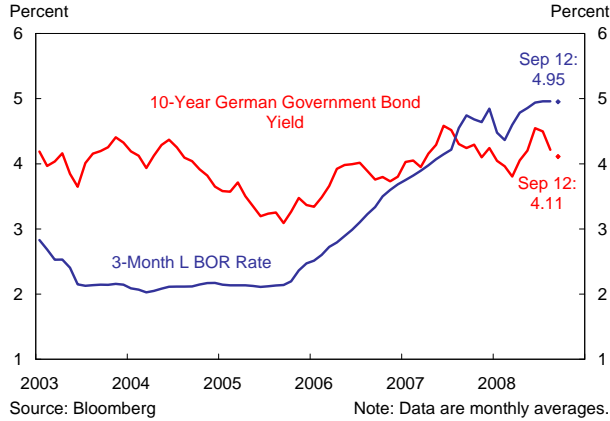
Source: Bloomberg

Note: Data between 9:30 am and 4:00 pm

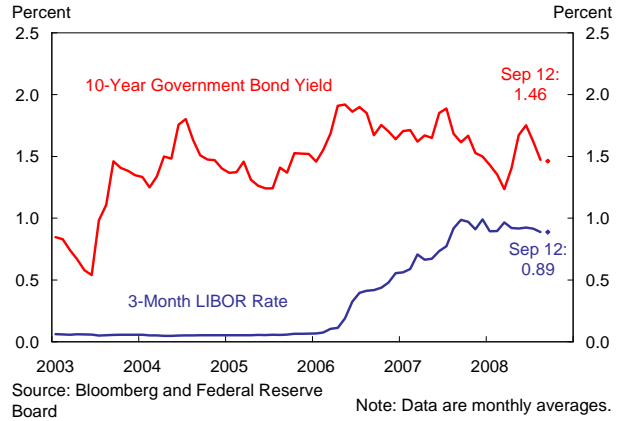
# A. Significant Developments

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

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

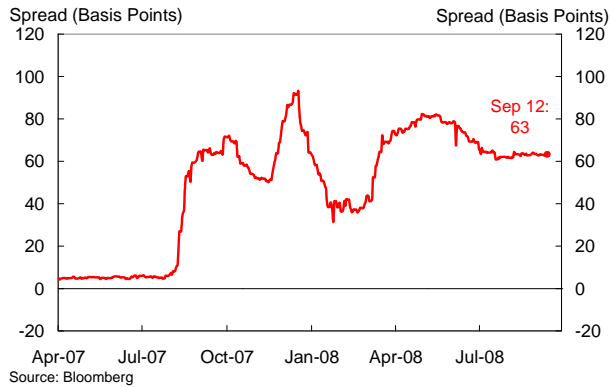


**Japan Short- and Long-Term Interest Rates**



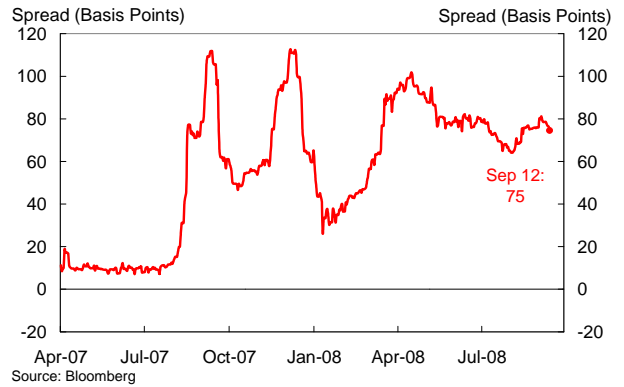
**Euro Area**

LIBOR Rate - OIS Swap Rate (3-month)

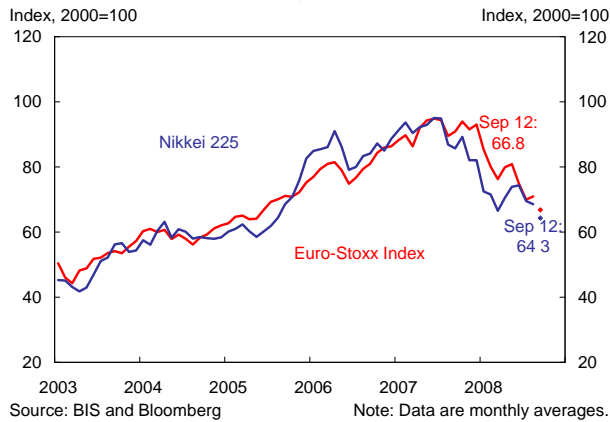


**United Kingdom**

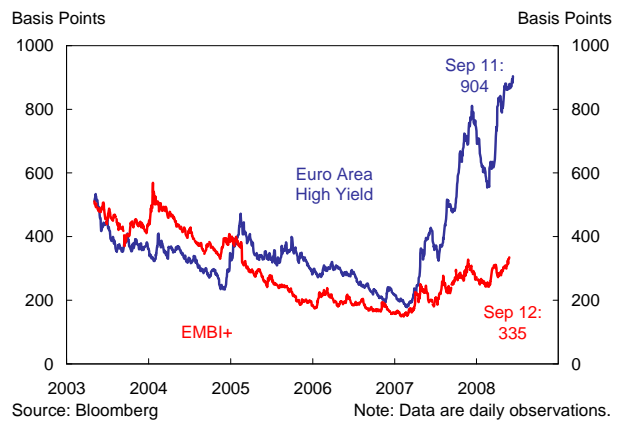
LIBOR Rate - OIS Swap Rate (3-month)



**Euro Area and Japan Equity Indices**



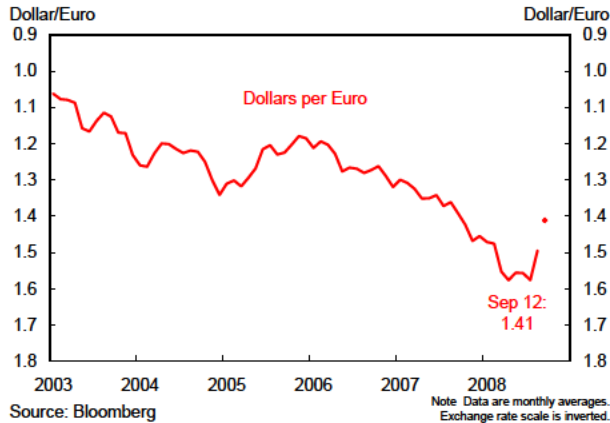
**EMBI+ and Euro Area Spreads**



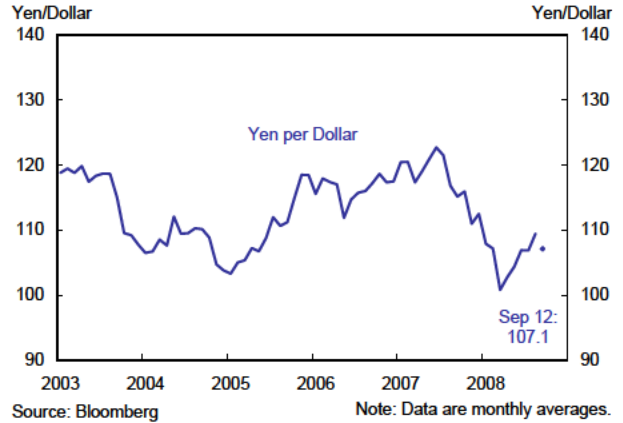
# A. Significant Developments

Exhibit A-9:  
Exchange Rates

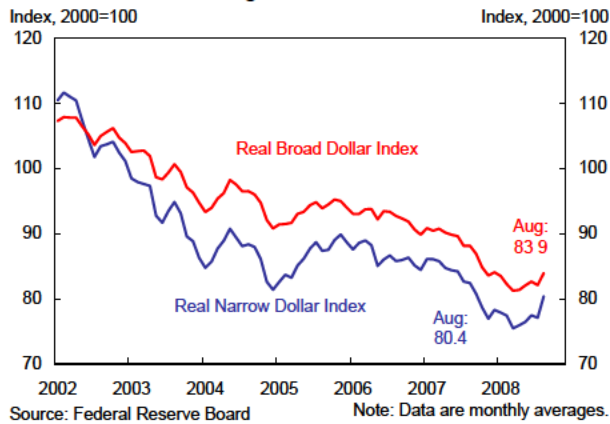
Dollar-Euro Exchange Rate



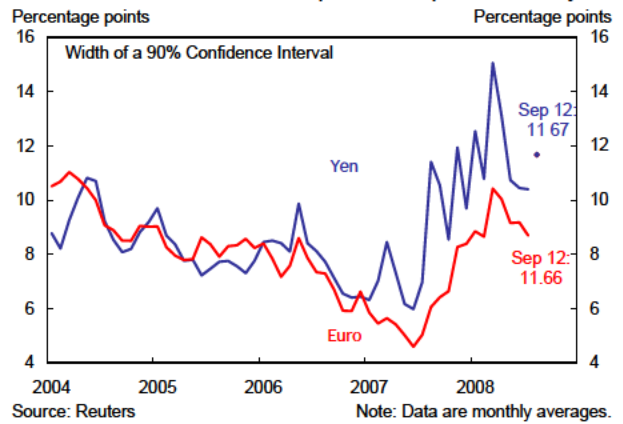
Yen-Dollar Exchange Rate



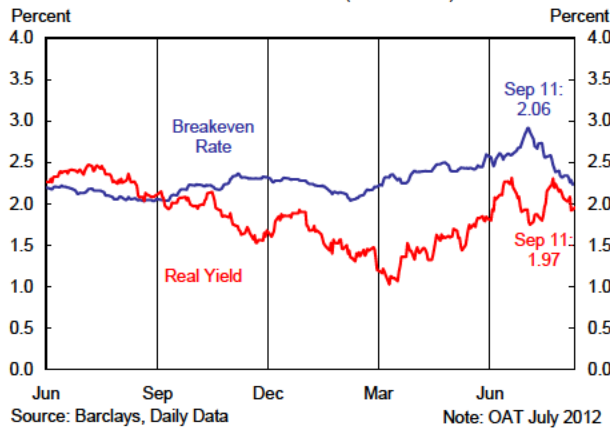
Real Effective Exchange Rates



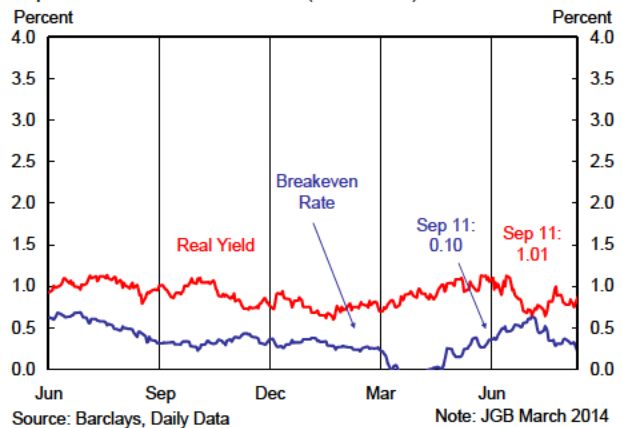
Euro and Yen One-Month Implied FX Option Volatility



