

FRBNY Blackbook

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1. Policy Recommendation and Rationale

In the August Blackbook, our central outlook called for a return to potential growth in the second half of 2007, with core inflation gradually slowing toward the middle of the acceptable range. Based on the economic and financial market developments over the inter-meeting period, we now expect that the recent tightening of credit conditions will delay a return to potential growth until mid-2008. Moreover, we have lowered our central outlook for inflation, bringing it solidly within acceptable ranges at even short horizons.

The change in the risks to the forecast has been more substantial than the changes to the central forecast. We have significantly increased the risk of a large decline in economic activity below potential. This adjustment reflects a higher likelihood placed on the *Over-Tightening* scenario, with a reduction in weight placed on the *Global High Demand* scenario. These changes imply that the risks to the inflation forecast are now approximately balanced.

The projections for core PCE inflation in 2007 (Q4/Q4), 2008, and 2009 are 1.8%, 1.7%, and 1.7%, respectively. The projections for 2007 and 2008 are slightly lower than they were in the August Blackbook and, as noted above, are now more solidly in the 1-2% range. We have lowered our 2007Q3 real GDP growth forecast from 3.3% (annual rate) in the last Blackbook to 2.8%; we also have lowered the forecast for Q4 and 2008H1 as we expect further declines in housing activity. The upward revisions to 2007Q2 growth mean that the effect of these changes on 2007 (Q4/Q4) is attenuated. Under our central scenario, we expect a return to potential growth in mid-2008.

We have made a number of changes to our assessments of the neutral policy rate and the appropriate policy path. We have shifted down the lower bound on the neutral rate range from 4¼ % to 3¾%, bringing our current range to 3¾ -4¾%. The new lower bound reflects several factors, the most important of which is the impact of apparent dramatic re-pricing of risk that has occurred in the past few weeks. In June, we had raised our assessment of the neutral policy rate from 4-4½% to 4¼-4¾%. One argument at that time for the relatively high lower bound of 4¼% was the large decline in the price of risk

over the last three years: with risk and term premia at historic lows, the real short equilibrium rate was required to be higher than historical averages to keep financial conditions from being too loose. The significant re-pricing of risk since late July has reversed some of this decline and tightened financial conditions. In addition, the ongoing liquidity issues in money markets, the responses of large financial institutions to these developments, and reduced credit availability in the mortgage market all imply further tightening of financial conditions over the inter-meeting period. The combined impact of a longer-term re-pricing of risk and the temporarily stressed trading conditions suggests a reduction in the lower bound for the neutral rate relative to June. At the same time, although we did not choose to change it in the August Blackbook, our lower estimate of potential growth suggested a reduction to the lower bound of the neutral policy rate range. While it is difficult to precisely measure the impact of these financial market developments, they all point in the direction of a decrease in the lower bound, and we have reacted by lowering our assessment of the neutral rate range.

The combination of our changed assessment of the neutral policy rate with the substantial changes in our overall outlook implies a renormalization of the nominal FFR to 4.75% at the September meeting. We now assume that this is followed by two more 25 basis point cuts over the next year to bring the FFR to the center of the neutral range by September 2008. The timing of these cuts depends on the evolution of the outlook. However, given the large downside risks to our outlook, we see it as more likely that these cuts will occur earlier rather than later.

This policy path has a quicker reduction in the policy rate than prescribed by standard policy rules with gradual adjustment of policy rates. However, the combination of the changes in our central outlook, neutral policy stance, and risk assessment suggests that the current stance of policy is too tight, and we believe a quick adjustment is more appropriate under current conditions. Using the *Baseline* rule (without the inertial component, see Section 5.2 and the appendix), the lowering of our neutral policy rate assessment and inflation and output paths prescribes a 25 basis point cut in the nominal FFR in September. In addition, the change in our risk assessment suggests an additional

10-40 basis points in cuts for September, with the magnitude depending on the rule used. The easing prescribed by the rules leads us to the assessment that the current stance of policy is too tight given our outlook. This view is supported by estimations using structural models with fixed inflation objectives, which indicate that the current neutral policy stance would be around 4¾ % (see the Special Topic, *Is Current Monetary Policy Restrictive?*).

Our recommended nominal policy path is below the nominal FFR path assumed in the Greenbook. Although we have a lower inflation projection, our real FFR path also is below that of the Greenbook. Nevertheless, the Greenbook forecast of real GDP growth is below the FRBNY forecast, and the Greenbook sees greater cyclical weakness than we expect. The differences in assumed policy paths may reflect the higher inflation, greater inflation persistence, and higher implicit neutral rate in the Greenbook forecast.

In the August Blackbook, we remained unconvinced that the moderation in inflation would be sustained. The July inflation reports, however, showed continued moderation and produced declines in our alternative inflation measures. The quicker-than-expected moderation in core inflation measures thus have been incorporated into a lower inflation forecast. The continued moderation in inflation also has had a substantial effect on our two estimated structural models, as discussed in the special topic, *Should the Recent Inflation Data Change Our Inflation Forecast? An Answer from Structural Models*. While some measures of long-term inflation expectations have drifted upward recently, their levels remain well contained. Furthermore, the movements in short- to medium-term inflation expectations are consistent with the drop in our inflation forecast.

The large change in our risk assessment now implies that the risks to the inflation forecast are approximately balanced. Indeed, if the recession risk is realized there is some probability of a fall in inflation below desirable levels. However, we continue to see the potential for upside surprises to our inflation outlook from higher energy prices, rising import prices, and, most importantly, slower productivity growth.

One concern raised in the August Blackbook was that sustained financial market turmoil could magnify some of the downside risks to the growth outlook. Unfortunately, those concerns have intensified during the inter-meeting period. Housing market activity has weakened further, while serious mortgage delinquencies and foreclosures have increased. However, some of the other concerns about real activity discussed in the August Blackbook, notably weak Q2 consumption and sluggish investment, have lessened some with recent data releases.

Over the inter-meeting period the functioning of the non-agency mortgage market has become seriously impaired. The price of jumbo, alt-A, and subprime mortgage credit has increased, while underwriting standards have been tightened. This development has reintroduced the downside risk to real growth from the housing market that had appeared to be easing during the second quarter. Although we have little hard data on the possible effects of these financial market developments on the real economy, data on housing activity in July was weaker than expected. The new home inventory-sales ratio remains high, with slow-to-negative price appreciation persisting. Though we have again marked down our residential investment forecast, we cannot rule out the possibility that the slowdown in this sector will be deeper and more protracted than we currently anticipate and will occur simultaneously with a weakening in the labor market (the risk of significant slowdown in labor market conditions increased substantially with the weak August labor market report and downward revisions to June and July payrolls).

Nevertheless, there is little hard evidence that the housing market weakness is spilling over directly into consumer spending. Our assessment that the slow growth of consumption in Q2 was likely due to transitory factors (despite concerns of more persistent contributing), such as the marked rise in energy prices in the spring, was given support by the healthy increase in real consumption in July, the increase in auto sales in August, and a fairly solid increase of retail sales excluding motor vehicles and gasoline between Q2 and the July-August average. We recognize, however, that consumption might enter a more protracted slowing if home prices fall more in real terms and/or income growth slows with a weaker labor market.

Although there was evidence of more robust capital spending in July, it is possible that the financial market turmoil and tighter credit conditions will restrain investment going forward. At the moment, it is difficult to assess how much the disruption in financial markets will reduce the availability of credit to corporations. Investment-grade issuance was strong in August, but speculative-grade issuance was very weak. A larger risk is that business confidence declines with a weaker macroeconomic environment. The ISM and regional surveys, however, have yet to show a substantial decline in August, and the fall in equity valuations has been relatively small compared to previous periods of financial turmoil.

In recent weeks, financial market movements have continued to raise and amplify a number of downside risks to our real activity outlook. Furthermore, the longer the turmoil is sustained, the more vulnerable the economy will become to the impact of unrelated shocks (e.g. a large hurricane, terrorist attacks). The Federal Reserve has a number of tools to directly add liquidity to financial markets and facilitate activity amongst market participants that will complete the re-pricing and reallocation of risk. The FFR can also help by being adjusted initially to a more neutral stance. If despite these changes in policy the financial market turmoil continues, it might be necessary to move to a more accommodative stance more quickly even without a definitive signal that the real economy is weakening further.

Currently, financial markets are pricing in a series of rate cuts, with the FFR falling to 4% or lower within 12 months. In contrast to the extended period following the last rate increase in June 2006, markets expect most of these cuts to occur in the next three months. The anticipation of these cuts has lowered Treasury rates substantially; however, other rates more directly related to consumer and producer decisions have not fallen, as risk premiums have increased. Furthermore, the rates for short-term funds are trading well above the current FFR target. While our policy rules give an ambiguous assessment of the need for a 50bp cut in September, it is possible that cutting the FFR only 25 bp might exacerbate financial market pressures, and, by itself, precipitate an inter-meeting move.

Overall, while we view the developments during the inter-meeting period as confirming that a sustained moderation in inflation has taken hold, there has also been a substantial increase in the risk of a recession. The source of this risk is partly the continued weakening in the housing sector but also the sustained period of financial market turmoil. Therefore, our recommendation now has the FFR falling to 4.25% over the next year, including an immediate cut of 50bp at the September meeting. Even with this move to a more neutral stance we still view the risks to growth skewed to the downside, and further large cuts in the FFR will be required, if the economy weakens in a manner consistent with the *Over-Tightening* scenario. However, if the economy weakens in a manner more consistent with either the *Productivity Slump* or the *Effects of Overheating* scenario, then further drops in the FFR would not be justified. Hence, future inflation developments and measures of inflation expectations are as important to monitor as developments in the real economy.

2. Significant Developments

2.1 Economic Developments

The economic indicators released during the inter-meeting period impacted both our outlook and risk assessment. On our outlook, they have prompted us to reduce our near- and medium-term inflation forecasts and to lower modestly our near-term real growth projection. For our risk assessment, the data led us to reduce the upside inflation risks to the point where inflation risks are fairly balanced. The data also led us to raise considerably the downside risks to real activity; these risks are now substantially skewed to the downside.

The recent behavior of core inflation measures continued to be consistent with our outlook of a slow moderation of underlying inflation [Exhibit A-1]. The July changes in core CPI and (especially) the core PCE deflator were moderate. Consequently, the changes in both measures at most horizons between 3 and 24 months remained within their respective “comfort zones,” further solidifying this pattern.

Overall inflation measures were affected by two conflicting developments, which resulted in moderate overall inflation in July and 12-month changes near those of the core measures. One development was that consumer energy prices fell again in July. Declines in August retail gasoline prices suggest that energy prices may fall again in that month, but the recent increases in spot energy prices could portend that energy prices may begin to rise in the following months. The other development was the continued relatively large increase in food prices, which remains some cause for concern.

Nevertheless, our alternative inflation measures, many of which take into account energy and food prices, have declined recently. Smoothed inflation had only a very modest decline, but the underlying inflation gauge (UIG) and signal component (SiCo) measures displayed more significant declines. In addition, the inflation forecast from our DSGE-VAR model decreased. These developments suggest that the recent moderation of core inflation now reflects not just transitory factors but also longer-lasting factors. These developments, therefore, were a factor behind the reductions in our near- and medium-term inflation forecasts as well as the reduced upside inflation risks.

Inflation expectations measures remained well contained [Exhibits A-2 and A-3]. Short-term financial market expectations fell, consistent with a sustained moderation of and greater downside risks to real activity. Financial market expectations at the 4-5 year horizon fell moderately, but those at the 5-10 and 9-10 year horizons increased modestly. The difference in the behavior of expectations at these horizons may reflect an increase in the perceived risks of higher inflation from possible policy responses to the recent financial market turmoil, leading to an increase in inflation risk premia. This rise could reflect an increase in uncertainty about inflation or an increase in risk aversion that raises the willingness to pay for inflation protection; given the repricing of risks with the financial market turbulence during the inter-meeting period, it is difficult at this time to assess the relative contribution of these alternatives. Household expectations, as measured by the Michigan survey, remained within their recent ranges in August and the first half of September. Overall, the continued good behavior of core inflation, combined with more confirming signals from alternative measures and contained inflation

expectations, has led us to reduce our inflation outlook and upside inflation risks relative to those of the last Blackbook.

Real GDP growth in 2007Q2 was revised upward from 3.4% to 4.0% (annual rate), which was near our projection based on the monthly releases subsequent to the advance GDP estimate; it thus had little effect on our outlook. Productivity growth in the nonfarm business sector was solid in 2007Q2 at 2.6% (annual rate), but the four-quarter change was only 0.9%. Productivity growth over 2004-2007Q1 was revised downward in a manner consistent with the GDP revisions released prior to the last Blackbook. Consequently, we had lowered our estimate of trend productivity growth to 1 $\frac{3}{4}$ %, which implies that we see the slow productivity growth over the past year as reflecting cyclical factors. Nevertheless, the Kahn-Rich productivity model now places a relatively high probability (0.69) that the economy is in the low-trend-productivity-growth regime. The possibility of below-trend productivity growth thus remains a downside risk to our outlook.

Much of the monthly expenditure and production data has been fairly solid, suggesting that aggregate growth in the current quarter may be near or above our estimate of potential GDP growth (2.7%). Despite the concerns engendered by weak (1.4% annual rate) PCE growth in 2007Q2, the subprime mortgage problems, financial market turmoil, and flat-to-declining home prices, the recent monthly indicators of consumer spending so far point to a rebound in real PCE growth in 2007Q3 to around 3%. Real PCE in July was stronger than expected, with solid growth in discretionary services such as recreation and personal business services being positive signs. Auto sales, which had been notably weak in June and July, rebounded fairly strongly in August to above our expectations. Although retail sales excluding motor vehicles fell in August, much of the decline was in gasoline, where prices fell. Taking this into account along with upward revisions to July indicate that these sales were maintained through August. Although consumer confidence measures fell considerably in August, probably reflecting responses to the news of financial market turbulence during the month, their levels remained above recent lows, and they did not decline further in the second half of August and the first half of

September (even though financial turbulence continued); therefore, as yet, they do not signal a deterioration of the consumer outlook.

Most indicators of business activity also remained fairly solid despite the onset of financial market turbulence. Manufacturing production and orders data indicated that the manufacturing sector was in fairly good shape in July just before the onset of the financial market turbulence, as the inventory correction that had retarded production in late 2006 and early 2007 appeared to reach its end. However, production softened somewhat in August outside of the high-tech sector (even in high tech, the August rise was somewhat less robust than typical). In contrast, August business survey measures generally remained consistent with moderate growth in activity, and thus the data suggest that business and manufacturing conditions remained fairly solid, even as financial and credit markets were disrupted during the month. Although the headline number for the Empire State Survey decline in September (to be released on September 17), its level also was consistent with moderate growth in activity. However, July inventory growth was rather tepid despite low inventories-sales ratios, suggesting that firms were cautious in their inventory policies even before the full onset of financial and credit market turbulence.

Capital spending indicators were largely in line with our outlook. Real equipment and software expenditures for 2007Q2 were revised upward, and capital goods shipments and orders rose in July. These developments suggest that the near-term outlook for equipment and software expenditures is somewhat better than it was during the lull of 2006Q2-2007Q1. Growth of private nonresidential construction in June and July slowed from the robust pace in the first half of 2007, but it appears to be a slowdown to a more sustainable pace rather than a prelude to a slump.

Of course, one area that remains weak and is a source of downside risk is the housing market. Housing starts and permits fell in July and now are at their lowest levels since 1997. In addition, the homebuilders index fell again in August and is near its 1991 low, indicating continued pessimism from homebuilders about the housing market. Although

they were little changed in July, sales of new and existing homes remain weak. Furthermore, a sharp decline in July pending home sales and anecdotes of little sales traffic suggest further future sales declines. The combination of continued weak sales and high inventories-sales ratios of new and existing homes suggest that the housing market will remain weak over the coming months. Consequently, we see the slump in housing activity as more protracted than we did in the last Blackbook, with residential investment falling through the rest of this year and into 2008.

In part because of the weakness in housing sales activity, home price appreciation is near-zero to negative in nominal terms. The latest four-quarter change in the Case-Shiller national index (-3.2%) was the lowest in the 20-year history of the series. The one- and four-quarter changes in the OFHEO index did remain positive at 0.3% (annual rate) and 3.2%, respectively, but the four-quarter change was the lowest since 1997.¹ Furthermore, even in the case of the OFHEO index, it would appear that there are declines in real home prices; these declines raise the downside risks from spillovers into consumption.

Mortgage markets continued to be impacted by the weakness in the housing market and the turmoil in financial markets [Exhibit A-10]. Delinquency and foreclosure rates continued to rise sharply; this pattern is most apparent in subprime adjustable rate mortgages, but there have also been notable rises in delinquencies and foreclosures for prime adjustable rate mortgages. The rises in losses and changes in MBS ratings and rating methodologies have led investors to avoid holding non-agency MBS and their related derivatives, one factor behind the recent financial market turmoil. Consequently, spreads on nonconforming mortgages, including prime jumbo mortgages, have widened substantially during the inter-meeting period, much more so than in previous financial crises. Furthermore, even as Treasury rates declined during the inter-meeting period, the declines were not fully reflected in mortgage rates, and mortgage applications have thus increased less than is typical in periods of low market rates.

¹ Although the Case-Shiller and OFHEO indices use similar methodologies, differences in the geographic and mortgage coverage as well as technical estimation differences probably account for most of the difference between the prices changes measured by the two indices

To some extent, the situation in mortgage markets, which had been deteriorating since early July, has stabilized some since mid-August. For example, prices of the ABX have recovered a bit in the past few weeks, particularly for higher-rated tranches. Even so, the developments over this period imply that new mortgage credit will be less readily available for some segments of the market, and what is available probably will be more costly. Such developments likely will have another negative impact on home sales and housing construction and are thus another reason we see the housing slump as being more protracted in the future. In addition, these developments could have a negative impact on home prices and increase the potential of spillovers from housing into consumption.

The other major source of increased downside risk to the real activity outlook is the labor market. Payroll employment fell in August, and there were downward revisions to previous months. Consequently, the pace of payroll growth has fallen markedly; the three-month average change in payroll employment has declined from 162,000 in May to 44,000 in August. The decline in employment was concentrated in goods-producing industries (both manufacturing and construction) and government; however, even though employment at private service-producing industries continued to rise, its pace in recent months also has slowed notably. In addition, recent declines in temporary help services employment may be another worrisome sign for future employment growth.

The weakness in August employment occurred in a context in which unemployment insurance claims have risen only slightly and remain within ranges of the past year. Typically, fairly stable unemployment claims data would suggest little further deterioration of labor market conditions related to job destruction. Nevertheless, they also raise a couple of less sanguine possibilities. First, the recent weakness of net job creation may reflect weaker job creation rather than greater job destruction. Second, the possible weakness in employment that is not being reflected in claims data is concentrated in categories that are not covered by unemployment insurance, such as independent contractors. For now, it remains important to monitor claims as a high-frequency indicator of labor market conditions at a time of a possible turning point: a

sharp rise in initial claims to well over 350,000 would confirm a more persistent weakness in the labor market.

Although the unemployment rate was unchanged at 4.6% in August, many other facets of the household survey also point to a weaker labor market. There were sharp drops in the August labor force participation rate and the employment-population ratio. Technical factors related to teenage labor force participation (which dropped very sharply in the month) may have exaggerated the August decline in the labor force participation rate and the employment-population ratio, nevertheless, a downward trend over the past few months is apparent. Also, even though payroll-comparable household employment growth was fairly solid in August, its growth so far in 2007 has been below that of payroll employment.

It is possible that the decline in the labor force participation rate is a development consistent with the Board view of a declining trend in labor force participation; as such, we may continue to see weak employment growth with little change in the unemployment rate. However, the pattern of a low and flat unemployment rate accompanied by a declining labor force participation rate resembles that of the first half of 2001, when the economy entered the last recession. There is one important difference: labor force participation of prime-age workers declined in 2001, while in the current situation, the decline in labor force participation has been concentrated in teenage workers. An obvious explanation of the current situation, especially given the timing, is that the labor force movements primarily reflect students returning to school. Nevertheless, we need to monitor the movements of young workers in the coming months, because these workers typically have greater cyclical volatility of hours. Therefore, it is possible that the declines in their labor force participation may herald greater weakness in the labor market with eventual substantial rises in unemployment. This possibility factors into the rise in our downside risks to the real activity outlook.

Measures of labor compensation provide differing views about labor cost pressures. The 12-month change in average hourly earnings was 3.9% in August, near its recent levels

and below the levels in the second half of 2006. This would suggest little change in labor cost pressures. In contrast, revisions to compensation per hour and unit labor costs have raised their four-quarter changes through 2007Q2 to their highest levels since 2000 and thus point to some upward labor cost pressures.

Indicators for the major foreign economies point to continued solid growth in the second half of 2007. Downside risks to the outlook from financial market volatility have increased since the last Blackbook, but, at the moment, we attach a low probability to a significant effect on overall foreign growth. In the Euro area, the labor market was tight through July, and business confidence was stable at a high level in the first half of August. Japanese employment and exports remain strong, although there has been some softness in production. Chinese data continue to be very robust, with attention now focused on the government's response to the recent upswing in inflation.

Robust export growth and moderate import growth may be starting to narrow the U.S. external imbalance. The depreciation of the dollar over the past year may be spurring exports and reducing imports by increasing import prices and by leading domestic firms (such as auto firms) to source from domestic suppliers to reduce input costs. The June and July trade data imply a lower positive growth contribution from trade in Q2 (1.3 rather than 1.4 percentage points) and a higher positive contribution in Q3 (0.6 percentage points rather than the 0.3 estimated in the previous Blackbook). Overall, our forecast of a modest positive contribution from trade in the second half of the year is unchanged from the August Blackbook, though it has inched up by 0.1 percentage point. Exports to Europe and NAFTA countries remained strong on a year-over-year basis in July; however, exports to Asia (most notably Japan and China) declined substantially, a somewhat worrisome development going forward.

2.2 Financial Markets

In an environment of turbulence and weak indicators in housing and labor markets, developments in financial markets suggested that market participants have reduced their outlook for real activity and inflation as well as raised their downside risks for real

activity. There were declines in expectations of future policy rates, real interest rates, and inflation compensation at short- and medium-term horizons.

In large part, the re-evaluation and re-pricing of risk in financial markets that began in the previous inter-meeting period continued into the current period. Corporate credit spreads, which had widened sharply in the last inter-meeting period, generally widened further in the current period [Exhibit A-7]. A-rated investment grade spreads widened 15 basis points (bp) to 154 bp, while BB-rated speculative grade spreads widened 1 bp to 353 bp. 10-year swap spreads declined slightly (3 bp) since the last FOMC meeting; in contrast, 2-year swap spreads widened considerably (23 bp) during the inter-meeting period.

Still, much of the effects of risk re-evaluation and re-pricing occurred in short-term financing markets. Concerns about the effects of rising subprime mortgage delinquencies and foreclosures on commercial paper (CP) backed by subprime mortgages led to significant dislocations in the asset-backed commercial paper (ABCP) market, as many market participants were not willing to hold the perceived risk in these securities. As a result, liquidity in the market dropped, leading to declines in CP outstanding, particularly of ABCP [Exhibit A-11], as some firms had to resort to back-up liquidity lines from banks. Furthermore, much of the issuance in the period was in very short (less than one week) maturities, as participants were less willing to accept the additional credit and liquidity risk at long maturities. Spreads on CP, particularly lower-rated securities, and ABCP rose sharply.

