

FRBNY BLACKBOOK

April 2009

FRBNY Blackbook

RESEARCH AND STATISTICS GROUP

FOMC Background Material

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1. Policy Recommendation and Rationale

Our policy recommendation is that the commitment to maintain the current target range for the federal funds rate for an extended period of time be clarified and that the asset purchase program be continued in its current form.

We recommend that the FOMC state more explicitly that it is committed to maintaining the current target range for an extended period of time. The last two FOMC statements leave some room for interpretation of what is an “exceptionally low level” for the federal funds rate. Moreover, the Primary Dealers Survey shows an expected path for the federal funds target rate that is above our policy assumption over the medium-term. In addition, the Committee should consider being explicit about the expected duration of the current target range. One way to do this would be to state that “given the current outlook for inflation and economic activity, the Committee expects to maintain the current target range for the federal funds rate until the end of 2010.” We suggest 2010 in order to be consistent with both our assumed policy path and the Greenbook’s policy path.

We recommend that the committee maintain the asset purchase program announced at the March FOMC meeting. It is premature to draw conclusions about the effectiveness of the program, but there are reasons to be encouraged as financial markets experienced a partial recovery over the intermeeting period. However, the outlook is still for a very weak recovery with a high unemployment rate maintained through the forecast horizon.

It is likely too soon to increase the size of the asset purchase program. It is our view, though, that such a move be considered as soon as the June meeting. In particular, the apparent impact of the program argues for doing more to give a clear signal of the FOMC’s commitment to promote a stronger economic recovery.

2. Evolution of Outlook and Risks

2.1 Central Forecast

Conditioning Assumptions. Data received over the intermeeting period have been generally consistent with our modal forecast. Those indicators suggest that real GDP declined between 6% and 6 ½% (annual rate) in 2009Q1, with the steep drawing down of inventories contributing roughly 3 percentage points of that drop. While the rate of decline of real GDP in the first quarter is likely to have been comparable to that of 2008Q4, we expect that real final sales declined at a 3.3% annual rate in Q1 versus 6.2% in Q4, due to modest growth of real PCE and a significant growth contribution from net exports. We still anticipate that 2009Q2 will be the trough of this business cycle, with the level of real GDP at the trough about 2 ¾% below the 2007Q4 NBER peak. Thus, while this downturn is expected to be the longest of the post WWII period, it would be modestly less than the most severe recessions of that period. By the second half of 2009 a relatively tepid recovery is expected to take hold, aided by the preemptive path of monetary policy, various initiatives to foster financial market stability, and aggressive fiscal stimulus measures. Growth returns to just above its potential rate by the second half of 2010 and then accelerates to about 2 ½% above its potential rate in 2011. Barring a significant decline in the economy's potential growth rate, this point forecast implies that a significant output gap will persist over this entire period. At the trough, the unemployment rate is expected to be around 8 ¾%, a full four percentage points above the level at the peak. This is somewhat less than might be expected from an Okun's Law relationship as the labor force participation rate and average weekly hours have declined and productivity growth has slowed, all of which tend to damp the increase in unemployment. The unemployment rate is expected to continue rising over the first year of recovery, likely to between 9 ½% and 9 ¾%, as growth remains relatively sluggish and as the participation rate and average weekly hours begin moving upward again. Thereafter, the unemployment rate moves down only gradually. The risks to this modal forecast are substantially skewed to the downside with an uncomfortably high probability that the current downturn will end up being the deepest since the 1930s.

In addition to our forecast for the US, the current forecast for foreign growth has changed relatively little over the intermeeting period, particularly for the major industrial economies. Among the emerging economies, growth prospects for China have improved somewhat over the past month while those of Mexico have deteriorated. We now project that foreign GDP (on a GDP-weighted basis) will contract by 1.2% in 2009 (Q4/Q4) versus -1.4% in the March Blackbook. The forecast for foreign growth in 2010 is unchanged at 2.0% (Q4/Q4).

For the first time in nearly a year we have raised the projected path of oil prices that is assumed in the modal forecast. From an expected 2009Q2 average of \$50, we expect the WTI price per barrel to rise to \$59 by 2009Q4 and to \$67 in 2010Q4. On average, this path is about \$9/barrel above the path in the March Blackbook. Our assumed path for oil prices is modestly higher than that of the Greenbook.

We have left unchanged our path for the federal funds rate at 0 to 0.25% over the entire forecast horizon [Exhibit B-2]. Moreover, an explicit underlying assumption of our forecast is that various Fed and Treasury initiatives to improve liquidity and to restore confidence in the financial sector will have increasingly beneficial effects over time and thereby ease overall financial conditions.

Our fiscal policy assumptions are unchanged in this Blackbook. Our modal forecast incorporates the provisions of the American Recovery and Reinvestment Act of 2009. Relying on Congressional Budget Office and Joint Committee on Taxation scoring of this legislation, we estimate that the increases in outlays and reduction in taxes amount to about 1% of GDP in FY2009 and a little over 2% of GDP in FY2010. In our view this fiscal impulse modestly raises the modal forecast for GDP above what it otherwise would be, but has a more pronounced effect on the balance of risks. Moreover, we expect the legislation to have meaningful impacts on the income side. Specifically, increases in transfer payments and decreases in individual income taxes are expected to contribute to an increase of the personal saving rate to around 5% by the end of 2009, after which it edges lower to around 3% by the end of 2010.

As is our usual practice, our assumptions for equity prices, the real exchange value of the dollar, and home prices are similar to those of the Greenbook. Equity prices are assumed to increase at an annual rate of about 15% over the forecast horizon, about the same as in the last Greenbook, but from a starting point that is 18% higher. The real exchange value of the dollar is assumed to decline gradually over the remainder of 2009 and through 2010. The projected path of home prices is essentially unchanged. The Board anticipates a further 14% to 15% decline of the Loan Performance home price index by the end of 2010, for a total peak-to-trough decline of about 31%. This corresponds to our assumption of about a 22% peak-to-trough decline of the Federal Housing Finance Administration (FHFA, formerly the OFHEO) purchase-only home price index.

We maintain our estimate of potential GDP growth at 2.6% over the forecast horizon, composed of 1.2% trend hours growth and 1.4% trend productivity growth (on a GDP basis, which is equivalent to 1.8% on a nonfarm business sector basis). We assume, however, that potential growth will begin to slow in 2011 and beyond due primarily to demographic factors. As always, there is substantial uncertainty around our estimate of potential GDP growth. The Board staff has maintained their estimate of potential over the forecast horizon at 2%.

We expect the lower degree of inflation persistence evident since the early 1990s to continue. This assumption is in contrast to the greater degree of inflation persistence assumed in recent Board staff forecasts. In our central scenario, inflation expectations remain well anchored. This assumption is essential to achieve the gradual rise of core inflation back toward the midpoint of the FOMC's objective of 2.0% for core PCE inflation.

Inflation. In our central scenario, total consumer price inflation is negative over the first half of 2009 as the effects of the sharp declines in energy and other commodity prices during 2008Q4 work their way through the system. Core inflation remains relatively low in 2009, reflecting the significant increase in slack in the US economy. But by 2010 both total and core inflation gradually increase as final demand firms within the context of

anchored inflation expectations. However, it will likely take until 2011 before inflation returns to the mandate-consistent range.

The balance of risks around the central scenario for inflation is skewed to the downside, but somewhat less so than for growth. Clearly, the significant downside risk to the growth projection implies downside risk to the inflation projection. Further, if some of the more adverse risks to the global economy are realized, then we assess a substantial chance of deflation. In contrast, in the current environment of aggressive global monetary and fiscal policy response to the ongoing financial crisis, there is some risk of higher inflation if the economy proves more resilient than in our central scenario. The net effect of these competing risks is somewhat to the downside.

Real Activity. The broad outlines of our central projection are as follows. Consumer spending remains relatively sluggish as credit conditions remain somewhat restrictive and as households respond to the decline in their net worth by boosting saving out of current cash flow. The correction in housing production is expected to be largely completed by mid-2009. At that point the large drag that residential investment has exerted on growth for nearly the past four years will be over. Thereafter, housing is likely to be a modest plus for growth, but the surge of residential investment experienced in the early stages of past recoveries is not anticipated to transpire due to the continued high volume of homes coming onto the market through the foreclosure process and, again, continued relatively tight mortgage underwriting standards. Indeed, the correction in house prices is expected to continue through the end of 2010, with a cumulative 22% peak-to-trough decline in the FHFA purchase-only home price index. (For other indices, such as the Case-Shiller 20 city composite, the peak-to-trough decline is likely to be around 40%.)

Business investment in new structures and new equipment and software is expected to decline sharply in 2009 as capacity utilization rates decline and as vacancy rates rise. In typical business cycle fashion, these components of final demand do not begin to recover until the second half of 2010. In addition, during the first half of 2009 businesses aggressively pare inventories to get them better aligned with sales. With the sharp downgrading of foreign growth prospects, exports are expected to decline through the

middle of 2009 with significant growth not returning until 2010. Nonetheless, in the near term net exports remain a plus for growth from an accounting sense as imports also decline sharply due to the weakness of domestic demand. During the second half of 2009 the net export contribution gradually declines and then turns negative in 2010 as the recovery of domestic demand induces an increase in the rate of growth of imports. Finally, the growth contribution of the government sector begins to rebound in the second half of 2009 as the effects of the stimulus legislation begin to take hold. Underlying this projected path of private final demand is the expectation that financial market functioning returns to more normal conditions and that consumer and business confidence is gradually restored.

The risks to our central projection for real activity are substantial and are skewed to the downside. In the near-term, the key risk is that financial market conditions and consumer and business confidence do not improve as assumed. This in turn leads to lower-than-expected asset prices, less recovery in the supply of credit and, therefore, an even weaker path for final demand. A related risk is that, even if financial markets and asset prices behave as assumed, the decline of household net worth embedded in this central projection induces a steeper-than-expected increase of the personal saving rate, keeping consumer spending weaker for longer. The sharp increase in the prime-age male unemployment rate during the current cycle, combined with the large share of workers nearing retirement age, make this risk particularly acute. Finally, an important risk over the medium term is the uncertainty surrounding our assumption of the economy's potential growth rate. There is increasing evidence that potential growth has slowed somewhat, but it is too soon to tell whether this is a cyclical or a structural phenomenon.

2.2 Alternative Scenarios and Risks

The highlight of this section is the fact that the risk assessment did not worsen during the intermeeting period, which contrasts with the experience during the past few Blackbooks. In fact, the risk assessment has very modestly improved as a result of the recent spate of better-than-expected news on the financial and economic fronts. However, these improvements are very small and the substantial downside risks to the projections that

have been with us since September 2008 still persist.

The *Global Credit Crunch* still remains the most likely scenario by far, with an associated probability above 40% [Exhibit C-1]. The likelihood of the *Global Deflation* scenario has marginally declined since the last FOMC, and is now at about 5%.

Although this decline is small, it has substantial effects on the forecast distribution, as shown in Exhibit C-3: The risks associated with this scenario are so large that even small changes in the associated probability produce large effects on the forecast distribution for output and inflation. The likelihood of the *Loss of Credibility* scenario has increased following concerns associated with the unwinding of the Fed's balance sheet. The increase in the likelihood of the *Loss of Credibility* scenario is quantitatively comparable to the decrease for the *Global Deflation* scenario, but the impact on the forecast distribution is much smaller.

Exhibit C-2 displays the core PCE inflation and GDP growth paths associated with the various scenarios. These paths have modestly changed to the upside since the last Blackbook, particularly for core PCE inflation. The changes are mainly due to higher short-term core PCE inflation forecasts in the *Central Scenario*, following recent higher-than-expected inflation readings (recall that the alternative scenarios paths are defined relative to the *Central Scenario*). Still, the *Global Deflation* scenario currently foresees a decline in year-to-year core PCE and output growth lasting through the end of 2010 and the first quarter of 2011, respectively.

The changes in the probabilities associated with the various scenarios result in an upward shift in the 5th quintile of the forecast distributions for inflation and, to a lesser extent, output [Exhibit C-3]. The 95th quintile of the core PCE forecast distribution has also increased, albeit very modestly. The "Depth of Deflation" chart [Exhibit C-3] shows that the probability of low inflation/deflation (defined as average annual inflation lower than 1.5% during the 2009-2011 period) has decreased from 19% to 16%. The expected decline in the level of output conditional on being in a low inflation/deflation environment is still very high at 13%, indicating that a deflationary environment

represents a major risk for the US economy. The “Depth of Recession” chart [Exhibit C-3] shows that the likelihood of a “severe” recession, defined as a four-quarter drop in output larger than 3%, is a bit lower than in the last Blackbook.

3. Forecast Comparison

3.1 Greenbook Comparison

The path for the FFR is the same for the Greenbook and the Blackbook, with both projecting the FFR to stay in the current target range of 0.0 - 0.25% at least until the end of 2010.

Overall, the FRBNY and the Board staff forecasts are uncommonly close. This is mainly due to the fact that the Greenbook forecast for economic activity is substantially more optimistic than in March. The only remarkable difference concerns the evolution of the price level as the Board staff predicts a lower path for core PCE inflation. Concerning forecast uncertainty, the Blackbook still incorporates substantially more downside risk in economic activity than the Greenbook over the forecasting horizon.

Conditioning Assumptions. The Board staff assumes more favorable conditions in financial markets relative to the previous Greenbook. This improvement is partly attributed to the FOMC decision to expand the scale of asset purchases. In particular, long-term Treasury yields display a less pronounced upward tilt relative to the March forecast, reflecting more aligned private expectations about the planned asset purchases. Private borrowing rates are expected to be lower than in the previous Greenbook. Also, the path of stock prices is above the March forecast.

International. The FRBNY forecast for the net export contribution to 2009 GDP growth is 0.3 percentage point, whereas the Board is forecasting a 0.1 percentage point contribution. The differences are very small despite substantial differences in foreign GDP growth, with the Board far more pessimistic, particularly about Japan. The FRBNY forecast of -0.2 for the net export contribution to 2010 GDP growth is also similar to the Board’s forecast of -0.5.

Inflation. Relative to March, we have increased our forecast for core PCE inflation in 2009 from 0.7% to 0.9%, which remains somewhat lower than the Greenbook forecast (unchanged at 1.2%). However, the biggest difference remains in the 2010 forecast. Our projection is still considerably higher than the Greenbook projection (1.5% versus 0.7%, respectively). The two forecasts for total PCE inflation in 2010 differ by a similar amount.

Real Activity. The FRBNY and the Board staff⁷ forecasts for real activity are significantly closer than in previous versions of the Greenbook and Blackbook. In particular, the point forecast for GDP growth for both 2009 (Q4/Q4) and 2010 (Q4/Q4) are now the same. Both the FRBNY and the Board staff have revised upwards their forecasts for 2009 to -1.6% (from -1.9% and -2.3%, respectively). More noticeably, the Greenbook forecast for GDP growth in 2010 (Q4/Q4) has increased from 1.5% to 2.6%, while our staff forecast is unchanged at 2.6%. The Board staff predicts unemployment to be lower than our forecast in both 2009 Q4 (9.3% versus 9.6%) and 2010 Q4 (9.1% versus 9.5%). The difference is partly explained by the lower participation rate assumed in the Greenbook.

Uncertainty around forecasts. The Board staff has reassessed their estimates of forecast uncertainty, which results in wider estimates of average forecast uncertainty than in previous Greenbooks. However, our forecast still has wider confidence intervals than the Board staff forecast. As in March, the Blackbook forecast has significantly greater inflation and output uncertainty than the Greenbook, particularly for 2009. The Blackbook still assigns more probability to lower inflation this year than the Greenbook, with the bottom of the forecast probability interval at -0.5% versus +0.8% in the Greenbook. However, the bottom of the inflation forecast probability interval for 2010 is now lower in the Greenbook (-0.1%) than in our forecast (0.2%). This reflects the lower path for core inflation assumed by the Board staff. For GDP growth, the Blackbook incorporates substantially more downside risk than the Greenbook. The lower end of our 70% forecast interval is now -5.3% for 2009 and -0.7% for 2010, while the corresponding

numbers in the Greenbook are -2.8% and 1%.

To assess the importance of the differences between our outlook and the Greenbook forecasts, we calculate the percentile of the Greenbook forecasts for core PCE inflation and GDP growth in our forecast distribution. The results are shown in Table 2, with the March values in parentheses. The difference between the forecasts of the Greenbook and the Blackbook is more pronounced than it was in March. Once again, the largest gaps appear in the forecasts for core PCE inflation.

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>
2009	-0.5, 1.6 (-0.9, 1.5)	0.8, 1.7 (0.5, 1.5)	-5.3, 0.2 (-6.0, 0.0)	-2.8, -0.3 (-3.7, -0.8)
2010	0.2, 2.1 (0.2, 2.1)	-0.1, 1.4 (-0.4, 1.3)	-0.7, 4.0 (-0.7, 4.1)	1.0, 4.3 (0.1, 3.0)
2011	0.9, 2.4 (0.9, 2.5)	n/a (n/a)	2.3, 6.5 (2.2, 6.5)	n/a (n/a)

Table 2: Percentile of Greenbook Forecast in FRBNY Forecast Distribution

	Core PCE Inflation	Real GDP Growth
2009	71 (69)	59 (54)
2010	29 (20)	62 (42)
2011	11 (9)	55 (38)

Alternative Greenbook forecasting scenarios. The Greenbook explores five alternative scenarios. The first one considers the return of more acute financial strains coupled with a renewed bout of economic weakness. The second assumes an almost instantaneous end to the current recession followed by a “typical” recovery path. The third scenario allows

the ongoing downturn to have persistent adverse effects on the efficiency of labor markets. The last two scenarios look at alternative assumptions regarding the dynamics of inflation and inflation expectations. In all scenarios, the FFR is unchanged at the effective lower bound until the end of 2011.

The first scenario, *False Dawn*, assumes that financial conditions worsen, rather than ease, and that the economy experiences a renewed bout of weakness. As a result, risk premiums on various assets increase by 50 basis points relative to baseline and banks tighten lending terms and standards. Stock prices drop 25% below the level in the baseline scenario in the next three months, GDP falls at an annual rate of -3.5% in 2009H2, and unemployment reaches a level of 10.5% in mid-2010. Core PCE inflation remains below baseline through the end of the scenario horizon.