Euro Area Inflation-Linked Bonds (Past Year)



Japan Inflation-Linked Bonds (Past Year)

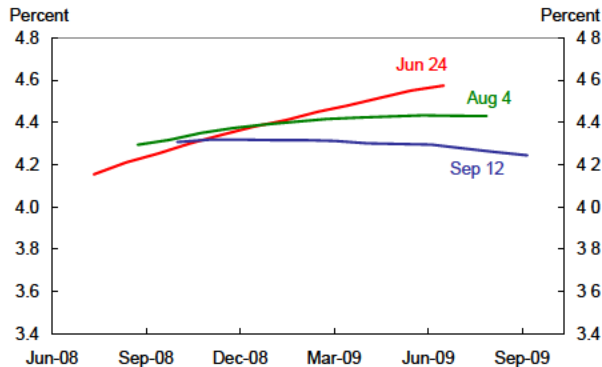


## A. Significant Developments

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

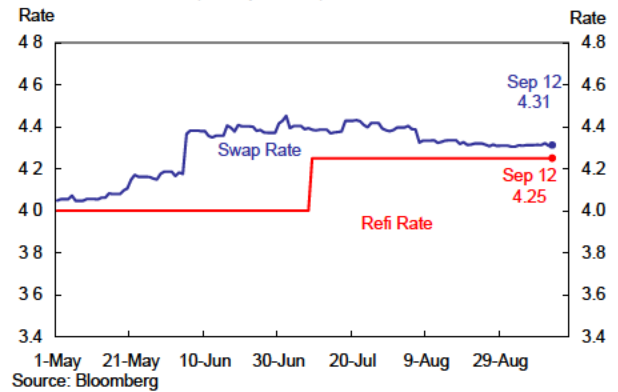
**Euro Area Swap Curve**

Expected Average Overnight Rate Months Ahead



Source: Bloomberg

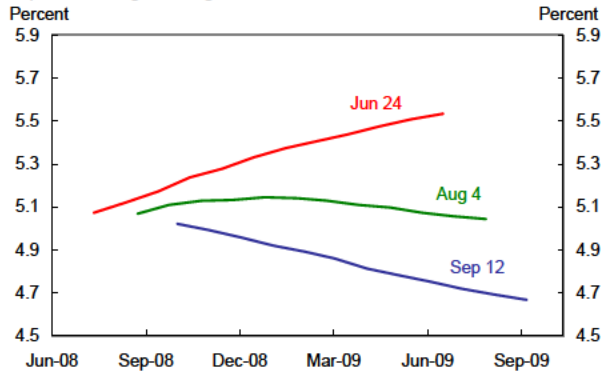
**Euro Area: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)**



Source: Bloomberg

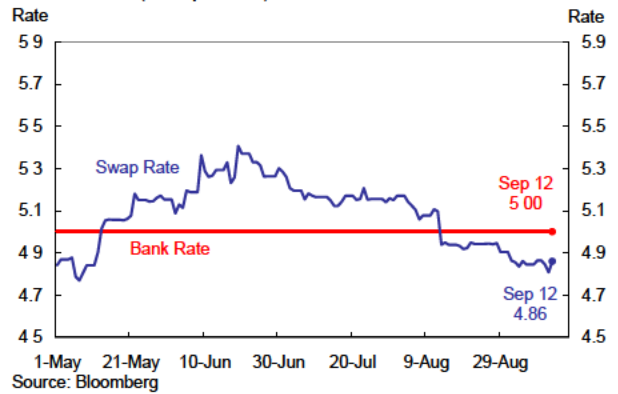
**UK Swap Curve**

Expected Average Overnight Rate Months Ahead



Source: Bloomberg

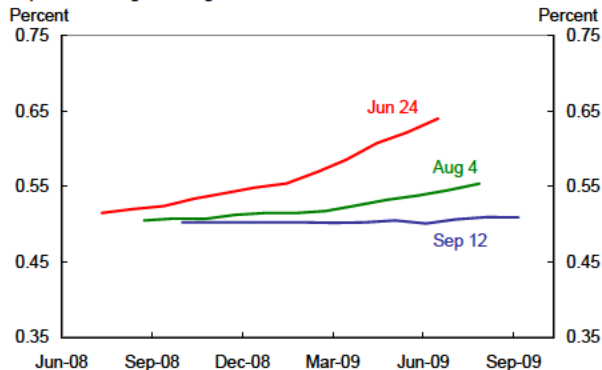
**UK: Expected Average Overnight Rate Over the Next Six Months (Swap Rate)**



Source: Bloomberg

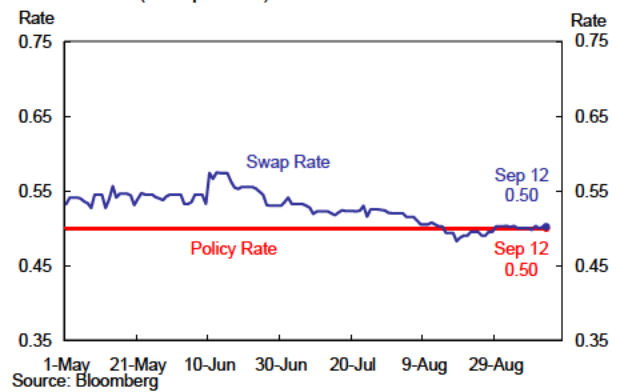
**Japan Swap Curve**

Expected Average Overnight Rate Months Ahead



Source: Bloomberg

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



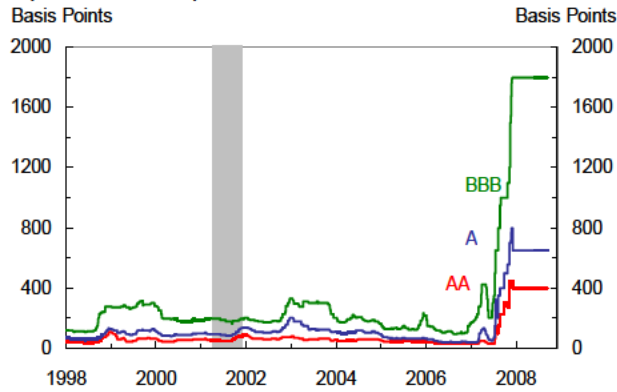
Source: Bloomberg

Note: Shading represents NBER recessions.

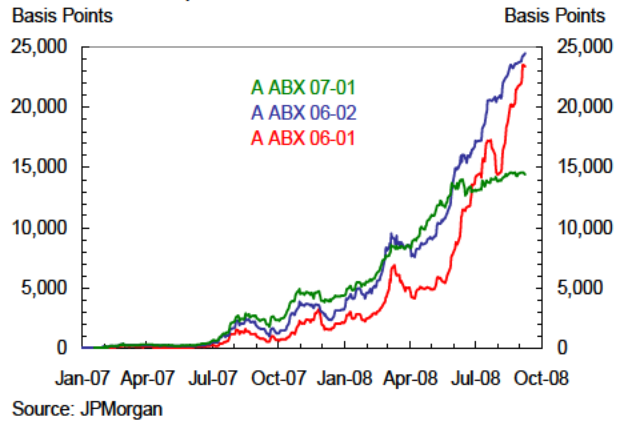
## A. Significant Developments

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

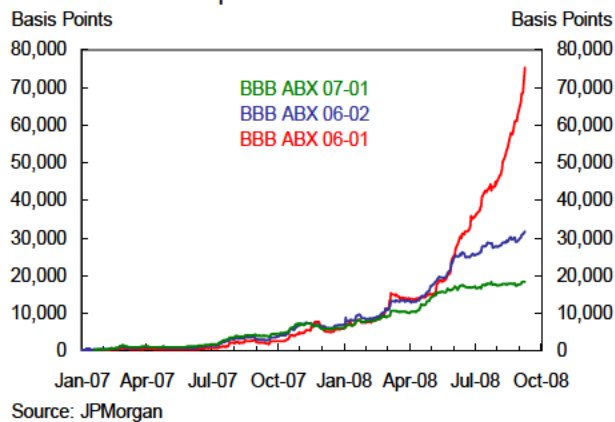
#### Spreads on Subprime MBS Tranches



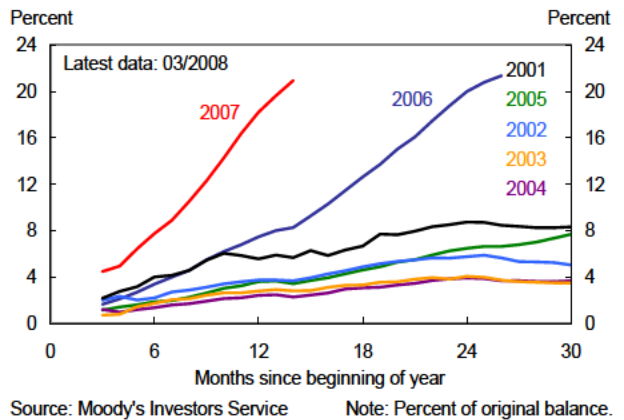
#### A-Rated ABX Spreads



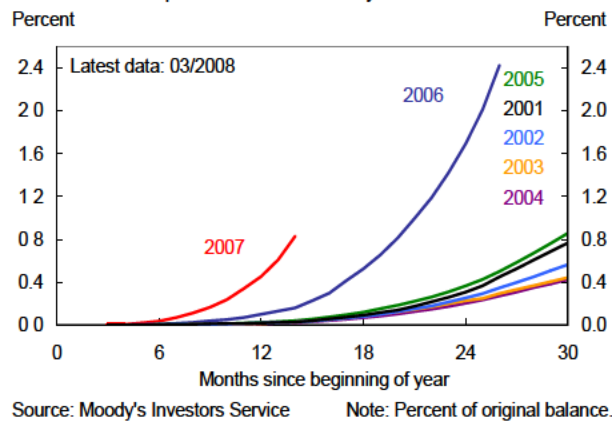
#### BBB-Rated ABX Spreads



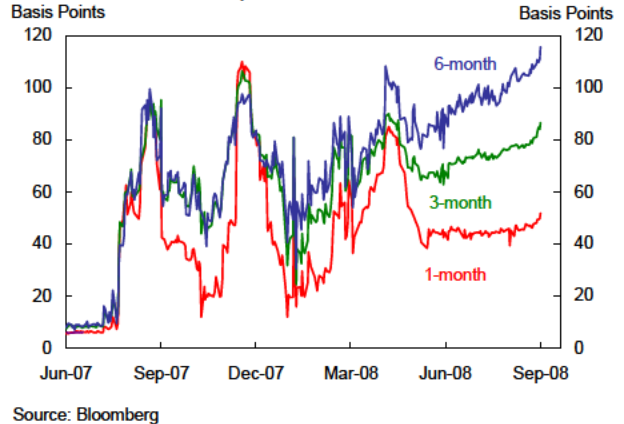
#### 60+ Day Subprime ARM Delinquencies by Year Securitized