As market participants moved out of the CP market, many of the flows moved into the Treasury bill market, leading to considerable volatility in that market [Exhibit A-4]. The 3-month yield declined 81 bp on net to 4.05%; at times when dislocations in the CP market were most severe during the period, this rate was near 3%. In addition, there were sharp rises in inter-bank rates such as LIBOR [Exhibit A-11]. The severe dislocations in financing markets (including wide on-the-run/off-the-run spreads, tight repo markets, and unusually high spreads on term fed funds) led to a number of liquidity measures put into

place by the Fed in mid-August (as well as by other central banks, see below), including lowering the discount rate and extending term financing through the discount window. These measures had some success in calming markets, although conditions remain strained, as illustrated by the continued high levels of term LIBOR [Exhibit A-11]. In part, the elevated levels of term inter-bank rates reflect concerns that the reduced liquidity of the CP market will lead to an expansion of bank balance sheets (as firms have to draw on the backup liquidity lines), which would the amount of reserves need and possibly put strains on capital ratios.

In the longer-term Treasury coupon market, the increase in downside risk to real activity from strained financial conditions as well as from the data on housing and the labor markets led to decreases in expected future short rates and thus to sizable declines in yields [Exhibit A-4]. The 10-year yield fell 27 bp to 4.47%, and the 2-year yield declined 48 bp to 4.03%. The larger decline at shorter maturities is consistent with expectations of a lower policy path over the medium term (see below), although it may be exaggerated somewhat by the disruptions in some credit markets. The 10-year/3-month spread turned positive at +42 bp, but given the dislocations in short-term financing markets, the signal from this spread is considerably noisier.

Real interest rates also declined, but less than nominal rates [Exhibit A-4]. The carry-adjusted 5- and 10-year rates fell 37 and 29 bp to 2.06% and 2.19%, respectively. As a result, inflation compensation fell at short- and medium-term horizons and rose slightly at long-term horizons (see above).

With market participants perceiving greater economic weakness and more downside risk, the expected FFR path shifted down sharply [Exhibit A-5]. The implied rate after the October 2007 FOMC meeting, inferred from the November fed funds contract, declined 36 bp to 4.64%, suggesting at least 50 bp of easing by then. The expected FFR path bottoms out in 2008Q4 at 4.02% (49 bp below its August 6 level), and remains between 4% and 4.25% through the end of 2009. Even with the changes in our policy path, the expected FFR path is somewhat below our policy path.

Policy uncertainty as measured by implied interest rate volatility increased further during the inter-meeting period, leaving it elevated compared to recent years [Exhibit A-6]. Implied skewness, which declined in late July to quite negative levels, suggesting that market participants are more concerned about a large unexpected rate cut, was little changed during this inter-meeting period.

Equity markets displayed some volatility in response to turmoil in other financial markets and to some of the economic data. Nevertheless, equity market indices were essentially unchanged on net over the inter-meeting period [Exhibit A-7]. Equity implied volatility is below the peaks of mid-August, but is still elevated.

The strains in US credit conditions spread further to global financial markets during the inter-meeting period. As in the U.S., the turnover in financing for terms longer than one week dropped to very low levels for all major currencies, despite central banks' effort to enhance liquidity by unscheduled and large operations. Rates on term (longer than one week) money market instruments have risen well above plausible expected policy rates, as financial institutions have moved to increase their holdings of term liquidity. Some Euro area institutions have appeared especially vulnerable, given their exposure to investment vehicles linked to the U.S. mortgage market.

Long-term rates have fallen in main industrial countries, largely reflecting a decline in real rates, while breakeven rates on major inflation-linked bonds have remained stable [Exhibits A-8 and A-9]. In the Euro area, a simultaneous rise in money market rates has now lifted three-month rates about 50 bps above ten-year rates, though much of this inversion reflects the (possibly transitory) premium at which short-term financing is selling in the Euro area, as well as flight-to-quality effects into long-term (especially sovereign German) bonds. Corporate spreads rose sharply, and global equity markets dropped from their early-July historic highs, eroding virtually all gains recorded since end-2006. Japanese equity markets were especially hurt by a strong yen, and then by political instability, losing more than 10% (in yen terms) since the last FOMC meeting, while losses in European equities were buffered by the recovery staged in the second half

of August. Asset prices appear to have stabilized since end-August, despite still-strained short-term financing conditions.

As global investors scaled back much of their risky positions, currency markets experienced the effects of a substantial unwinding of yen carry positions [Exhibit A-9]. The yen appreciated strongly against a number of currencies; in particular, it appreciated over 2% on the dollar since the last FOMC. Other major currencies were more stable, although the euro crept to an all-time high of 1.391 on September 12. The dollar lost about one percent in both real and nominal effective terms, but these losses continue a trend of weakness established in early 2006, which has become more acute since the beginning of 2007. Option-implied volatility has reached multi-year highs for the yen/dollar rate, at both the three-month and one-year maturity, while it remains moderate for the dollar/euro rate.

2.3 Global Monetary Policy

During the inter-meeting period, strained conditions in a number of short-term financing markets led major central banks to step up their effort to inject short-term liquidity. The ECB was especially active in its use of fine-tuning operations to add short-term liquidity. Policy rates generally were held unchanged in the main areas; the exceptions were Australia, Sweden, and Switzerland, where rates were hiked by 25 basis points, and China, where policy rates were raised twice during the inter-meeting period and reserve requirements also were increased. Notably, the Bank of Japan and the ECB, which appeared to be poised for rate hikes as of the last Blackbook, did not raise rates during the period. The ECB also modified its assessment of economic conditions to mitigate expectations of further rate hikes at this time. In an unusual move, the Bank of England issued a statement accompanying its no-policy-change decision, reaffirming its inflation forecast from the August Inflation Report and noting that future developments in credit markets also were being included in their assessments. This pause in global tightening, and the efforts to provide short-term liquidity at unchanged policy rates, appear to have had some success in limiting further deterioration of confidence, although they have had

less impact in alleviating the lack of turnover in the inter-bank and commercial paper markets for terms longer than one week.

3. Evolution of Outlook and Risks

3.1 Central Forecast

Conditioning assumptions. The economic and financial market developments during the inter-meeting period have led us to change the monetary policy path consistent with our central outlook: we have moved forward cuts in the FFR, leading to a steeper path toward our estimate of the neutral FFR [Exhibit B-2]. We assume that the target FFR will decline 50 bp to 4.75% at the September FOMC meeting and another 50 bp to 4.25% by September 2008, and then remain there over the rest of the forecast horizon.

There are two primary reasons for this change in our FFR assumption. First, the changes in our forecast for real growth and inflation, along with the changes in the risk assessment (lower upside inflation risks, greater downside real activity risks), suggest a lower FFR path using standard monetary policy rules. Second, the recent developments raise the possibility that the neutral FFR is lower than we had previously thought, although any estimate of it is more uncertain. We have responded to this possibility by widening our estimated range of the neutral FFR from 4.25%-4.75% to 3.75%-4.75%.

In addition, the developments in credit and financial markets—higher CP spreads and reduced issuance (particularly for term CP), higher term LIBOR rates, higher credit spreads, etc.—imply that financial conditions are tighter than they were prior to the onset of the recent financial market turbulence. Consequently, a decision to not reduce the FFR effectively would tighten monetary conditions. Furthermore, even by September 2008, the assumed level of the FFR is near our central estimate of the neutral FFR; therefore, our assumed path is an acceleration of the return to a neutral stance rather than toward an accommodative stance.

Our assumed path of the FFR is below that assumed in the Greenbook forecast. Because our inflation forecast is slightly below of the Greenbook, the difference between the real

FFR paths is somewhat less than that between the nominal paths; nevertheless, the FRBNY real FFR path is still below that of the Greenbook. In contrast, our assumed path remains above the expected FFR path implied by futures markets.

Besides our monetary policy assumption, the conditioning assumptions behind our central forecast are similar to those of the last Blackbook. We maintain our estimate of potential GDP growth at 2.7%: 1.2% trend hours growth (although we assume it will begin to decline in 2009-2010) and 1.5% trend productivity growth (GDP basis, this is equivalent to 1.8% on a nonfarm business sector basis). In regard to the hours growth assumption, we see the recent decline in the labor force participation rate to 65.8% as partly reflecting some technical transitory factors that soon will be reversed, and thus expect it return to around 66% through 2009. For trend productivity growth, the increase in the probability of the low-trend-productivity-growth state according to the Kahn-Rich model suggests that we will have to monitor productivity developments over coming quarters to determine if our productivity assumption may have to be revised. Although our estimates are somewhat more uncertain in the current environment, we still believe that the current output gap is near zero.

We expect that the lower inflation persistence evident since the early 1990s to continue; this assumption is in contrast to the greater inflation persistence assumed in recent Board staff forecasts. The recent moderation of core inflation along with the more recent moderation in alternative underlying inflation measures would be consistent with this assumption. We also assume that long-run inflation expectations remain contained at or below current levels. The declines in financial market expectations at the 4-5 year horizon and in household expectations as measured by the Michigan survey support this assumption. Given these assumptions, we expect that inflation will gradually move toward our assumed FOMC objective for core PCE inflation of 1.5%.

We expect that term premia will remain fairly low, although these levels are slightly higher than those assumed in the Blackbook. As measured by the Board staff three-factor model, term premia declined modestly over the inter-meeting period. As is our usual

practice, our assumptions for equity prices, home prices, and the real exchange rate are similar to those of the Greenbook. For nominal home prices, this assumption implies little to negative appreciation (but not significant deterioration), which would lead to a moderate decline in real home prices similar to the experience of the housing downturns in the early 1980s and early 1990s. The real exchange value of the dollar is assumed to depreciate gradually. Fiscal policy provides a small impetus to real GDP growth in 2008-09, again similar to the last Blackbook and to the Greenbook.

Because of short-term net supply concerns and inventory draw-downs, spot oil prices have risen to around \$80 in the past few days; however, futures prices have not risen to the same extent and generally have been lower over the inter-meeting period. Therefore, based on average futures prices during the inter-meeting period, we lowered our assumed path of oil prices, with the larger changes in the medium term. We expect the spot price of West Texas intermediate crude oil to be \$73.00 in 2007Q4 (\$74.25 in the last Blackbook), \$69.75 in 2008Q4 (\$72.50 in the last Blackbook), and \$69.25 in 2009Q2.

The 2007 foreign GDP outlook has been lowered to 3.2% (Q4/Q4) from 3.4%. Soft Q2 output knocked down the 2007 outlooks for Japan and the euro area. Their H2 forecasts are not much changed from those of the August Blackbook. Asian emerging economies were either left unchanged (China) or marked up (Korea and Singapore). The one notable case of a lower H2 forecast is Mexico, reflecting the effects of the less favorable US outlook. A risk to the foreign GDP outlook is the possible effects from a slowdown in the US as well as from the financial market turbulence. The special topic, *Transmission of Shocks across Countries: Trade vs. Financial Markets*, discusses some of the avenues through which this could occur.

Inflation. The three-month change of the core PCE deflator was 1.6% (annual rate) in July, below our expectations as of the last Blackbook. Although we do not think underlying inflation is quite that low, the recent declines in alternative underlying inflation measures suggest that a greater proportion of the recent decline in core inflation reflects more persistent factors rather than transitory factors. Forecasts from two

estimated structural models also indicate that a significant portion of the recent decline will persist (see the special topic, *Should the Inflation Data Change Our Forecast? An Answer from Structural Models*). As such, we now think that the current true trend of core inflation is closer to 1.8% rather than the 1.9% we thought in the last Blackbook. Consequently, we have lowered our projected path for inflation [Exhibits B-1, B-2, and B-3]. Near term, our projection for core PCE inflation for the second half of 2007 is reduced from 1.9% to 1.8% (annual rate). From this lower starting point, we continue to expect a gradual moderation to 1.7% in 2008 and 2009 [Exhibit B-4].

Along with a lower central forecast, we see the risks around our inflation forecast as more balanced. Core services inflation has continued to show some moderation. Given the greater supply and vacancies in housing, it is possible we will continue to see moderation in OER and rent inflation, which could continue the trend in core services. Core goods prices also continued to fall on a 12-month basis. The evident caution in inventory practices shown in July may persist, keeping demand for goods low and core goods prices relatively weak. Nevertheless, higher import prices, recent rises in spot oil prices and some other commodity prices, and the possibility that global demand growth may accelerate as the effects of the recent financial market events wane still pose upside risks. In regard to import prices, the 12-month change in import prices excluding petroleum has firmed some in recent months, lending some note of caution.

Real activity. Much of the expenditure and production data released during the inter-meeting period was consistent with the moderate, near-potential growth in the second half of 2007 that we had projected in the August Blackbook. However, the exceptions to this pattern, the housing data and the August labor market data, along with the probable effects of recent credit market conditions suggest somewhat slower growth over the near term. Consequently, we have lowered our 2007H2 real GDP growth forecast from 3.0% (annual rate) in the August Blackbook to 2.6% [Exhibits B-1, B-2, and B-3].

The continued imbalances between inventories and sales, combined with the increases in nonconforming mortgage rates and tighter underwriting standards, suggest that the slump

in the housing market will be deeper than we have previously thought and persist through the rest of this year and into early 2008. Accordingly, we have lowered our projected path for housing starts by another 100,000 units over the forecast horizons: we now expect single-family housing starts to be about one million units (annual rate) in the current quarter, 900,000 units in 2007Q4 and 2008Q1, and then begin a slow recovery [Exhibit B-2]. With this path, we see residential investment as continuing to fall significantly through the rest of this year and into the first half of 2008.

Because of the weakness in the housing market as well as some weakness in labor markets, which suggests somewhat weaker income growth, we also have reduced our real consumption projection for 2007Q4, further contributing to the lower projection in that quarter. Based on the July inventory data, the inventory investment GDP growth contribution appears to be somewhat smaller than we had projected in the August Blackbook, but this is offset by a somewhat larger contribution from net exports.

Beyond the second half of this year, the broad outlines of our central forecast for real growth have not changed substantially from the August Blackbook [Exhibit B-4]. The more protracted housing slump does keep real growth somewhat below the potential growth rate through mid-2008, reducing our 2008 forecast slightly. Thereafter, we still expect that real GDP growth will be near its potential rate.

A key to our outlook remains our long-held view that any spillovers from housing and mortgage markets into consumer spending will be relatively small. This assumption reflects our view that a wealth effect and /or a home equity withdrawal effect from housing was not a major factor behind the robust growth of consumer spending over recent years. The recent consumption data appear to be consistent with our view, as it has held up despite the recent events in mortgage and credit markets. However, the recent weakness in the labor market makes our view more tenuous, as it suggests that income gains may be less than we had thought and may not be sufficient to support consumption growth near its recent trend.

Another concern for the forecast is the effect of the recent events in credit markets. What has started as largely a mortgage event has spread into a number of credit, financing, and inter-bank markets. As such, the length of the current turbulence along with its wider scope suggests more pervasive declines in credit supplies that could restrict consumer spending and business investment. Furthermore, if these events continue and re-intensify, they could lead to postponement of spending decisions in light of the greater uncertainty engendered by such events. To this point, business and household surveys do not indicate that anything of this sort has occurred.

Upside risks have subsided considerably, but have not completely disappeared. If foreign growth remains strong in the aftermath of the financial market events, US export performance may continue to surprise on the upside. Nevertheless, the sustained nature of financial events has reduced the probability of this scenario.

Special Topic

Transmission of Shocks across Countries: Trade vs. financial markets

Linda Goldberg Redacted

The two key channels for shock transmission internationally are trade and financial markets. Spillovers from the U.S. to the rest of the world have been limited in the recent period. One reason is that the recent slowdown in the U.S. has been concentrated in housing, which is not as import intensive as some other sectors of the economy. Transmission through trade channels would be substantially higher if the U.S. housing market slowdown portends a broader US consumption slowdown, leading to more broad-based contractions in imports. Moreover, increased cross-border financial linkages may lead to output contractions, if credit contractions broaden to foreign markets, limiting the availability of funds for consumption and investment projects abroad.

The IMF has performed extensive analysis to estimate the size and sources of spillovers between the U.S., the Euro area, Japan, and the small industrial countries, with the key findings reported in the World Economic Outlook (April 2007). The channels for spillovers are through real net exports, commodity prices, and financial variables (short- and long-term interest rates and equity prices). Financial

linkages may now be more important for transmission than the traditional trade linkages. The rule of thumb from this analysis is that U.S. spillovers to the Euro area, Japan, and small industrial countries are roughly one-quarter to one-half as large as the disturbance in U.S. growth. Financial market conditions play the largest role in transmitting spillovers across regions, with the largest contribution coming from monetary policy but significant roles also played by equity prices and bond yields. Between one-quarter and one-half of U.S. real interest rate shocks, which can be interpreted as shocks to credit conditions more broadly, are transmitted to foreign markets. U.S. market developments account for a quarter to a third of fluctuations in foreign inflation expectations.

Special Topic

Should the Recent Data Change Our Inflation Forecast? An Answer from Structural Models

Marco Del Negro Redacted

The FRBNY core PCE inflation forecast has moderated in the past few months, following the recent decline in core PCE inflation. In this special topic, we examine whether the core PCE inflation forecasts from structural models also declined substantially or whether these models instead interpret the recent decline as transitory.

In this exercise, we compare the core PCE inflation forecasts from two structural models to that of the FRBNY central scenario. These models are the DSGE-FRBNY model developed by the FRBNY MMS function and the DSGE-VAR Atlanta Fed forecasting model (see the International Economic Review 2004 article by Marco Del Negro and Frank Schorfheide, "Priors from DSGE models for VARs"). At its core, the DSGE-VAR model is a general equilibrium model similar to the DSGE-FRBNY model. However, the DSGE-VAR methodology allows the model's dynamics to deviate from the restrictions imposed by the underlying general equilibrium structure. The intention is to characterize better within the model the dynamics in the data and to improve on the forecasts.

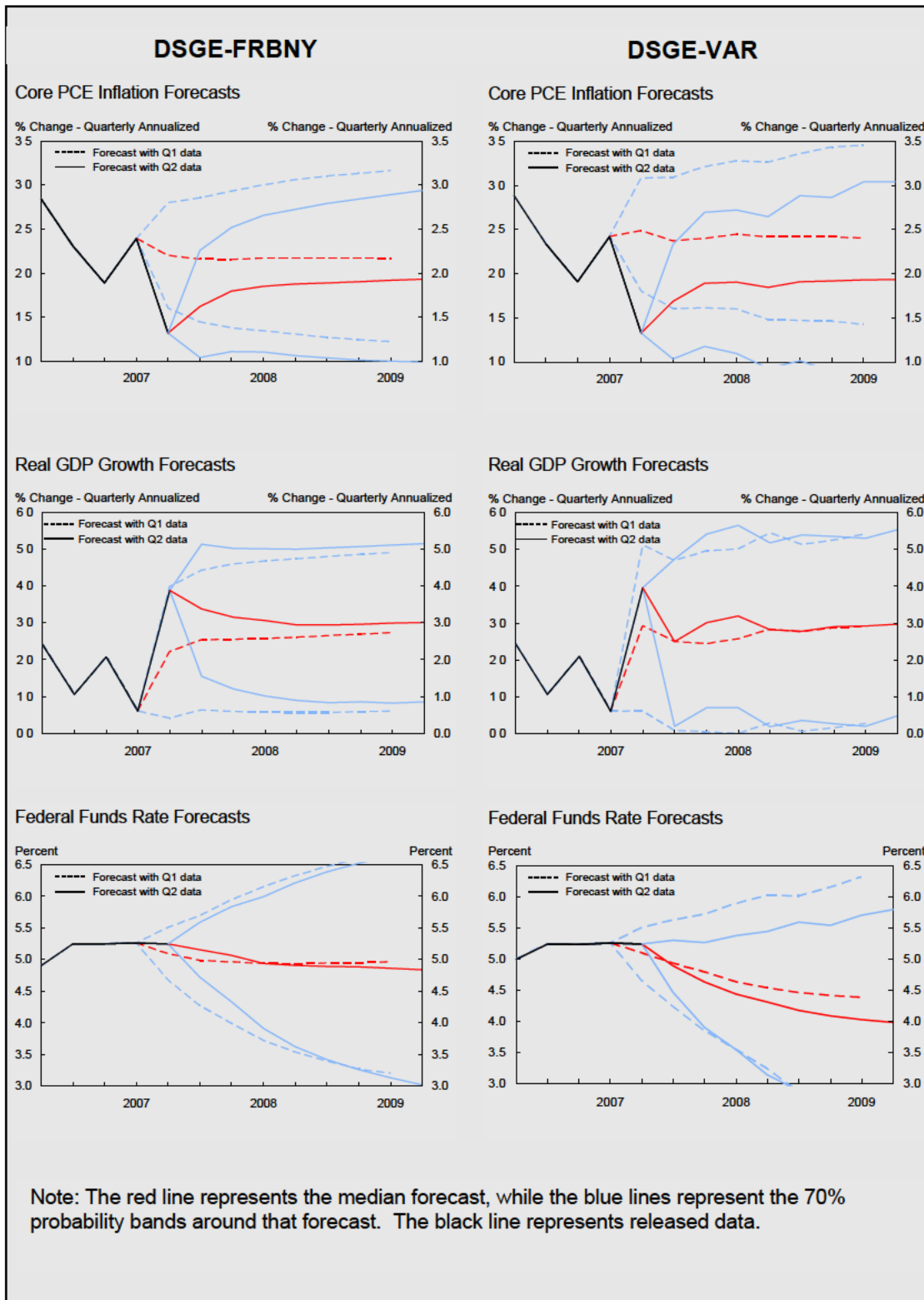
The top two charts show the core PCE forecasts using data through 2007Q1 (dashed lines) and data through 2007Q2 (solid lines) and the 70% probability bands around each forecast. Using data through Q1, neither model projected the drop in core PCE inflation from 2.4% in 2007Q1 to 1.3% in 2007Q2 (annual rate), as actual Q2 inflation lies outside of the 70% probability bands around the forecast.

Looking at the forecast using data through 2007Q2, both of these models react to the sizable forecast error by reducing their short-run (2007Q3 DSGE-FRBNY and DSGE-VAR forecasts are 53 and 68 basis points respectively below their forecasts using data only through Q1) and medium-run inflation forecasts (2008Q4 DSGE-FRBNY and DSGE-VAR forecasts drop 27 and 50 basis points, respectively, between the two forecast vintages). Consequently, the mean inflation forecasts now lie within the 1-2 percent comfort zone at all horizons for both models, which was not the case prior to the inclusion of the Q2 data.

Real GDP forecasts did not change nearly as much between the two vintages (two middle charts). This is partly because the increase in real growth from Q1 to Q2 was less of a surprise as was the case for core PCE inflation, particularly with respect to the DSGE-VAR model. The DSGE-FRBNY

model forecasts have increased somewhat and are now slightly above 3% (annual rate) for 2008Q4 and at 3% (annual rate) for 2009. The DSGE-VAR forecast path is slightly lower with the 2007Q3 growth forecast at 2.5% (annual rate) and slightly below 3% (annual rate) for longer forecast horizons.