The *Typical Recovery* scenario entertains the possibility that the ongoing recession ends promptly and that the economy experiences a recovery that follows the pattern of postwar episodes. Credit availability improves and risk spreads narrow by more than in the baseline scenario. GDP growth peaks at 6.25% (annual rate) in 2009H2, and remains in the 3.6 - 4.6% range from 2010-2013. Unemployment barely increases from its current level, and drops to 4.5% in 2012-13.

In qualitative terms, the third scenario, *Labor Market Damage*, is somewhat similar to scenarios in previous Greenbooks that explored potential supply-side disruptions induced by the ongoing crisis. It assumes that the current downturn might have an adverse effect on labor market efficiency and lead to an increase in NAIRU of one percentage point relative to its pre-crisis level. As a result, there should be less slack in goods and labor markets, and less downward pressure on prices. However, the differences in inflation relative to the baseline case are negligible.

Similar to the previous Greenbook, the *Anchored Inflation Expectations* scenario incorporates moored long-run inflation expectations at around 2.0%. As a result, core PCE inflation falls less and in 2012-13 it is 0.5 percentage point higher than in the

baseline scenario. The outlook for real activity is slightly better than in baseline. However, the FFR only deviates from the baseline (and thus the lower bound) in 2012-13.

Finally, the *Deflation* scenario considers the possibility that the baseline case has understated the extent of current deflationary pressures in the economy. Core PCE inflation declines to -0.4% in 2009H2, and to -0.6% in 2011. With the FFR at its lower bound, real interest rates and the burden of nominal debt obligations increase. As in the corresponding scenario in the March Greenbook, the differences in terms of real activity are small relative to the baseline case.

3.2 Comparison with Private Forecasters¹

The most recent release of the Survey of Professional Forecasters is from mid-February. Subject to this caveat, the FRBNY forecast still predicts the largest contraction in GDP for 2009Q1 when compared to the median SPF, PSI model, Blue Chip, and Macro Advisers forecasts. There is much less dispersion in forecasts for 2009 (Q4/Q4) growth, but our forecast remains the most pessimistic at -1.6% (annual rate). The differences for 2010 (Q4/Q4) are relatively small. In terms of inflation, the biggest differences are between our forecasts for 2010 (Q4/Q4) and those of Macro Advisers. Forecasts are reported in Exhibit B-8 as percent changes at an annual rate.²

Real GDP Growth. The FRBNY has the lowest estimate for GDP growth for 2009Q1, at -6.2%. The corresponding PSI model, Blue Chip, median SPF and Macro Advisers estimates are -3.8%, -5.1%, -5.2%, and -5.3% (annual rate), respectively. In contrast, for 2009Q2 we have the second highest growth forecast, at -1.2%, after Macro Advisers' -0.6% forecast. The corresponding PSI model, Blue Chip, and median SPF forecasts are -2.8%, -2.1% and -1.8%, respectively. We project 2009 (Q4/Q4) growth of -1.6%, compared to -1.3%, -1.1% and -0.9% for Blue Chip, median SPF and Macro Advisers,

¹ Release dates of the private forecasts discussed in this section are in parentheses: Blue Chip consensus (04/10), SPF (02/13), Macro Advisers (04/24 for real GDP growth; 04/07 for inflation measures), and the PSI Model (04/21).

² Please note that the median SPF is a "year over year" rather than a Q4/Q4 forecast.

respectively. Once again, the dispersion in forecasts for 2010 is lower than in the previous Blackbook, and we continue to forecast the lowest rate of growth.

Core PCE Inflation. The dispersion in forecasts declined relative to the previous Blackbook. The biggest difference remains in the forecasts for 2010 (Q4/Q4), with Macro Advisers forecasting core PCE inflation of only 0.2% (annual rate), whereas our forecast is 1.3%. The difference for 2009 (Q4/Q4) is much smaller, with Macro Advisers forecast of 0.8% being only slightly lower than ours (0.9%). The forecasts for 2009Q2 are also somewhat more aligned (FRBNY: 0.6%; Macro Advisers: 0.8%).

CPI Inflation. Across all horizons, our forecast is aligned with Blue Chip and median SPF. For 2009 our forecasts are also roughly in line with Macro Advisers. For 2010 (Q4/Q4) the discrepancy between our forecast and Macro Advisers is quite significant. We forecast CPI inflation of 1.7% (similar to Blue Chip and median SPF), whereas Macro Advisers forecast is at 0.5%.

Core CPI Inflation. The picture for core CPI inflation is somewhat similar to that of headline CPI inflation. Macro Advisers maintain somewhat lower forecasts for 2009 (Q4/Q4). For 2010 (Q4/Q4) Macro Advisers forecast of 0.3% is significantly lower than our forecast of 1.5%.

4. Robustness of Policy Recommendation

4.1 Sensitivity to Alternative Scenarios and Policy Rules

Our current policy recommendation is to keep the target federal funds rate in the 0-0.25% range through 2010. This recommendation is consistent with *all* of our policy rules under almost *all* scenarios [Exhibit D-1]. This has been the case for the last few Blackbooks.

Since there is no change in the nominal FFR paths, as they are all constrained by the zero bound, the information provided in the section is mostly about the *shadow* real rates - that is, the real FFR rates implied by the various rules under the various scenarios *ignoring* the zero bound constraint. Exhibit D-1 shows that, under the different scenarios, the

“shadow” real rate implied by the *Baseline* rule ranges from about -2.5% to -5.5% in the current quarter, and from -3% to -7% in 2009Q4, depending on the scenario. These figures can be interpreted as indicating the desired level of expected inflation under each scenario, given that the nominal FFR is constrained at zero. For example, under the *Global Deflation* scenario, the policy maker would ideally generate an expected inflation rate of about 7% in 2009Q4 to bring the real rate to the desired level.

The prescription from the alternative policy rules, namely the *Asymmetric Price Targeting*, *Dove*, and *Outcome-based* rules, differ from that of the *Baseline* rule to the extent that the alternative rules tend to be either more reactive to output (i.e. *Dove* rule) or more averse to disinflation (i.e. the *Asymmetric Price Targeting* rule) [Exhibit D-3]. For instance, the *Asymmetric Price Targeting* rule implies a real FFR rate of about -17% under the *Global Deflation* scenario by the end of 2009, versus the -7% real FFR implied by the *Baseline* rule. For the *Outcome-based* rule, we show the nominal FFR ignoring the zero bound. This rule therefore has the nominal FFR reaching -6% under the *Central Scenario* in mid-2010 and then, as conditions improve, rising to -2% by the end of 2011.

We also use the DSGE-VAR to assess the current stance of monetary policy. We perform a counterfactual exercise eliminating past policy shocks and find that the DSGE-VAR predicts a FFR of about 1% in 2009-Q1. This follows from the fact that the historical policy rule i) mainly responds to inflation, and ii) is characterized by strong gradualism.

4.2 Comparison to Market Expectations

Our policy recommendation coincides with the path currently priced into markets and with the forecast of the primary dealers through the end of 2009. The market-implied FFR suggests a gradual renormalization starting at the beginning of 2010, while the average forecast from the primary dealers implies 28 basis points of tightening by the middle of 2010. Nonetheless the majority of primary dealers do not expect the FOMC to start raising rates until 2011, consistent with our recommendation.

5. Significant Developments

5.1 Economic Developments

U.S. Data Releases. Data over the intermeeting period largely were in line with expectations. Production and orders are falling as firms worked to reduce their inventories and cut spending, while consumer spending remains weak. The unemployment rate continues to rise.

GDP: Output fell 6.3% (saar) in 2008Q4, essentially unchanged from its preliminary estimate. Profits were down 21% over the year, with large declines in the financial services and energy sectors.

Production: Industrial production index fell 1.5% in March and is now 15% below its year-ago level. For 2009Q1, production fell at a 20% annual rate and was at its lowest level in over ten years. Capacity utilization dipped below 66% for the first time in the history of this data series that extends back sixty years.

Orders: Orders for durable goods fell 0.8% in March according to the advance report, with the level of orders roughly in line with expectations. New orders for nondefense capital goods excluding aircraft rose 1.5%, offsetting some sign of stabilization in investment spending.

Retail Sales: Retail sales were weaker than expected in March, falling 1.1%. Sales excluding autos were down a steep 0.9%, suggesting no forward momentum entering 2009Q2.

Inventories: Business inventories fell 1.3% in February, the fourth month of declines exceeding 1.0%. Auto retail inventories were down 7% since December. An increase in sales caused the inventory-sales ratio to decline for the first time since last June.

Home Sales/Starts: Housing starts fell 11% in March following February's surprising increase. The data were slightly disappointing, but are still consistent with a bottoming out of housing construction after a contraction that has been ongoing for the last three and a half years. Existing home sales have stabilized near an annual rate of 4.6 million units. New home sales were surprisingly high in March. Inventories of unsold new homes continued to decline rapidly, although they are still high relative to sales.

House Prices: The FHFA index rose for the second month in a row in February, but is still down 6.5% over the year and down 9.5% from its peak. The Case-Shiller (20) index, which includes a broader set of sales, was down 15% over the year in January.

Construction Spending: Non-residential construction rose in February, but not enough to change the forecast of a substantial fall in 2009Q1.

Labor Market: Nonfarm payrolls dropped 663,000 and the unemployment rate increased to from 8.1% to 8.5%, roughly in line with expectations. For 2009Q1, aggregate hours worked fell at an 8.5% annual rate. Continuing claims have recently moved above 6 million.

Trade: The trade deficit narrowed to \$26 billion in February, down from \$36 billion in January. Exports were slightly higher, surprisingly, while imports continued to fall. Over the year, exports were down 17% while non-oil imports were down 25%.

CPI: The headline price index fell 0.1% in March and was down 0.5% over the year, the most pronounced drop since 1955. The core index was up 0.1% over the month and up 1.8% over the year. Core inflation has been stable in recent months, but there were signs of softness in consumer goods prices.

PCE Deflator: The core PCE deflator firmed a bit in February, with the 12-month increase moving up to 1.8% from 1.7%.

Foreign Data Releases. Foreign output fell sharply in 2008Q4 and 2009Q1 in an unusually synchronized global recession. There are signs that the downturn is easing, with Asian exports stabilizing and various confidence measures improving modestly in March and April.

Europe: Euro area industrial production was down 18% over the year in February, with auto production down 35%. Exports were down 23%. Business and consumer confidence measures deteriorated through March to record lows, although April PMI and German IFO data improved somewhat. The unemployment rate reached 8.5% in February with the number of unemployed up 19% over the year. Labor productivity was down 1.5% over the year in 2008Q4.

U.K. manufacturing output was down 14% over the year in February, the largest annual decline since 1981. The unemployment rate reached 6.4% in December and likely continued to rise in 2009Q1. House prices were off 18% over the year in March, although there were some signs that the housing market might be stabilizing.

Asia: In Japan, the March Tankan report on business conditions showed a sharp increase in pessimism. Industrial production fell 38% over the year in February. Surveys suggest that that production is rebounding modestly in April, especially in terms of exports.

China's GDP was up 6.1% over the year in 2009Q1. Credit growth has been skyrocketing since late last year, with state-controlled banks responding strongly to government stimulus directives. Consistent with a stimulus-led domestic recovery, China's PMIs, industrial production, and imports have all firmed.

Latin America: Mexico's economy contracted 10.4% (saar) in 2008Q4, pulled down by large declines in manufacturing output, while Brazil's economy fell 13.6% (saar).

5.2 Financial Markets

U.S. Markets. The equity market, and particularly financial sector sub-indices, rallied over the intermeeting period. As illustrated in the top two charts in Exhibit A-15 (Equity Premium: Turning Points), temporary rallies on the order of 20-40% were common during the Great Depression. However, at low frequencies, the equity premium has a large degree of predictability. For example, a regression of the 10-year rolling return on the S&P500 in excess of the 10-year Treasury rate on the 10-year lag of the P/E ratio, the 10-year lag of the term spread, and the 10-year lag of the 10-year return, yields an R^2 of 0.28. Such a regression suggests that we might be close to a turning point, at least when the regression is run in sample. Out of sample, we are still far from the bottom of the bear market, as mean reversion in equity prices seems to have become stronger in the recent decade.

Exhibit A-15 (Equity Premium: Turning Points) suggests that the part of the equity

premium not explained by lagged forecasting variables is explained by the evolution of leverage of financial institutions (ABS issuers, broker-dealers, commercial banks, GSEs). In general, risk premia can be decomposed into a part that is due to macro risks and a part that is due to liquidity risks. The expected returns to leverage have declined sharply since the beginning of the crisis, returning to negative territory, as was the case in the 1970s and 1980s.

Exhibit A-8 (Financial Intermediaries) plots the yield curves in “haircut space.” The y-axis represents the yields in excess of the repo rate of the underlying asset, while the x-axis represents the haircuts for each of the assets. The data are from the haircut survey conducted by the Markets Group. The yield curves have three dimensions: level, slope, and length. Since February 2008, the curves have shifted up, they have become longer, and they have become steeper. The upward shift indicates that market compensation per unit of haircut has increased. The steepening indicates that compensation per unit of haircut is increasing with the haircut. The lengthening of the curve indicates that maximum haircuts on the surveyed collateral have increased. The figure is a useful way to summarize the equilibrium impact of programs such as TALF, as both expected returns and haircuts are affected.

A notable development since the last FOMC is the decline in the usage of liquidity facilities, primarily PDCF, CPFF, and TSLF (Exhibit A-10). Furthermore, liquidity swap usage has declined, in conjunction with a decline of the FX basis spread.

Analysis of balance sheet leverage from the flow of funds shows that broad balance sheet deleveraging continues (Exhibit A-11). This deleveraging is particularly pronounced among the market-based intermediaries (e.g. broker-dealers and ABS issuers). It can also be seen among the insurance funds and pension funds, as well as mutual funds. The magnitude of the Fed’s balance sheet expansion is small relative to the overall deleveraging in the economy, despite the growth rate of the monetary base. Liquidity buffers of commercial banks, broker-dealers, and GSEs are increasing.

The single most important theme in markets since the last FOMC was the government's stress tests. Exhibits A-16 and A-17 give an overview.

Foreign Markets. Global funding conditions improved over the inter-meeting period, with LIBOR-OIS spreads declining about 30 basis points across Europe. Conditions remain fragile, however, as extensive liquidity support by central banks in Europe and Asia is still seen as necessary. Several European governments have made announcements regarding "bad bank" mechanisms to clean up their banking sector's balance sheets.

- On April 8th, the Irish government announced it will set up a new agency that will take over commercial property assets worth 80-90 billion euro from the nation's top six banks and lenders. In return, banks receive government bonds with the government taking haircuts on the value of these assets.
- Similarly, Germany announced a preliminary "bad bank" plan on April 21st under which banks will transfer assets that they are unable to sell to separate special purpose vehicles in return for debt certificates. These "bad bank" units will manage and eventually liquidate the assets, which in turn will be guaranteed by the government in return for fees.

In emerging markets, sovereign debt spreads declined, but global capital markets continued to be closed to emerging world corporate borrowers. Financial sector pressures remain in emerging markets with the IMF providing liquidity support for a number of these economies.

- On April 2nd, the G-20 announced a \$1.1 trillion funding plan for emerging market economies, consisting of extra funds for the IMF, an extra \$100 billion for lending by multilateral development banks and \$250 billion in trade finance.
- Mexico, Poland and Columbia applied for IMF FCL credit lines worth \$47 billion, \$20.5 billion and \$10.4 billion respectively, as an emergency back-stop. The IMF's new Flexible Credit Line (FCL) lending facility was developed for countries with strong fundamentals and sound policies that are facing external financing difficulties.

Tentative signs of an easing of the global economic slowdown as well as declining risk aversion amongst investors resulted in higher global equities and long-term interest rates since the last FOMC meeting. The increase in global long term interest rates was also driven by the deterioration of government finances in major economies.

- In Europe and Japan, equities were up between 7% and 17%, whereas emerging Asian and European equities showed even larger gains. European financials also gained substantially – for example, UBS and Barclays rose, respectively, 18% and 138%.
- European and Japanese 10-year government bond yields increased 11 to 60 basis points.

The trade-weighted U.S. dollar index fell over the period as the growth outlook abroad appeared to become less dire and investors' risk appetite increased. The dollar depreciated *vis-à-vis* the euro and the yen by 1% and 0.70%, respectively. The dollar remained broadly stable against the Chinese yuan and forward contracts suggest modest dollar weakening over the next 12 months.

5.3 Global Economic Policy

Central banks around the world continued to ease their policies over the intermeeting period:

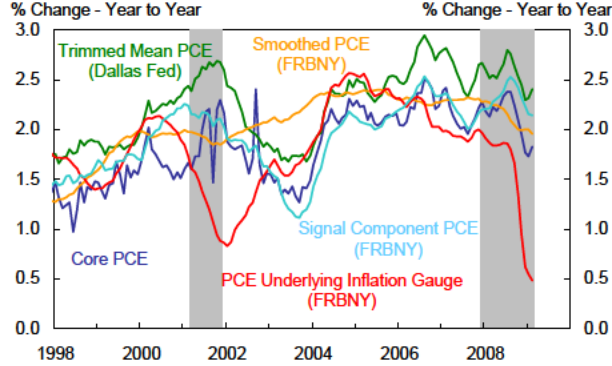
- The ECB lowered its policy rate on April 2nd by 25 basis points to 1.25% and announced that details about potential additional policy easing measures will be provided at the May meeting.
- As of April 17th, the Bank of England purchased roughly GBP 35 billion worth of government bonds that was financed by expanding its monetary base.
- After its policy meeting on March 18th, the Bank of Japan increased its monthly outright purchase of government bonds from 1.4 trillion to 1.8 trillion yen.
- The central banks of Australia, Canada and Sweden decreased their policy rates between 25 and 50 basis points each to, respectively, 3.0%, 0.25%, and 0.50%. In its April 22nd policy statement, the Bank of Canada committed to hold its rate at

- 0.25% until 2010Q2, conditional on the inflation outlook. It also identified three instruments for use if additional easing is needed: (i) conditional statements about the future policy rate path, (ii) outright purchases of financial assets financed by monetary base expansion and (iii) targeted purchases of assets in credit markets aimed at reducing credit spreads.
- Elsewhere, central banks in India, Chile, Mexico, Kuwait, Pakistan, the Philippines, Russia, Saudi Arabia and Turkey lowered their respective policy rates between 25 and 100 basis points each. In Emerging Asia outside China, the pace of monetary easing has slowed somewhat, which suggests that the loosening cycle that began last September is nearing an end.