#### 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**		
	Jun	Aug	Sep	Jun	Aug	Sep	Jun	Aug	Sep	Jun	Aug	Sep
<b>2008</b>												
Q1	2.2	2.2	2.2	1.0	0.9	0.9	4.9	4.9	4.9	2.3	2.3	2.3
Q2	1.8	2.1	2.1	2.2	1.9	3.3	5.3	5.3	5.3	2.0	2.0	2.0
Q3	2.0	2.2	2.8	2.4	2.2	0.5	5.7	5.7	5.9	2.0	2.0	2.0
Q4	2.0	2.0	2.1	1.0	1.0	1.7	5.8	5.9	6.3	2.3	2.3	2.0
<b>2009</b>												
Q1	1.8	2.0	2.0	3.0	2.0	1.6	5.7	5.9	6.4	2.5	2.5	2.3
Q2	1.8	1.9	1.9	3.0	2.4	2.0	5.6	5.9	6.5	3.0	3.0	2.5
Q3	1.7	1.8	1.8	3.0	3.0	2.1	5.5	5.8	6.7	3.5	3.5	2.8
Q4	1.7	1.7	1.7	3.0	2.5	2.5	5.5	5.8	6.7	3.8	3.8	3.0
<b>2010</b>												
Q1	--	--	1.7	--	--	3.3	--	--	6.5	--	--	3.3
Q2	--	--	1.7	--	--	3.3	--	--	6.3	--	--	3.5
Q3	--	--	1.7	--	--	2.7	--	--	6.1	--	--	3.8
Q4	--	--	1.7	--	--	2.7	--	--	6.0	--	--	4.3
<b>Q4/Q4</b>												
2007	2.1	2.2	2.2	2.5	2.3	2.3	0.4	0.4	0.4	-1.0	-1.0	-1.0
2008	2.0	2.1	2.3	1.6	1.5	1.6	1.0	1.1	1.5	-2.0	-2.0	-2.3
2009	1.7	1.8	1.8	3.0	2.5	2.0	-0.3	-0.1	0.4	1.5	1.5	1.0
2010	--	--	1.7	--	--	3.0	--	--	-0.7	--	--	1.3

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.

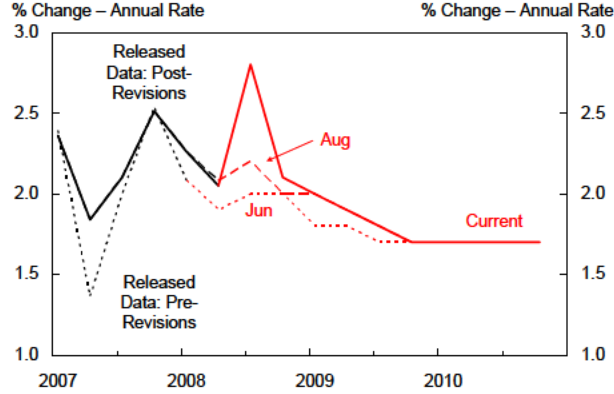
\*\*Quarterly values are the end-of-quarter value. Yearly values are the difference between the end-of-year value in the previous year and the end-of-year value in the listed year.



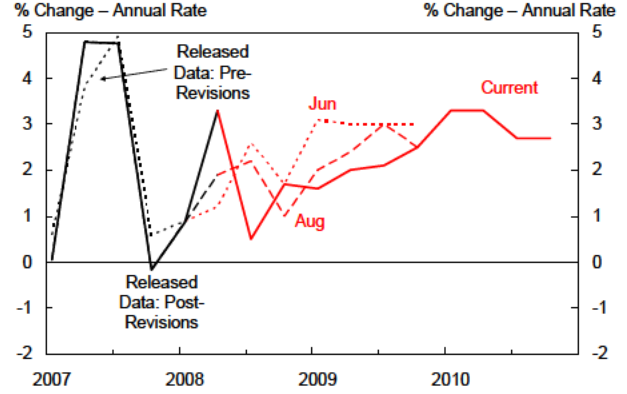
## B. FRBNY Forecast Details

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

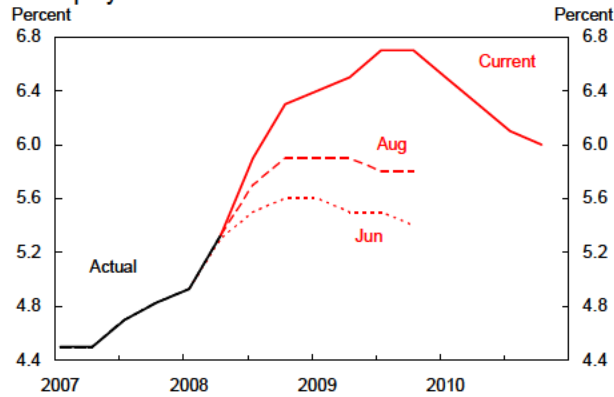
**Core PCE Inflation**



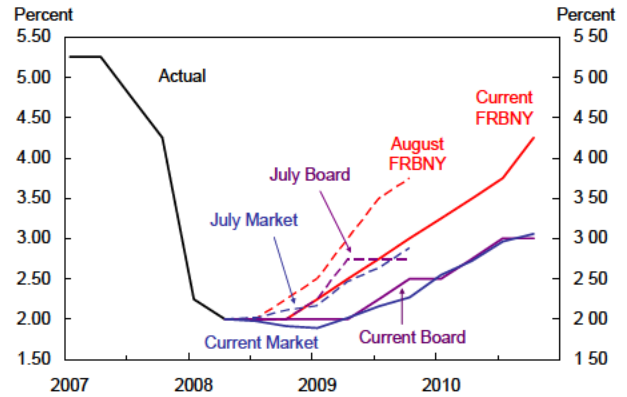
**Real GDP Growth**



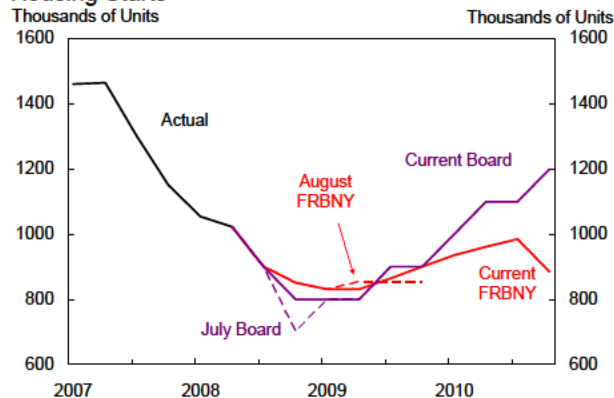
**Unemployment Rate**



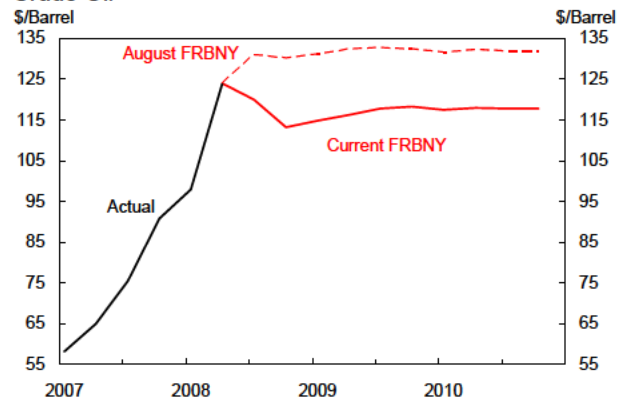
**Federal Funds Rate**



**Housing Starts**



**Crude Oil**



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

## B. FRBNY Forecast Details

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

	<u>Quarterly Growth Rates (AR)</u>		<u>Quarterly Growth Contributions (AR)</u>	
	2008Q3	2008Q4	2008Q3	2008Q4
<b>OUTPUT</b>				
<b>Real GDP</b>	0.5 (2.2)	1.7 (1.0)	0.5 (2.2)	1.7 (1.0)
<b>Final Sales to Domestic Purchasers</b>	-0.5 (0.3)	0.3 (0.1)	-0.5 (0.3)	0.3 (0.1)
<b>Consumption</b>	-0.5 (1.3)	0.2 (0.5)	-0.4 (0.9)	0.2 (0.4)
<b>BFI: Equipment and Software</b>	-1.0 (-2.5)	5.0 (5.0)	-0.1 (-0.2)	0.3 (0.3)
<b>BFI: Nonresidential Structures</b>	8.0 (8.0)	5.0 (-5.0)	0.3 (0.3)	0.2 (-0.2)
<b>Residential Investment</b>	-20.0 (-25.0)	-20.0 (-20.0)	-0.8 (-1.0)	-0.7 (-0.7)
<b>Government: Federal</b>	1.0 (1.0)	1.5 (1.5)	0.1 (0.1)	0.1 (0.1)
<b>Government: State and Local</b>	2.2 (1.5)	1.5 (1.5)	0.3 (0.2)	0.2 (0.2)
<b>Inventory Investment</b>	-- --	-- --	0.2 (1.4)	0.4 (0.3)
<b>Net Exports</b>	-- --	-- --	0.9 (0.5)	1.0 (0.5)
<b>INFLATION</b>				
<b>Total PCE Deflator</b>	5.6 (4.5)	2.1 (1.9)		
<b>Core PCE Deflator</b>	2.8 (2.2)	2.1 (2.0)		
<b>PRODUCTIVITY AND LABOR COSTS*</b>				
<b>Output per Hour</b>	1.3 (2.4)	2.0 (1.8)		
<b>Compensation per Hour</b>	3.8 (3.8)	4.0 (4.0)		
<b>Unit Labor Costs</b>	2.5 (1.4)	2.0 (2.2)		