Although the core PCE inflation and real GDP forecasts are similar across the two models, the FFR forecasts are quite different. In the DSGE-FRBNY model, the FFR forecast declines slowly to 5% by 2008Q1 and reaches 4.8% by 2009Q2. The DSGE-VAR model predicts a more rapid and sustained decline; the FFR falls to 4.9% in 2007Q3 and 4.1% in 2008Q4. We suspect that these differences primarily reflect the different estimated policy reaction functions in the two models. The DSGE-VAR rule has a constant inflation target rate, and thus declines in inflation translate into declines in the FFR through its policy rule. In DSGE-FRBNY model, the target inflation rate is time-varying, and the model determines that much of the recent decline in inflation is matched with a decline in target inflation (see special topic, *A Surprise FFR Cut? A Counterfactual Analysis of the 1998 Policy Move.*). Since both inflation and target inflation are declining, there is little change in the difference and thus only modest changes in the FFR.



3.2 Alternative Scenarios and Risks

The most significant changes we made to the alternative scenario probabilities were increasing the weight on the *Over-Tightening* and *Effects of Overheating* scenarios and lowering the weight on the *High Global Demand* scenario. While we lowered the weights on the other productivity scenarios only slightly, increasing the weight on the *Over-Tightening* scenario further lowered the probability of reaching the productivity scenarios and increased the probability of being in the central scenario in the end of 2008, 2009 and 2010. This is due to the more transitory nature of the *Over-Tightening* scenario [Exhibit C-1]. In addition to changing the probabilities attached to alternative scenarios, we also increased the scale of the downside risks in the scenarios that produce deviations below our central scenario. This quantifies the judgment that the recent financial turmoil magnifies the effect of downside risks to our forecast.

After raising the probability of the *Over-Tightening* scenario to a relatively high level in March, we diminished it in the May and June Blackbooks. We increased it again in the August Blackbook in response to the early stages of the current financial turmoil. With the continuation of the turmoil and more evidence of an abrupt tightening of financial conditions, we have increased it to a higher level than it was in March. This is consistent with financial market leading indicators, such as the inversion of the yield curve over most of the past year, recent increases in speculative-grade bond spreads, and increased volatility, but it is inconsistent with some of the high-frequency indicators of real activity, such as new claims for unemployment insurance and business surveys. However, the surprising drop in August payrolls and the downward revisions to payrolls in prior months provide some evidence that the economy might be weakening in a manner consistent with this scenario.

The increased probability of the *Effects of Overheating* scenario reflects the continued housing correction and its significant contribution to the financial turmoil. Much of the recent turmoil in financial markets appears to be related to an over-extension of credit in the past, supporting the view that the economy overheated in 2004 to mid-2006. However, the pickup in consumption in July and auto sales in August is less consistent

with this scenario, since the scenario implies a correction of previous over-consumption by US consumers.

The decreased probabilities of the *Productivity* scenarios are mainly the result of the increased weight on the *Over-Tightening* scenario. We also decreased the weight slightly on both scenarios because the upward revision to productivity in 2007Q2 is more supportive of the trend productivity assumption in our central scenario, as was the most recent change in the probabilities in the Kahn-Rich model.

As can be seen in Exhibit C-1, we have decreased the weight on the *High Global Demand* scenario because of more moderate growth in foreign economies (with the exception of China) and the possible effects of financial turmoil on foreign economies. The persistent high oil price and continued upward movement in Chinese inflation, however, have led us to maintain some weight on this scenario.

All of the above changes imply a slightly lower probability of remaining in the central scenario over the forecast horizon [Exhibit C-1], which increases the overall uncertainty around our inflation and output projections over the forecast horizon, particularly in 2008 [Exhibit C-3]. The results of the change in the risk assessment across scenarios and the increased scale of downside risks are to make the risks to inflation balanced and introduce large downside risks to output, as indicated by the difference between our central scenario projections and the expected value of the forecast distributions. In addition, the changes in the 5th and 95th percentiles of the forecast distributions from the previous to the current Blackbook indicate that the risks of low outcomes for inflation and output have increased dramatically. The effects of the changes in our risk assessment can be also be seen in the probability of core PCE inflation below 2% and probability of a continuing expansion [Exhibit C-3]. In particular, the probability of two consecutive negative quarters of growth in 2008 has risen to high levels. Most of the change in these probabilities is attributable to the additional weight on the *Over-Tightening* scenario.

Finally, Exhibit C-4 depicts the evolution of our forecast over the past year and its performance relative to released data. Both output and inflation surprised us on the downside. The output surprise, however, was larger than the inflation one, despite having downside risk to the output forecast and upside risk to the inflation forecast in September 2006. The source of the output surprise is a combination of the larger-than-anticipated correction in housing and the NIPA revisions to earlier data. This exhibit also shows that we currently are assessing much more downside risk to output than we did last September, as evidenced by the differences between the central scenario projections and expected values.

The downward surprise to inflation was smaller. One explanation for the faster-than-expected decline in inflation is the unwinding of transitory factors that increased inflation in 2006H1. Given the uncertainty around the central scenario inflation forecast, such a quicker unwinding was not unexpected. Last September we believed there to be upside risks to the inflation forecast; we now assess them to be balanced.

4. Forecast Comparison

4.1 Greenbook Comparison

The Greenbook continues to project lower output growth and higher inflation than we do for 2007 and 2008. Although we both made downward revisions to our growth rate projections, the discrepancies between our forecasts still remain and have even widened for 2008. The Greenbook projection has core PCE inflation flat at slightly below 2% through 2007, 2008, and 2009, while we expect a somewhat more pronounced moderation because of our assumptions of a less persistent inflation process, contained inflation expectations, and a 1.5% core PCE inflation objective.

Conditioning assumptions. The Board staff changed their FFR assumption from that of the August Greenbook, which had assumed a FFR fixed at 5.25% through 2008. They now assume that the target FFR will be lowered 25 bp at both the September and October meetings and then stay at 4.75%. This path is above the market-implied path and the path

assumed in this Blackbook; our assumption is that the FOMC will cut rates 50 bp at the September meeting and then cut rates another 50 bp to 4.25% over the next year.

Another important change in the September Greenbook is that the Board staff lowered their NAIRU estimate from 5.0% to 4.8%. Consistent with this adjustment, the Board staff increased their estimate of the potential output level and lowered their estimate of the output gap. In particular, they reduced their estimates of the 2006 and 2007 output gaps fairly significantly. They also project that the output gap will be essentially zero by the end of this year, which is consistent with our forecast; and then expect output to fall short of potential in 2008 and 2009, which is contrary to our forecast.

The Board staff continues to assume that the labor force participation rate declines gradually to 65.6% through 2009, while we assume a stable participation rate of 66.0%.

The Board's foreign growth outlook for 2007 is similar to our forecast. We both expect foreign growth to slow to 3.2% from 3.9% percent last year (using our weights). The Board lowered its 2007Q2 foreign GDP growth forecast by 0.4 percentage points in light of weak Q2 data (e.g., Japan) and heightened uncertainties, while we lowered our estimate by 0.3 percentage points. The forecasts, however, diverge slightly in 2008, with the Board having significantly slower growth for Canada and Mexico, consistent with its outlook that US growth will slow in 2008 relative to 2007.

Inflation. The Board staff's expected trajectory for core PCE inflation is lower relative to that of the August Greenbook. Core PCE inflation is projected to be 1.9% for both 2007 (Q4/Q4) and 2008, 0.1 percentage points lower than the August Greenbook forecast. The lower core PCE inflation forecasts stem from their changed view on resource utilization; they now view product and labor markets as being less tight (consistent with their lower NAIRU estimate), implying a reduction in inflationary pressures. Nevertheless, the Board core PCE inflation projections are higher than our forecasts for 2007 and 2008.

With regard to overall inflation, our 2007 total PCE inflation forecast is 0.1 percentage points lower than the Board staff projection of 2.9%, while our 2008 total PCE inflation forecast is 0.2 percentage points higher than the Board staff's 1.9% projection. The difference between these forecast largely reflects different assumptions about prospective moderation in food price inflation.

Real activity. The Board staff's output growth forecasts for 2007 and 2008 is somewhat different from the August Greenbook and markedly lower than our current staff forecasts. Output growth is projected to be 2.0% (up from 1.9%) for 2007 (Q4/Q4) and 1.7% for 2008 (down from 2.0%). Our staff forecast for GDP growth is 0.4 percentage points higher than the Board projection for 2007 and 0.9 percentage points higher for 2008. The differences between the two forecasts reflect differing estimates of potential GDP growth rates as well as a deeper cyclical slowing in the Greenbook forecast compared to our projections. The sources of the slowing in the Greenbook forecast are consumption spending, reflecting wealth effects from declining real home prices and effects from tighter and more expensive credit; and business fixed investment, resulting from weaker final sales and tighter credit conditions.

The Board staff estimate of the 2007 unemployment rate is 4.7%, consistent with the Board staff's lowered NAIRU assumption. They expect the unemployment rate to increase to 4.9% in 2008, while we project unemployment rate to remain at 4.6%. This discrepancy is consistent with their forecast of a deeper cyclical slowing in real activity than our outlook in late-2007 and 2008.

The Board staff also projects substantially lower employment growth for 2008 than our forecast. They project monthly non-farm payroll gains of 75,000 in 2008, while we expect 125,000 per month over the same horizon. Besides the slower aggregate growth forecast in the Greenbook, the difference reflects the Board staff assumption of a declining labor force participation rate.

The Greenbook 2007H2 trade deficit outlook is similar ours. However, while the Greenbook predicts a surge in exports (over 13%) in 2007Q3, we expect sustained export growth of 7% across 2007Q3 and 2007Q4. This discrepancy accounts for the Greenbook's 0.3 percentage point higher growth contribution from trade in 2007Q3 and 0.4 percentage point lower contribution from trade in 2007Q4 relative to our forecasts.

Uncertainty around forecasts. The uncertainty around the Board forecasts has not changed substantially since August, while the uncertainty around the FRBNY forecasts has increased notably, particularly for output.

The 70% probability intervals for inflation in 2007 and 2008 are shown in Table 1 (left panel below), with the August values in parentheses. For core PCE inflation, the probability intervals around the two forecasts have about the same width in 2007 and 2008. For 2009, however, the Board's forecast has substantially higher uncertainty; the width of our 70% probability interval is 1.4 percentage points compared to 2.2 percentage points for the Greenbook (in part, this reflects the greater persistence in the inflation process underlying the Greenbook forecast).

The 70% probability intervals for output in 2007 and 2008 are shown in Table 1 (right panel below), with the August values in parentheses. For output, the probability interval around the Board's forecasts is essentially unchanged since August for both 2007 and 2008 forecasts. On the other hand, the probability interval for the FRBNY forecast has widened notably, especially for the 2008.² The probability interval has shifted downward substantially for our 2008 forecast, reflecting an increase in the downside risks to output in the FRBNY forecast. Our probability intervals for real GDP growth are wider than the Greenbook intervals for 2007 (1.8 compared to 1.5 percentage points) and for 2008 (3.4 compared to 3.2 percentage points). For 2009, both forecasts have similar degrees of uncertainty.

² This discrepancy is a reflection of the differences in our construction of forecast probability distributions.

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>
2007	1.4-2.1 (1.6-2.3)	1.6-2.2 (1.7-2.3)	1.3-3.1 (1.7-3.2)	1.2-2.7 (1.2-2.7)
2008	1.0-2.5 (1.3-2.7)	1.2-2.6 (1.3-2.7)	0.1-3.5 (1.1-3.8)	0.1-3.3 (0.4-3.5)
2008	1.0-2.4 (1.1-2.5)	0.8-3.0 (N/A)	0.6-3.8 (1.0-3.8)	0.4-3.9 (N/A)

To gauge the importance of the differences between our outlook and the Greenbook forecasts, we calculate the percentile of the *Baseline* Greenbook forecasts for inflation and output in our forecast distributions. The results are shown in Table 2, with August values in parentheses. As in August, our forecasts of core inflation are fairly close when we account for our risk assessment, with the exception of 2010, where the gap remains quite wide. The increase in the gap at this horizon largely reflects our different inflation objective assumptions.

The discrepancy between our outlooks for output growth has narrowed since August, particularly for 2007. The closing of the gap between the two forecasts reflects the increased uncertainty around our point forecasts. Despite the substantial differences in our point forecasts, our outlooks look more similar once we take the increase in downside risk and uncertainty to our growth forecast into account.

Table 2: Percentile of Greenbook Forecast in FRBNY Forecast Distribution

	Core PCE Inflation	Real GDP Growth
2007	59 (59)	41 (22)
2008	54 (48)	47 (41)
2009	59 (57)	50 (44)
2010	69 (67)	47 (40)

Alternative Greenbook forecasting scenarios. The Greenbook alternative simulations focus primarily on the potential negative effects on aggregate demand of a steep decline in prices and activity in the housing market as well as the effects of a credit crunch. In the first scenario, *Greater housing correction (GHC)*, residential investment is 10% below the Greenbook baseline projection by 2008, while home prices drop 10% in both 2007 and 2008. Negative wealth effects from lower home prices and multiplier effects on consumption and investment spending decrease GDP growth to 1.5% in 2008 and 2% in 2009, while the unemployment rate increases to 5%. In response to slower growth, the FFR drops to 4.25% in 2009. This scenario is the same as one discussed in the August Greenbook.

The next alternative scenario builds on the *Greater housing correction* conditioning assumptions for the housing market. In that one, *GHC with larger wealth effect*, the fall in home prices is accompanied by a wealth effect that is twice as large as that under the baseline, which causes a further reduction in consumption growth. The overall effects on GDP and inflation are not significantly different than under the *GHC* scenario, though, thanks in part to a more sustained fall in the FFR of below 4% in 2009.

Another scenario, *Bank capital crunch*, attempts to examine the effects of the recent financial market turmoil on the ability of banks to lend. The effect of this fallout on spending is calibrated to be roughly consistent with the weakness in demand experienced during the “headwinds” period of the early 1990s. As a result, the economy falls into a recession starting at the end of 2007. In response, the FFR drops close to 3% by the middle of 2008, significantly below the current expected market path, while inflation is only slightly lower than in the benchmark Greenbook forecast. Interestingly, output growth recovers quickly under this scenario, so much so that the level of output at the end of 2009 is virtually the same as under the original *GHC* scenario, unemployment is lower, and the FFR is close to neutral.

Some of the real weakness included in the Greenbook’s baseline projection for the end of 2007 and 2008 reflects fairly judgmental assumptions on the effects of the current

financial market turbulence on spending. Two of the alternative scenarios revolve around the possibility that those effects will not be realized, leading to a *Faster Rebound* and *Faster Rebound with Stronger Demand*. In terms of GDP growth, these scenarios are closer to our own central projection, but they imply a rise in the FFR in 2008 and stable inflation around 2%.

4.2 Comparison with Private Forecasters

Our real growth forecasts continue to be somewhat different from the projections of private forecasters. In contrast, our near-term outlook for inflation is quite similar to the projections of private forecasters.

In general, our 2007 quarterly and 2007 (Q4/Q4) forecasts are more optimistic than the projections of private forecasters. Our 2007Q3 real GDP growth forecast of 2.8% (annual rate) is 0.2, 0.4 and 0.3 percentage points higher than the Macro Advisors, Blue Chip and Median SPF (released on 8/14/2007) forecasts, respectively. The difference between our real growth projections and those of private forecasters is mostly due to our expectation of a larger improvement in net exports in 2007Q3.

Our 2007Q4 real GDP growth forecast of 2.4% (annual rate) is 0.4 and 0.3 percentage points above the Macro Advisors and Blue Chip forecasts, respectively, as we continue to expect somewhat stronger inventory investment than private forecasters.

There is little difference between our 2007 (Q4/Q4) and 2008 (Q4/Q4) real growth forecasts and those of private forecasters. Our real GDP forecast of 2.4% (annual rate) for 2007 (Q4/Q4) is only 0.1 percentage point above the Macro Advisors and Blue Chip forecasts. Our 2008 (Q4/Q4) real GDP growth forecast of 2.6% (annual rate) is 0.1 percentage point above the Macro Advisors projection and 0.1 percentage point below the Blue Chip forecast.

With regards to inflation, our 2007Q3 core CPI forecast of 2.3% (annual rate) is the same as the Median SPF (released on 8/14/2007) projection and 0.3 percentage points below

the Macro Advisors forecast. The Macro Advisors core CPI forecasts are also above ours for 2007 (Q4/Q4) and 2008 (Q4/Q4), the difference likely stemming from differences in assumed energy price pass-through into core inflation as well as in assumptions about the level of resource utilization.

5. Robustness of Policy Recommendation

5.1 Sensitivity to Alternative Scenarios and Policy Rules

Our policy recommendation has changed from the August Blackbook and is below the policy prescription of the *Baseline* rule in four of the five alternative scenarios [Exhibit D-1]. The exception is the *Over-Tightening* scenario, wherein the *Baseline* rule prescribes quicker rate cuts than in our policy recommendation. Under three of the four other alternative scenarios and our central scenario, the *Baseline* rule is consistent with at least one 25 basis point rate cut over the next three meetings. The prescription under the *High Global Demand* scenario is more ambiguous. One source of the change in our policy recommendation is a reduction in our neutral rate assumption in all our policy rules. We now center the range for the neutral rate at 4.25% versus 4.50% in the August Blackbook.

The real FFR paths using the *Baseline* rule differ more significantly across the five alternative scenarios, reflecting the differences in inflation outcomes in the alternative scenarios and the resulting policy stances [Exhibit D-1]. Notably, the *Over-Tightening* scenario implies the largest drop in real interest rates. The distribution of the FFR under the *Baseline* rule indicates a probability of about 0.05 of very sharp drops in the FFR; this probability was similar in March [Exhibit D-5].

We consider the same three alternative policy rules that we considered in the June and August Blackbooks: the *Dove* rule, the *Opportunistic Disinflation* rule, and the *Outcome-based* rule. The *Outcome-based* rule, combined with our downside risk to output growth and our relatively benign inflation outlook, continues to prescribe cuts in the FFR [Exhibit D-2] under all scenarios except *High Global Demand* [Exhibit D-3]. As in past Blackbooks, this rule implies considerably more uncertainty about the FFR going forward [Exhibit D-5].

The prescription of the *Opportunistic Disinflation* rule, which keeps the FFR above 4.50% over the next two years under the central scenario and all of the alternative scenarios except *Over-Tightening*, is well above our policy recommendation [Exhibit D-3]. Following this rule would better preserve Fed credibility, if ex post it appeared that either the *Productivity Slump* or the *Effects of Overheating* scenarios explained recent developments well. However, this behavior of the FFR under this rule depends on the assumption that the financial market turmoil does not spill over into the real economy and lead to sharper declines in real growth and inflation. This rule implies very little uncertainty about the future FFR [Exhibit D-5].

The *Dove* rule is designed to be very sensitive to drops in output below potential. Thus, with the increase in the downside risk to real activity, it prescribes cuts in the FFR in 2007 and 2008 [Exhibits D-2 and D-3] under all of our scenarios. As can be seen in Exhibit D-5, it places very little probability on a FFR above 5.25% over the next few quarters and considerable probability on a FFR below 4.50% over the forecast horizon.

The special topic, *Is Current Monetary Policy Restrictive?*, investigates the policy prescriptions of two estimated structural models. One of the models, known as the DSGE-VAR, gives a very similar prescription to our recommendation. The other model, the FRBNY-DSGE, gives a prescription closer to the *Opportunistic Disinflation* rule.

Special Topic

Is Current Monetary Policy Restrictive?

Marco Del Negro

Redacted

This special topic uses the FRBNY-DSGE and DSGE-VAR models (see the special topic, *Has the recent data changed our inflation forecasts? An answer from structural models*) to assess the stance of monetary policy given current macroeconomic conditions. We then examine whether current monetary policy is restrictive, and, if so, how restrictive it is.

We analyze these issues by performing the same counterfactual exercise in both models: we shut down all policy shocks of the last four quarters, where policy shocks are defined as exogenous deviations from the estimated policy reaction function. The DSGE-VAR model has only one type of policy shock: erratic deviations of the actual FFR from its fitted value according to the estimated policy rule. This type of shock is in the FRBNY-DSGE model and was the focus in the counterfactual exercise for 1998 (see the special topic, *A surprise FFR cut? A counterfactual analysis of the 1998 policy move*). However, the FRBNY-DSGE model has an additional policy shock, which is interpreted to capture changes in the inflation target.

In this analysis, the DSGE-VAR model suggests

that the current stance of policy is restrictive: assuming no policy shocks over the last year, the model implies that the current FFR should be roughly 4.75%; i.e., policy has been and currently is about 50 basis points more restrictive than what the model's estimate rule would warrant. Therefore, according to this model, a policy consistent with historical behavior would respond to the recent decline in inflation with a proportional decline in policy rates.

Conversely, the FRBNY-DSGE model estimates that the current stance of policy is not restrictive, as the model explains much of the recent decline in inflation as negative shocks to the target inflation rate. Because the FFR responds to the difference between inflation and its target under the FRBNY-DSGE policy rule, its path has not changed much because both inflation and the target have declined, resulting in little change in their difference. Under the FRBNY-DSGE model, the current decline in inflation can be interpreted as an example of "opportunistic disinflation" (e.g., as arguably occurred in the early nineties), where policymakers implicitly allow a decline in inflation to enable a decline in inflation expectations and in the implicit long-run inflation objective.

5.2 Comparison to Market Expectations

The FFR path priced into financial markets has moved down dramatically since the August Blackbook; the expected FFR for May 2009 is now about 4.15%, compared with a level of more than 5.0% before the June FOMC meeting. In the last year, discrepancies between the market path and our prescriptions mainly have been at horizons of six months or more. This cycle there is more disagreement on policy in the near term. Even with a large increase in the downside risk to real activity and a more benign inflation outlook, only the recommendation prescribed by the *Outcome-based* rule has moved down as much as the market-implied path for horizons up to six months.

However, there are two important caveats to this assessment. First, due to the tensions in short-term money markets, inter-bank interest rates have been trading away from the FFR target. Second, there has been a large re-pricing of risk by financial markets. Therefore, the translation of market prices on Fed funds and Eurodollar derivatives into market expectations of future policy is more fragile than usual.

The changes in prescription according to our *Baseline* rule under the central scenario and under the mean of our forecast distribution are similar, as both have shifted down considerably over the inter-meeting period. In part, this shift is due to removing the inertia of the FFR from the current to the next quarter that we typically incorporate in the *Baseline* rule and its variants. Because the August 17th FOMC statement allowed the possibility of more rapid changes in the FFR, such restrictions seemed less plausible (this is discussed more in the appendix). The market-implied path remains below both of these paths [Exhibits D-1 and D-2]. The change in the *Baseline* rule prescription under the central scenario mainly reflects the change in the neutral rate assumption and the changes in the short-term forecast. For the *Baseline* rule evaluated under the expected value of the forecast distribution (i.e., reflecting the change in the risk assessment), the drop in the prescription is large and similar in magnitude to the change in the market path. It is also closer to the level of the average expectation in the primary dealer survey.