A. Significant Developments

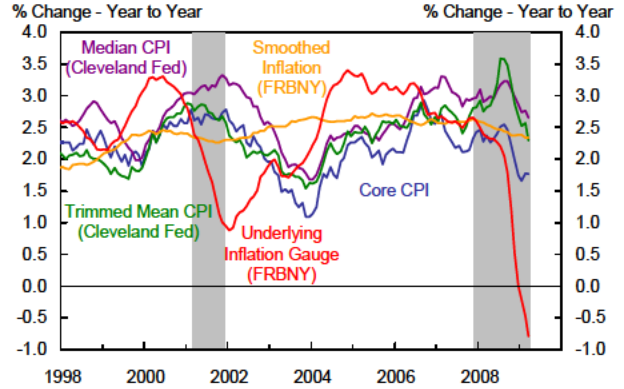
Exhibit A-1:
Measures of Trend Inflation

Alternative Measures of PCE Inflation



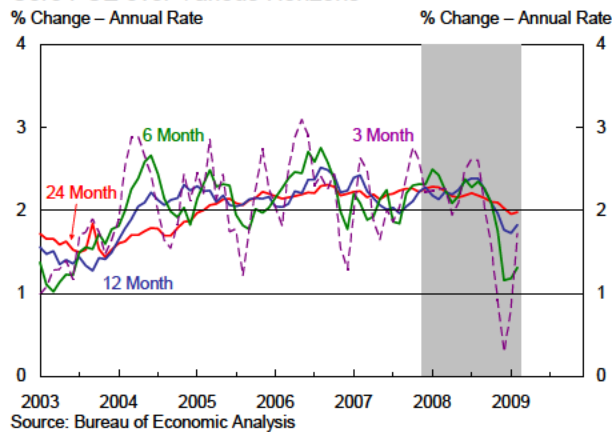
Source: Bureau of Economic Analysis, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Alternative Measures of CPI Inflation



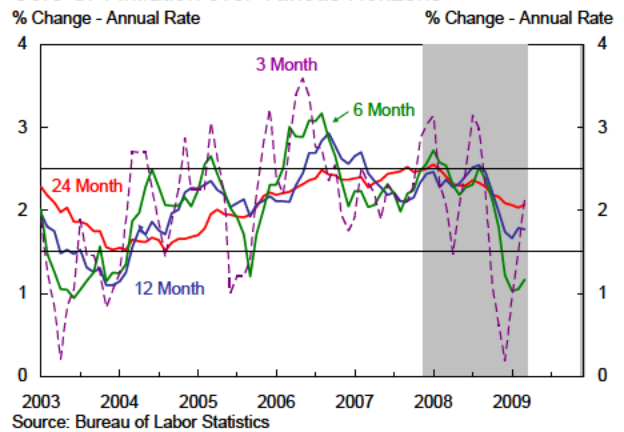
Source: Bureau of Labor Statistics, Cleveland Fed, MMS Function (FRBNY), and Swiss National Bank

Core PCE over Various Horizons



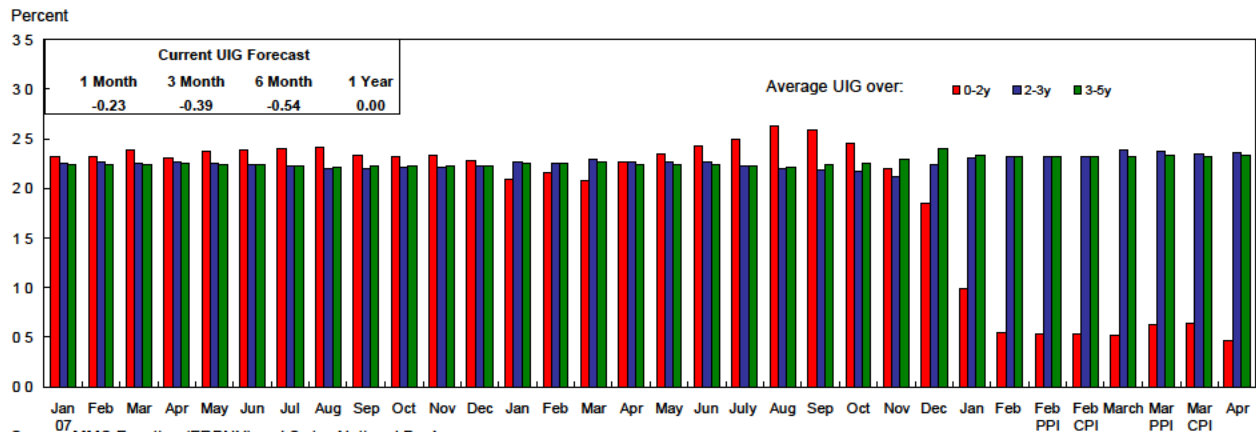
Source: Bureau of Economic Analysis

Core CPI Inflation over Various Horizons



Source: Bureau of Labor Statistics

Exhibit A-2:
Underlying Inflation Gauge (UIG)



Source: MMS Function (FRBNY) and Swiss National Bank

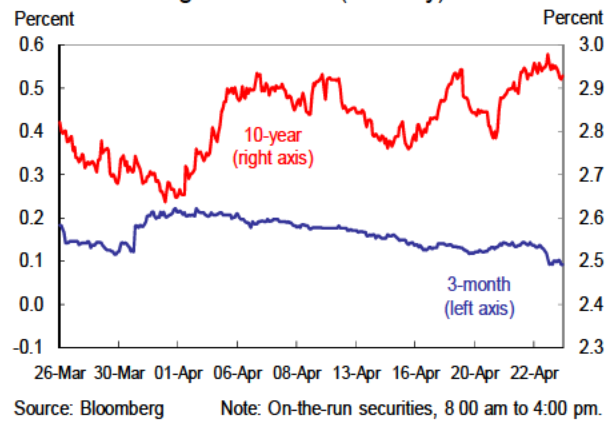
A. Significant Developments

**Exhibit A-3:
Treasury Yields**

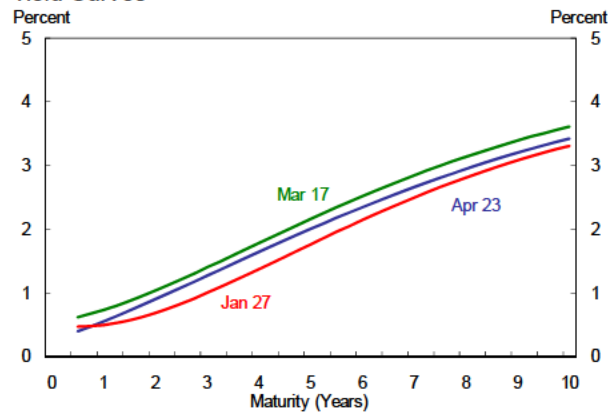
Short- and Long-Term Rates



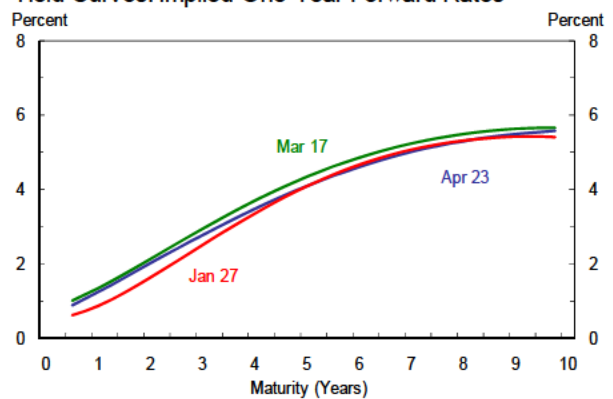
Short- and Long-Term Rates (Intraday)



Yield Curves



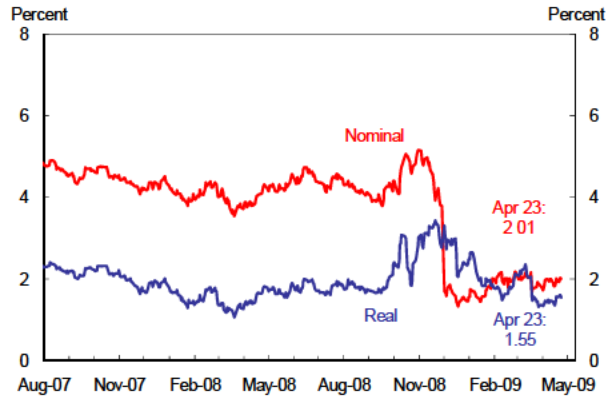
Yield Curves: Implied One-Year Forward Rates



A. Significant Developments

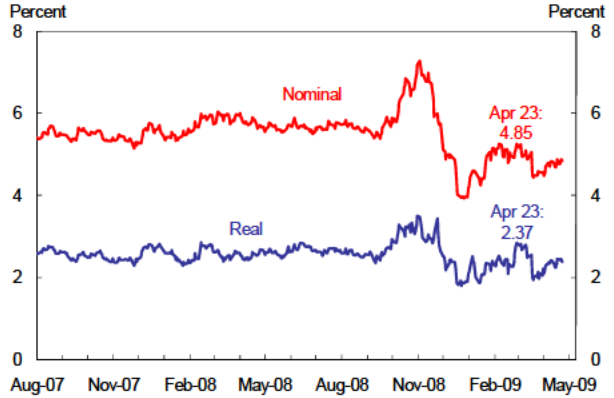
Exhibit A-4: Real Yields and Implied Inflation

5 Year Spot Rate



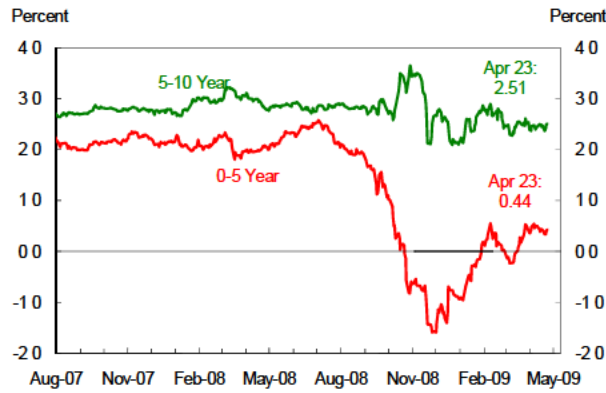
Source: Federal Reserve Board

5-10 Year Forward Rates



Source: Federal Reserve Board

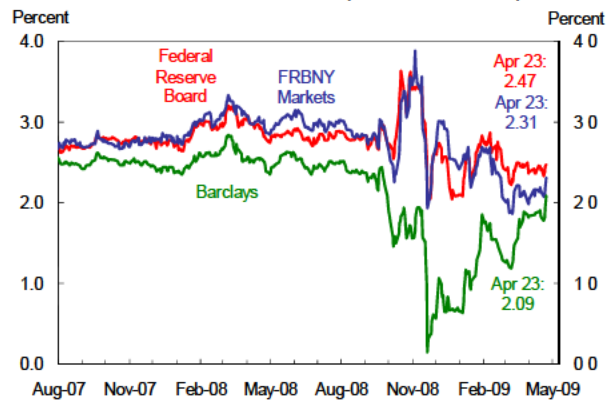
TIPS Implied Inflation Compensation: 0-5, 5-10 Year Horizons



Source: Federal Reserve Board

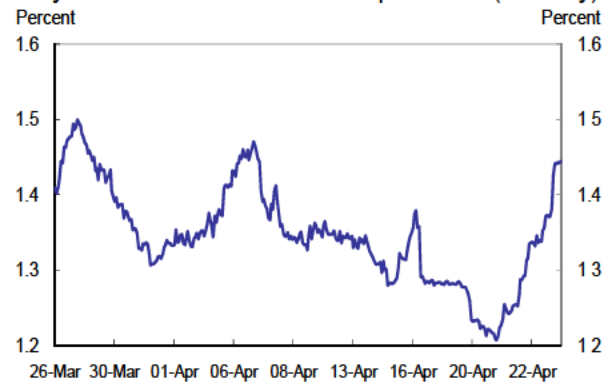
Note: Carry-adjusted

Alternative Measures of 5-10 Year Implied Inflation Compensation



Source: Federal Reserve Board, Barclays, and FRBNY calculations

10-year Breakeven Inflation Compensation (Intraday)



Source: Bloomberg

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

Implied Inflation from Inflation Swaps: 0-5, 5-10 Year Horizon

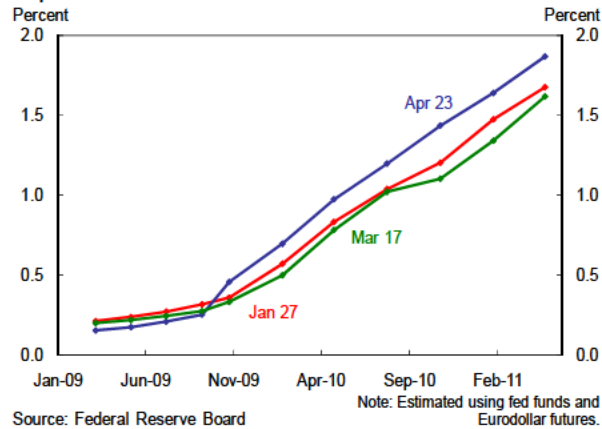


Source: Barclays

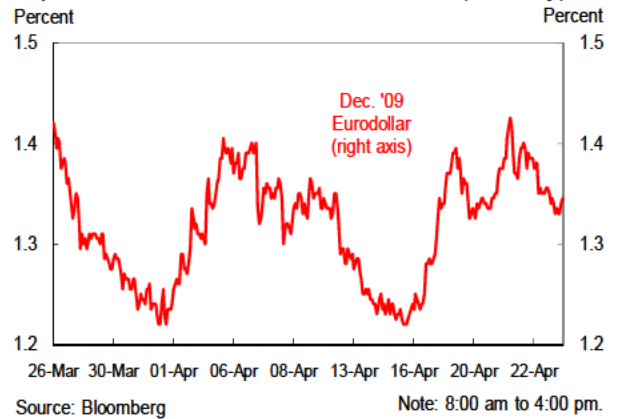
A. Significant Developments

**Exhibit A-5:
Policy Expectations**

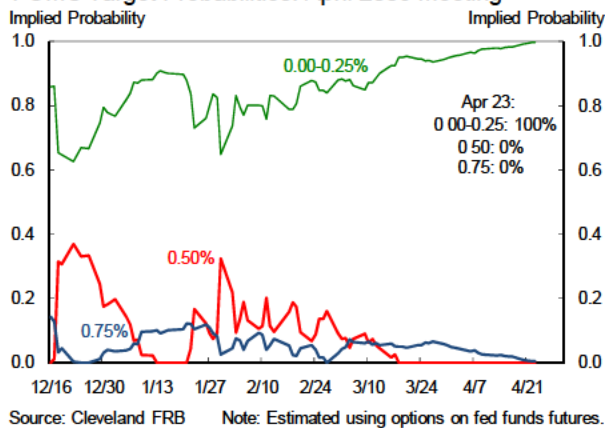
Expected Fed Funds



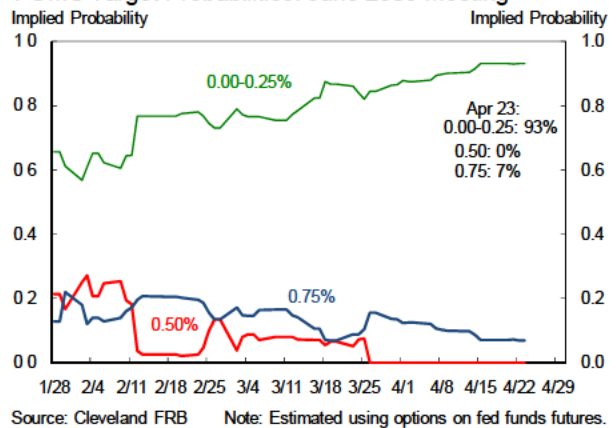
Implied Fed Funds and Eurodollar rates (Intraday)



FOMC Target Probabilities: April 2009 Meeting



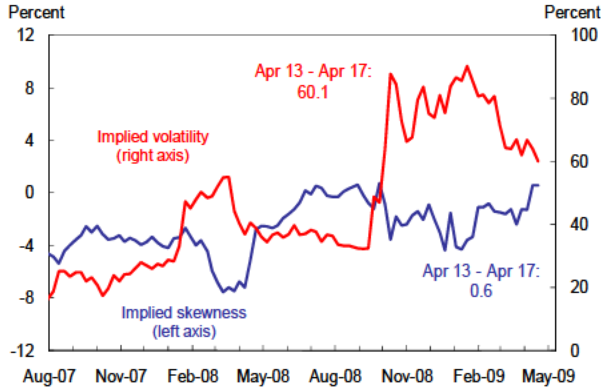
FOMC Target Probabilities: June 2009 Meeting



A. Significant Developments

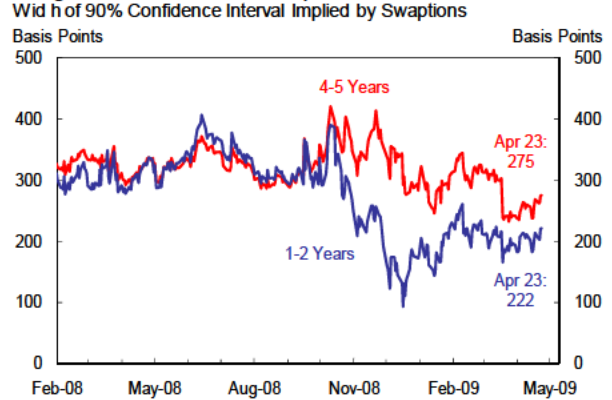
Exhibit A-6: Implied Volatility

Implied Skewness and Volatility



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

Long-Term Interest Rate Expectations



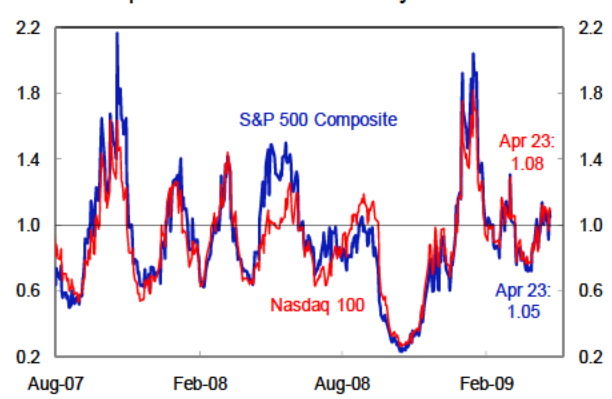
Source: Datastream, FRBNY calculations

Equity Index Implied Volatility: 1-Month



Source: Datastream

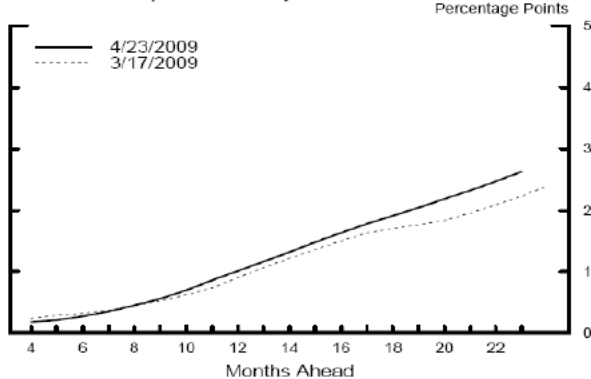
Ratio of Implied to Realized Volatility



Source: Datastream

Note: Realized volatility is annualized 1-month rolling standard deviation of daily returns (360 day year) for S&P 500 and Nasdaq 100.