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>	1.6 (1.5)	2.0 (2.5)	3.0 --	1.6 (1.5)	2.0 (2.5)	3.0 --
<b>Final Sales to Domestic Purchasers</b>	0.4 (0.4)	1.6 (1.7)	2.2 --	0.4 (0.5)	1.6 (1.7)	2.3 --
<b>Consumption</b>	0.6 (1.0)	1.4 (1.6)	2.0 --	0.4 (0.7)	1.0 (1.2)	1.4 --
<b>BFI: Equipment and Software</b>	0.0 (-0.4)	3.5 (3.5)	5.0 --	0.0 (0.0)	0.2 (0.2)	0.3 --
<b>BFI: Nonresidential Structures</b>	8.8 (6.2)	3.0 (2.2)	3.0 --	0.3 (0.2)	0.1 (0.1)	0.1 --
<b>Residential Investment</b>	-20.3 (-21.5)	-2.4 (-2.4)	3.0 --	-0.8 (-0.9)	-0.1 (-0.1)	0.1 --
<b>Government: Federal</b>	3.8 (3.7)	1.5 (1.5)	1.5 --	0.3 (0.3)	0.1 (0.1)	0.1 --
<b>Government: State and Local</b>	1.4 (1.1)	1.7 (1.7)	1.8 --	0.2 (0.1)	0.2 (0.2)	0.2 --
<b>Inventory Investment</b>	-- --	-- --	-- --	-0.2 (-0.1)	0.0 (0.0)	0.3 --
<b>Net Exports</b>	-- --	-- --	-- --	1.4 (1.1)	0.4 (0.8)	0.4 --
<b>INFLATION</b>						
<b>Total PCE Deflator</b>	3.9 (3.6)	1.7 (1.7)	1.7 --			
<b>Core PCE Deflator</b>	2.3 (2.1)	1.8 (1.8)	1.7 --			
<b>Total CPI Inflation</b>	3.4 (4.5)	3.8 (2.2)	1.9 --			
<b>Core CPI Inflation</b>	2.1 (2.2)	2.1 (2.0)	2.7 --			
<b>GDP Deflator</b>	2.4 (1.9)	1.8 (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

	Q4/Q4 Growth Rates		
	2008	2009	2010
<b>INTEREST RATE ASSUMPTIONS</b>			
Federal Funds Rate (End-of-Year)	2.00 (2.25)	3.00 (3.75)	4.25 --
10-Year Treasury Yield (Avg. Q4 Level)	3.6 (3.8)	4.3 (4.5)	5.0 --
<b>PRODUCTIVITY AND LABOR COSTS*</b>			
Output	1.6 (1.7)	2.2 (3.1)	3.5 --
Hours	-1.0 (-0.9)	0.4 (1.3)	1.7 --
Output per Hour	2.5 (2.6)	1.8 (1.8)	1.8 --
Compensation per Hour	3.8 (4.0)	3.9 (3.9)	4.0 --
Unit Labor Costs	1.3 (1.5)	2.1 (2.1)	2.2 --
<b>LABOR MARKET</b>			
Unemployment Rate (Avg. Q4 Level)	6.3 (5.8)	6.7 (5.7)	6.0 --
Participation Rate (Avg. Q4 Level)	66.1 (66.0)	66.1 (66.0)	66.1 --
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-56 (-48)	15 (122)	137 --
<b>INCOME</b>			
Personal Income	3.4 (3.6)	3.2 (4.0)	5.0 --
Real Disposable Personal Income	-0.5 (0.0)	1.5 (2.3)	3.2 --
Corporate Profits Before Taxes	-3.9 (-0.4)	2.6 (2.8)	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

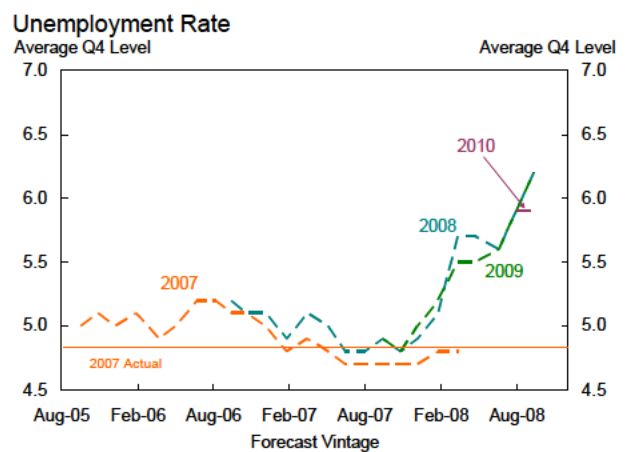
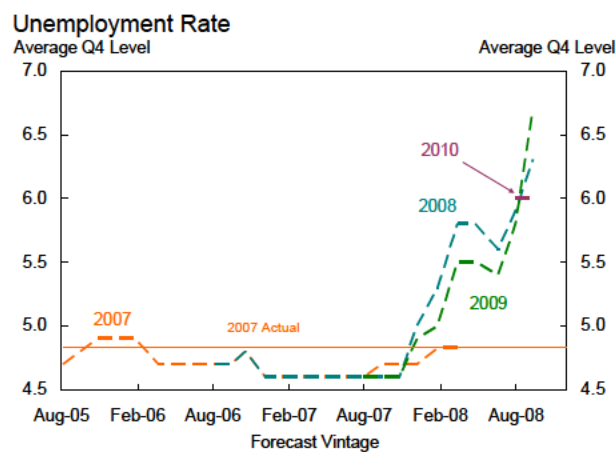
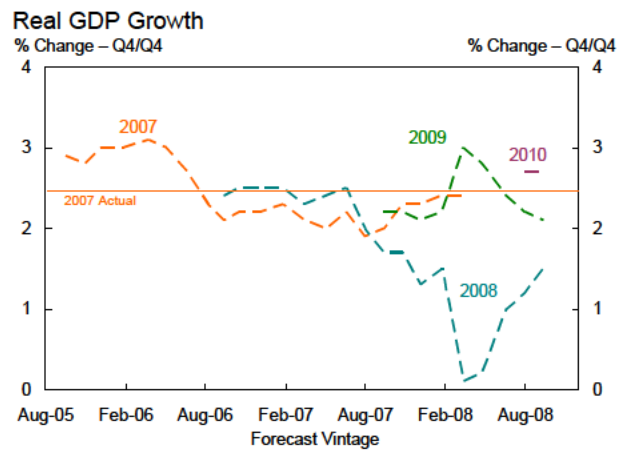
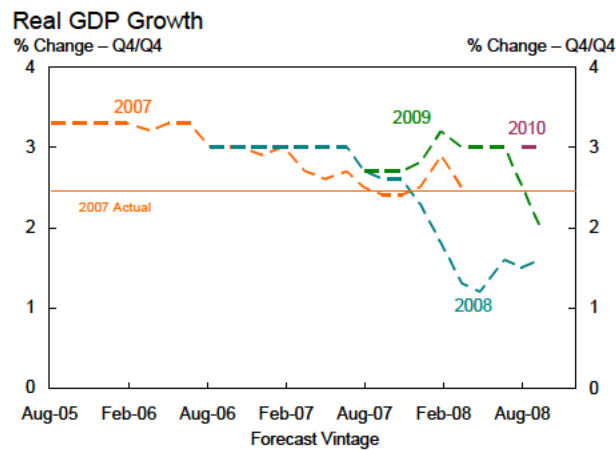
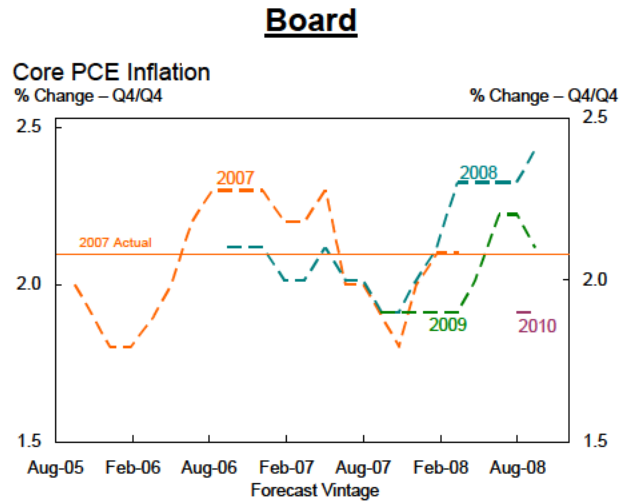
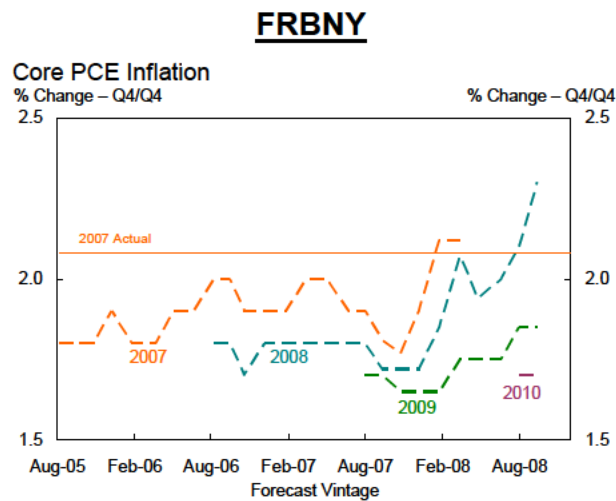
	FRBNY			Board		
	2008	2009	2010	2008	2009	2010
<b>OUTPUT</b>						
Real GDP	1.6 (1.5)	2.0 (2.5)	3.0 --	1.5 (1.2)	2.1 (2.2)	2.7 --
<b>GDP Growth Contributions</b>						
Final Sales to Domestic Purchasers	0.4 (0.5)	1.6 (1.7)	2.3 --	0.0 (-0.2)	1.4 (0.9)	3.0 --
Consumption	0.4 (0.7)	1.0 (1.2)	1.4 --	0.1 (0.3)	1.3 (0.9)	1.8 --
BFI	0.3 (0.2)	0.4 (0.3)	0.5 --	0.2 (0.0)	0.0 (-0.1)	0.5 --
Residential Investment	-0.8 (-0.9)	-0.1 (-0.1)	0.1 --	-0.8 (-1.0)	-0.2 (-0.2)	0.5 --
Government	0.4 (0.4)	0.3 (0.3)	0.3 --	0.5 (0.5)	0.3 (0.3)	0.2 --
Inventory Investment	-0.2 (-0.1)	0.0 (0.0)	0.3 --	0.1 (0.2)	0.4 (0.7)	-0.1 --
Net Exports	1.4 (1.1)	0.4 (0.8)	0.4 --	1.4 (1.2)	0.3 (0.6)	-0.1 --
<b>INFLATION</b>						
Total PCE Deflator	3.9 (3.6)	1.7 (1.7)	1.7 --	3.5 (3.7)	2.2 (2.4)	1.9 --
Core PCE Deflator	2.3 (2.1)	1.8 (1.8)	1.7 --	2.4 (2.3)	2.1 (2.2)	1.9 --
<b>INTREST RATE ASSUMPTION</b>						
Fed Funds Rate (End-of-Year)	2.00 (2.25)	3.00 (3.75)	4.25 --	2.00 (2.00)	2.50 (2.75)	3.00 --
<b>PRODUCTIVITY AND LABOR COSTS*</b>						
Output per Hour	2.5 (2.6)	1.8 (1.8)	1.8 --	2.4 (2.1)	1.8 (1.8)	2.1 --
Compensation per Hour	3.8 (4.0)	3.9 (3.9)	4.0 --	4.1 (4.2)	3.9 (4.1)	3.6 --
Unit Labor Costs	1.3 (1.5)	2.1 (2.1)	2.2 --	1.6 (2.1)	2.1 (2.2)	1.5 --
<b>LABOR MARKET</b>						
Unemployment Rate (Avg. Q4 Level)	6.3 (5.8)	6.7 (5.7)	6.0 --	6.2 (5.9)	6.2 (5.9)	5.9 --
Participation Rate (Avg. Q4 Level)	66.1 (66.0)	66.1 (66.0)	66.1 --	66.0 (65.9)	65.7 (65.6)	65.5 --
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-56 (-48)	15 (122)	137 --	-75 (-58)	75 (83)	100 --
<b>HOUSING</b>						
Housing Starts (Avg. Q4 Level, Thous.)	850 (950)	900 (1000)	885 --	800 (700)	900 (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