The path prescribed by the *Opportunistic Disinflation* rule under the expected value of the forecast distribution is now well above the market path. This pattern is the opposite of the situation in June, when the *Opportunistic Disinflation* path almost exactly matched the market path over most of the forecast horizon [Exhibit D-2]. The path prescribed by the *Dove* does not fall as quickly as the market path initially, but gives a similar value of FFR for the end of 2008. Our *Average* rule, which weights the *Baseline* rule and the two variants to match the market path as closely as possible, now places 0% of the weight on the *Opportunistic Disinflation* rule, 10% of the weight on the *Baseline* rule, and 90% of the weight on the *Dove* rule; their respective weights are unchanged from the August Blackbook [Exhibit D-4].

The recent movement of the market path relative to the prescriptions of our *Baseline* rule and the two variants, *Opportunistic Disinflation* and *Dove*, suggests that the shift in the market path reflects market participants' continued reassessment of the FOMC's reaction function. In particular, they may believe the reaction function has shifted in light of the recent financial market turbulence and lower inflation. It is interesting that the market path is now consistent with the prescription of the *Outcome-based* rule combined with our risk assessment. With inflation falling solidly into the perceived comfort zone and the history of the FOMC lowering rates in periods of financial turmoil (e.g., 1987 and 1998), markets appear to think the FOMC may have become more sensitive to low-probability events that may lead output to fall well below potential.

The implied volatility around the market-implied path has increased since the August Blackbook and is comparable to the uncertainty around the *Dove* rule and the near-term uncertainty around the *Baseline* rule [Exhibit D-5]. Furthermore, the implied distributions of most of the rules capture most of the negative skewness priced into markets. Notably, the negative skewness implied by our *Baseline* rule in the medium- and long-term horizons appears larger than what is currently priced into markets [Exhibit A-6]. This can be reconciled to some extent by the lower market-implied expected policy path.

Overall, our analysis suggests that, holding market perceptions of the FOMC reaction function constant, the decrease in the level of market expectations and the increase in the market's implied volatility are mainly consistent with the large increase in downside risk to real activity and switch to balanced risk to inflation over the inter-meeting period.

6. Key Upcoming Issues

Three major changes to the macroeconomic landscape have occurred during the inter-meeting period. First, revisions to 2007Q2 core PCE inflation data along with the July CPI and PCE deflator readings further confirmed that inflation is moderating, dispelling some of the doubts expressed in the August Blackbook regarding the sustainability of this moderation. Consequently, we have reduced our near- and medium-term inflation forecasts and shifted to an essentially balanced risk assessment around our inflation outlook. This shift reflects a significant increase in the probability of the *Over-Tightening* scenario, a modest increase in the probability of the *Effects of Overheating* scenario, and a reduction to the weights of all other alternative scenarios, particularly the *High Global Demand* scenario.

Second, the August labor market report indicated a fairly sharp slowdown in job creation, with a decline in August payroll employment and sizeable downward revisions to June and July. This development, therefore, might be an initial sign that the puzzle we had been facing over the past year, that of rather sluggish aggregate growth with a well-maintained labor market, might be moving towards a less benign resolution, with employment growth slowing down with output. Housing market indicators also continued to be weak, indicating a more protracted housing slump than we had previously projected. As a result, we have lowered somewhat our real GDP growth projections for each of the next four quarters from those of the last Blackbook, leaving our 2007 (Q4/Q4) and 2008 (Q4/Q4) forecasts each 0.1 percentage points lower. More importantly, we have increased substantially the downside risks to real activity, primarily on account of the higher probability now placed on the *Over-Tightening* scenario.

Third, turbulence in financial markets has continued over the inter-meeting period, intensifying and spreading to markets fairly removed from subprime mortgages, such as the term inter-bank funding markets. In addition, spreads on corporate bonds and non-conforming mortgages have widened significantly, especially for riskier borrowers, while volatility remains elevated in many markets. These developments increase the probability of spillovers from weakness in housing and dislocations in financial markets into consumption and investment. The effects of such a spillover are captured by the *Effects of Overheating* and *Over-Tightening* scenarios.

In terms of policy, we recommend a 50 basis point cut in the FFR at the September 2007 meeting as part of a policy path that reduces the FFR over the next year to 4.25%, the midpoint of our neutral FFR range estimate. Roughly speaking, our *Baseline* rule attributes 25 basis points of easing to the modified central outlook for output and (especially) inflation. The additional 25 basis points of easing can be attributed to our lower assessment of the current neutral rate as well as the substantially larger downside risk to output growth.

Looking forward, we recognize that the current wide divergence between our central forecast for real growth and the mean of the forecast distribution cannot persist for long. Either some of the risks to growth will dissipate in the next few months, or our central forecast will need to be reduced. The issue for our forecast and policy recommendation is then what economic developments would prompt such a reassessment of our growth forecast.

A robust labor market has been one of the main pillars of the current late-stage expansion. The sustained growth in labor input through the spring, which enabled sufficient income growth to support consumer spending, was one of the key forces counteracting slower productivity growth and the drag from the contraction in housing. The employment report for August raised some doubts on the solidity of this pillar as a source of continued support for the expansion. If the recent deterioration in the labor market continues, our outlook would certainly be affected. In this respect, the weekly

readings on unemployment insurance claims will provide an important high-frequency indicator of labor market evolution.

The second important source of a possible revision to the growth outlook is the housing market. Residential investment now has fallen to such a degree that, short of a total collapse, it will begin to have a less dramatic impact on GDP growth directly. However, if real home prices dropped substantially and if expectations of continued declines took hold, the likelihood of a weakening in consumption would increase. In this respect, the substantial widening of interest rate spreads on non-conforming mortgages over the inter-meeting period is not an encouraging sign.

Finally, another area of potential concern is the external imbalance. In recent data releases, we have seen some signs that a rebalancing of the trade deficit may be starting, as stronger exports have been coupled with weak imports. If this dynamic continues to be gradual, with most of the adjustment carried by stronger exports, it will represent a positive contribution to the strength of the economy. However, external adjustments rarely happen so smoothly and tend to be driven instead by a drop in imports, often brought about by a general weakening of the domestic economy. From this perspective, the evolution of the external balance in the forthcoming months might provide useful clues on the underlying strength of domestic demand. The jury is still out on which of the two dynamics outlined above has driven the adjustment that has already occurred.

In terms of policy, the main challenge going forward will be to balance the response to a possible rapid deterioration of the real outlook with the need to solidify the recent gains in terms of lower inflation. A crucial input into this balancing act will be the ability to distinguish the *Effects of Overheating* and *Productivity Slump* scenarios from the unfolding of the *Over-Tightening* scenario. In the first case, policymakers would face a difficult tradeoff between growth and inflation. In the case of *Over-Tightening*, however, the policy recommendation more clearly would be a sequence of rate cuts. For this reason, news on real developments should be considered jointly with those on inflation to update our assessment of the relevant risks and the appropriate policy response.

A further and largely independent challenge for policy is to calibrate an appropriate response to the recent developments on financial markets. One useful guideline in this respect, which we attempted to follow in this Blackbook, is to focus on the ultimate economic goals of stable inflation and maximum sustainable growth, without forgetting that the attainment of both those goals could be undermined by a protracted period of turbulence in financial markets. In concluding the August Blackbook, we observed that “if nervousness on the markets translated into a lack of liquidity, rather than just into a surge in volatility, a policy intervention might be necessary.” Since then, we have experienced a significant reduction in liquidity, especially in some segments of financial markets. The main policy intervention initially devised to address this problem was a reduction of 50 basis points in the discount rate, along with some adjustments in the terms of that lending. Since that intervention, the financial market situation has stabilized to a degree, but strains remain in a number of markets. One important task for the months ahead will be to monitor the extent to which these problems, if they persist, will be a source of macroeconomic headwinds, and to ask if other policy interventions, including perhaps additional cuts in the FFR, might help to mitigate those headwinds.

Special Topic

A Surprise Rate Cut? A Counterfactual Analysis of the 1998 Policy Move

Andrea Tambalotti Redacted

In the fall of 1998, faced with a bout of turbulence in financial markets that many commentators have compared to the one we are currently experiencing, the FOMC cut the fed funds rate (FFR) by 75 basis points. The move was implemented with three successive 25 basis point cuts: one at the September 29 meeting, the next in an inter-meeting move on October 15, and the last at the November 17 meeting. This special topic uses the FRBNY DSGE model (described in the October 2006 Blackbook special topic, *The DSGE at Work: What is Behind the Productivity Slowdown?*) to analyze these rate cuts and their effects on output and inflation.

In particular, we ask two questions. The first is: to what extent was the observed policy path a deviation from the interest rate rule estimated by the model to describe the “historical” behavior of the FOMC? The answer is illustrated in Figure 1. The yellow line describes the actual path of the effective FFR, which fell from 5.5% to 4.75% in 1998Q4. The red line shows what would have happened to the FFR if the FOMC instead had followed the interest rate rule that describes its average systematic behavior over our sample (1984 to 2007).

According to this rule, the Committee reacts smoothly to deviations of core inflation from target and of output growth from its potential, as in the inertial Taylor rules used in Exhibit D of the Blackbook.

According to the estimated rule, the FFR would have fallen about 25 basis points in 1998Q4 (red line), as compared to the actual 75 basis point decline (yellow line). This result suggests that a large fraction of the cut implemented by the FOMC represented a deviation from the estimated rule. In fact, this is the third largest such deviation out of the approximately one hundred in our sample. As a result of this unusual deviation, the FFR observed in 1998Q4 is at the edge of the forecasted 75% probability interval (blue shaded region). This finding is consistent with the anecdotal accounts of the FOMC’s policy moves in the fall of 1998, which attribute them in part to the desire of the Committee to preempt the possible spillovers of the financial markets’ turbulence onto the real economy, even in the absence of a directly observable deterioration of the macroeconomic situation (an example of the so-called “risk management approach”).

The second question we ask is: what would have happened to GDP growth and core PCE inflation if the FOMC had adhered to its historical rule instead? The answer is: not much. According to the model, without the additional intervention of the Fed, GDP

growth would have been close to one percentage point lower than it actually was in 1998Q4 (Figure 2). However, because of the economy's strength at the time, growth would have remained well above the model's estimate of its long-run average (3%). Moreover, this deterioration would have been partially reversed in the first half of 1999, when the counterfactual (red line) is above the actual path (yellow line). At the same time, the consequences for core PCE inflation would have been negligible (Figure 3).

One very important caveat in interpreting these results is that our model in its current form is too simple to capture fully the interaction between financial turmoil and macroeconomic developments that was the apparent motivation for the 1998Q4 policy. The only channel through which such an interaction might appear in the model is a fall in the natural real rate, which is in fact captured by our estimates. However, this fall in the natural rate is quantitatively modest. Furthermore, the model does not incorporate features that could amplify the effects of such a shock on economic activity, in a manner consistent with the concerns expressed by Chairman Greenspan and the Committee at the time. Nevertheless, this counterfactual exercise is useful because it provides a best case scenario for the possible consequences of withholding the interest rate cut. Including a

channel through which financial market turbulence could have a larger effect on the real economy would put a "normal" policy reaction in worse light. How much worse, unfortunately, this model cannot say.

Figure 1: Effective Federal Funds

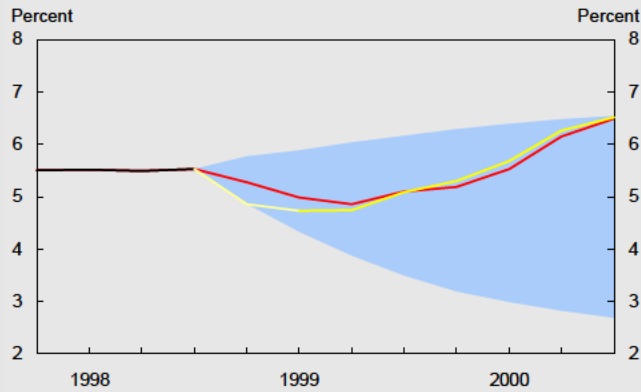


Figure 2: Real GDP Growth

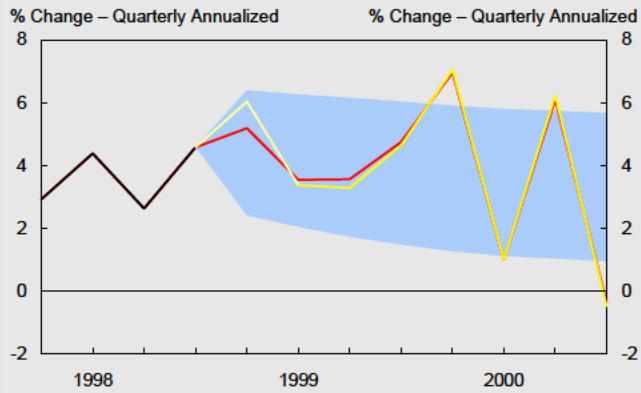
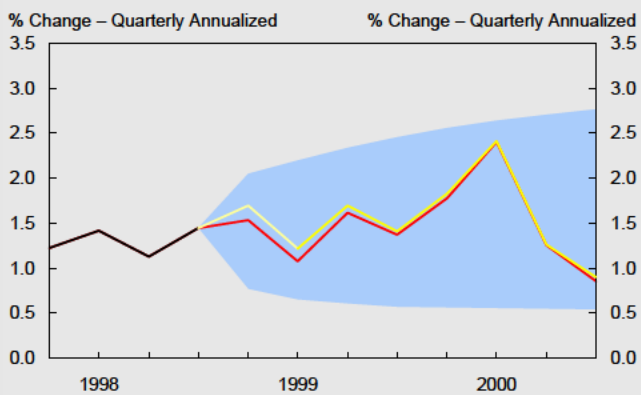


Figure 3: Core PCE Inflation

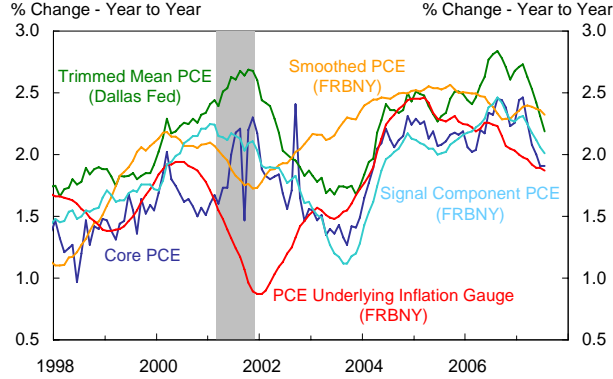


The black line reflects the path prior to the FFR cuts, while the yellow line reflects the actual path after the FFR cuts. The red line reflects the counterfactual path simulated by the DSGE under the assumption that the FFR does not deviate from the estimated rule. The shaded areas reflect the 75% probability intervals around each forecast as of 1998Q3.

A. Significant Developments

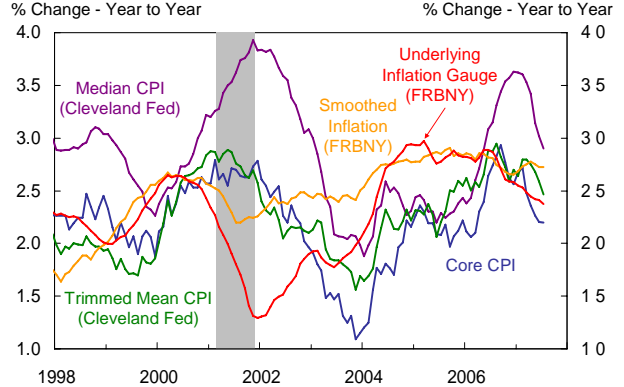
Exhibit A-1: Measures of Trend Inflation

Alternative Measures of PCE Inflation



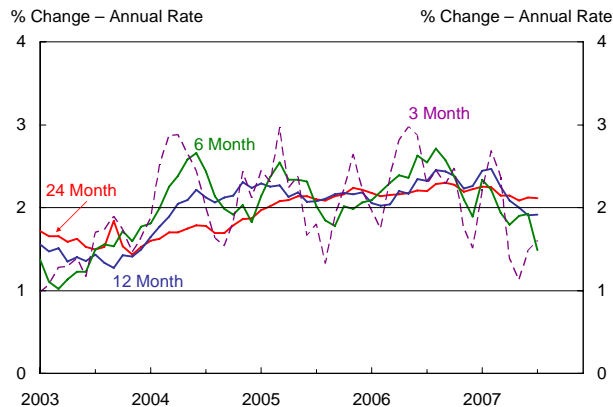
Source: Bureau of Labor Statistics, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Alternative Measures of CPI Inflation



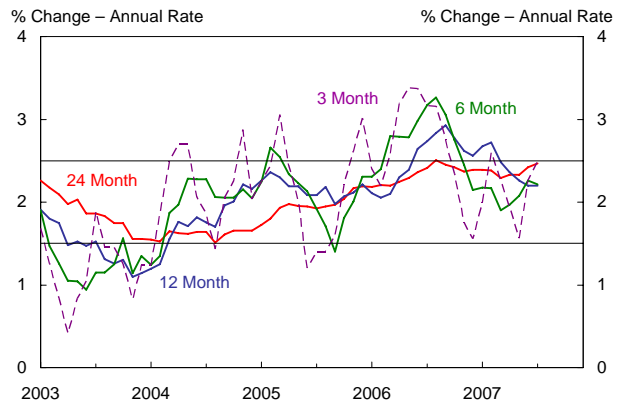
Source: Bureau of Labor Statistics, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Core PCE over Various Horizons



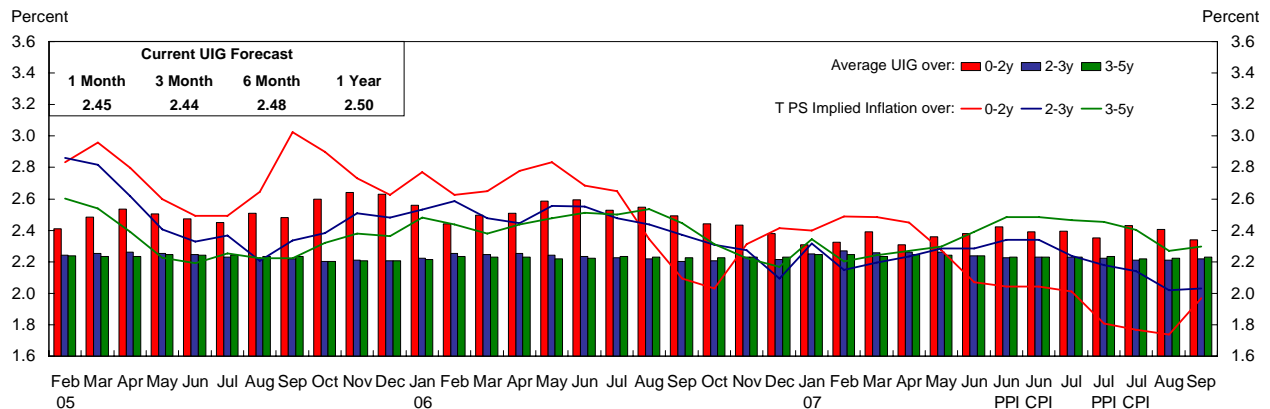
Source: Bureau of Economic Analysis

Core CPI over Various Horizons



Source: Bureau of Labor Statistics

Exhibit A-2: Underlying Inflation Gauge (UIG)

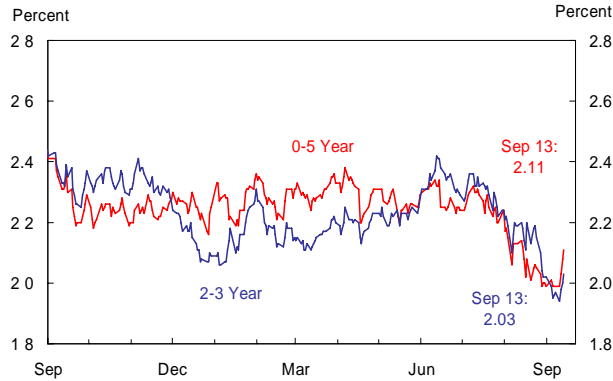


Source: MMS Function (FRBNY), Federal Reserve Board, and Swiss National Bank

A. Significant Developments

Exhibit A-3: Implied Inflation

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



TIPS Implied Inflation: 4-5, 5-10 Year Horizons

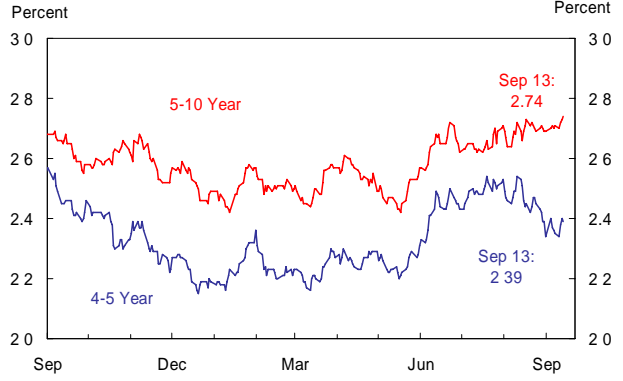
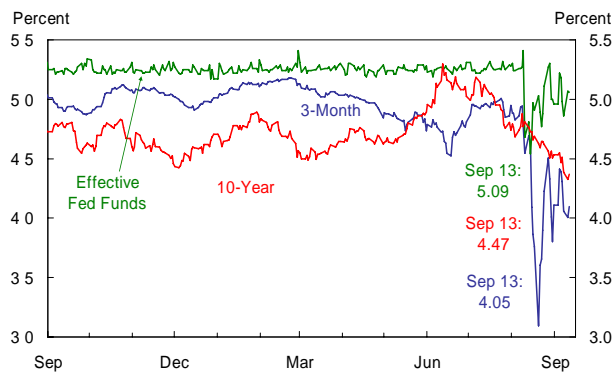
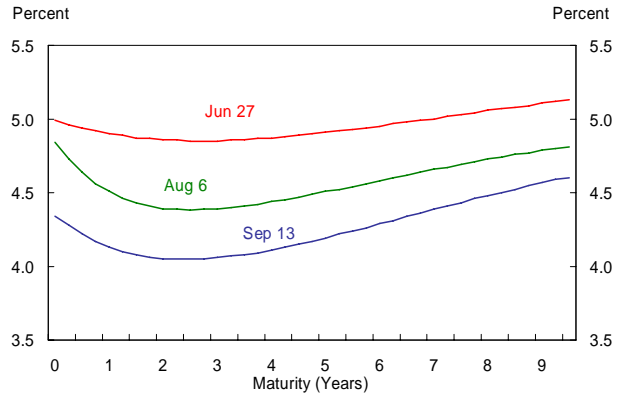