Eurodollar Implied Volatility Term Structure*

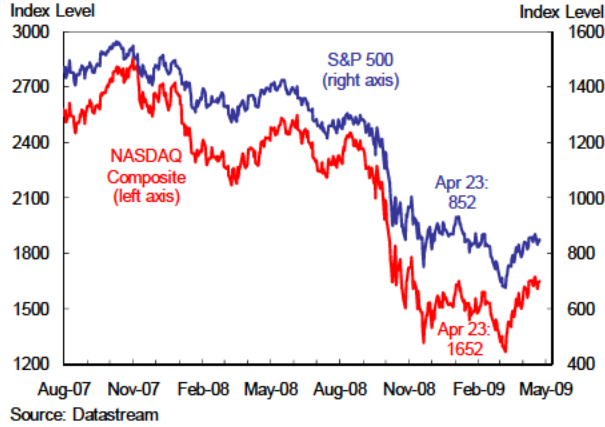


*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

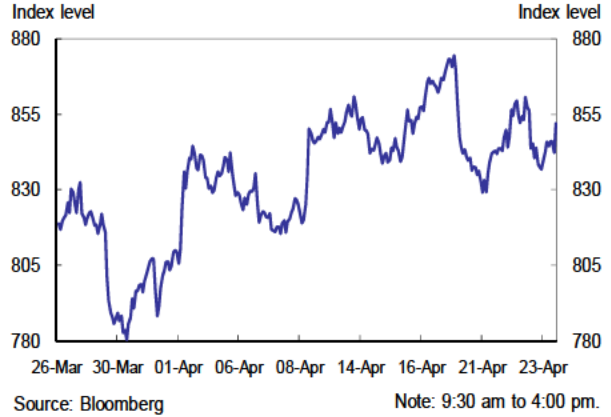
A. Significant Developments

Exhibit A-7: Equity and Credit

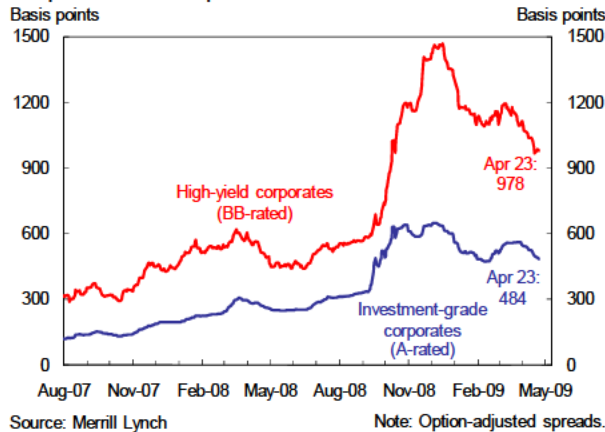
Equity Index Levels



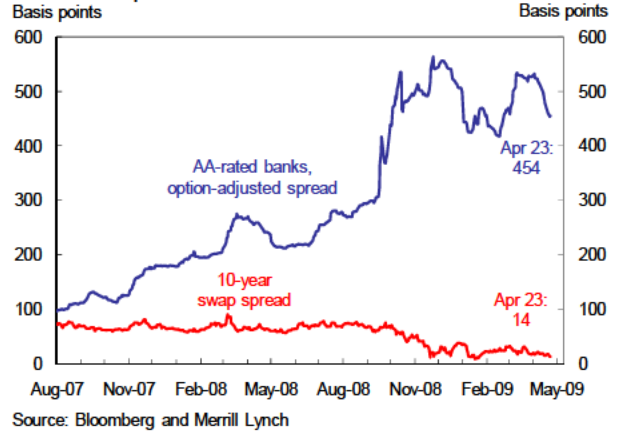
S&P 500 Index (Intraday)



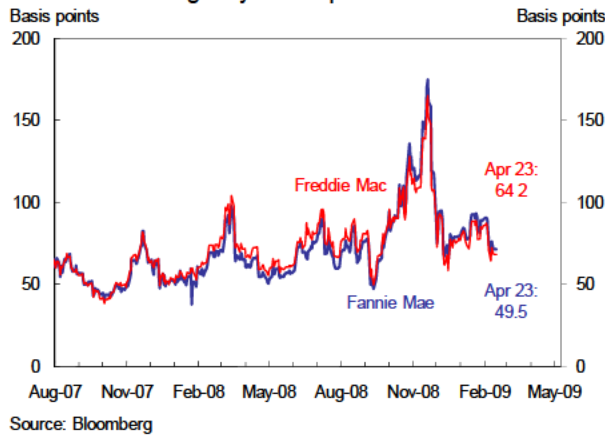
Corporate Credit Spreads



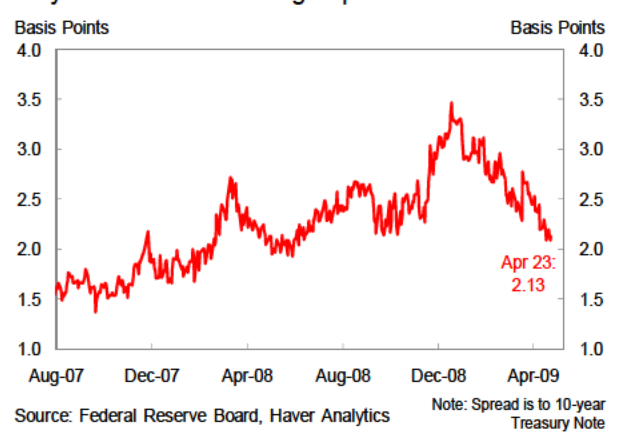
AA Credit Spreads



10-Year Senior Agency Debt Spreads



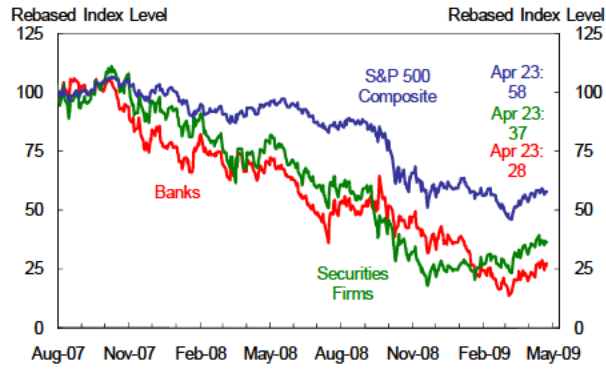
30-year Fixed Rate Mortgage Spread



A. Significant Developments

Exhibit A-8: Financial Intermediaries

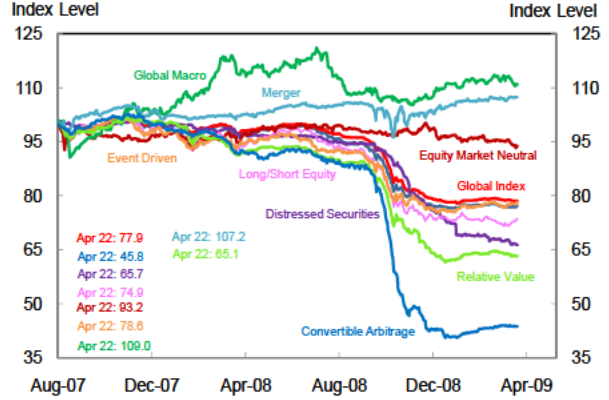
Equity Performance



Source: Datastream

Note: Rebased to equal 100 on August 1, 2007. Banks series is S&P 500 Banks index. Securities Firms series is S&P 500 Investment Banks and Brokerages index.

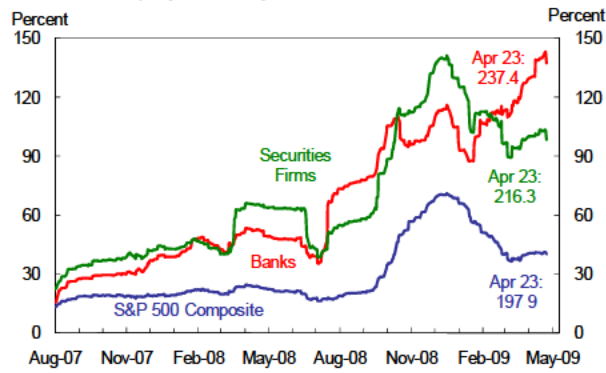
HFRX Hedge Fund Indices



Source: HFR

Note: Rebased to equal 100 on August 1, 2007.

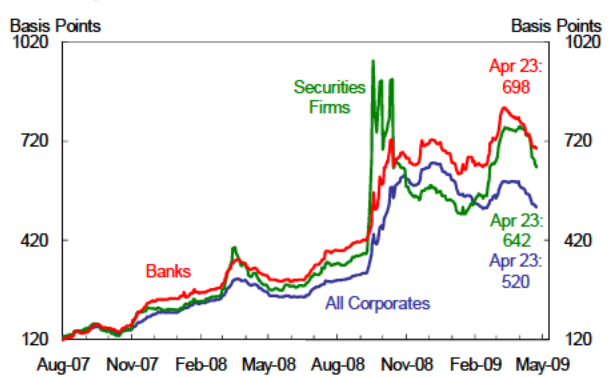
Historical Equity Volatility



Source: Datastream

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

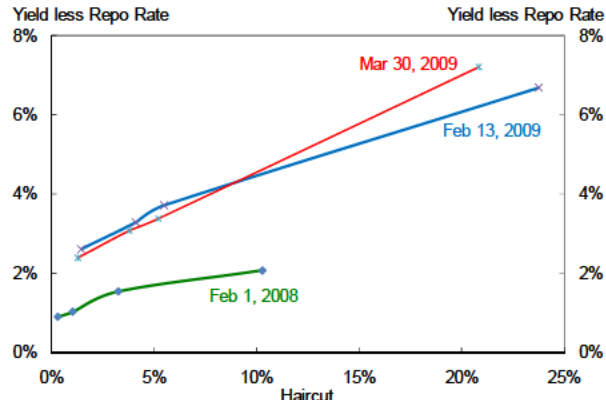
Credit Spreads



Source: Merrill Lynch

Note: Option-adjusted spreads. Banks series is Merrill Lynch Corporates, Banks bond index. Securities Firms series is Merrill Lynch Corporates, Brokerages bond index.

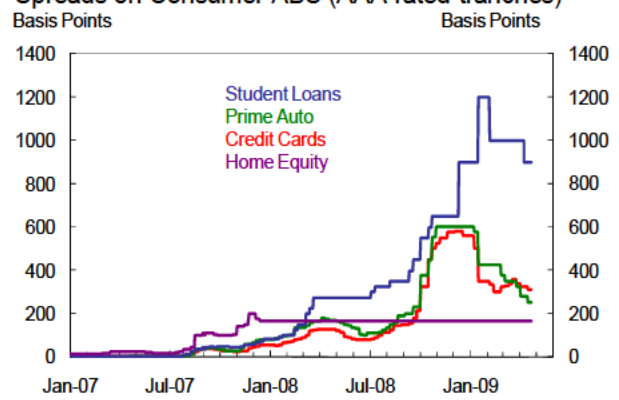
Collateral Haircut - Return Curves



Source: Bloomberg, FRBNY Markets survey

Note: Includes Treasury, Agency, Agency-MBS and HG Corporate collateral

Spreads on Consumer ABS (AAA-rated tranches)

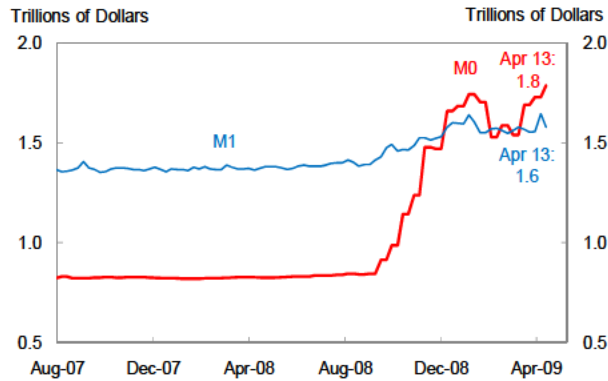


Source: JPMorgan

A. Significant Developments

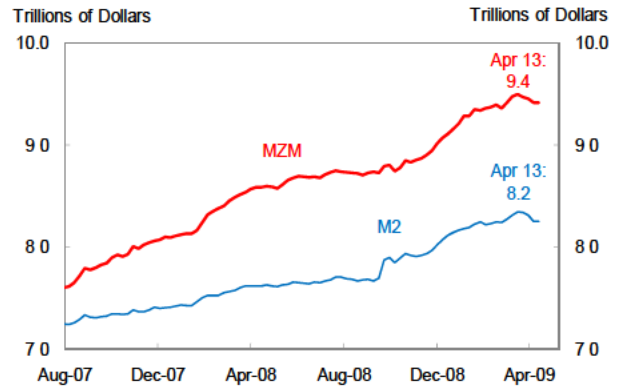
Exhibit A-9: Money and Banking

Measures of Money Supply: M0,M1



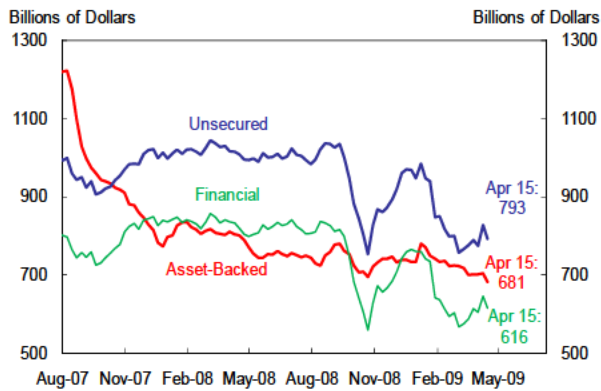
Source: Federal Reserve Board, Haver Analytics

Measures of Money Supply: M2, MZM



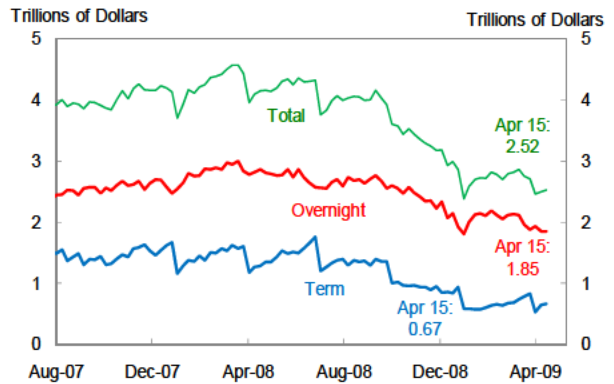
Source: Federal Reserve Board, Haver Analytics