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

## B. FRBNY Forecast Details

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

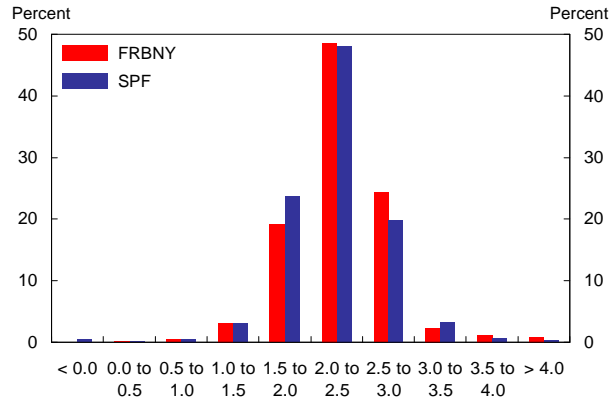
		Real GDP Growth			
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
FRBNY	9/12/2008	0.5 (2.2)	1.7 (1.0)	1.6 (1.5)	2.0 (2.5)
PSI Model	9/10/2008	-0.2 (-0.3)	0.8 --	-- --	-- --
Blue Chip	9/10/2008	1.0 (1.3)	0.2 (0.6)	1.3 (1.0)	2.1 (2.3)
Median SPF	8/12/2008	1.2 (1.7)	0.7 (1.8)	1.7 (1.5)	1.5 (2.2)
Macro Advisers	9/12/2008	1.7 (1.5)	-1.0 (-0.5)	1.1 (1.3)	2.8 (3.1)
		Core PCE Inflation			
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
FRBNY	9/12/2008	2.8 (2.2)	2.1 (2.0)	2.3 (2.1)	1.8 (1.8)
Median SPF	8/12/2008	2.2 (2.1)	2.1 (2.1)	2.2 (2.1)	2.0 (2.1)
Macro Advisers	9/12/2008	2.7 (2.4)	2.3 (2.4)	2.3 (2.2)	2.0 (1.9)
		CPI Inflation			
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
FRBNY	9/12/2008	8.4 (6.1)	2.5 (2.5)	3.4 (4.5)	3.8 (2.2)
Blue Chip	9/10/2008	6.3 (4.9)	2.2 (2.9)	4.5 (4.1)	2.3 (2.5)
Median SPF	8/12/2008	5.3 (3.2)	2.9 (2.5)	4.3 (3.3)	2.4 (2.4)
Macro Advisers	9/12/2008	7.3 (6.5)	2.1 (3.3)	4.7 (4.6)	2.2 (2.1)
		Core CPI Inflation			
	Release Date	2008Q3	2008Q4	2008 Q4/Q4	2009 Q4/Q4
FRBNY	9/12/2008	3.1 (2.3)	2.2 (2.2)	2.1 (2.2)	2.1 (2.0)
Median SPF	8/12/2008	2.5 (2.3)	2.3 (2.3)	2.3 (2.3)	2.2 (2.3)
Macro Advisers	9/12/2008	3.2 (2.4)	2.7 (2.6)	2.6 (2.3)	2.2 (2.2)

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

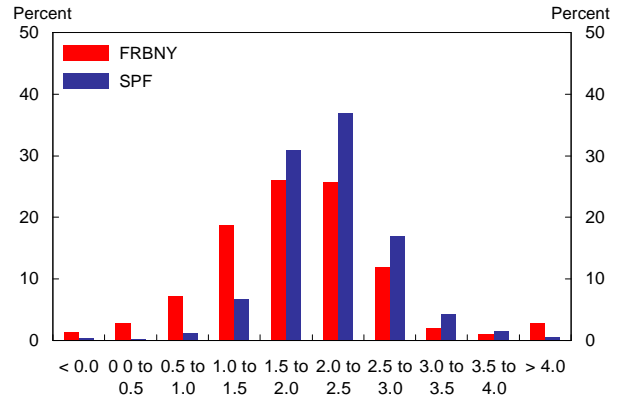
## B. FRBNY Forecast Details

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

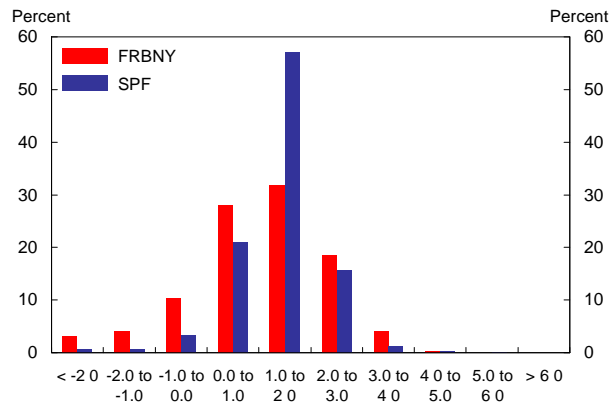
2008Q4/Q4 Core PCE Inflation Probabilities



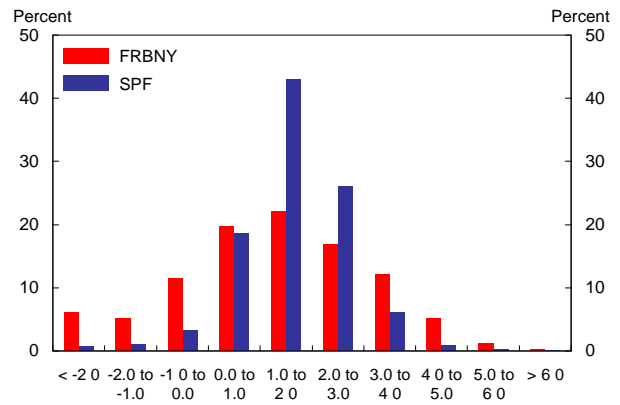
2009Q4/Q4 Core PCE Inflation Probabilities



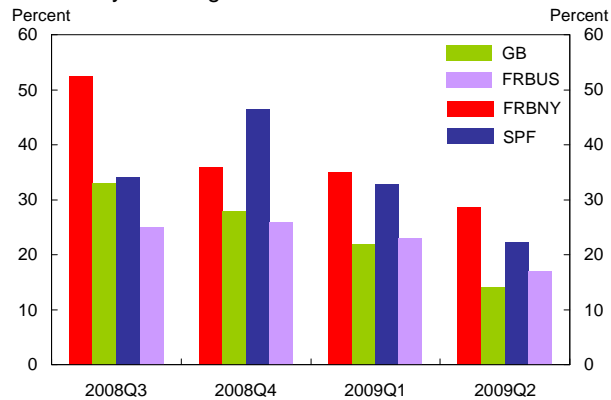
2008/2007 Real GDP Growth Probabilities



2009/2008 Real GDP Growth Probabilities



Probability of a Negative-Growth Quarter

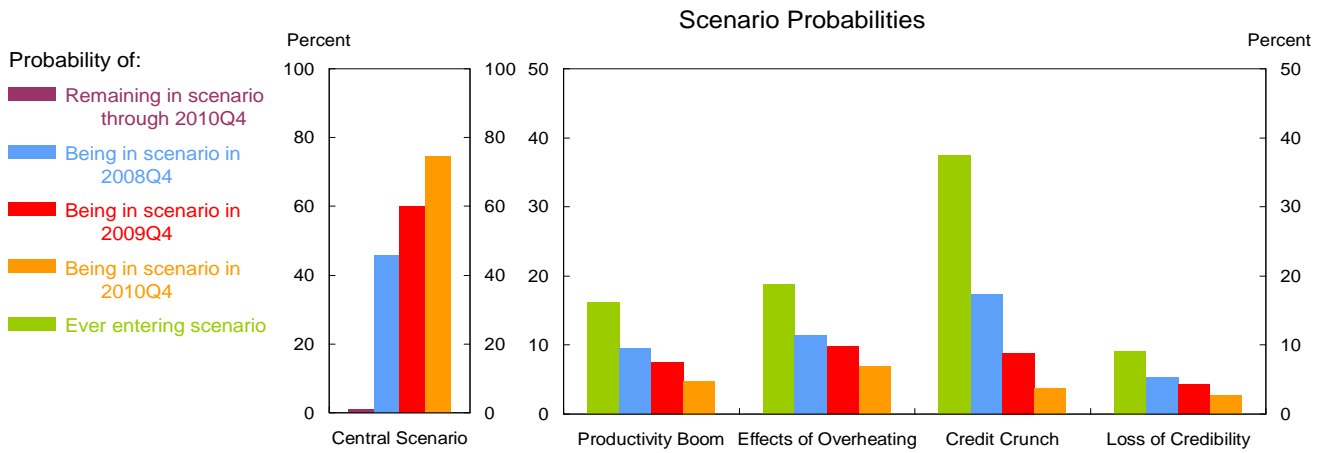


Source: MMS Function (FRBNY), FRB Philadelphia Survey of Professional Forecasters, and Federal Reserve Board  
 Note: SPF forecast was released August 12, 2008. Board forecasts are from the September Greenbook.