Exhibit A-4: Treasury Yields

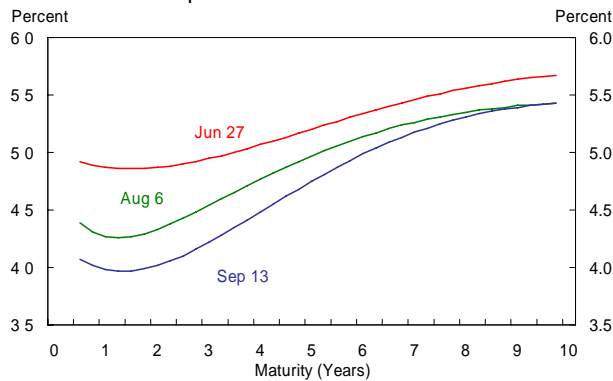
Short- and Long-Term Rates



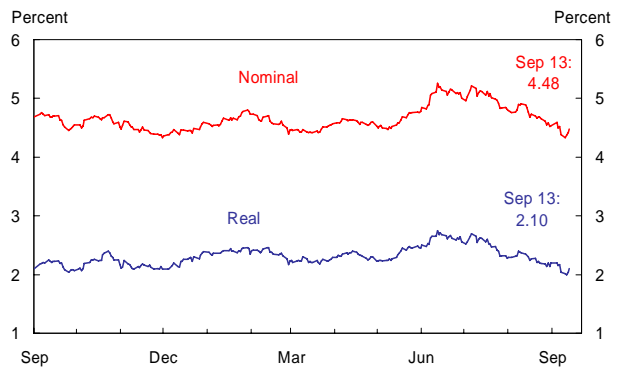
Yield Curves



Yield Curves: Implied One-Year Forward Rates

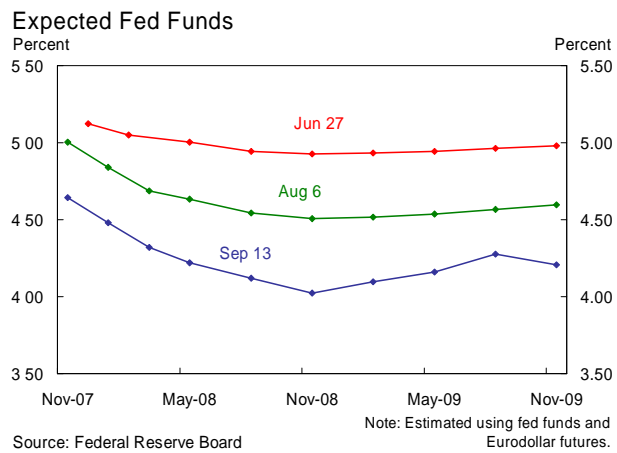


4-5 Year Forward Rates



A. Significant Developments

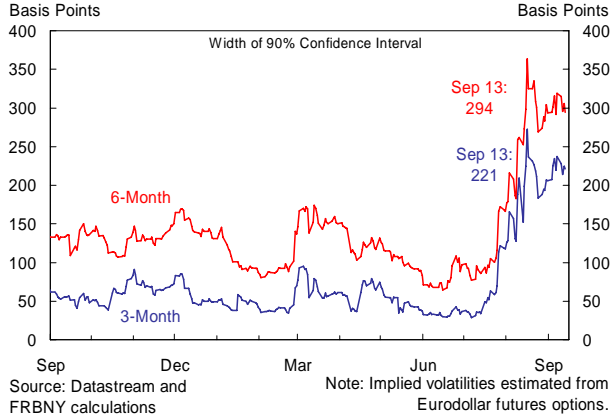
**Exhibit A-5:
Policy Expectations**



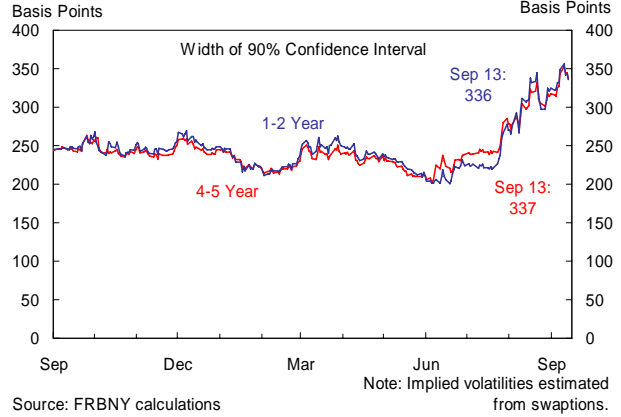
A. Significant Developments

Exhibit A-6: Policy Uncertainty

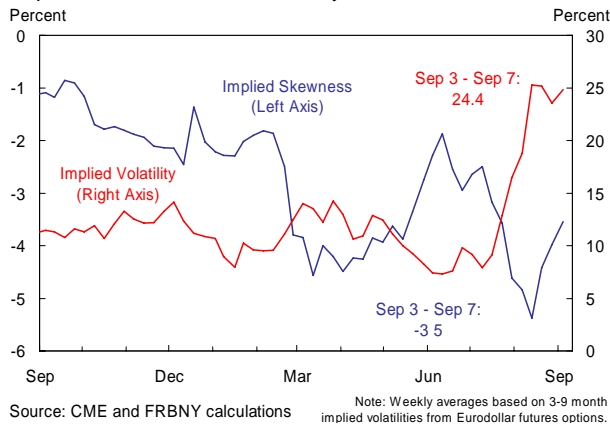
Interest Rate Volatility: Short-Term



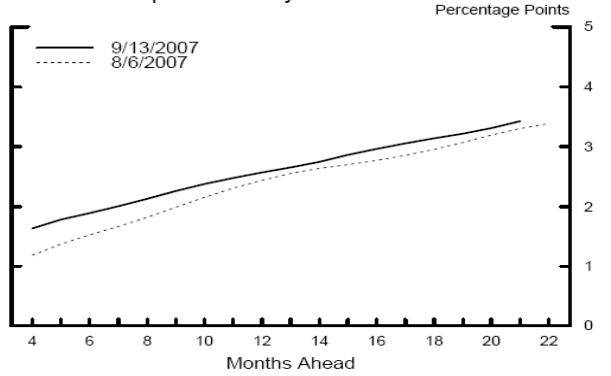
Interest Rate Volatility: Long-Term



Implied Skewness and Volatility



Eurodollar Implied Volatility Term Structure*

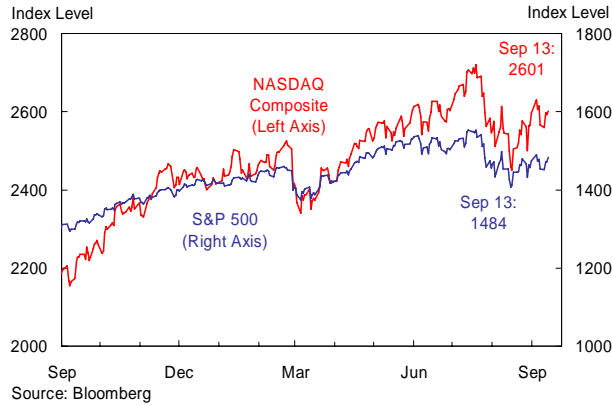


*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

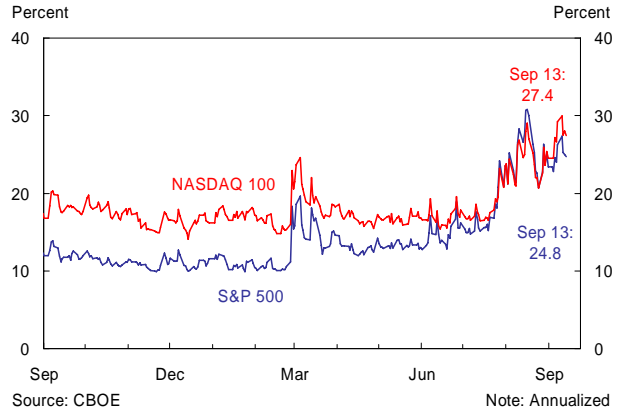
A. Significant Developments

Exhibit A-7: Equity Markets and Corporate Credit Risk

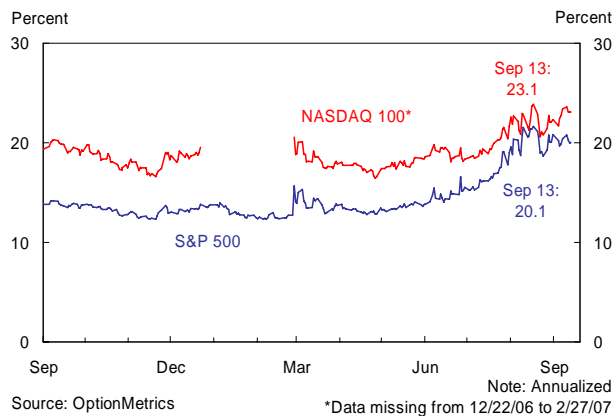
Equity Market Performance



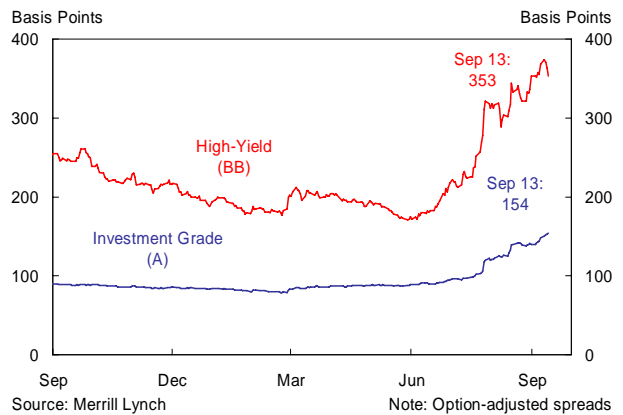
Implied Volatility: 1 Month



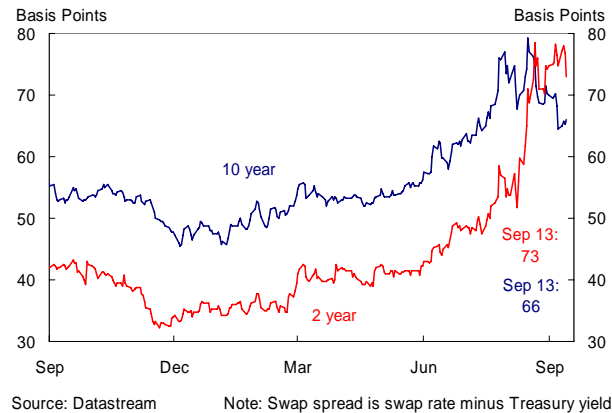
Implied Volatility: 12 Months



Corporate Credit Spreads



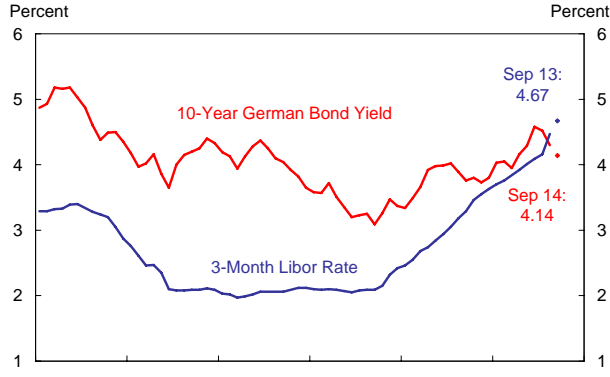
Swap Spreads



A. Significant Developments

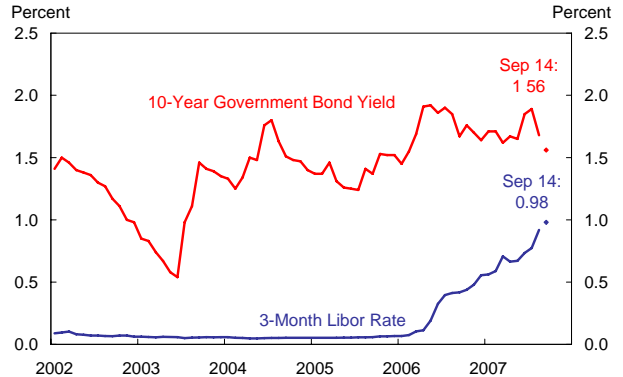
Exhibit A-8: Global Interest Rates and Equity Markets

Euro Area Short and Long-Term Interest Rates



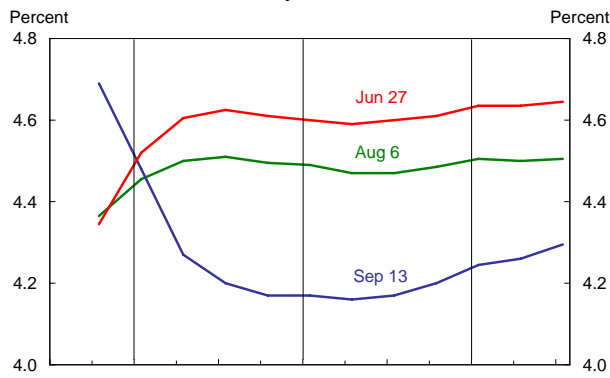
Source: BIS and Federal Reserve Board Note: Data are monthly averages.

Japan Short and Long-Term Interest Rates



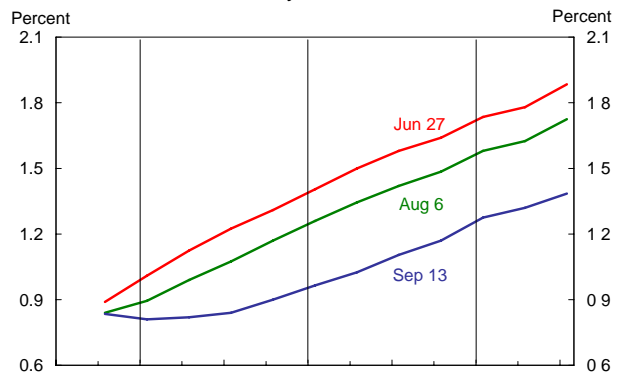
Source: Bloomberg and Federal Reserve Board Note: Data are monthly averages.

Three-Month Eurocurrency Futures Rates: Euro



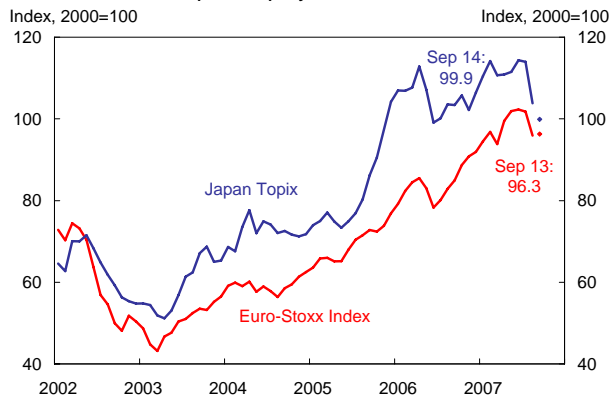
Source: Datastream

Three-Month Eurocurrency Futures Rates: Yen



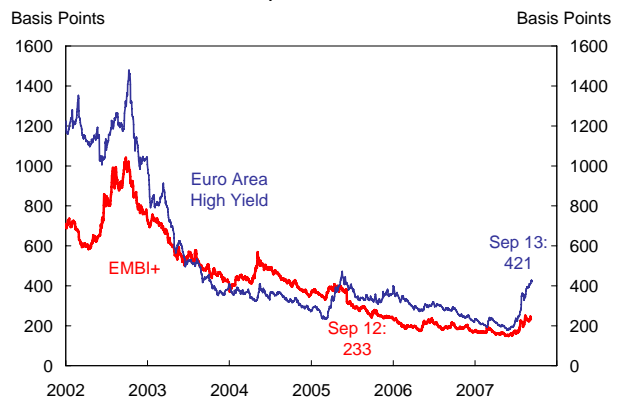
Source: Datastream

Euro Area and Japan Equity Indices



Source: BIS and Bloomberg Note: Data are monthly averages.

EMBI+ and Euro Area Spreads

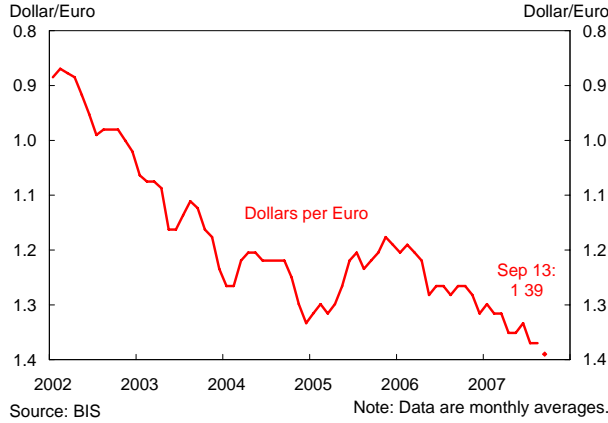


Source: Bloomberg Note: Data are daily observations.

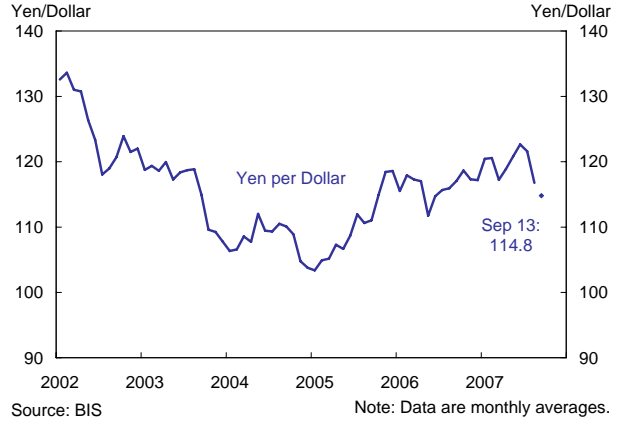
A. Significant Developments

Exhibit A-9: Exchange Rates

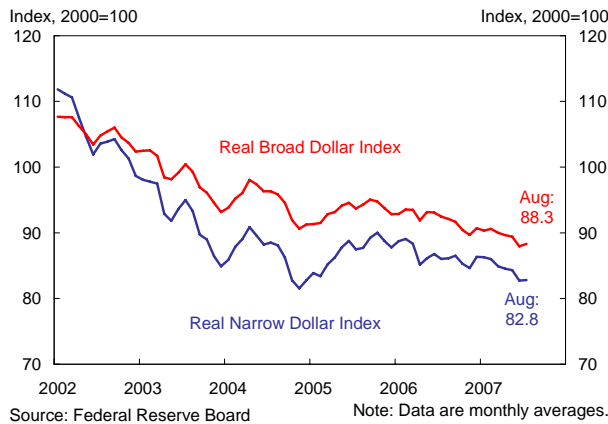
Dollar-Euro Exchange Rate



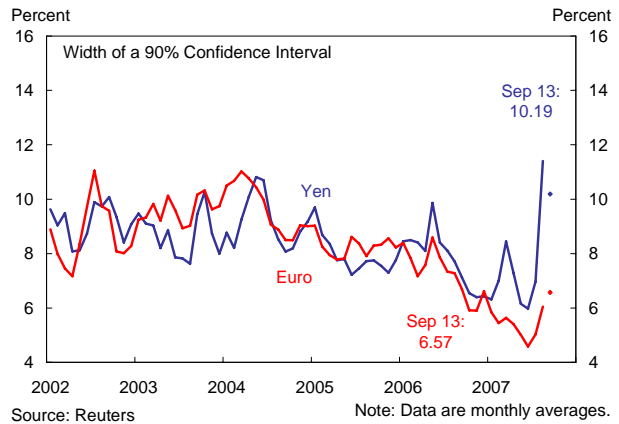
Yen-Dollar Exchange Rate



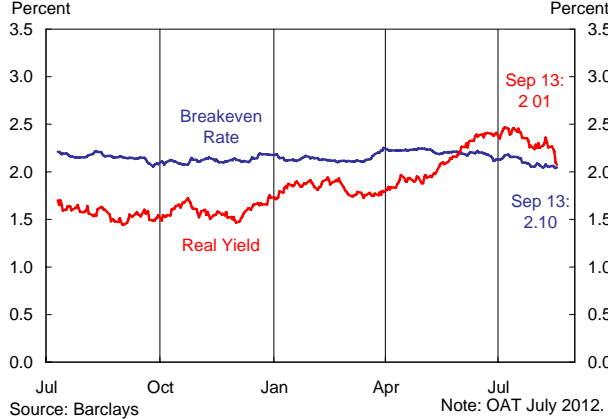
Real Effective Exchange Rates



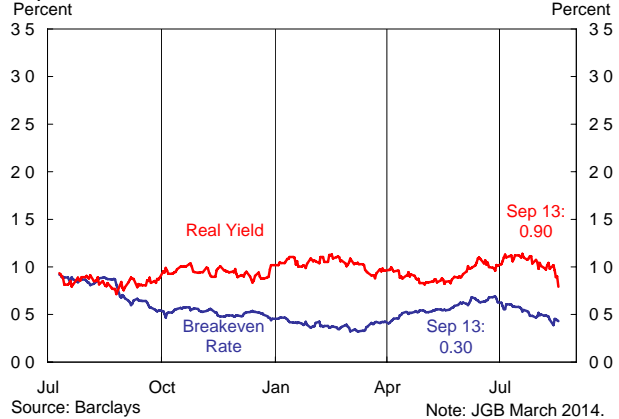
Euro and Yen One-Month Implied FX Option Volatility



Euro Area Inflation-Linked Bonds



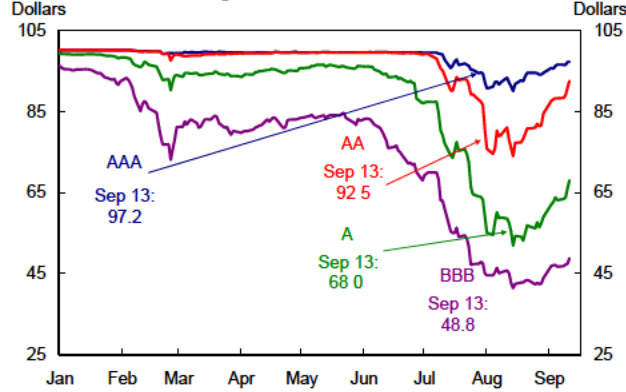
Japan Inflation-Linked Bonds



A. Significant Developments

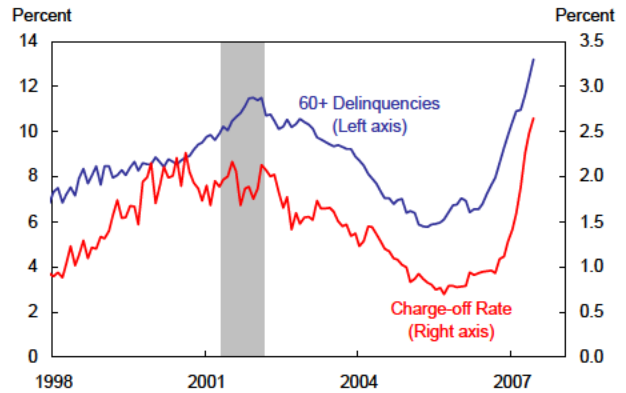
Exhibit A-10: Mortgage Market Indicators and Mortgage Credit Quality