Commercial Paper Outstanding



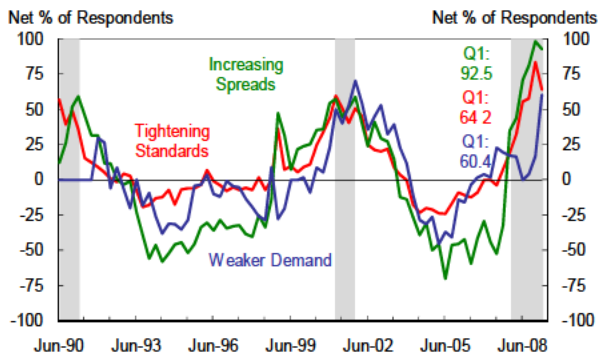
Source: Federal Reserve Board

Primary Dealer Repurchase Agreements



Source: Federal Reserve Board

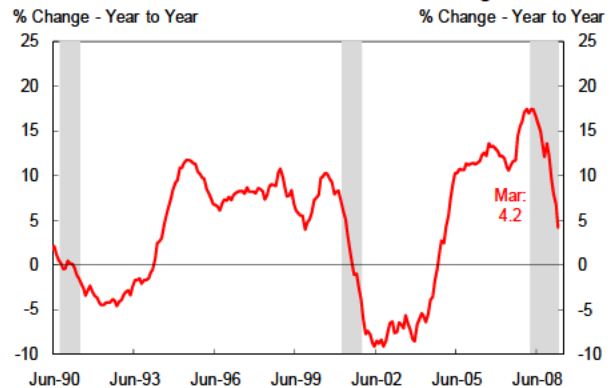
Bank Lending Practices



Source: Federal Reserve Board

Note: Data cover C&I loans to large- and medium-sized firms

Commercial and Industrial Loans Outstanding

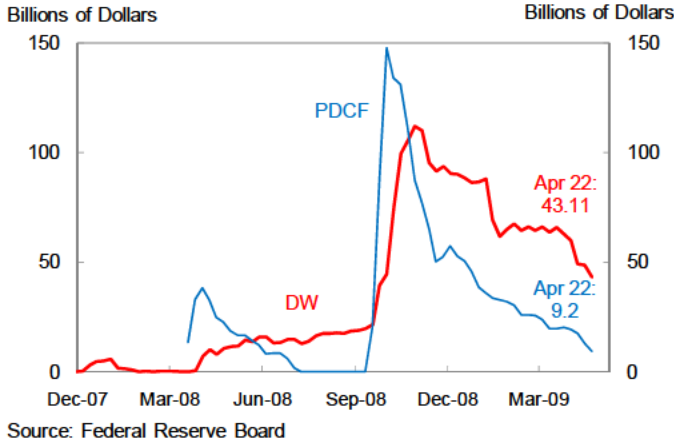


Source: Federal Reserve Board

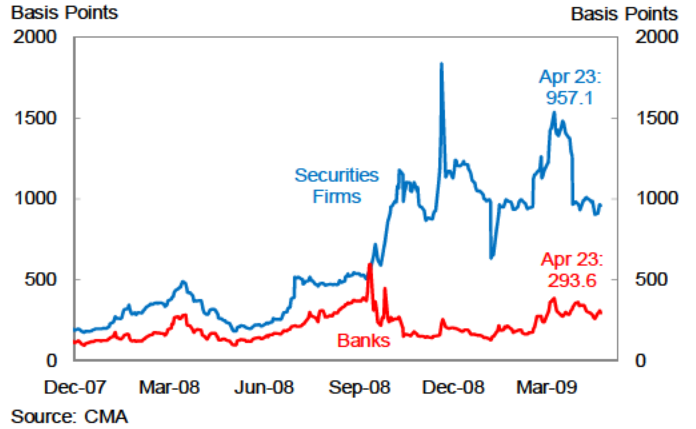
A. Significant Developments

Exhibit A-10: Liquidity Facilities

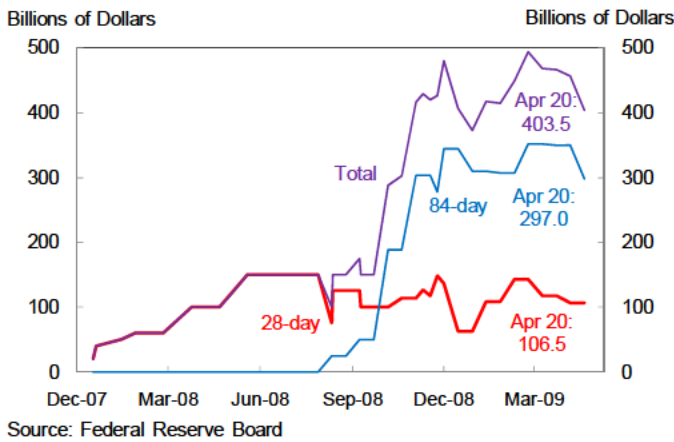
Discount Window and PDCF Borrowing



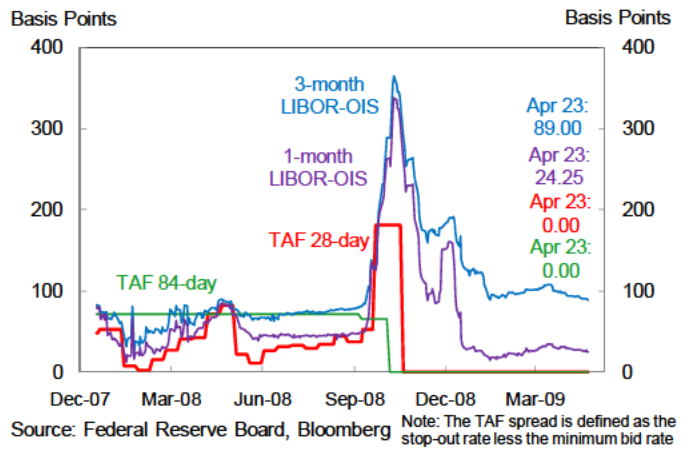
Sector CDS Spreads



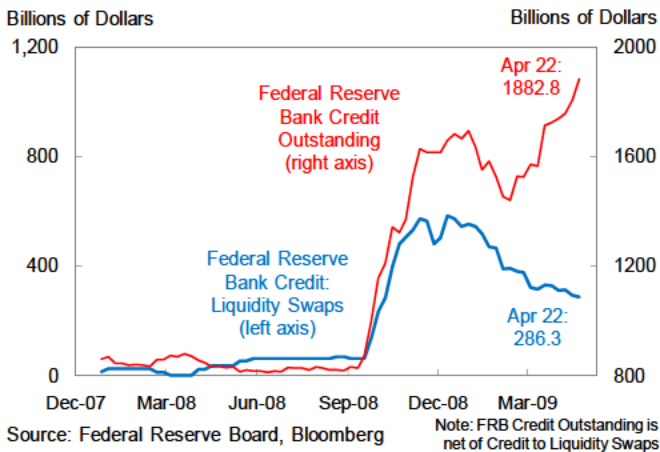
TAF 28-day, 84-day, and Total Outstanding



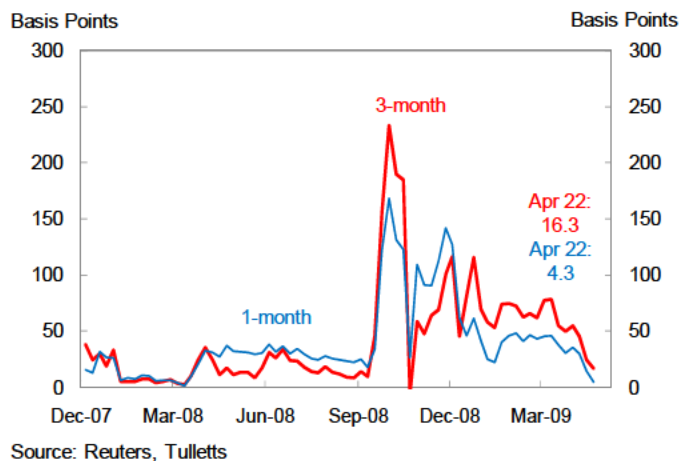
TAF spreads and Libor to OIS



Central Bank Liquidity Swaps



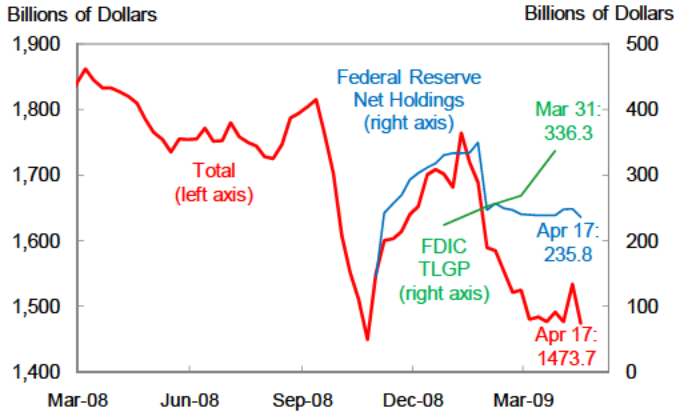
Euro-Dollar Swap Implied Basis Spreads



A. Significant Developments

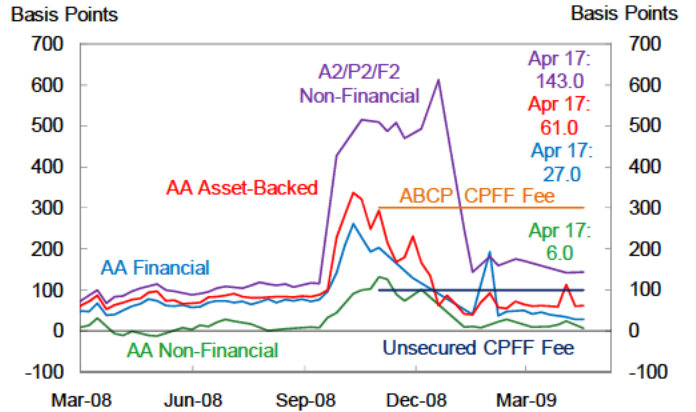
Exhibit A-10:
Liquidity Facilities

CPFF and Commercial Paper Outstanding



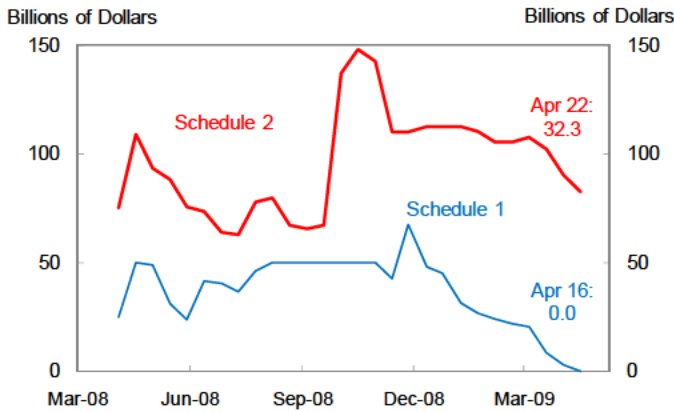
Source: Federal Reserve Board, Haver, FDIC

3-month CP Rates over OIS



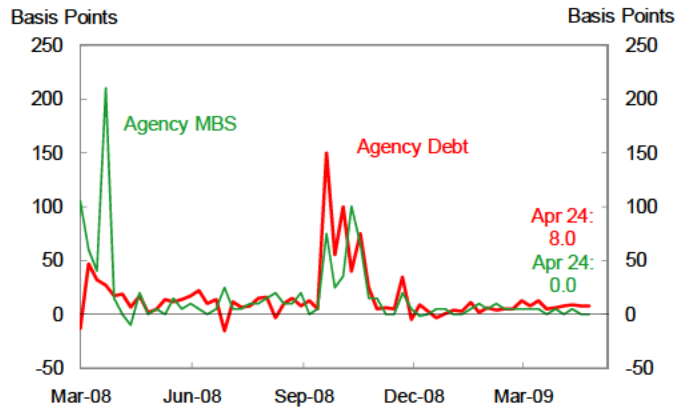
Source: Federal Reserve Board, Haver, Bloomberg

TSLF Schedule 1 & 2 Total Outstanding



Source: Federal Reserve Board

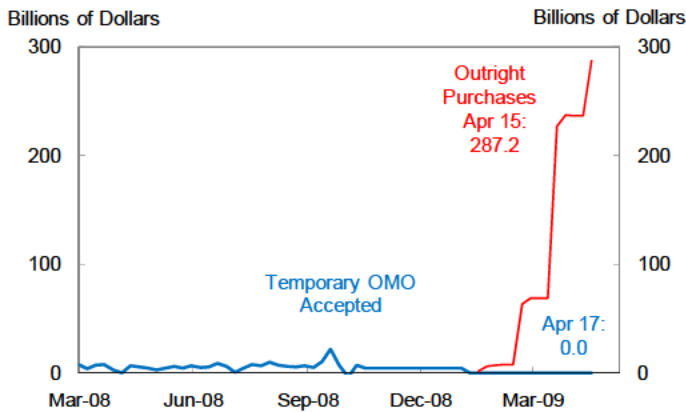
Overnight Financing Spreads



Source: Bloomberg

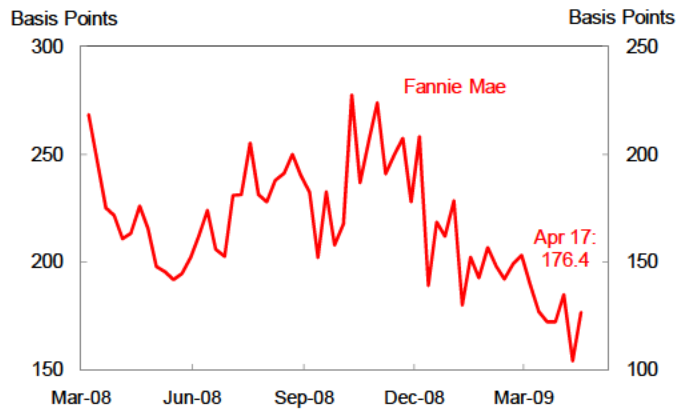
Note: Spreads are between overnight agency debt and MBS and Treasury general collateral repo rates

Agency MBS Transactions



Source: Federal Reserve Board, Haver

Agency MBS to Average 5y and 10y Yields



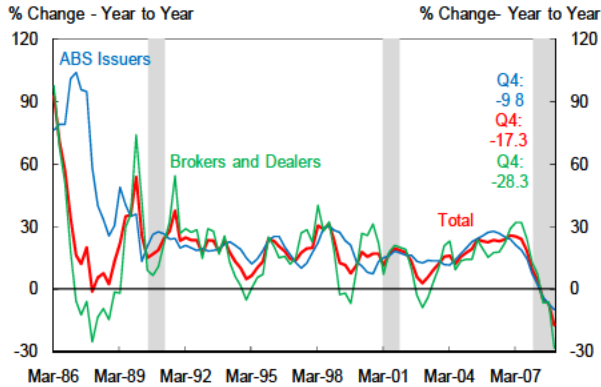
Source: FRB, Haver, Bloomberg

Note: Spreads are agency 30 year on-the-run coupon to average of 5 and 10 year yields

A. Significant Developments

Exhibit A-11:
Total Assets from the Flow of Funds

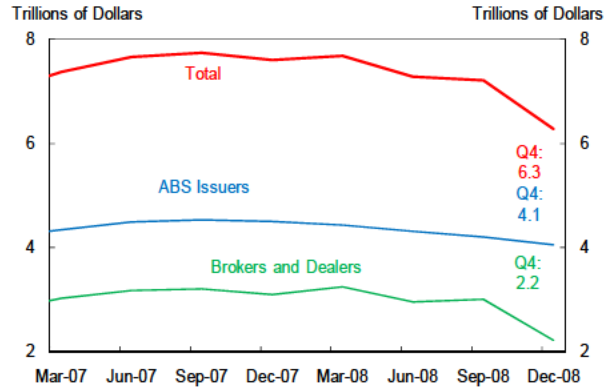
Market Based Intermediaries



Source: Federal Reserve Board

Note: Includes ABS issuers, Reits, security brokers and dealers

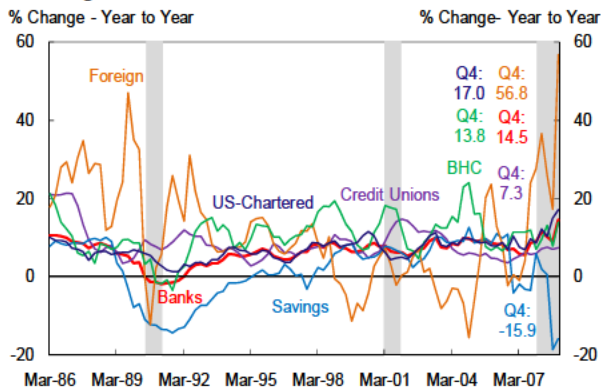
Market Based Intermediaries



Source: Federal Reserve Board

Note: Includes ABS issuers, security brokers and dealers

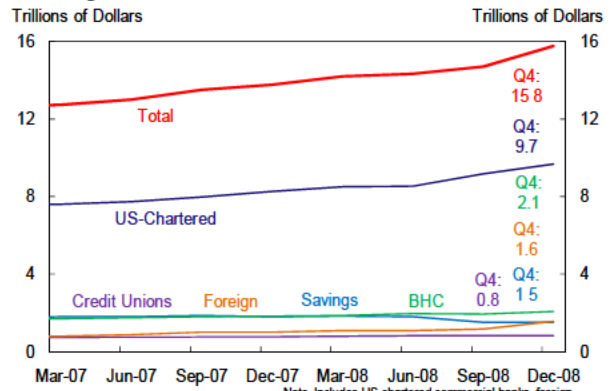
Banking Institutions



Source: Federal Reserve Board

Note: Includes households, nonfinancial businesses, state, local, federal government, monetary authority, rest of world

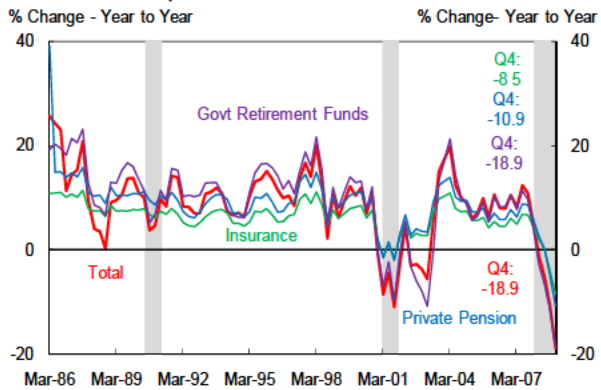
Banking Institutions



Source: Federal Reserve Board

Note: Includes US-chartered commercial banks, foreign banking offices in US, BHCs, banks in US possession, credit unions, savings institutions

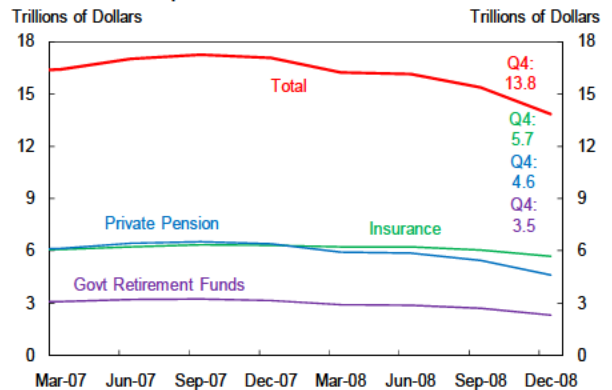
Insurance Companies and Pension Funds



Source: Federal Reserve Board

Note: Includes insurance companies, private pension funds, state, local, and federal government retirement funds