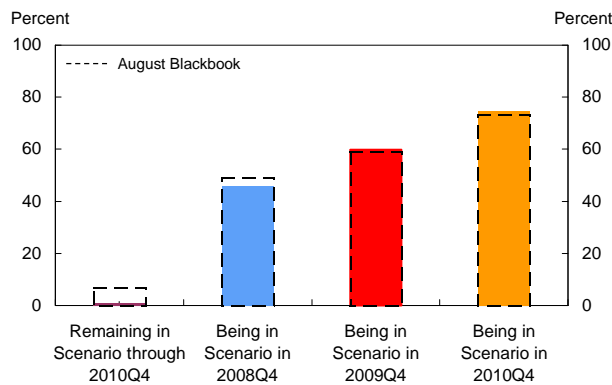


## C. FRBNY Forecast Distributions

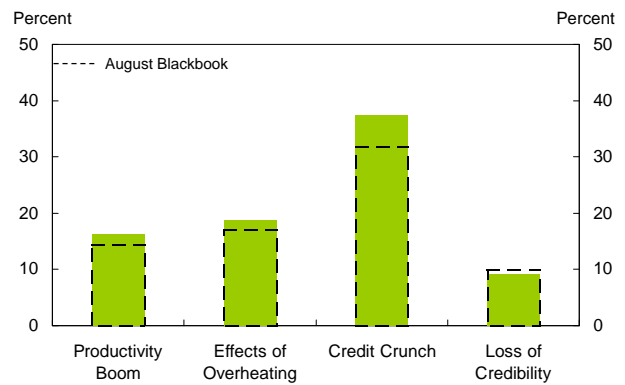
### Exhibit C-1: Risks



#### Change in Central Scenario Probabilities



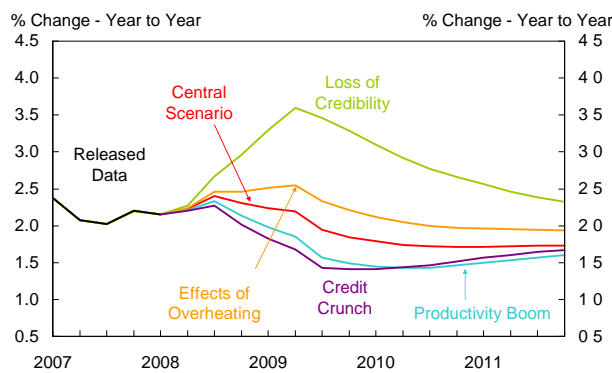
#### Change in Alternative Scenario Probabilities\*



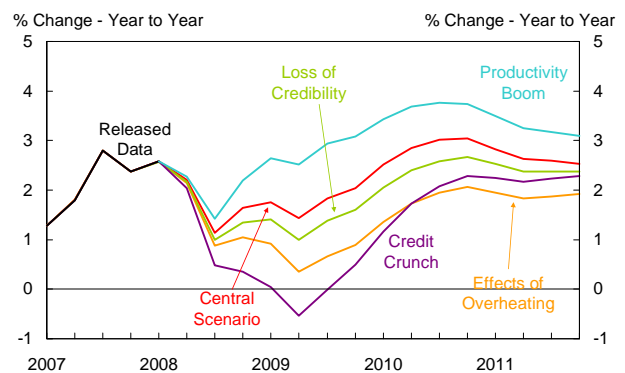
\*Probability of ever reaching scenario

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

#### Core PCE Inflation under Alternative Scenarios



#### Real GDP Growth under Alternative Scenarios

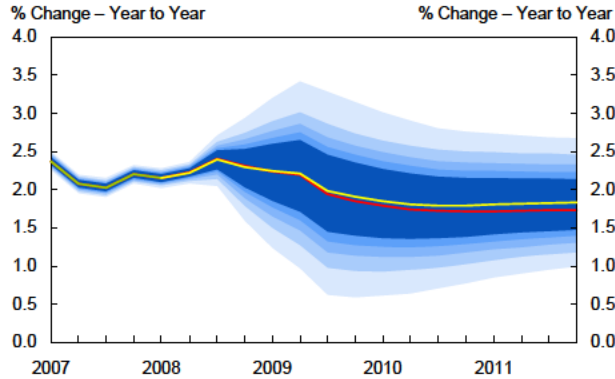


Source: MMS Function (FRBNY)

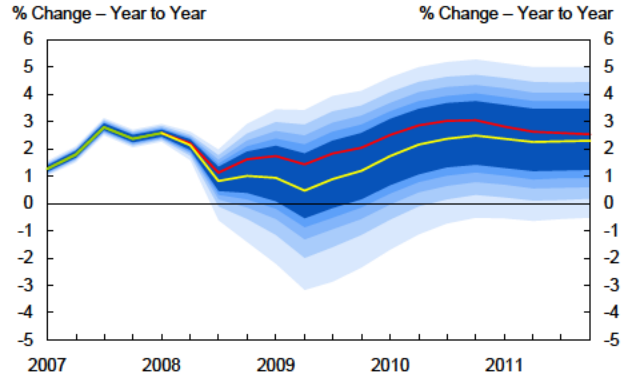
## C. FRBNY Forecast Distributions

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

**Core PCE Inflation Forecast Distribution**

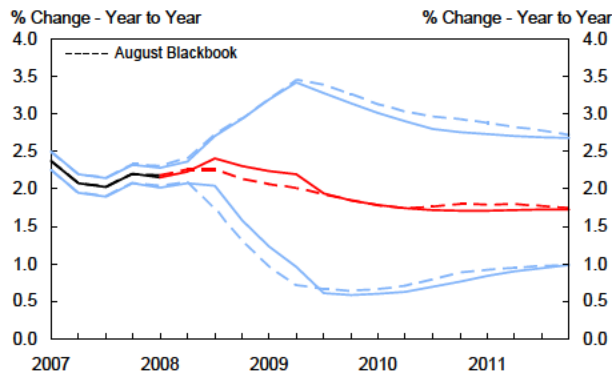


**Real GDP Growth Forecast Distribution**

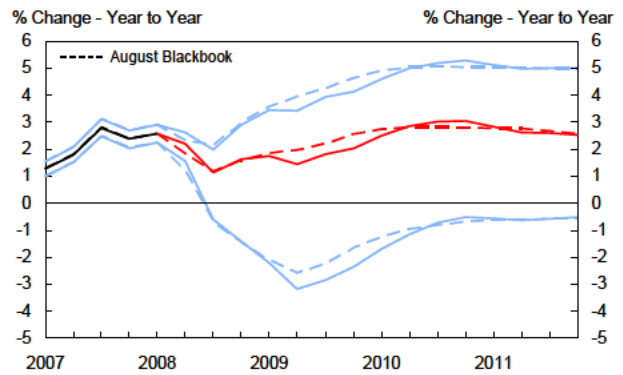


The yellow line is the expected value of the forecast distribution, the red line is the central scenario projection, and the green line is released data. The shading represents the 50, 60, 70, 80, and 90 percent chance that the four-quarter change will be within the respective range.

**Change in Core PCE Inflation Forecast Distribution**

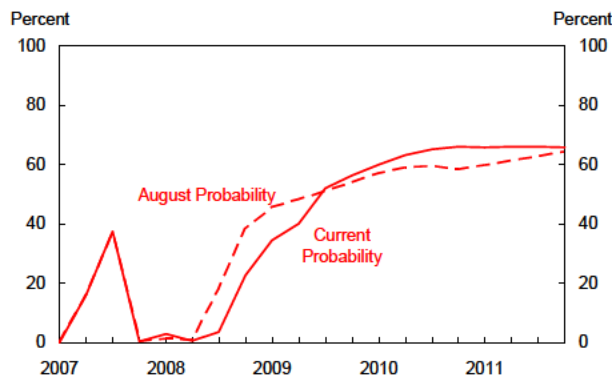


**Change in Real GDP Growth Forecast Distribution**

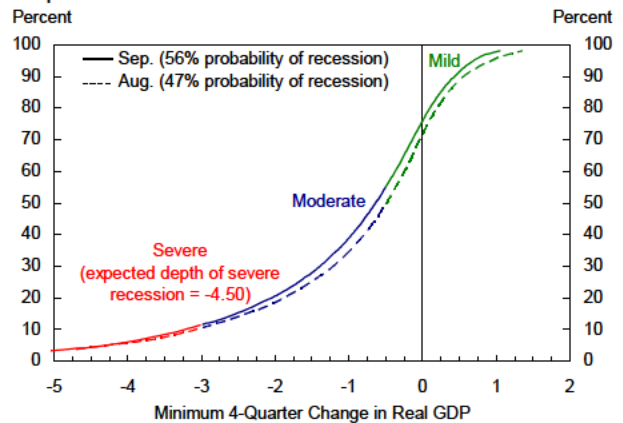


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from previous Blackbook.