2006-2 ABX Closing Price



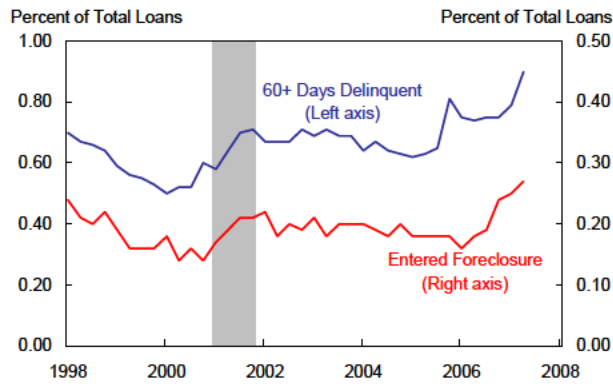
Source: JPMorgan

Delinquency and Charge-off Rates for Subprime MBS



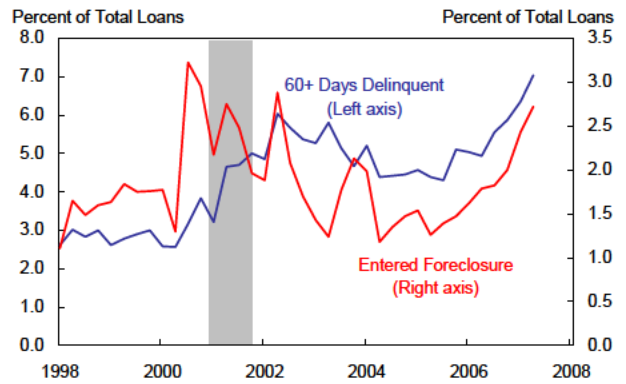
Source: Moody's, Markets Group

Prime Delinquencies and Foreclosures, SA



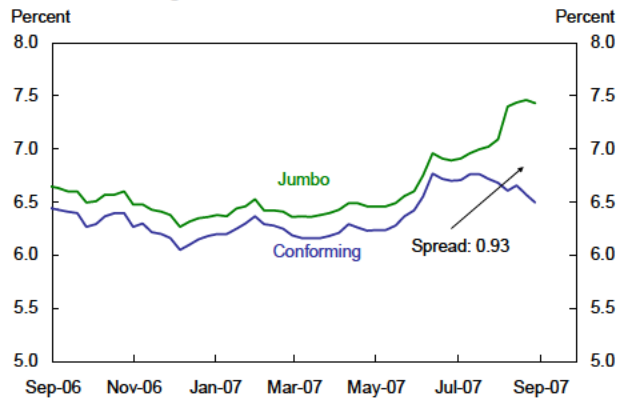
Source: Mortgage Bankers Association and Economy.com

Subprime Delinquencies and Foreclosures, SA



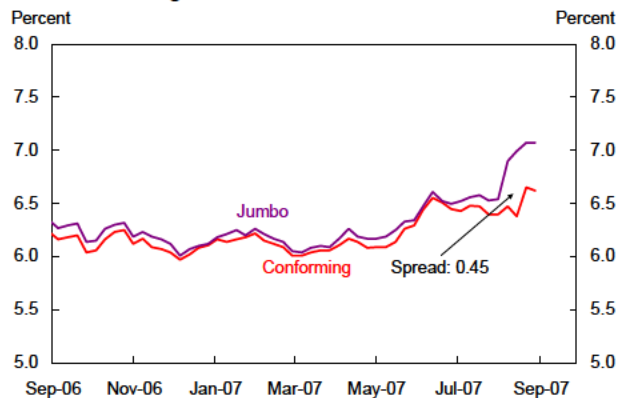
Source: Mortgage Bankers Association and Economy.com

National Average Offered Rates, 30-Yr FRM



Source: HSH Associates

National Average Offered Rates, 5/1 ARM



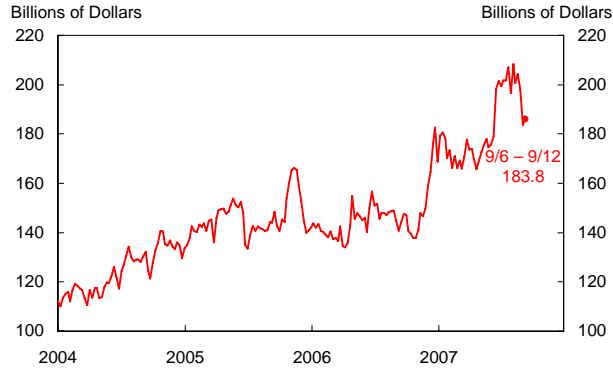
Source: HSH Associates

Note: Shading represents NBER recessions.

A. Significant Developments

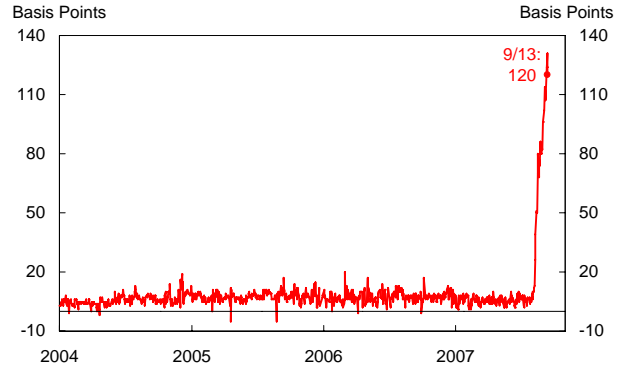
Exhibit A-11: Short-Term Money Market Indicators

Commercial Paper Outstanding
Nonfinancial Issuers



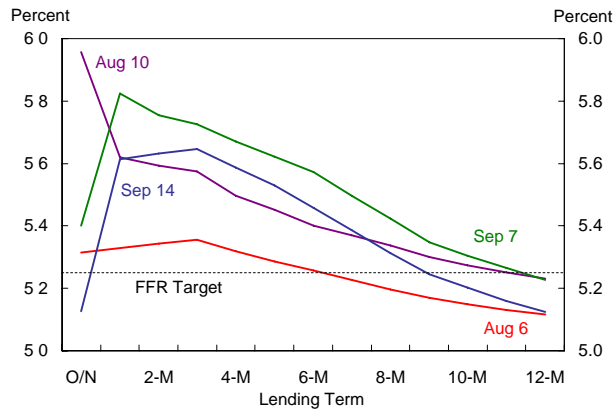
Source: Federal Reserve Board

Nonfinancial 30-Day CP Spread: ABCP - AA



Source: Federal Reserve Board

LIBOR Curves



Source: Financial Times

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
2007												
Q1	2.2	2.4	2.4	0.7	0.6	0.6	4.5	4.5	4.5	5.3	5.3	5.3
Q2	1.6	1.4	1.3	3.8	3.4	3.8	4.5	4.5	4.5	5.3	5.3	5.3
Q3	1.9	1.9	1.7	3.0	3.3	2.9	4.6	4.6	4.6	5.3	5.3	4.8
Q4	1.9	1.9	1.8	3.1	2.7	2.4	4.6	4.6	4.7	5.3	5.3	4.8
2008												
Q1	1.9	1.9	1.8	3.0	2.7	2.4	4.6	4.6	4.7	5.3	5.3	4.8
Q2	1.8	1.8	1.7	3.0	2.7	2.6	4.6	4.6	4.7	5.3	5.3	4.5
Q3	1.8	1.8	1.7	3.0	2.7	2.7	4.6	4.6	4.7	5.0	5.0	4.3
Q4	1.8	1.8	1.7	3.0	2.7	2.8	4.6	4.6	4.6	5.0	5.0	4.3
2009												
Q1	--	1.7	1.7	--	2.7	2.8	--	4.6	4.6	--	5.0	4.3
Q2	--	1.7	1.7	--	2.7	2.7	--	4.6	4.6	--	5.0	4.3
Q3	--	1.7	1.7	--	2.7	2.8	--	4.6	4.6	--	4.8	4.3
Q4	--	1.7	1.7	--	2.7	2.7	--	4.6	4.6	--	4.8	4.3
Q4/Q4												
2006	2.2	2.3	2.3	3.1	2.6	2.6	-0.5	-0.5	-0.5	1.0	1.0	1.0
2007	2.0	1.9	1.8	2.6	2.5	2.4	0.1	0.1	0.2	-0.3	0.0	-0.5
2008	1.8	1.8	1.7	3.0	2.7	2.6	0.0	0.0	-0.1	-0.3	-0.3	-0.5
2009	--	1.7	1.7	--	2.7	2.7	--	0.0	0.0	--	-0.3	0.0

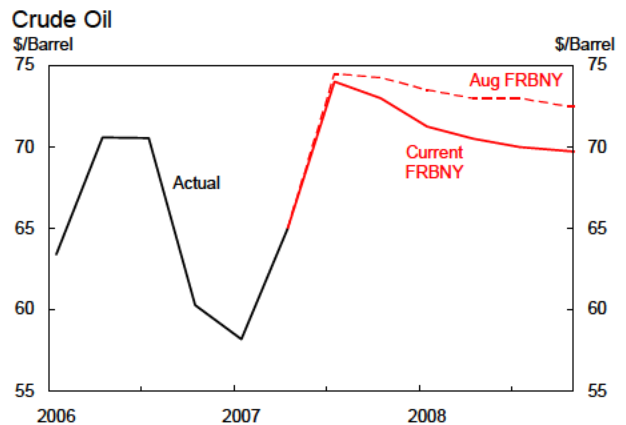
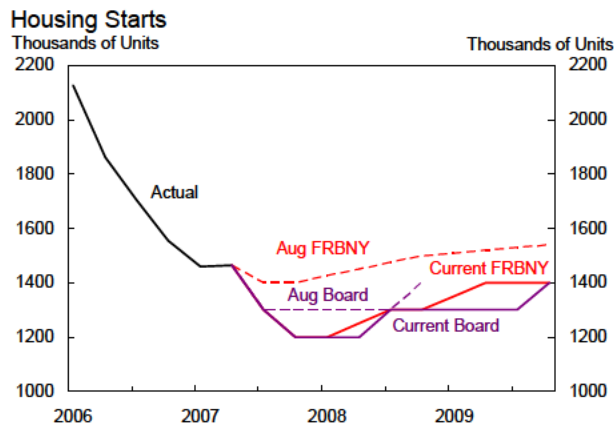
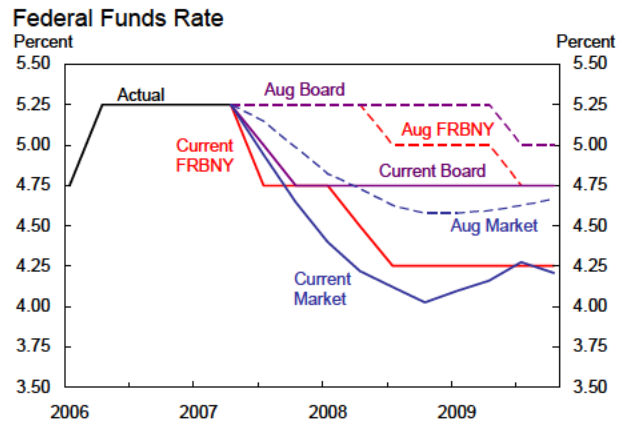
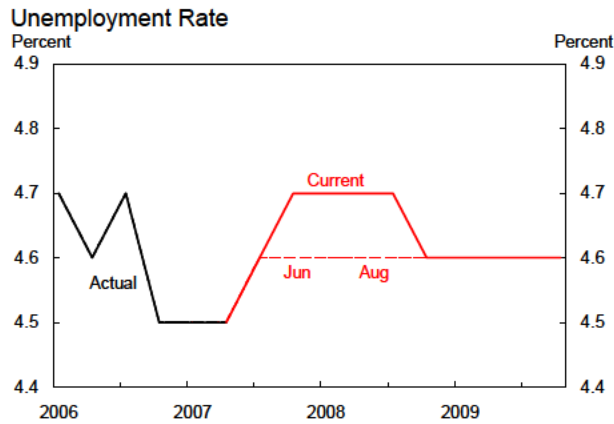
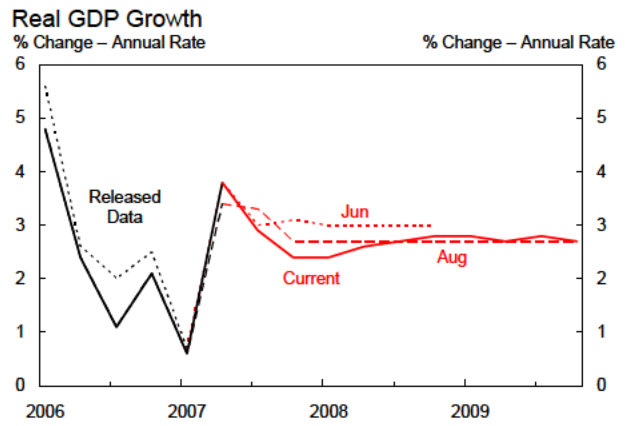
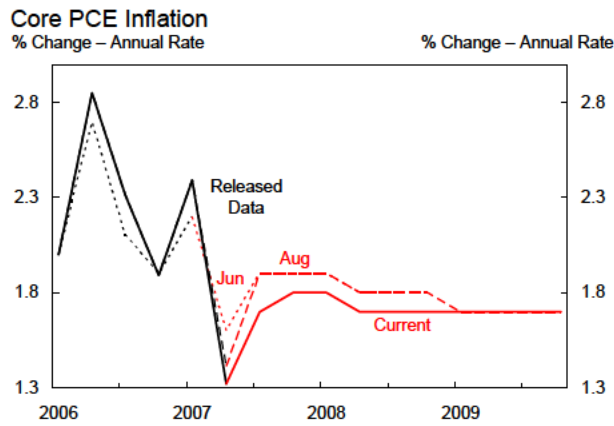
Note: Columns reflect the forecast dates. Numbers in gray are from previous Blackbooks, and numbers in italics are released data.

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

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

B. FRBNY Forecast Details

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



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

B. FRBNY Forecast Details

Exhibit B-3: Near-Term Projections

	Quarterly Growth Rates (AR)		Quarterly Growth Contributions (AR)	
	2007Q3	2007Q4	2007Q3	2007Q4
OUTPUT				
Real GDP	2.9 (3.3)	2.4 (2.7)	2.9 (3.3)	2.4 (2.7)
Final Sales to Domestic Purchasers	2.3 (2.7)	1.7 (2.4)	2.4 (2.8)	1.8 (2.5)
Consumption	3.0 (3.0)	2.5 (2.7)	2.1 (2.1)	1.7 (1.9)
BFI: Equipment and Software	2.0 (6.0)	4.0 (5.0)	0.1 (0.4)	0.3 (0.4)
BFI: Nonresidential Structures	9.0 (10.0)	7.0 (7.0)	0.3 (0.3)	0.2 (0.2)
Residential Investment	-15.0 (-12.0)	-20.0 (-9.0)	-0.8 (-0.6)	-1.0 (-0.4)
Government: Federal	5.5 (3.2)	3.0 (3.0)	0.4 (0.2)	0.2 (0.2)
Government: State and Local	2.0 (3.0)	2.5 (2.5)	0.2 (0.4)	0.3 (0.3)
Inventory Investment	-- --	-- --	0.0 (0.2)	0.3 (-0.1)
Net Exports	-- --	-- --	0.5 (0.2)	0.3 (0.3)
INFLATION				
Total PCE Deflator	1.6 (2.2)	2.1 (2.2)		
Core PCE Deflator	1.7 (1.9)	1.8 (1.9)		
PRODUCTIVITY AND LABOR COSTS*				
Output per Hour	3.2 (2.6)	1.7 (1.8)		
Compensation per Hour	4.0 (4.0)	7.0 (7.0)		
Unit Labor Costs	0.8 (1.4)	5.3 (5.2)		

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		
	2007	2008	2009	2007	2008	2009
OUTPUT						
Real GDP	2.4 (2.5)	2.6 (2.7)	2.7 (2.7)	2.4 (2.5)	2.6 (2.7)	2.7 (2.7)
Final Sales to Domestic Purchasers	2.0 (2.2)	2.4 (2.6)	2.6 (2.6)	2.1 (2.3)	2.5 (2.7)	2.7 (2.7)
Consumption	2.7 (2.7)	2.7 (2.7)	2.7 (2.7)	1.9 (1.9)	1.9 (1.9)	1.9 (1.9)
BFI: Equipment and Software	2.6 (3.4)	3.7 (3.7)	3.0 (3.0)	0.2 (0.2)	0.3 (0.3)	0.2 (0.2)
BFI: Nonresidential Structures	12.2 (11.2)	4.0 (4.0)	3.0 (3.0)	0.4 (0.4)	0.1 (0.1)	0.1 (0.1)
Residential Investment	-15.8 (-11.7)	-4.5 (-1.0)	3.0 (3.0)	-0.8 (-0.6)	-0.2 (-0.0)	0.1 (0.1)
Government: Federal	1.9 (1.5)	2.0 (2.0)	1.5 (1.5)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Government: State and Local	2.6 (2.8)	2.3 (2.3)	2.2 (2.2)	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)
Inventory Investment	-- --	-- --	-- --	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.0)
Net Exports	-- --	-- --	-- --	0.4 (0.3)	0.1 (0.1)	0.0 (0.0)
INFLATION						
Total PCE Deflator	2.8 (3.1)	1.9 (2.0)	1.7 (1.7)			
Core PCE Deflator	1.8 (1.9)	1.7 (1.8)	1.7 (1.7)			
Total CPI Inflation	3.5 (3.7)	2.2 (2.2)	1.9 (1.9)			
Core CPI Inflation	2.2 (2.1)	2.0 (2.0)	1.9 (1.9)			
GDP Deflator	2.4 (2.9)	2.2 (2.3)	1.9 (1.9)			

Note: Numbers in parentheses are from the previous Blackbook.

B. FRBNY Forecast Details

Exhibit B-5: Projections of Other Key Economic Variables

	Q4/Q4 Growth Rates		
	2007	2008	2009
INTEREST RATE ASSUMPTIONS			
Federal Funds Rate (End-of-Year)	4.75 (5.25)	4.25 (5.00)	4.25 (4.75)
10-Year Treasury Yield (Avg. Q4 Level)	4.5 (5.1)	4.8 (5.3)	4.8 (5.3)
PRODUCTIVITY AND LABOR COSTS*			
Output	2.7 (2.8)	2.9 (3.0)	3.0 (3.0)
Hours	0.7 (0.9)	1.1 (1.2)	1.2 (1.2)
Output per Hour	2.0 (1.8)	1.8 (1.8)	1.8 (1.8)
Compensation per Hour	5.2 (4.4)	4.7 (4.7)	4.7 (4.7)
Unit Labor Costs	3.1 (2.5)	2.9 (2.9)	2.9 (2.9)
LABOR MARKET			
Unemployment Rate (Avg. Q4 Level)	4.7 (4.6)	4.6 (4.6)	4.6 (4.6)
Participation Rate (Avg. Q4 Level)	66.0 (66.1)	66.0 (66.1)	66.0 (66.1)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	103 (133)	126 (133)	139 (135)
INCOME			
Personal Income	6.3 (6.6)	5.4 (5.4)	5.1 (5.06)
Real Disposable Personal Income	3.0 (3.0)	3.4 (3.4)	3.4 (3.4)
Corporate Profits Before Taxes	8.5 (1.1)	1.1 (-0.3)	0.5 (0.8)

Note: Numbers in parentheses are from the previous Blackbook.

*Nonfarm business sector.

B. FRBNY Forecast Details

Exhibit B-6: FRBNY and Greenbook Forecast Comparison

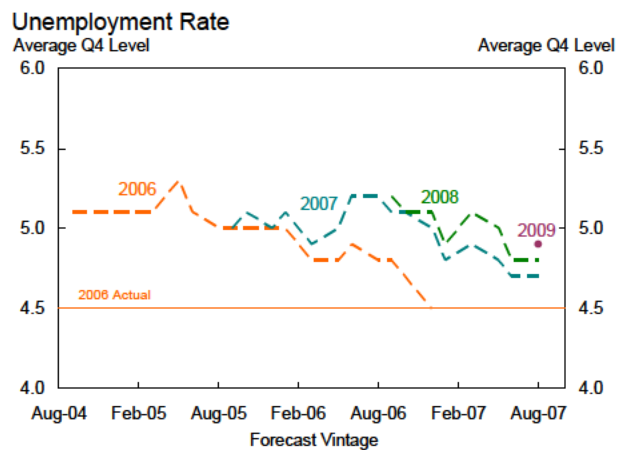
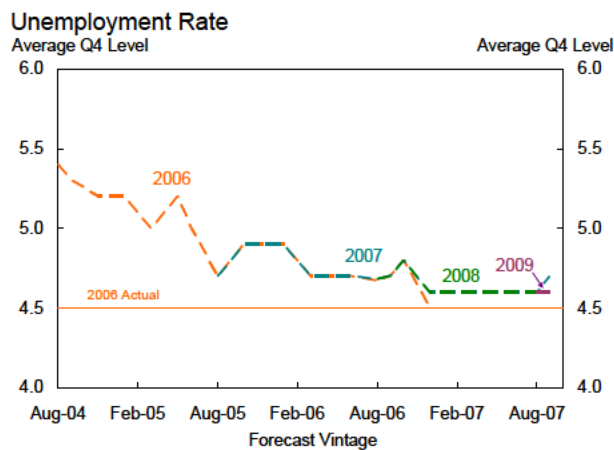
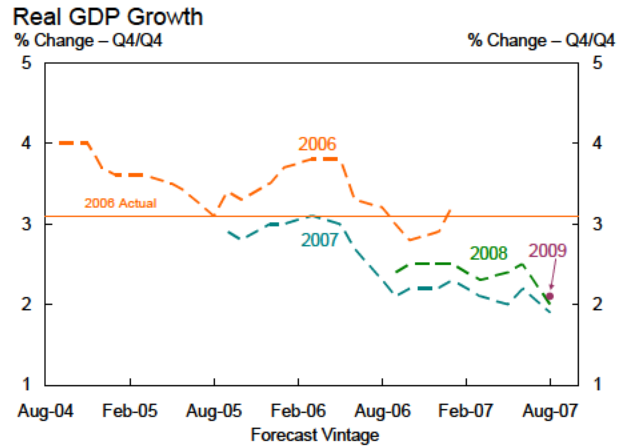
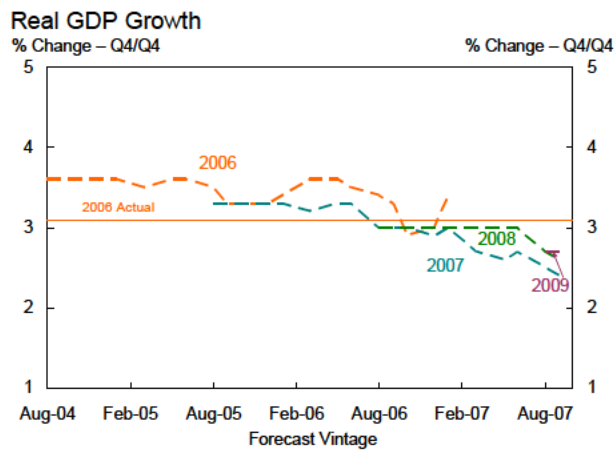
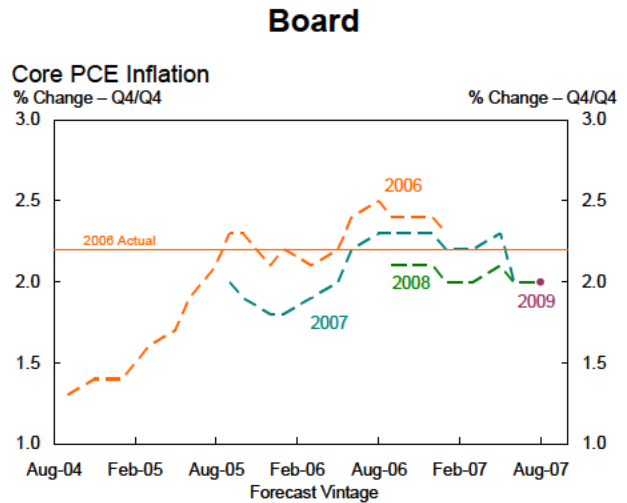
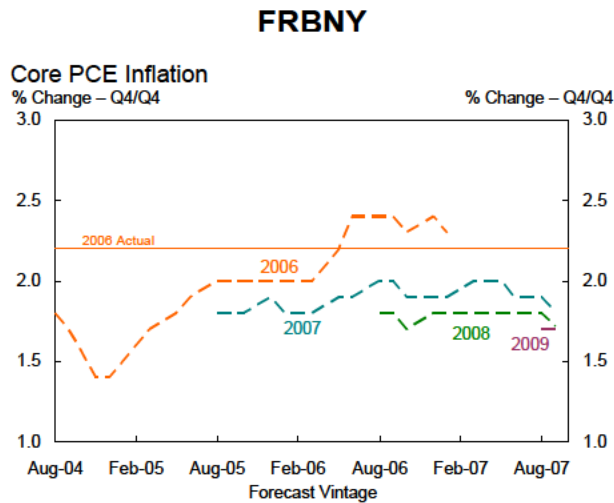
	FRBNY			Board		
	2007	2008	2009	2007	2008	2009
OUTPUT						
Real GDP	2.4 (2.5)	2.6 (2.7)	2.7 (2.7)	2.0 (1.9)	1.7 (2.0)	2.2 --
GDP Growth Contributions						
Final Sales to Domestic Purchasers	2.1 (2.3)	2.5 (2.7)	2.7 (2.7)	1.7 (1.7)	1.4 (1.8)	2.1 --
Consumption	1.9 (1.9)	1.9 (1.9)	1.9 (1.9)	1.7 (1.6)	1.2 (1.4)	1.5 --
BFI	0.6 (0.6)	0.4 (0.4)	0.3 (0.3)	0.5 (0.5)	0.2 (0.3)	0.3 --
Residential Investment	-0.8 (-0.6)	-0.2 (-0.0)	0.1 (0.1)	-1.0 (-0.9)	-0.3 (-0.2)	0.1 --
Government	0.5 (0.5)	0.4 (0.4)	0.4 (0.4)	0.5 (0.5)	0.3 (0.3)	0.2 --
Inventory Investment	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.0)	0.1 (0.1)	0.0 (-0.1)	0.1 --
Net Exports	0.4 (0.3)	0.1 (0.1)	0.0 (-0.0)	0.4 (0.3)	0.2 (0.2)	0.0 --
INFLATION						
Total PCE Deflator	2.8 (3.1)	1.9 (2.0)	1.7 (1.7)	2.9 (3.0)	1.7 (1.8)	1.8 --
Core PCE Deflator	1.8 (1.9)	1.7 (1.8)	1.7 (1.7)	1.9 (2.0)	1.9 (2.0)	1.9 --
INTREST RATE ASSUMPTION						
Fed Funds Rate (End-of-Year)	4.75 (5.25)	4.25 (5.00)	4.25 (4.8)	4.75 (5.25)	4.75 (5.25)	4.75 --
PRODUCTIVITY AND LABOR COSTS*						
Output per Hour	2.0 (1.8)	1.8 (1.8)	1.8 (1.8)	1.9 (1.7)	1.7 (2.0)	1.9 --
Compensation per Hour	5.2 (4.4)	4.7 (4.7)	4.7 (4.7)	4.7 (4.2)	4.4 (4.7)	4.2 --
Unit Labor Costs	3.1 (2.5)	2.9 (2.9)	2.9 (2.9)	2.7 (2.4)	2.6 (2.7)	2.3 --
LABOR MARKET						
Unemployment Rate (Avg. Q4 Level)	4.7 (4.6)	4.6 (4.6)	4.6 (4.6)	4.7 (4.7)	4.9 (4.8)	4.9 --
Participation Rate (Avg. Q4 Level)	66.0 (66.1)	66.0 (66.1)	66.0 (66.1)	66.0 (66.0)	65.8 (65.8)	65.6 --
Avg. Monthly Nonfarm Payroll Growth (Thous.)	103 (133)	126 (133)	139 (135)	108 (125)	67 (75)	83 --
HOUSING						
Housing Starts (Avg. Q4 Level, Thous.)	1200 (1400)	1300 (1500)	1400 (1540)	1200 (1300)	1300 (1400)	1400 --