Insurance Companies and Pension Funds



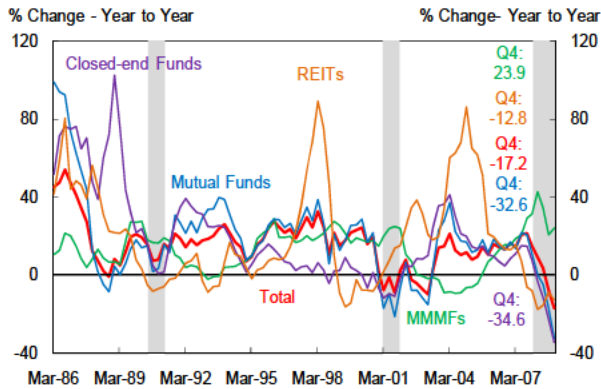
Source: Federal Reserve Board

Note: Includes insurance companies, private pension funds, state, local, and federal government retirement funds

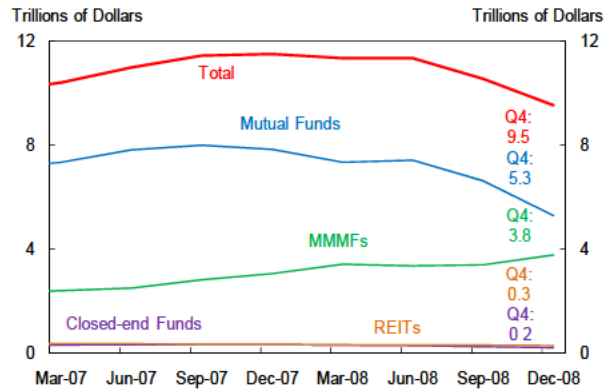
A. Significant Developments

Exhibit A-11:
Total Assets from the Flow of Funds

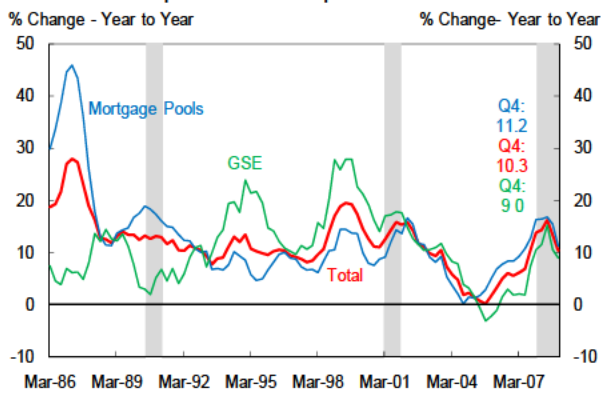
Funds and Trusts



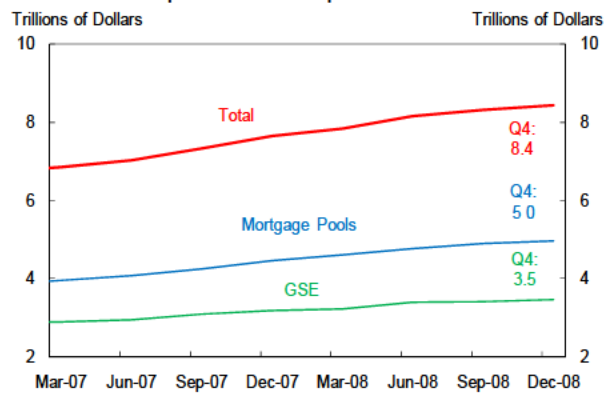
Funds and Trusts



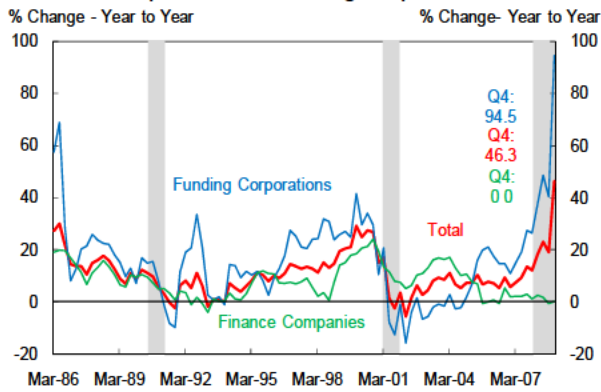
Government-Sponsored Enterprises



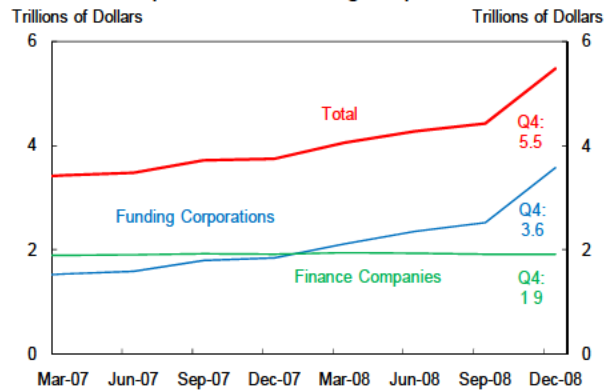
Government-Sponsored Enterprises



Finance Companies and Funding Corporations



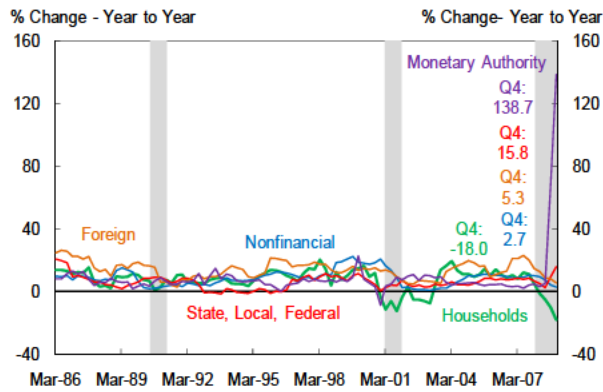
Finance Companies and Funding Corporations



A. Significant Developments

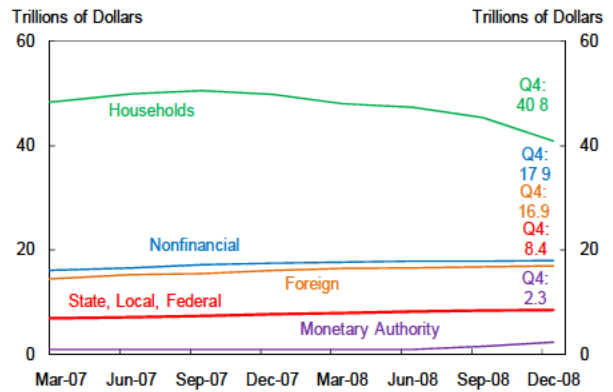
Exhibit A-11:
Additional Flow of Funds

Government and Demand for Credit



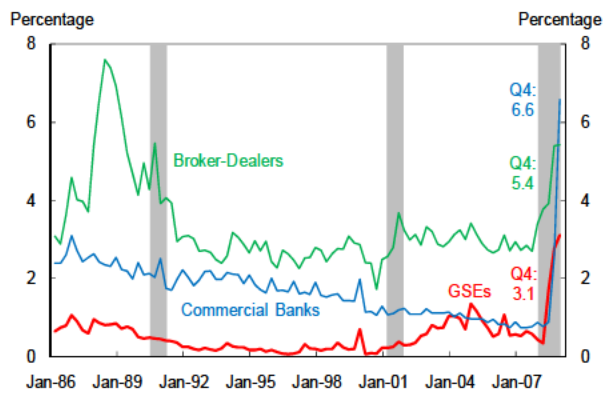
Source: Federal Reserve Board
Note: Includes households, nonfinancial businesses, state, local, federal government, monetary authority, rest of world

Government and Demand for Credit



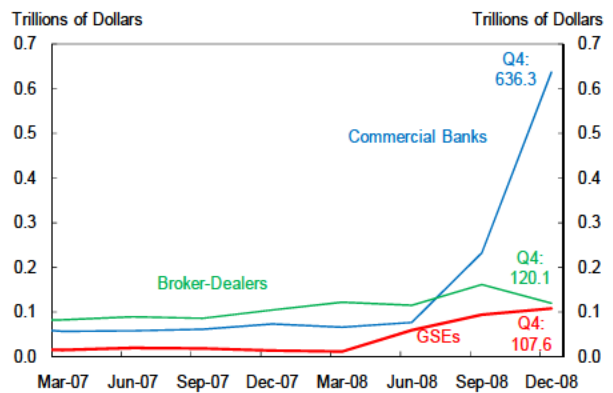
Source: Federal Reserve Board
Note: Includes households, nonfinancial businesses, state, local, federal government, monetary authority, rest of world

Cash as a Fraction of Total Assets



Source: Federal Reserve Board

Cash

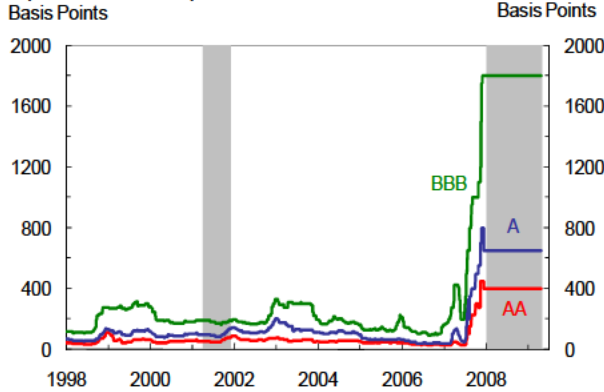


Source: Federal Reserve Board

A. Significant Developments

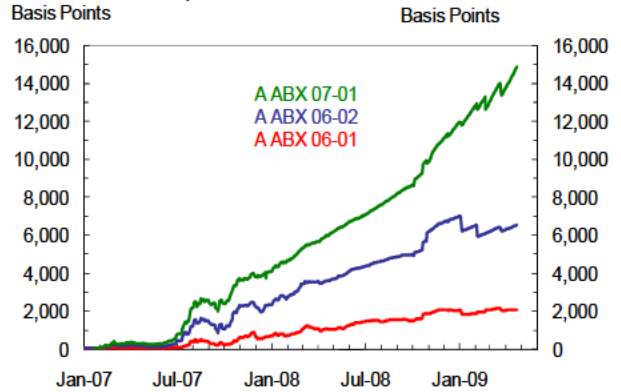
Exhibit A-12: Subprime Spillovers

Spreads on Subprime MBS Tranches



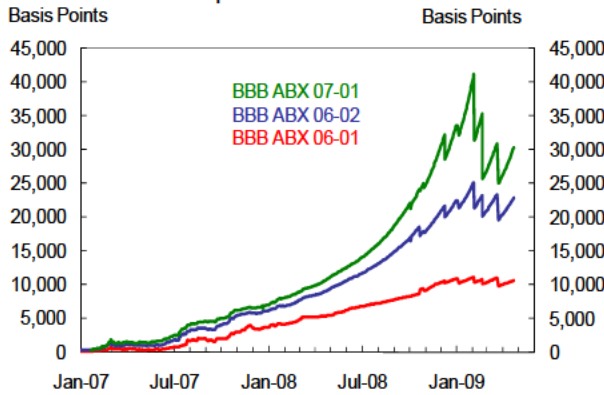
Source: JPMorgan

A-Rated ABX Spreads



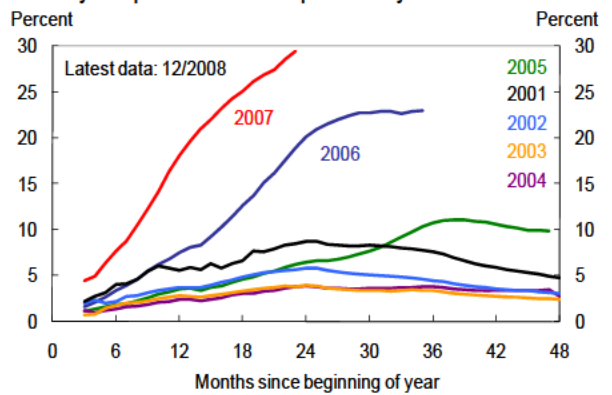
Source: JPMorgan

BBB-Rated ABX Spreads



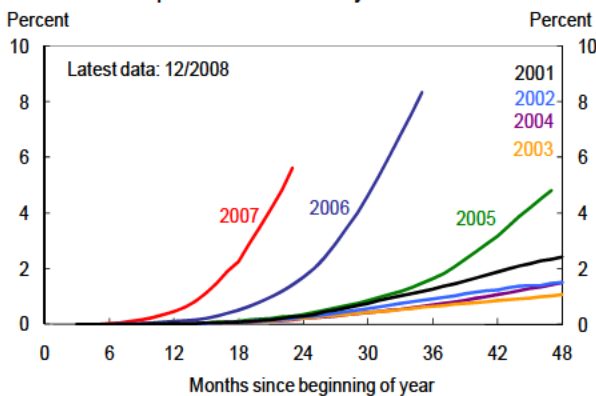
Source: JPMorgan

60+ Day Subprime ARM Delinquencies by Year Securitized



Note: Percent of original balance.

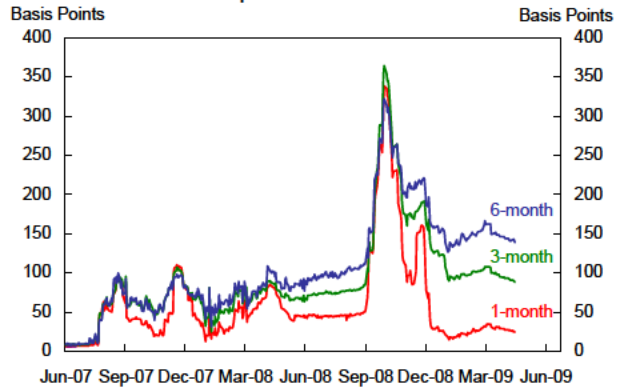
Cumulative Subprime ARM Losses by Year Securitized



Source: Moody's Investors Service

Note: Percent of original balance.

USD LIBOR-to-OIS Spread



Source: Bloomberg

A. Significant Developments

Exhibit A-13:
Interbank Funding Stress Index

	Current level (Apr 23)	Change since last FOMC (Mar 17)	Change since Jan FOMC (Jan 27)	1-year low	1-year high
Interbank funding stress index					
Overall index	4.58	-1.65	-0.37	2.19	10.67
Banking sector credit risk	9.23	-2.14	0.51	2.55	12.22
Fed lending facilities use	2.65	-1.22	-1.64	1.91	8.80
Cost of funds in the interbank market	1.86	-1.59	-0.12	1.01	12.75

Overall interbank funding stress index



Source: New York Fed calculations

Banking sector credit risk



Source: New York Fed calculations

Fed lending facilities use



Source: New York Fed calculations

Cost of funds in the interbank market

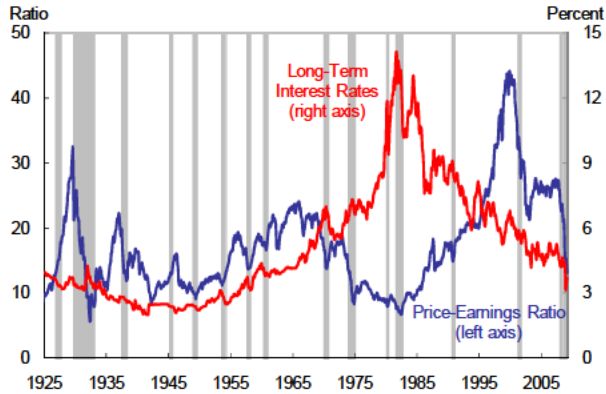


Source: New York Fed calculations

A. Significant Developments

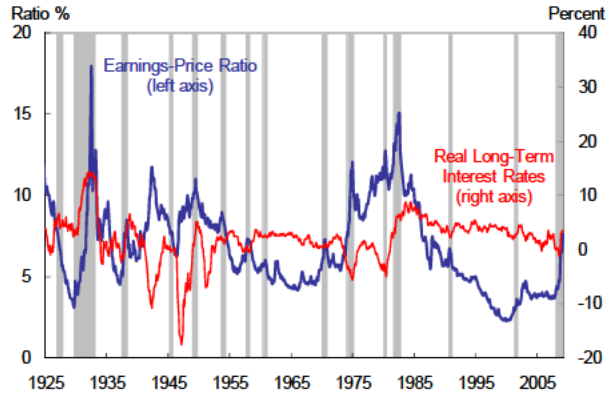
Exhibit A-14: Equity Premium: Institutions

Stock Market Valuation Since 1925



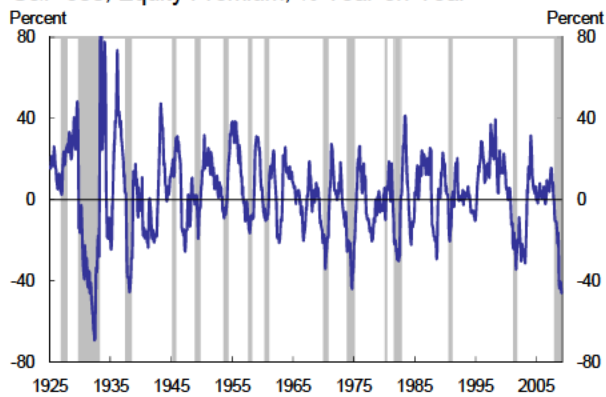
Source: Robert Shiller, U.S. Treasury

Stock Market Valuation Since 1925



Source: Robert Shiller, U.S. Treasury

S&P 500, Equity Premium, % Year-on-Year



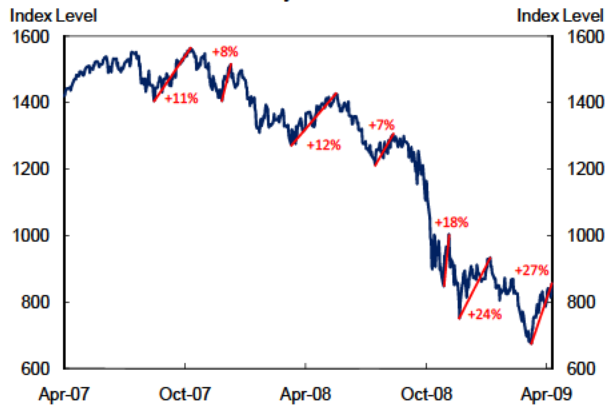
Source: Wall Street Journal, U.S. Treasury

Note: Percent changes are in excess of a composite of long-term Treasury rates.