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



**Depth of Recession**

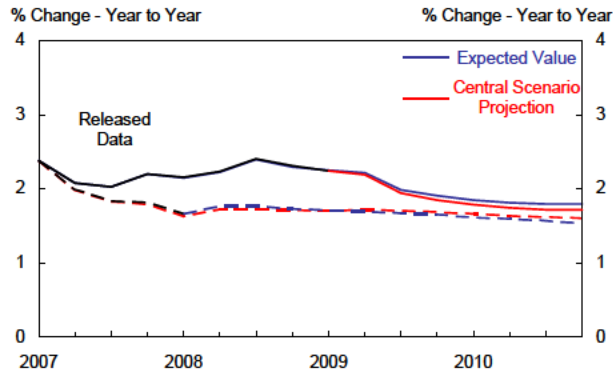


Source: MMS Function (FRBNY)

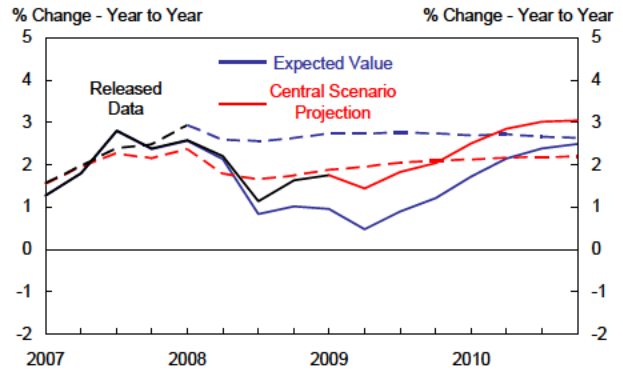
## C. FRBNY Forecast Distributions

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

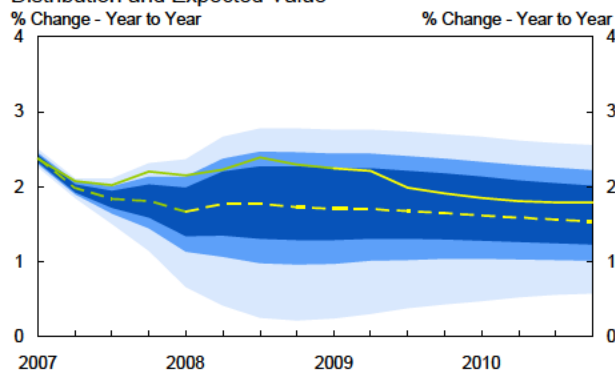
One-Year Comparison of Core PCE Inflation Forecast



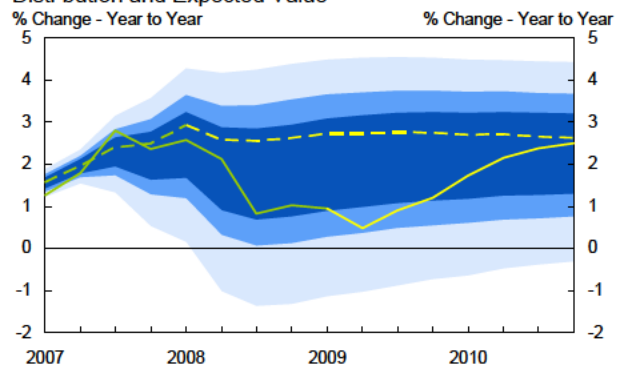
One-Year Comparison of Real GDP Growth Forecast



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



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



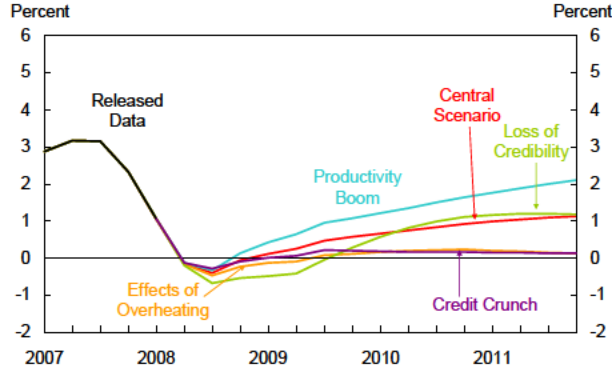
The solid yellow line is the **current** expected value of the forecast distribution, while the dashed yellow line is the **September 2007** expected value. The shading represents the 50, 70 and 90 percent probability intervals from the **August 2007** forecast. The green lines are released data.

Source: MMS Function (FRBNY)

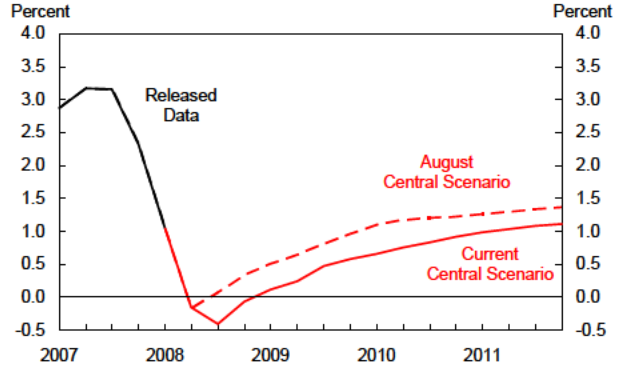
## D. FRBNY Fed Funds Rate Projections

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

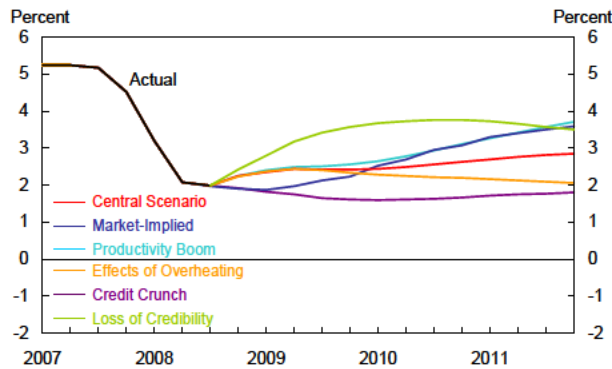
**Real FFR under Alternative Scenarios**



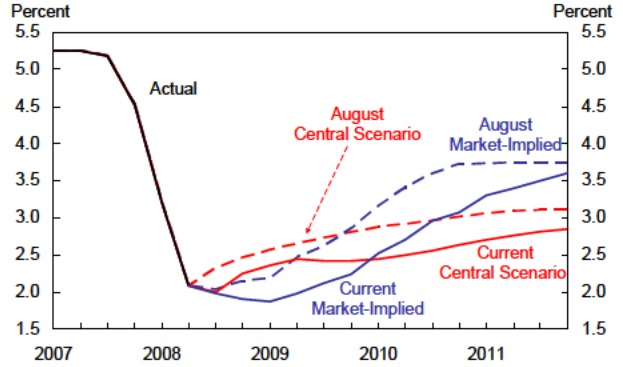
**Change in Central Scenario Real FFR**



**Nominal FFR under Alternative Scenarios**

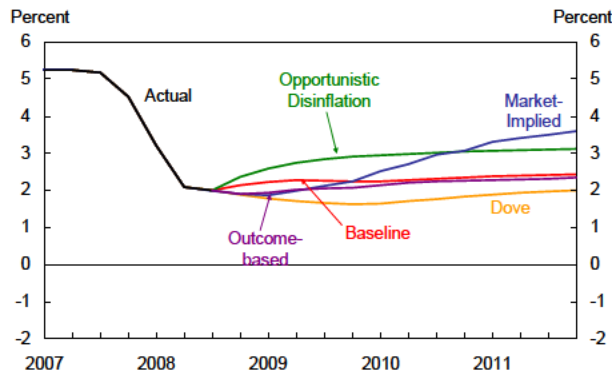


**Change in Central Scenario and Market-Implied Nominal FFR**



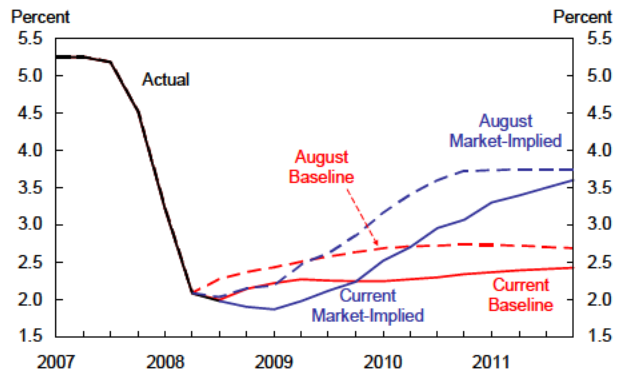
**Exhibit D-2: Alternative Policy Rules under  
Expected Value of Forecast Distribution**

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



\*Evaluated using yellow line from C-3

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



\*Evaluated using yellow line from C-3

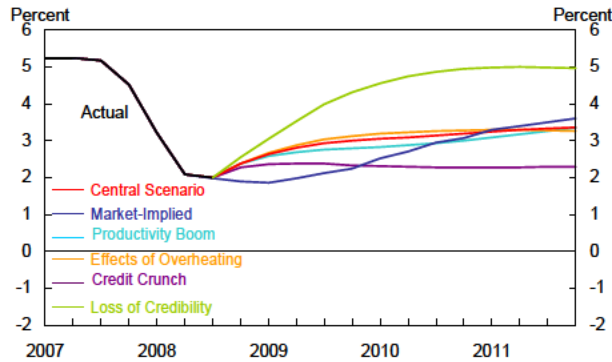
Source: MMS Function (FRBNY)

## D. FRBNY Fed Funds Rate Projections

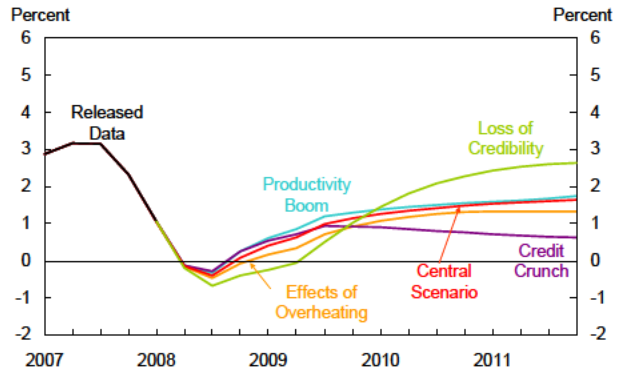
### Exhibit D-3: Alternative Policy Rule Analysis