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-2004



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

B. FRBNY Forecast Details

Exhibit B-8: Alternative GDP and Inflation Forecasts

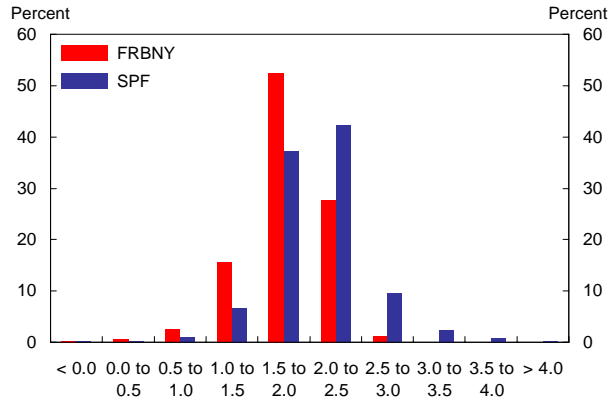
Real GDP Growth					
	Release Date	2007Q3	2007Q4	2007 Q4/Q4	2008 Q4/Q4
FRBNY	9/11/2007	2.9 (3.3)	2.4 (2.7)	2.4 (2.5)	2.6 (2.7)
PSI Model	9/12/2007	1.8 (2.3)	2.5 (2.8)	-- --	-- --
Blue Chip	9/10/2007	2.4 (2.6)	2.1 (2.8)	2.3 (2.3)	2.7 (2.9)
Median SPF	8/14/2007	2.5 (2.6)	2.7 (2.9)	1.9 (2.1)	2.8 (2.9)
Macro Advisers	9/5/2007	2.6 (2.4)	2.0 (2.5)	2.3 (2.2)	2.5 (2.6)
Core PCE Inflation					
	Release Date	2007Q3	2007Q4	2007 Q4/Q4	2008 Q4/Q4
FRBNY	9/11/2007	1.7 (1.9)	1.8 (1.9)	1.8 (1.9)	1.7 (1.8)
Median SPF	8/14/2007	1.9 (2.1)	1.9 (2.1)	1.9 (2.1)	2.0 (2.1)
CPI Inflation					
	Release Date	2007Q3	2007Q4	2007 Q4/Q4	2008 Q4/Q4
FRBNY	9/11/2007	1.8 (2.8)	2.3 (2.3)	3.5 (3.7)	2.2 (2.2)
Blue Chip	9/10/2007	2.3 (2.4)	2.1 (2.1)	3.4 (3.4)	2.4 (2.4)
Median SPF	8/14/2007	2.6 (2.5)	2.0 (2.3)	3.6 (3.2)	2.2 (2.4)
Macro Advisers	9/5/2007	2.1 (2.6)	2.2 (2.1)	3.5 (3.6)	2.1 (2.1)
Core CPI Inflation					
	Release Date	2007Q3	2007Q4	2007 Q4/Q4	2008 Q4/Q4
FRBNY	9/11/2007	2.3 (2.1)	2.1 (2.1)	2.2 (2.1)	2.0 (2.0)
Median SPF	8/14/2007	2.3 (2.3)	2.2 (2.3)	2.2 (2.3)	2.2 (2.3)
Macro Advisers	9/5/2007	2.6 (2.3)	2.4 (2.3)	2.3 (2.2)	2.3 (2.3)

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

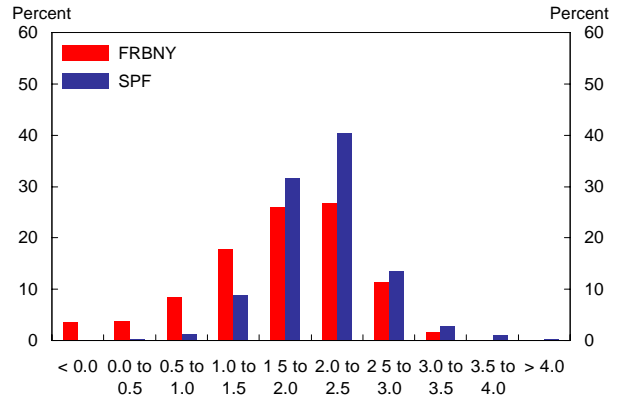
B. FRBNY Forecast Details

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

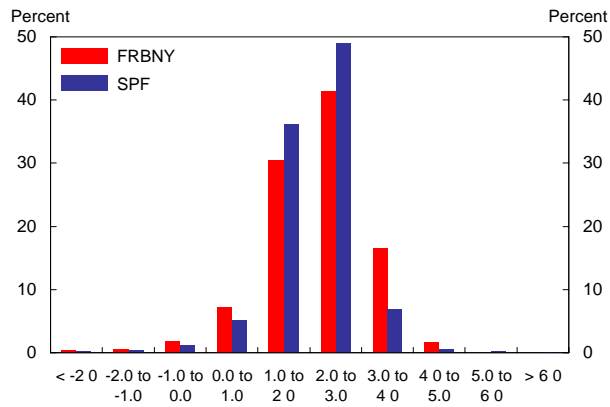
2007Q4/Q4 Core PCE Inflation Probabilities



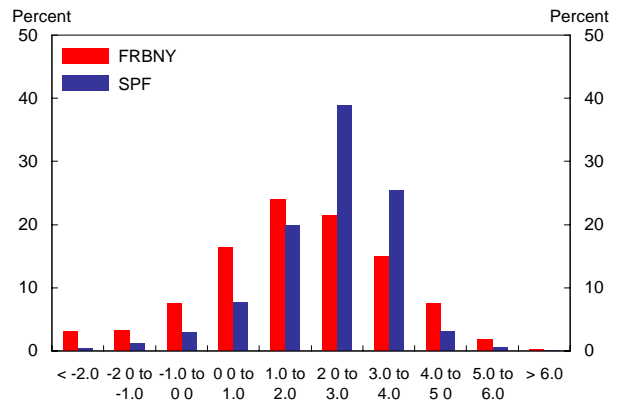
2008Q4/Q4 Core PCE Inflation Probabilities



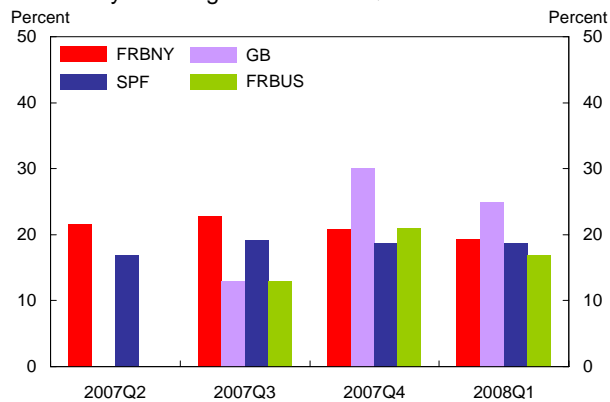
2007/2006 Real GDP Growth Probabilities



2008/2007 Real GDP Growth Probabilities



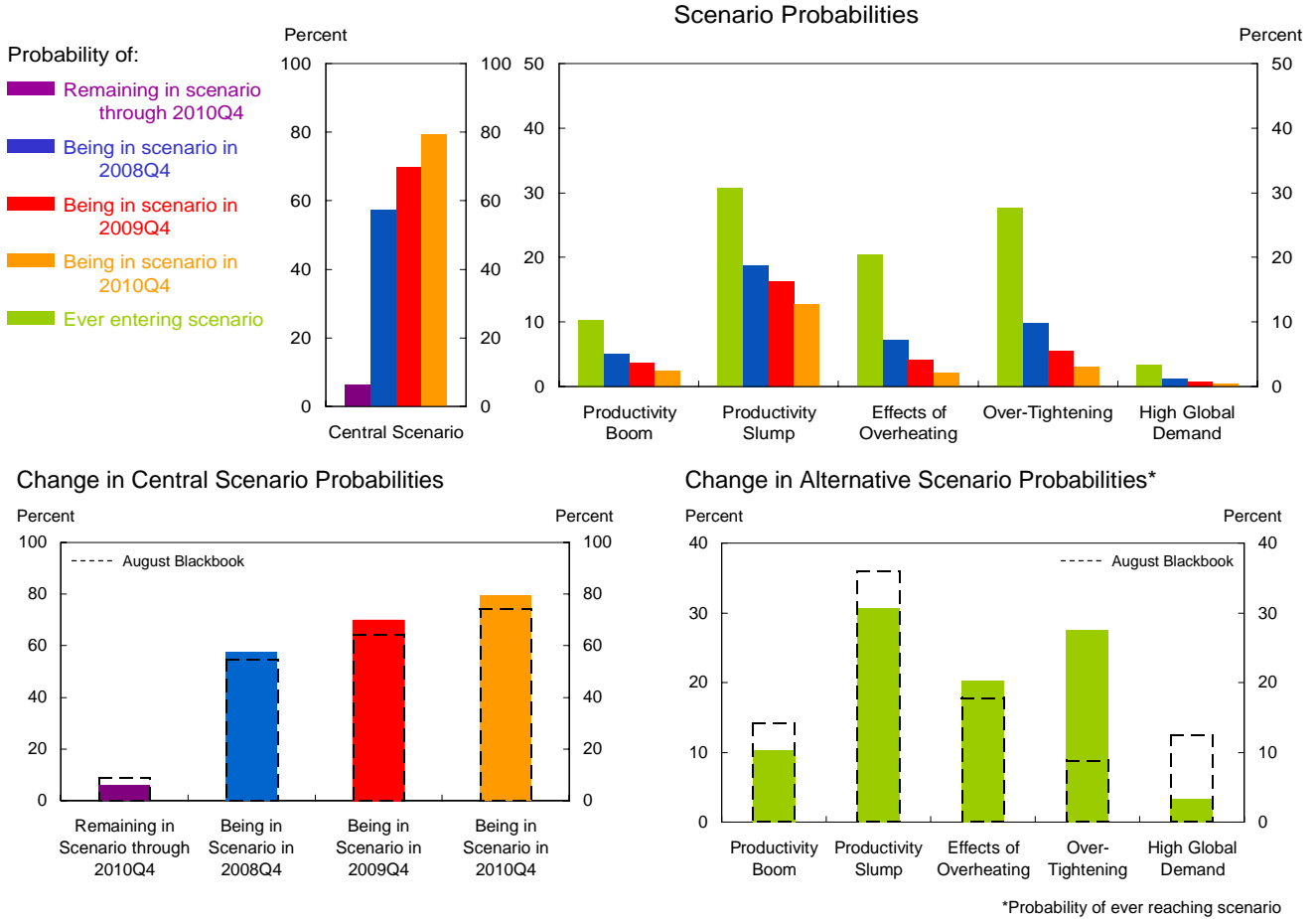
Probability of a Negative-Growth Quarter



Source: MMS Function (FRBNY), FRB Philadelphia Survey of Professional Forecasters, and Federal Reserve Board
 Note: SPF forecast was released August 14, 2007. Board forecasts are from the September Greenbook.

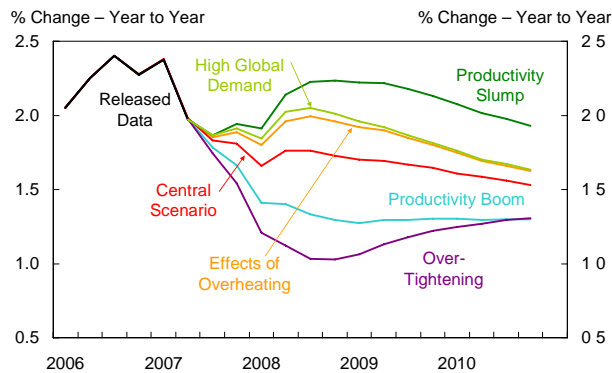
C. FRBNY Forecast Distributions

**Exhibit C-1:
Risks**

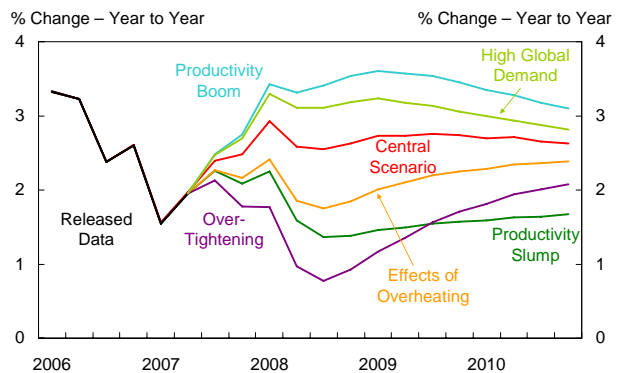


**Exhibit C-2: Projections
under Alternative Scenarios**

Core PCE Inflation under Alternative Scenarios



Real GDP Growth under Alternative Scenarios

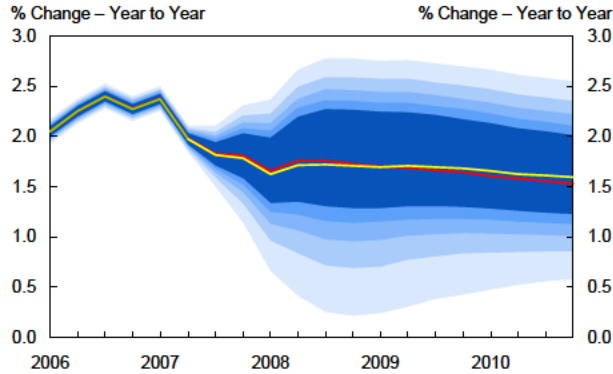


Source: MMS Function (FRBNY)

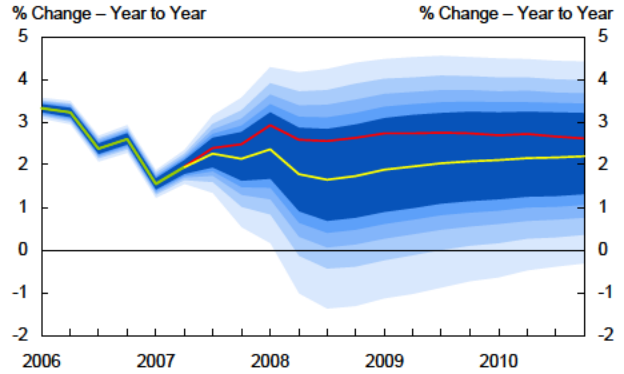
C. FRBNY Forecast Distributions

Exhibit C-3: Inflation and Output Forecast Distributions

Core PCE Inflation Forecast Distribution

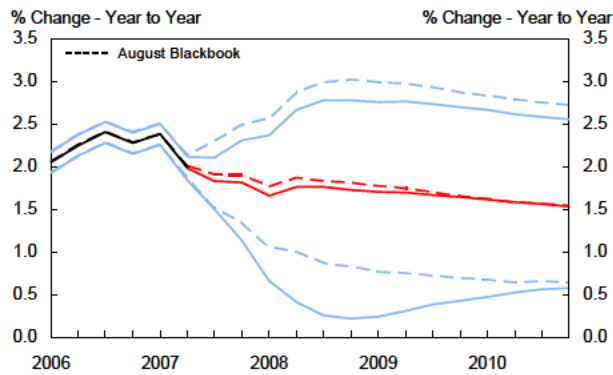


Real GDP Growth Forecast Distribution

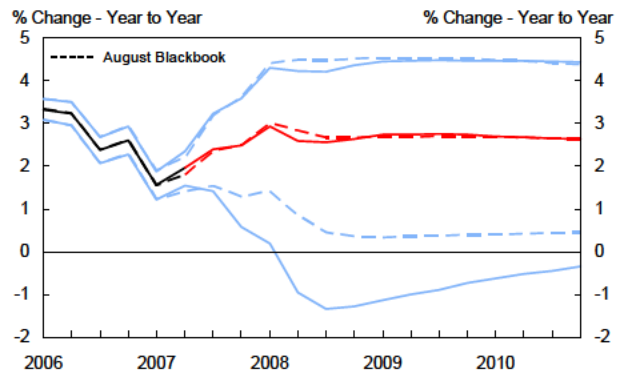


The yellow line is the expected value of the forecast distribution, the red line is the central scenario projection, and the green line is released data. The shading represents the 50, 60, 70, 80, and 90 percent chance that the four-quarter change will be within the respective range.

Change in Core PCE Inflation Forecast Distribution

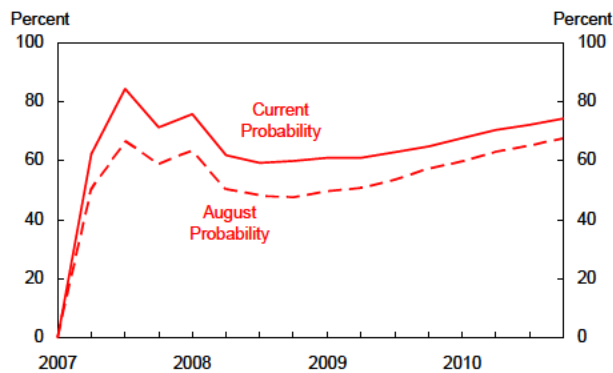


Change in Real GDP Growth Forecast Distribution

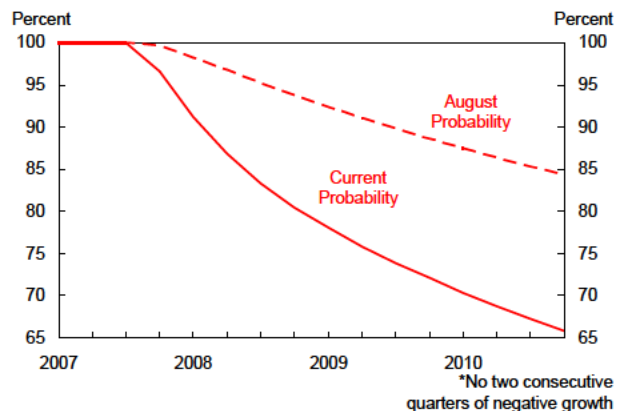


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from previous Blackbook.