A. Significant Developments

Exhibit A-15: Equity Premium: Turning Points

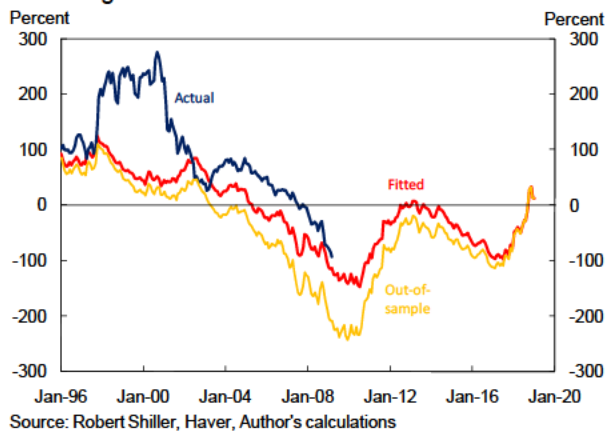
S&P 500 Rallies Since July 2007



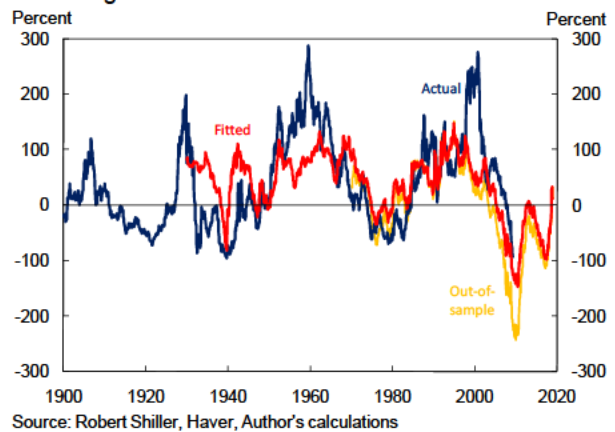
Post-Crash, Pre-Trough DJIA Rallies, October 1929 - July 1932



Predicting 10-Year S&P 500 Excess Returns



Predicting 10-Year S&P 500 Excess Returns



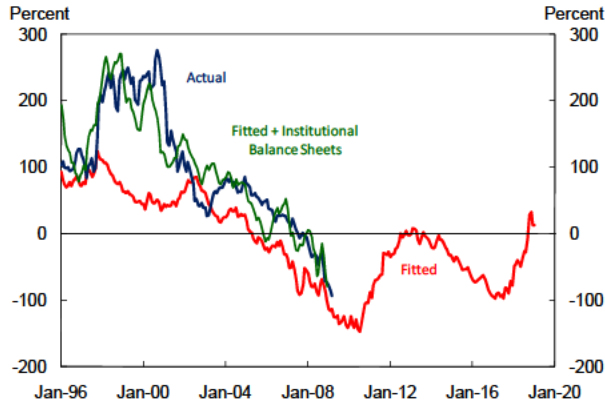
10yr S&P 500 Excess Returns

P/E ratio (10yr lag)	-9.286***
Term spread (10yr lag)	14.713**
10yr S&P 500 (10yr lag)	0.429***
Constant	153.746***
# of observations	951
Adjusted R-squared	28%

A. Significant Developments

Exhibit A-15: Equity Premium: Turning Points

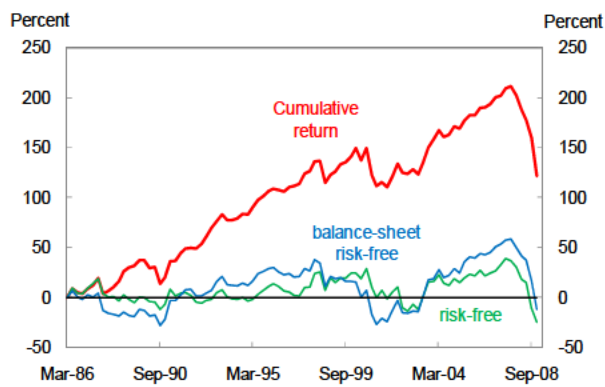
Predicting 10-Year S&P 500 Excess Returns



Source: Robert Shiller, Haver, Author's calculations

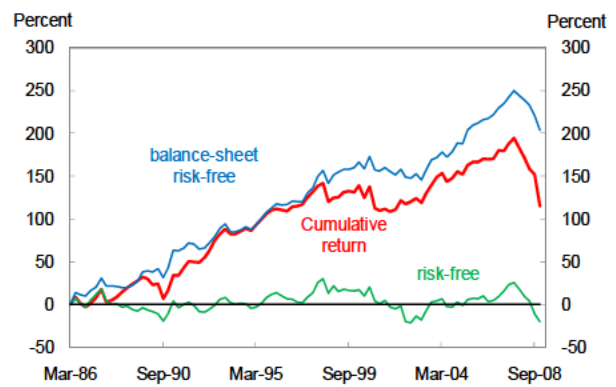
Annual Growth Rates in Total Assets	Residual
ABS Issuers	2.234**
Security Broker/Dealers	2.117**
US Commercial Banks	12.758***
GSEs	6.028***
Constant	-149.677***
# of observations	156
Adjusted R-squared	56%

Broker Dealer Equity



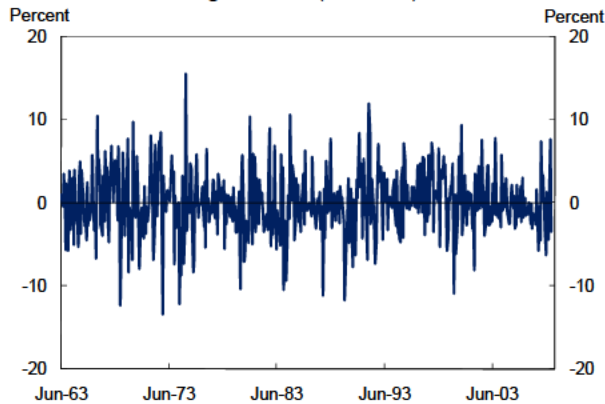
Source: CRSP, Author's Calculations

Bank Equity



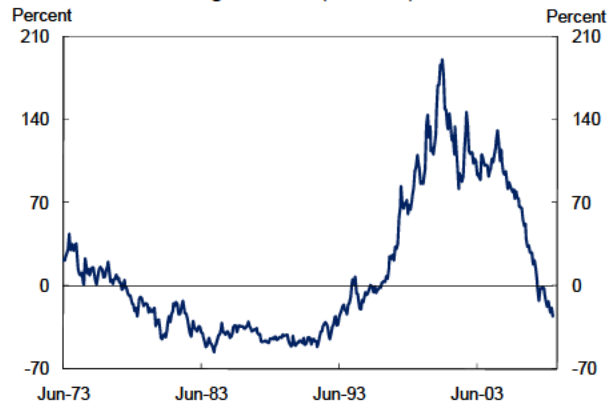
Source: CRSP, Author's Calculations

Institutional Leverage Factor (1-Month)



Source: Author's calculations

Institutional Leverage Factor (10-Year)

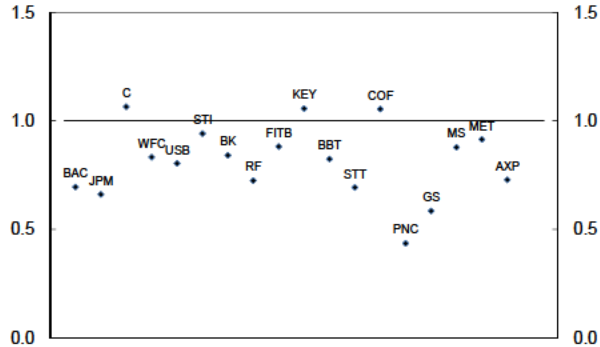


Source: Author's calculations

A. Significant Developments

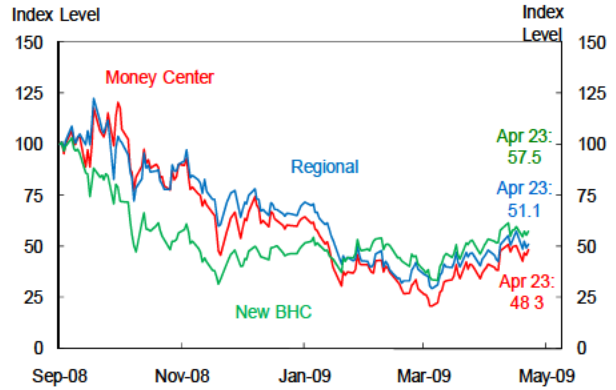
**Exhibit A-16:
CAP Bank Analysis**

Conversion Price to Common Equity



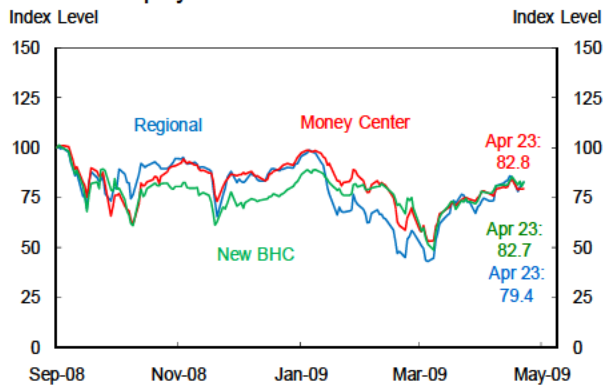
Source: Bloomberg
Data reflects market conditions on April 23, 2009. The conversion price is calculated as 90% of the 20-day trailing average as of Feb 9, 2009.

Common Equity Index



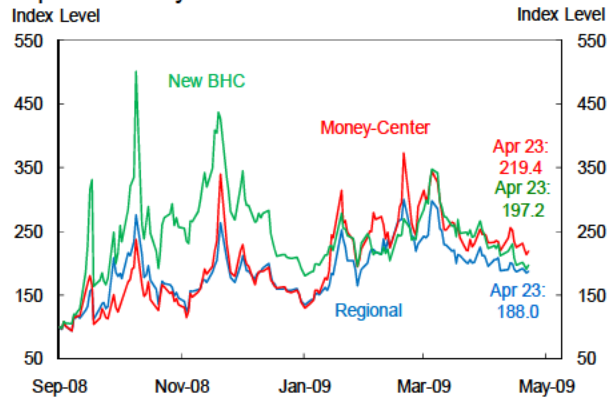
Source: Bloomberg
Index changes are with respect to September 2, 2008

Preferred Equity Index



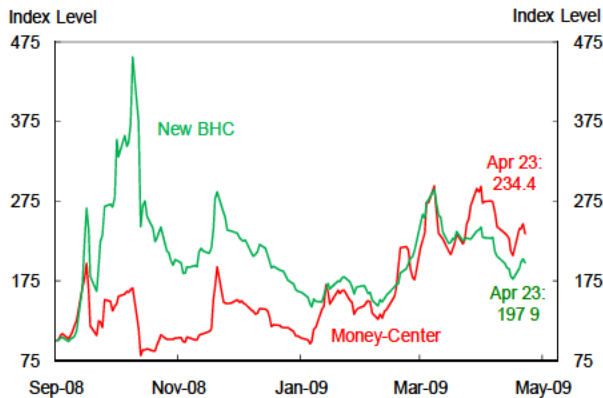
Source: Bloomberg
Index changes are with respect to September 2, 2008

Implied Volatility Index



Source: Bloomberg
Index changes are with respect to September 2, 2008

CDS Index

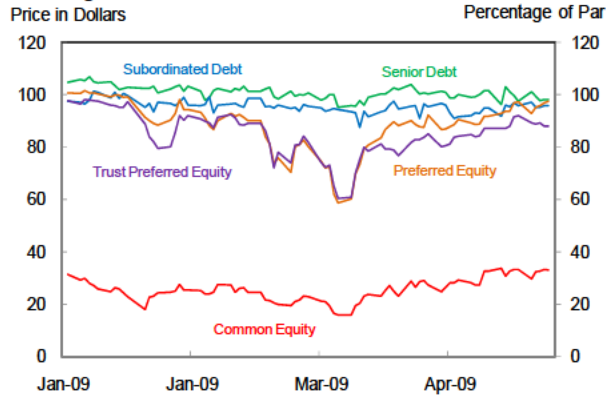


Source: Datastream
Index changes are with respect to September 2, 2008

A. Significant Developments

Exhibit A-17:
Bank Capital Structure

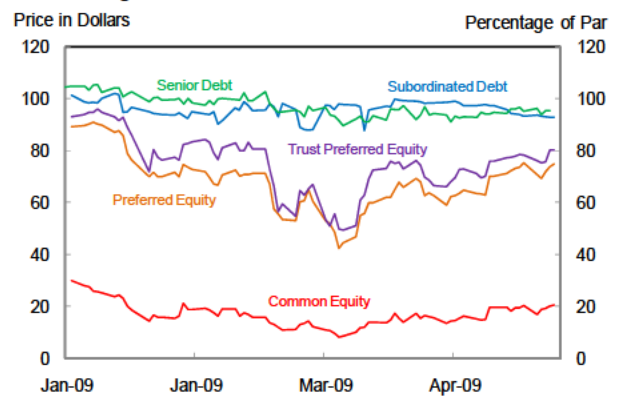
JPMorgan Chase



Source: Bloomberg

Note: Common equity is measured in dollar prices. Debt and preferred equity are measured in percentage of par.

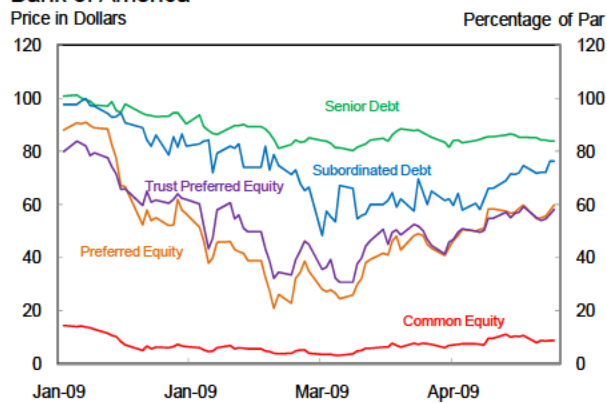
Wells Fargo



Source: Bloomberg

Note: Common equity is measured in dollar prices. Debt and preferred equity are measured in percentage of par.

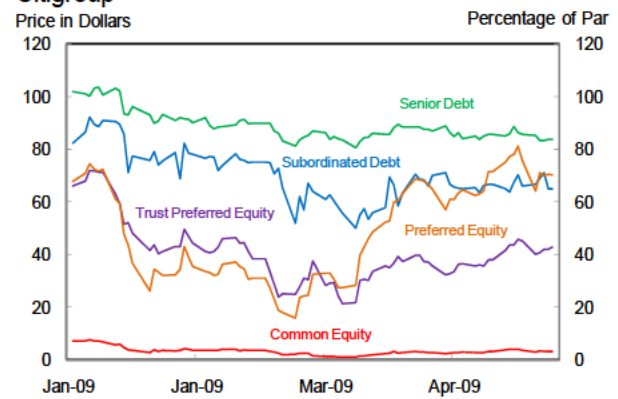
Bank of America



Source: Bloomberg

Note: Common equity is measured in dollar prices. Debt and preferred equity are measured in percentage of par.

Citigroup



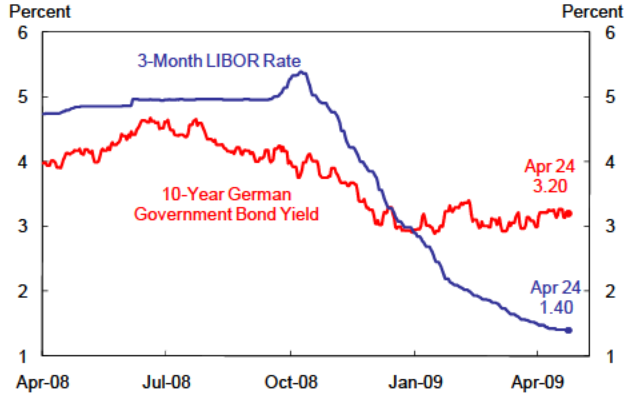
Source: Bloomberg

Note: Common equity is measured in dollar prices. Debt and preferred equity are measured in percentage of par.