#### Policy Rule: *Opportunistic Disinflation*

Nominal FFR under Alternative Scenarios

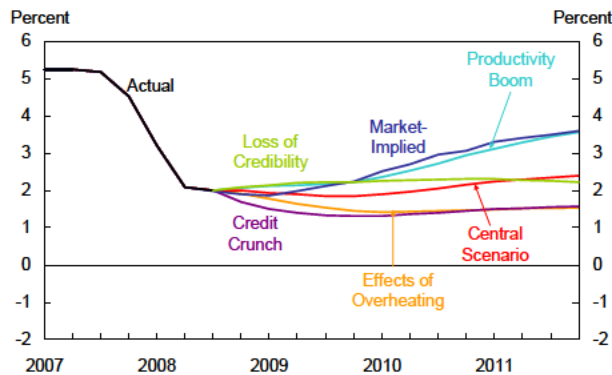


Real FFR under Alternative Scenarios

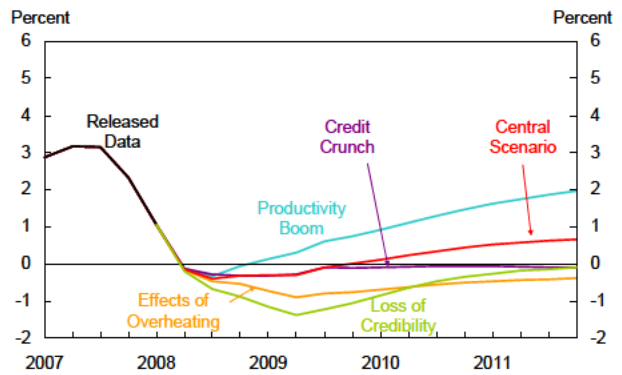


#### Policy Rule: *Dove*

Nominal FFR under Alternative Scenarios

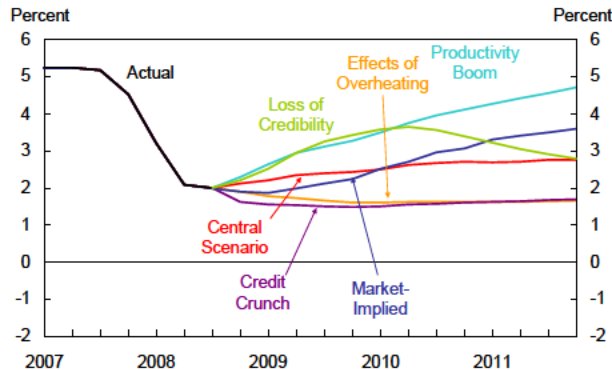


Real FFR under Alternative Scenarios

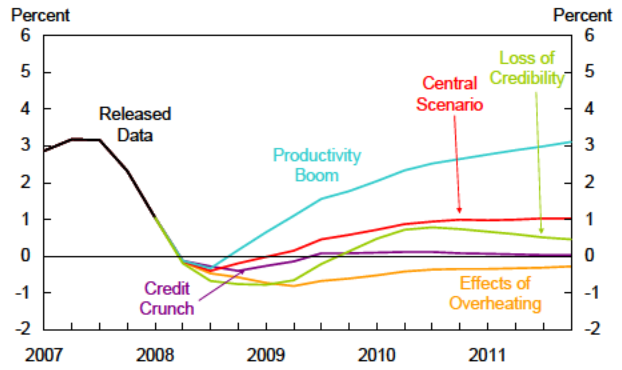


#### Policy Rule: *Outcome-based*

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

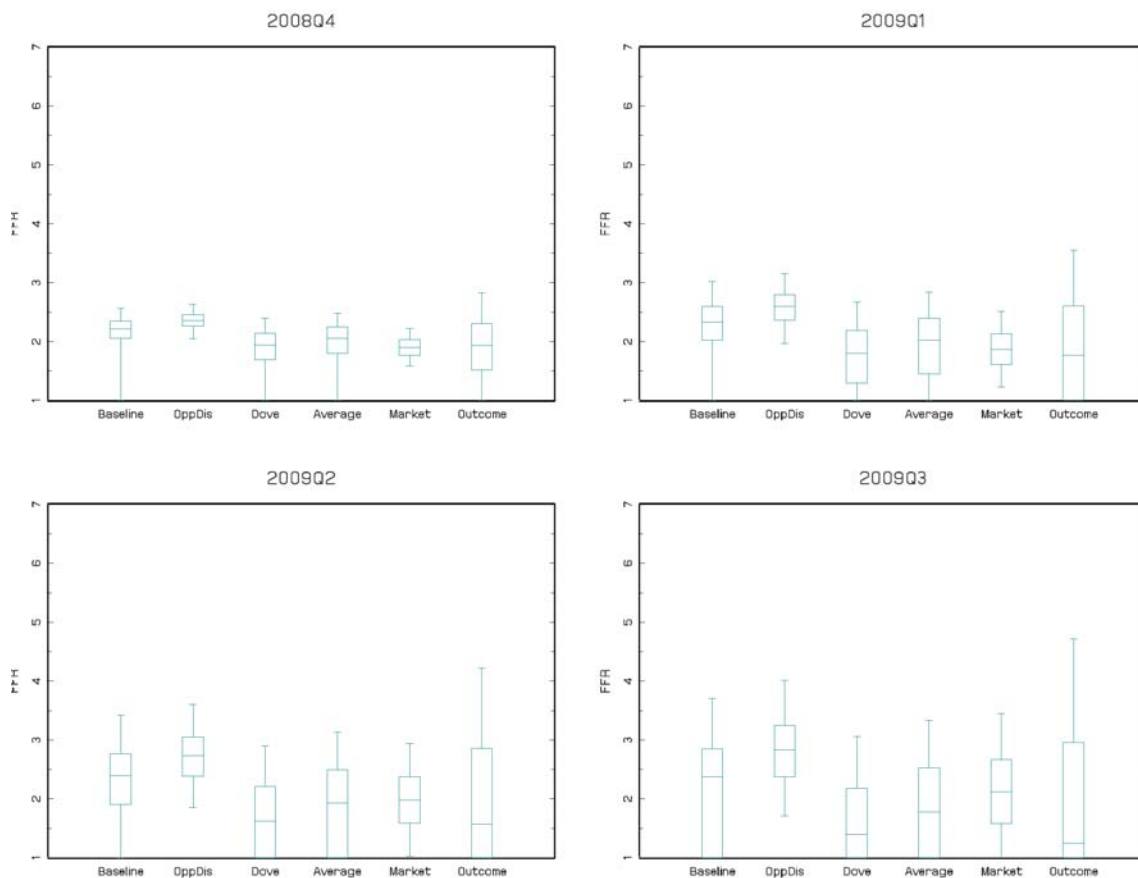
	Percentile of Rule Expectation in Market Distribution	Percentile of Market Expectation in Rule Distribution
<i>Baseline</i>	82 (68)	18 (27)
<i>Opportunistic Disinflation</i>	97 (89)	3 (8)
<i>Dove</i>	41 (30)	54 (64)
<i>Outcome-based</i>	57 (27)	53 (68)
<i>Average</i>	57 (43)	41 (51)

“Average” Weights:

Rule	Current	August Blackbook
<i>Baseline</i>	0.32	0.33
<i>Opportunistic Disinflation</i>	0.02	0.33
<i>Dove</i>	0.66	0.33

Note: Numbers in parentheses are from the previous Blackbook.

### Exhibit D-5: FFR Distributions



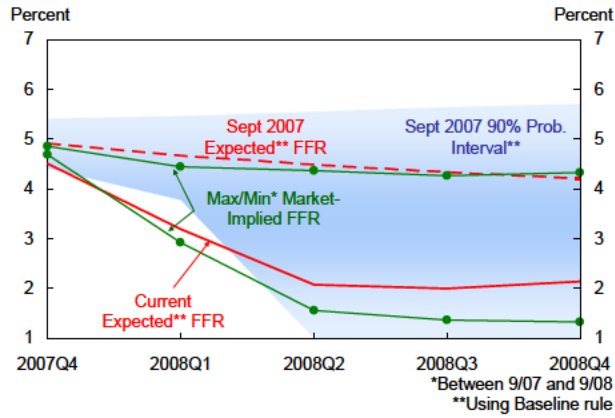
Note: The box represents the 50% probability interval, the line in the box the median, and the tails the 90% probability interval.

Source: MMS Function (FRBNY)

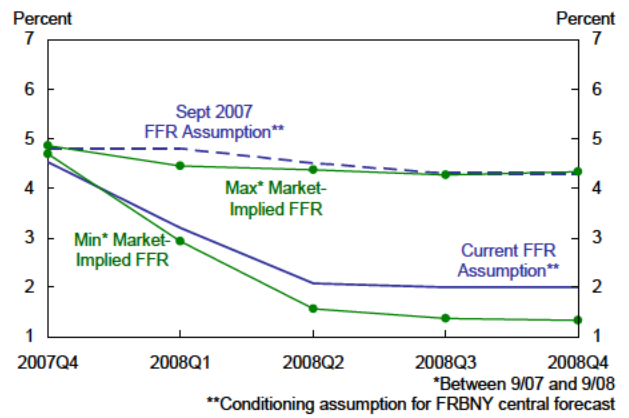
## D. FRBNY Fed Funds Rate Projections

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

FFR Forecast Distribution and Market-Implied FFR



FFR Conditioning Assumption and Market-Implied FFR



Source: MMS Function (FRBNY)

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## Alternative Scenario Descriptions

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

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

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

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

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

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



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

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

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

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

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

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

**Alternative 4:** *Credit Crunch*

The financial turmoil that started in the summer of 2007 has put a significant strain on the availability of credit. New issuances of commercial paper (CP) – in particular, asset-backed commercial paper (ABCP) – dropped sharply in the second half of 2007, and spreads between ABCP and AA-rated CP rose notably and remain unusually high. Spreads on other credit products, including corporate bonds and CDS, also rose significantly and remain at levels comparable to those of previous recessions. The Survey of Senior Loan Officers also indicates that standards for business loans and consumer loans have tightened considerably. In addition, mortgage rates have risen, while credit standards have tightened, making mortgages more difficult to attain; trends that may be exacerbated by the recent turmoil surrounding the GSEs. 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 financial markets 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,

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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. *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)

$\pi^* = 1.5$  (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

$i_{t-1}$  : interest rate in previous quarter<sup>1</sup>

Because we know that, if the FFR target moves at the next meeting, its move will usually be in increments of 25 basis points, we round the first forecasted FFR value from the *Baseline* and alternative policy rule prescriptions. This serves to both capture some of the discreteness in FFR movements and to smooth the FFR paths from the current to the

<sup>2</sup> For 2008Q1, we used a value of 4.25 instead of the interest rate in 2007Q4.

upcoming quarter. We currently perform this exercise according to the following table, where  $r^*$  is the actual output from the policy rule:

Policy Rule Prescription	Average FFR in 2007Q4
$r^* < 3.00$	$r^*$
$3.00 < r^* < 4.00$	4.50
$4.00 < r^* < 5.25$	4.54
$5.25 < r^* < 6.00$	4.75
$r^* > 6.00$	$r^*$

We then feed these modified values into the policy rules to calculate the remaining FFR values.

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 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 ( $\phi_x = 1$  instead of 0.5). When the output gap is positive, however, the *Dove* rule offers the same prescription as the *Baseline* rule ( $\phi_x = 0.5$ , 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

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between the three FRBNY rules and the *Outcome-based* rule is that the FRBNY rules offer a prescription for future behavior based on policymaker preferences and views of the economy, whereas the *Outcome-based* rule is a statistical description of the average of past FOMC behavior. Specifically, the *Outcome-based* rule calculates an FFR for a given quarter as a function of the FFR in the previous two quarters, the current quarter's four-quarter core PCE inflation, and the output gap for the current and the previous quarter using parameters estimated from real-time historical data (1988-2006)<sup>3</sup>.

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

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