Probability of Four-Quarter Core PCE Inflation below 2%



Probability of Continuing Expansion*

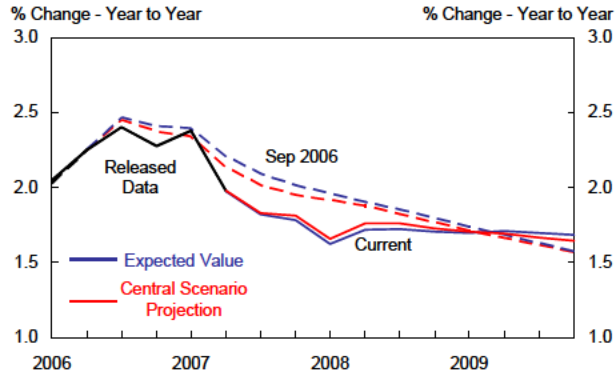


Source: MMS Function (FRBNY)

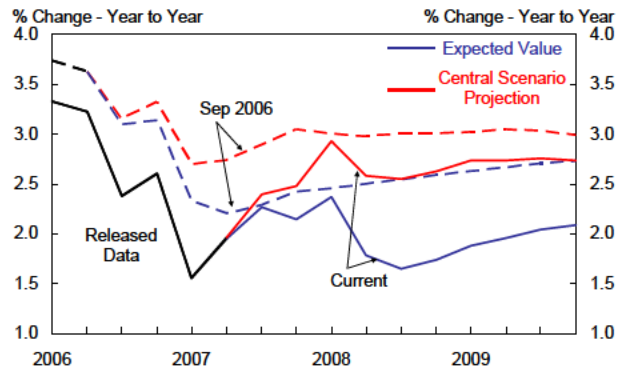
C. FRBNY Forecast Distributions

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

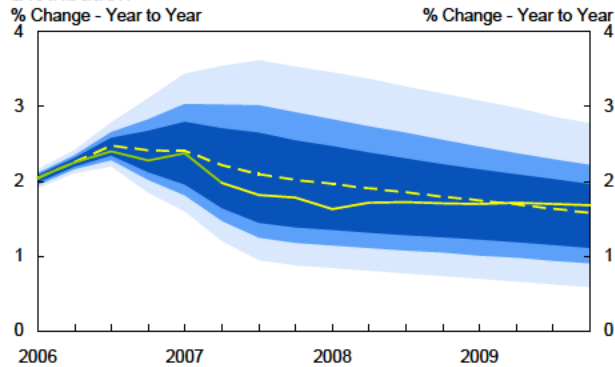
One-Year Comparison of Core PCE Inflation Forecast



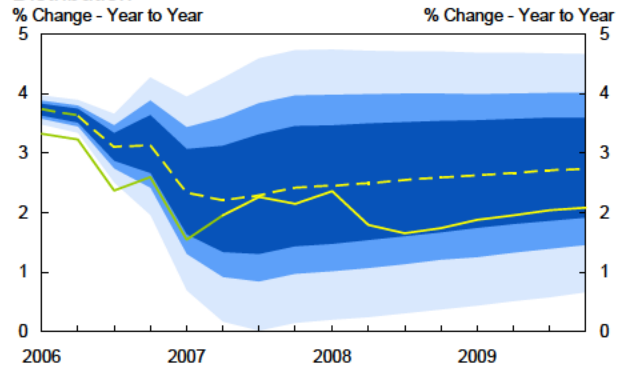
One-Year Comparison of Real GDP Growth Forecast



One-Year Comparison of Core PCE Inflation Forecast Distribution



One-Year Comparison of Real GDP Growth Forecast Distribution



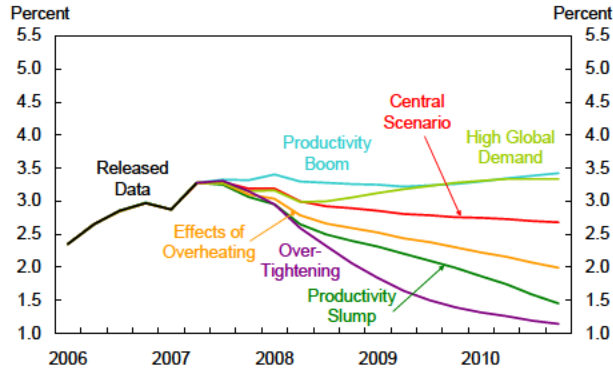
The solid yellow line is the **current** expected value of the forecast distribution, while the dashed yellow line is the **September 2006** expected value. The shading represents the 50, 75 and 90 percent probability intervals from the **September 2006** forecast. The green lines are released data.

Source: MMS Function (FRBNY)

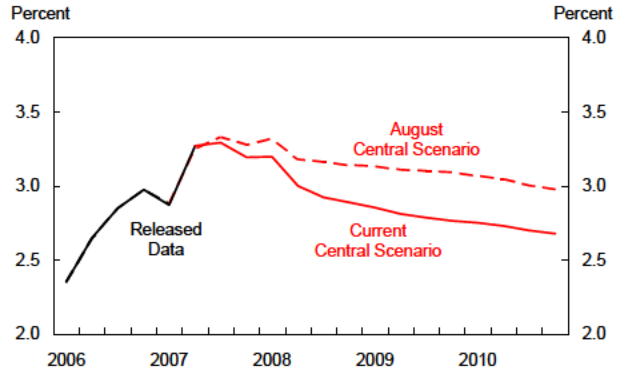
D. FRBNY Fed Funds Rate Projections

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

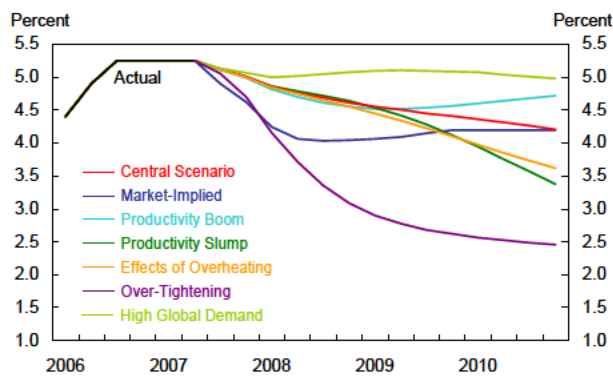
Real FFR under Alternative Scenarios



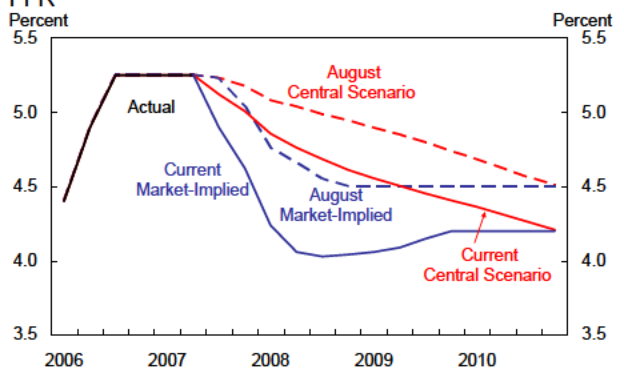
Change in Central Scenario Real FFR



Nominal FFR under Alternative Scenarios

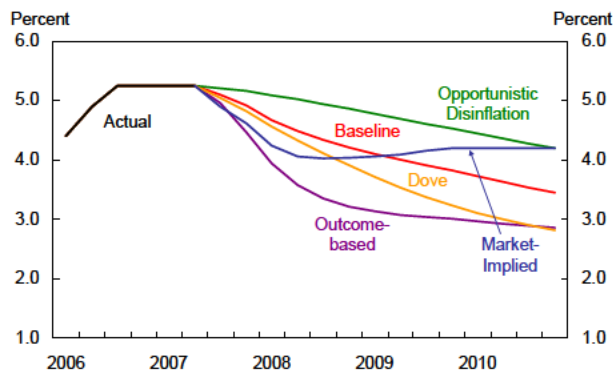


Change in Central Scenario and Market-Implied Nominal FFR



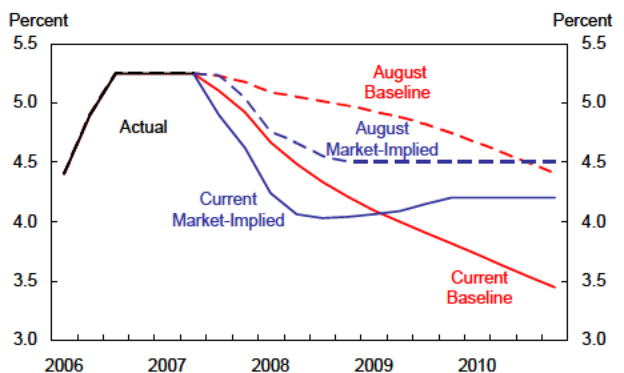
**Exhibit D-2: Alternative Policy Rules under
Expected Value of Forecast Distribution**

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

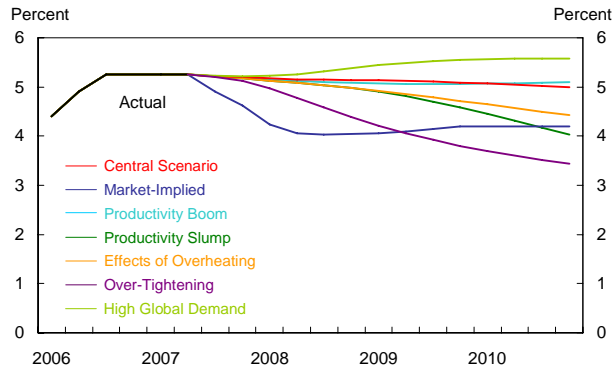
Source: MMS Function (FRBNY)

D. FRBNY Fed Funds Rate Projections

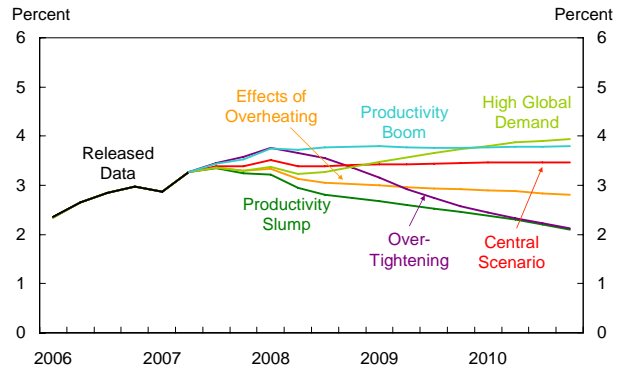
Exhibit D-3: Alternative Policy Rule Analysis

Policy Rule: *Opportunistic Disinflation*

Nominal FFR under Alternative Scenarios

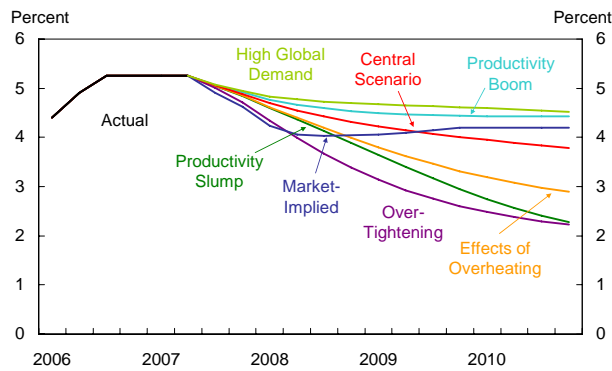


Real FFR under Alternative Scenarios

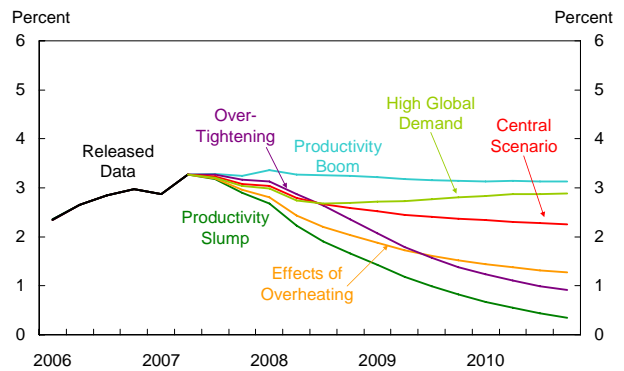


Policy Rule: *Dove*

Nominal FFR under Alternative Scenarios

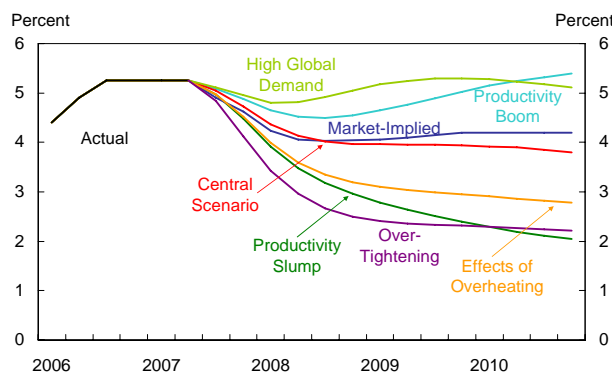


Real FFR under Alternative Scenarios

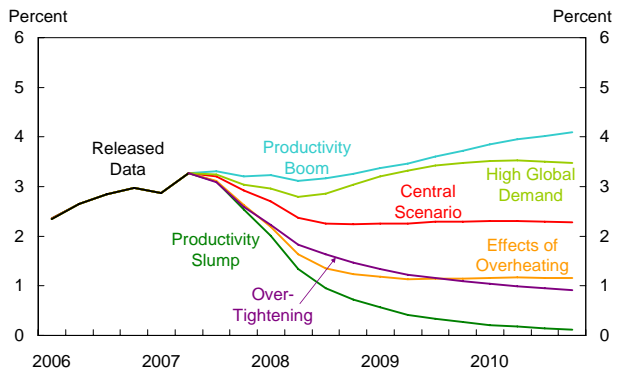


Policy Rule: *Outcome-based*

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: 2008Q2

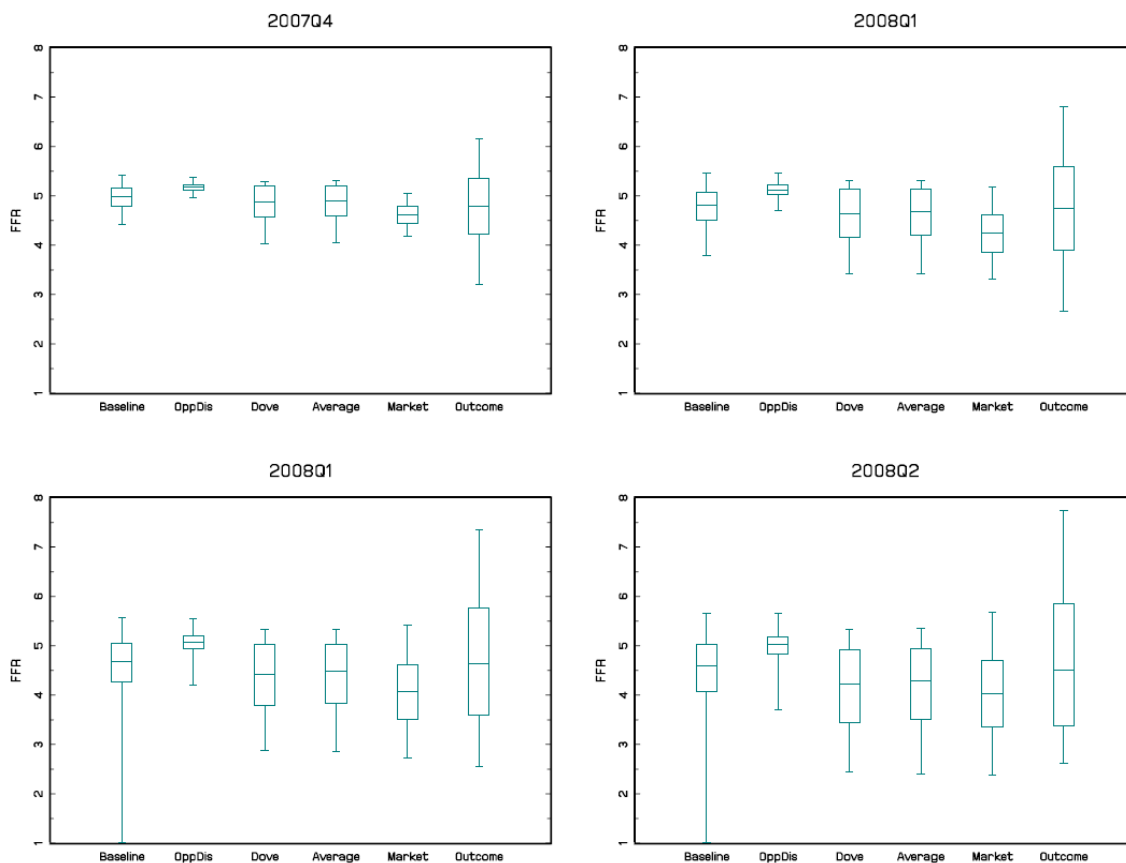
	Percentile of Rule Expectation in Market Distribution	Percentile of Market Expectation in Rule Distribution
<i>Baseline</i>	70 (73)	17 (21)
<i>Opportunistic Disinflation</i>	88 (85)	4 (1)
<i>Dove</i>	63 (56)	34 (38)
<i>Outcome-based</i>	80 (83)	36 (35)
<i>Average</i>	63 (57)	32 (36)

“Average” Weights:

Rule	Current	Aug. Blackbook
<i>Baseline</i>	0.10	0.10
<i>Opportunistic Disinflation</i>	0.00	0.00
<i>Dove</i>	0.90	0.90

Note: Numbers in parentheses are from the previous Blackbook.

Exhibit D-5: FFR Distributions



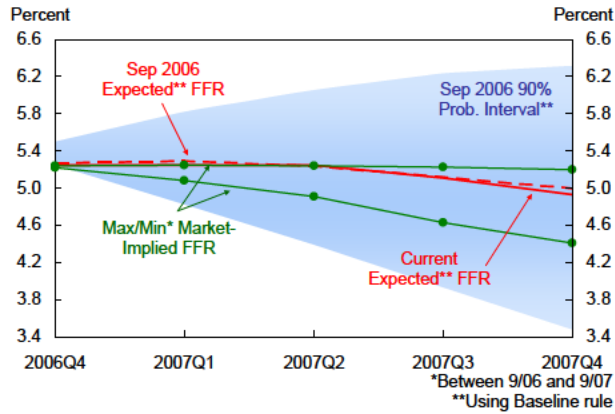
Note: The box represents the 50% probability interval, the line in the box the median, and the tails the 90% probability interval.

Source: MMS Function (FRBNY)

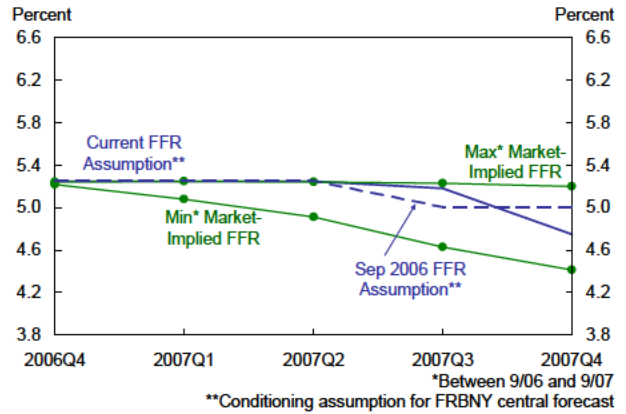
D. FRBNY Fed Funds Rate Projections

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)

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*

The recent decline in productivity growth might prove to be a temporary, cyclical one. In this case, it is possible we will return to the strong productivity growth 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 18th 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. Strong productivity growth would also limit labor cost pressures and thereby help to subdue inflation.

Alternative 2: *Productivity Slump*

It is possible that the upswing in productivity that began in the mid-1990s has ended as the IT-driven surge has run its course. This would mean a period of productivity growth below the trend in our central forecast. Furthermore, the increase in the level and volatility of energy and commodity prices could continue and cause 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 three additional scenarios, two related to the impact of past monetary policy and possible misperceptions of its past and current stances, and one 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 in 2004-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; however, there is a risk its effects will linger in the form of slightly above-forecast inflation and slightly below-forecast output growth.

Developments in the global economy during this period may have contributed to the economic conditions that motivated the initial policy and may also have made it more difficult for the FOMC to identify the overheating in real time. For example, one likely factor contributing to the deflation scare in the early part of this decade was the downward pressure on global goods prices triggered largely by growth in emerging economies' labor forces. Another critical factor may have been the exchange rate policies that a number of emerging market central banks adopted over this period. These policies, which were aimed at strengthening the dollar 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: *Over-Tightening*

We base our outlook on the assumption that the neutral policy rate is between 4.25% and 4.75%, with an implicit core PCE inflation target of 1.5%. For the past few years, however, core PCE inflation has been running above 2%. This combination of factors is consistent with recent fed funds rate levels and, if above-target inflation continues, is consistent with holding the FFR above 5%. We see some risk, however, that these inflation levels are a lagging indicator of demand pressures that have already subsided. We also see some risk that the neutral rate is actually lower than we assume. If either of these were true, it would imply recent policy has been more restrictive than necessary, which would cause the economy to slow significantly below potential over the forecast horizon.

Alternative 5: *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 (and especially 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 follows:

1. *Productivity Boom*: inflation below central forecast, output above central forecast.
2. *Productivity Slump*: inflation above central forecast, output below central forecast.
3. *Effects of Overheating*: inflation above central forecast, output slightly below central forecast.

4. *Over-Tightening*: inflation below central forecast, output far below central forecast.
5. *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)

$i^* = 4.5$ (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)

π_t : core PCE, 4 - quarter average

x_t : output gap, using 2.7% potential growth rate

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

Because we know that any given FFR move will be in increments of 0.25 within the quarter, we round the *Baseline* and alternative policy rule prescriptions for the upcoming quarter.³ This serves to both capture some of the discreteness in FFR movements and to smooth the FFR paths from the current to the upcoming quarter. We currently perform this exercise according to the following table, where r^* is the actual output from the policy rule:

³ For this Blackbook, we did not use this rounding rule. Instead, for each rule, we used the first forecasted FFR value exactly as given by the rule.

Policy Rule Prescription	Average FFR in Upcoming Quarter
$r^* < 3.00$	r^*
$3.00 < r^* < 3.75$	4.00
$3.75 < r^* < 4.00$	4.50
$4.00 < r^* < 4.75$	4.75
$4.75 < r^* < 5.00$	5.00
$5.00 < r^* < 5.50$	5.25
$5.50 < r^* < 6.00$	5.50
$r^* > 6.00$	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 ($\varphi_x = 1$ instead of 0.5). When the output gap is positive, however, the *Dove* rule offers the same prescription as the *Baseline* rule ($\varphi_x = 0.5$, as usual).

In addition to the *Baseline* rule and the two variants, we also consider the FFR paths generated by the Board staff's *Outcome-based* rule. The most significant difference between the three FRBNY rules and the *Outcome-based* rule is that the FRBNY rules offer a prescription for future behavior based on policymaker preferences and views of the economy, whereas the *Outcome-based* rule is a statistical description of the average of past FOMC behavior. Specifically, the *Outcome-based* rule calculates an FFR for a given quarter as a function of the FFR in the previous two quarters, the current quarter's four-quarter core PCE inflation, and the output gap for the current and previous quarters using parameters estimated from real-time historical data (1988-2006)⁴.

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 Exhibit D-6, 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).

Using a weighting scheme, it is possible to combine the *Baseline* and the two variants into an *Average* rule that may better reflect market beliefs about FOMC preferences and views of the structure of the economy than does any individual rule. (That is, we can think of the market-implied path as reflecting an amalgam of different perceived FOMC preferences, etc.) Each cycle we construct the *Average* rule by taking the weighted average of the *Baseline* rule and two FRBNY-derived variants that matches the market-implied path as closely as possible. The weights from the current and previous cycles are provided in the note to Exhibit D-4. Examining the change in the weights used to construct the *Average* rule from one cycle to the next can provide insight into the reasons behind shifts in the market path not explained by changes in the outlook.

⁴ *Outcome-based* rule: $i_t = 1.20*i_{t-1} - 0.39*i_{t-2} + 0.19*(1.17 + 1.73*\pi_t + 3.66*x_t - 2.72*x_{t-1})$