A. Significant Developments

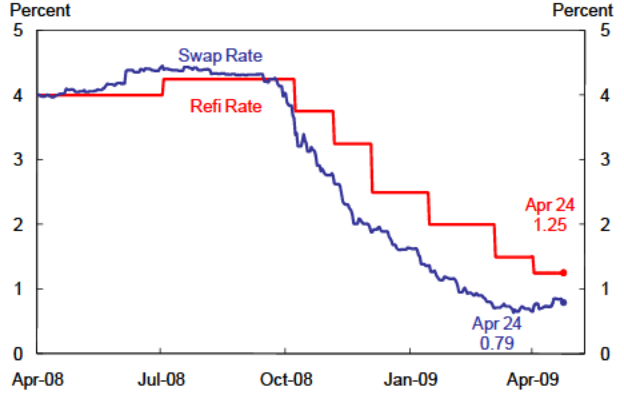
Exhibit A-18:
Global Interest Rates and Equity Markets

Euro Area Short- and Long-Term Interest Rates



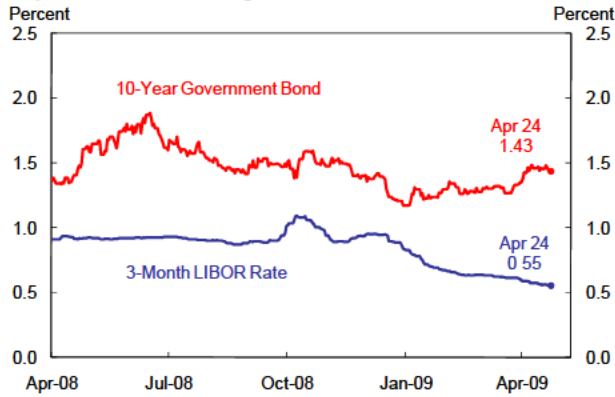
Source: Bloomberg

Euro Area: OIS Rate (Six Months)



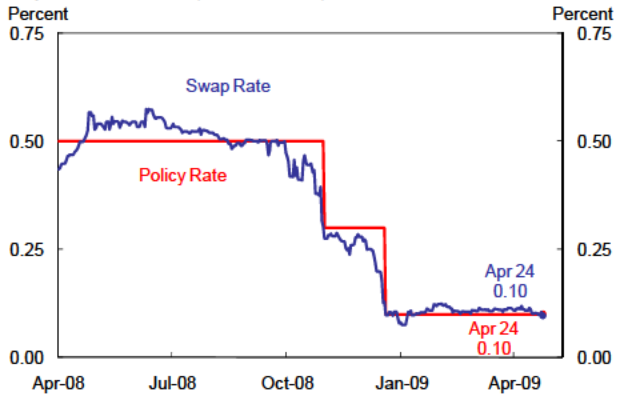
Source: Bloomberg

Japan Short- and Long-Term Interest Rates



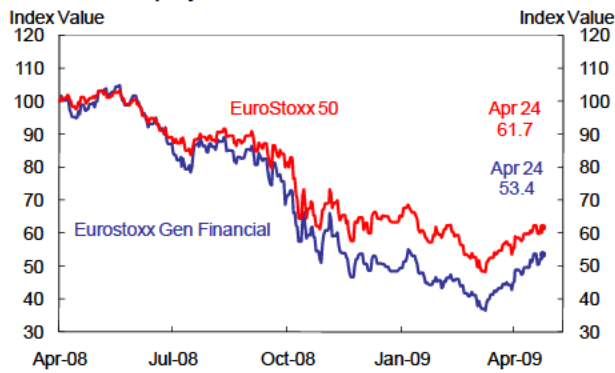
Source: Bloomberg

Japan: OIS Rate (Six Months)



Source: Bloomberg

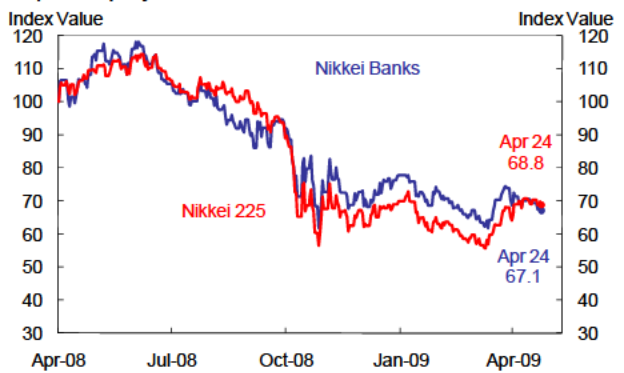
Euro Area Equity Price Indices



Source: Bloomberg

Indices are normalized to 4/1/2008=100

Japan Equity Price Indices



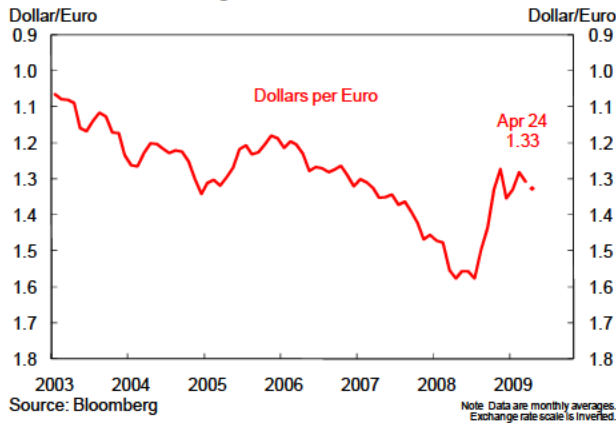
Source: Bloomberg

Indices are normalized to 4/1/2008=100

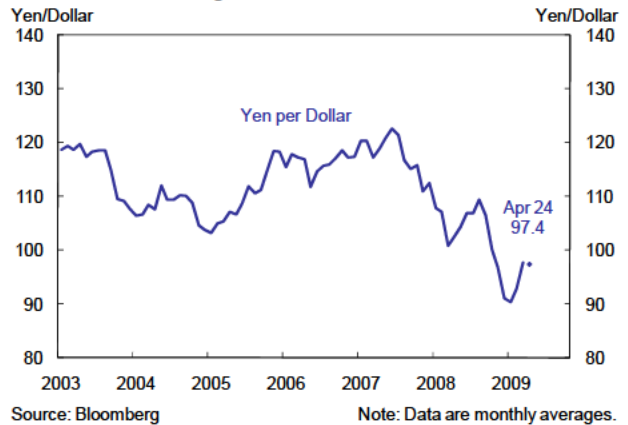
A. Significant Developments

**Exhibit A-19:
Exchange Rates**

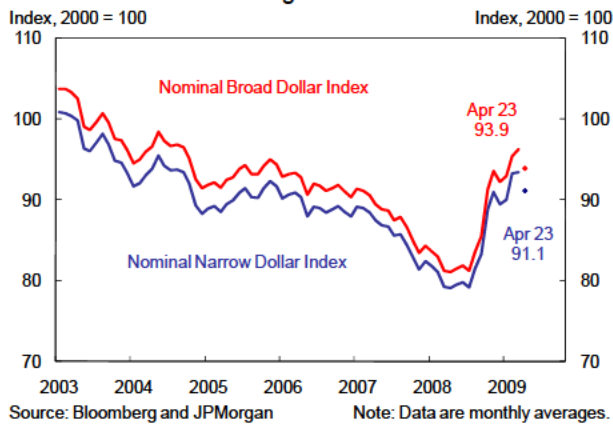
Dollar-Euro Exchange Rate



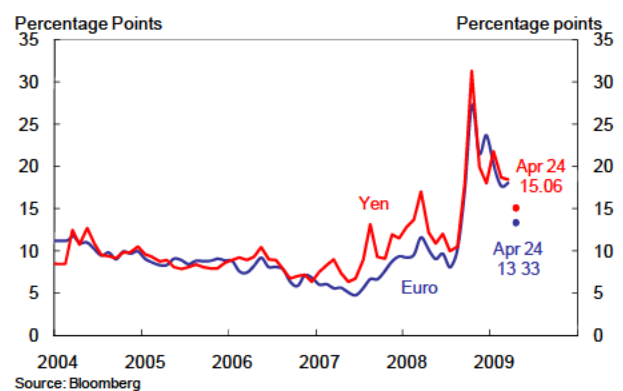
Yen-Dollar Exchange Rate



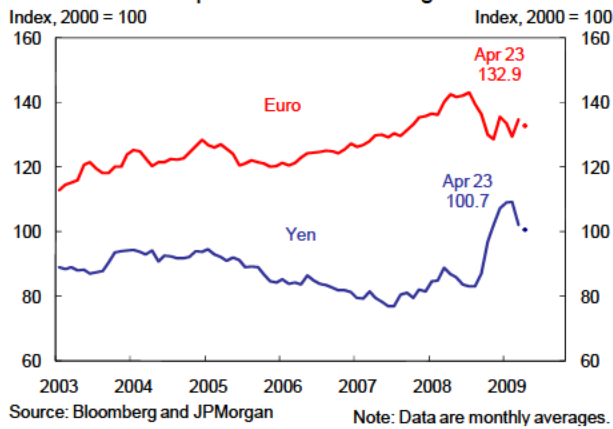
Nominal Effective Exchange Rates



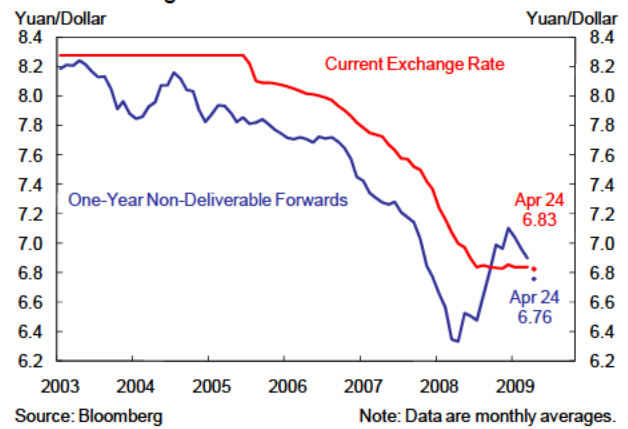
Euro and Yen One-Month Implied FX Option Volatility



Euro Area and Japan Effective Exchange Rates



China Exchange Rates



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**		
	Jan	Mar	Apr	Jan	Mar	Apr	Jan	Mar	Apr	Jan	Mar	Apr
2008												
Q1	2.2	2.2	2.2	0.9	0.9	0.9	4.9	4.9	4.9	2.3	2.3	2.3
Q2	2.1	2.1	2.1	2.8	2.8	2.8	5.4	5.4	5.4	2.0	2.0	2.0
Q3	2.4	2.4	2.4	-0.5	-0.5	-0.5	6.1	6.1	6.1	2.0	2.0	2.0
Q4	0.5	0.8	0.9	-4.5	-6.2	-6.3	6.9	6.9	6.9	0-0.25	0-0.25	0-0.25
2009												
Q1	0.2	0.6	1.5	-5.1	-6.3	-6.2	7.5	8.0	8.1	0-0.25	0-0.25	0-0.25
Q2	0.8	0.5	0.6	-2.0	-2.4	-1.2	8.1	8.8	8.7	0-0.25	0-0.25	0-0.25
Q3	1.2	0.8	0.7	0.5	0.6	0.3	8.7	9.3	9.3	0-0.25	0-0.25	0-0.25
Q4	1.4	1.0	0.9	1.3	0.7	1.0	9.2	9.6	9.6	0-0.25	0-0.25	0-0.25
2010												
Q1	1.5	1.2	1.1	2.1	1.8	1.6	9.3	9.7	9.7	0-0.25	0-0.25	0-0.25
Q2	1.6	1.4	1.3	2.9	2.4	2.5	9.3	9.8	9.7	0-0.25	0-0.25	0-0.25
Q3	1.7	1.5	1.4	3.4	2.9	2.9	9.2	9.7	9.7	0-0.25	0-0.25	0-0.25
Q4	1.8	1.6	1.5	3.8	3.1	3.2	9.2	9.5	9.5	0-0.25	0-0.25	0-0.25
Q4/Q4												
2007	2.2	2.2	2.2	2.3	2.3	2.3	0.4	0.4	0.4	-1.0	-1.0	-1.0
2008	1.8	1.9	1.9	-0.4	-0.8	-0.8	2.1	2.1	2.1	-4.0	-4.0	-4.0
2009	0.9	0.7	0.9	-1.3	-1.9	-1.6	2.3	2.7	2.7	0.0	0.0	0.0
2010	1.6	1.4	1.3	3.0	2.6	2.6	0.0	-0.1	-0.1	0.0	0.0	0.0

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

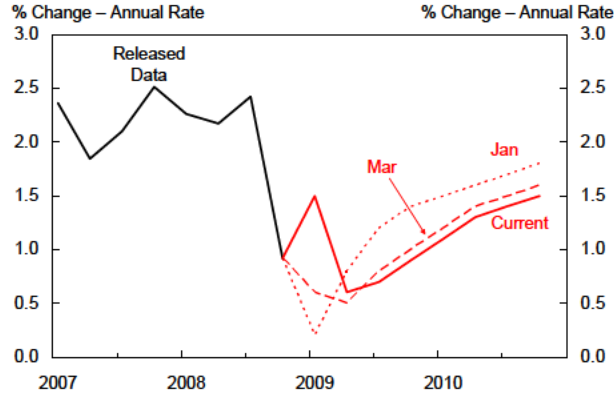
*Quarterly values are the average rate for the quarter. Yearly values are the difference between Q4 of the previous year and Q4 of the listed year.

**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.

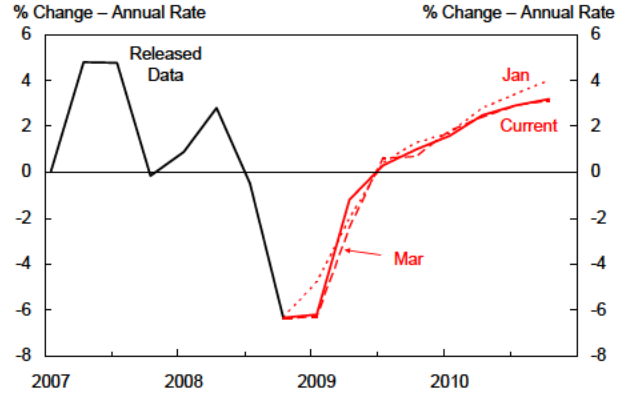
B. FRBNY Forecast Details

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

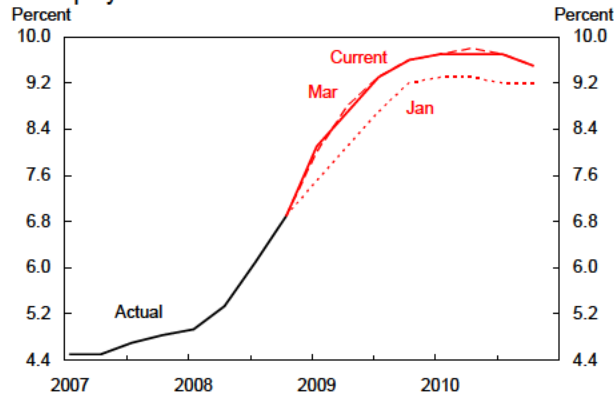
Core PCE Inflation



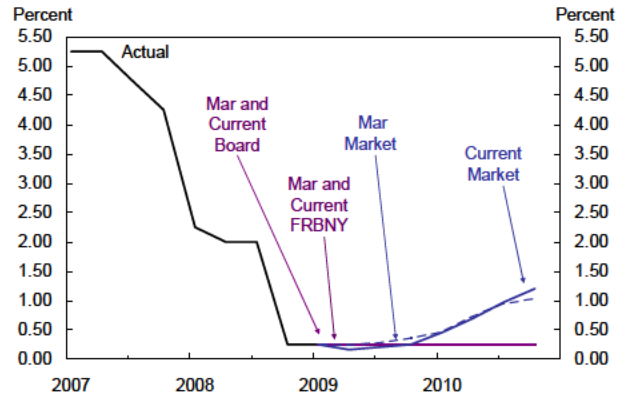
Real GDP Growth



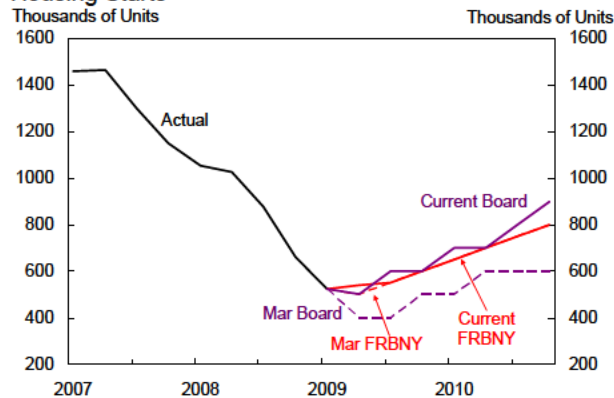
Unemployment Rate



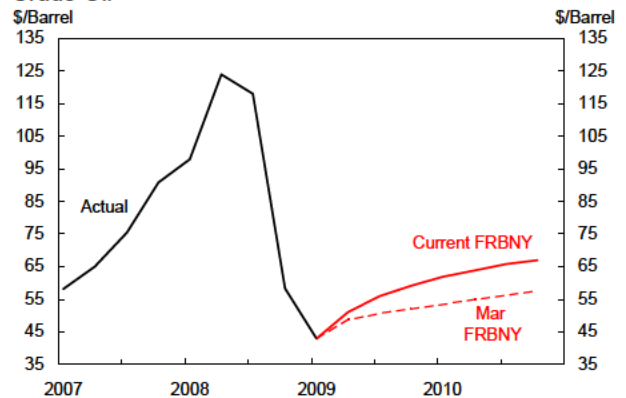
Federal Funds Rate



Housing Starts



Crude Oil



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

B. FRBNY Forecast Details

Exhibit B-3: Near-Term Projections

	Quarterly Growth Rates (AR)		Quarterly Growth Contributions (AR)	
	2009Q1	2009Q2	2009Q1	2009Q2
OUTPUT				
Real GDP	-6.2 (-6.3)	-1.2 (-2.4)	-6.2 (-6.3)	-1.2 (-2.4)
Final Sales to Domestic Purchasers	-3.7 (-3.1)	-2.9 (-2.9)	-3.9 (-3.3)	-3.0 (-3.0)
Consumption	1.4 (1.0)	0.5 (1.0)	1.0 (0.7)	0.4 (0.7)
BFI: Equipment and Software	-30.0 (-25.0)	-30.0 (-30.0)	-2.2 (-1.8)	-2.1 (-2.1)
BFI: Nonresidential Structures	-20.0 (-15.0)	-20.0 (-20.0)	-0.9 (-0.6)	-0.8 (-0.9)
Residential Investment	-30.7 (-40.0)	-15.9 (-30.0)	-1.1 (-1.5)	-0.5 (-0.9)
Government: Federal	-2.3 (2.0)	1.5 (1.5)	-0.2 (0.2)	0.1 (0.1)
Government: State and Local	-4.1 (-1.7)	-1.0 (0.5)	-0.5 (-0.2)	-0.1 (0.1)
Inventory Investment	--	--	-2.9 (-2.7)	1.4 (0.2)
Net Exports	--	--	0.6 (-0.4)	0.4 (0.3)
INFLATION				
Total PCE Deflator	-0.9 (-1.0)	0.8 (0.8)		
Core PCE Deflator	1.5 (0.6)	0.6 (0.5)		
PRODUCTIVITY AND LABOR COSTS*				
Output per Hour	-0.5 (0.5)	1.5 (-1.0)		
Compensation per Hour	2.0 (3.0)	2.3 (2.8)		
Unit Labor Costs	2.5 (2.5)	0.8 (3.8)		

Note: Numbers in parentheses are from the previous Blackbook.

*Nonfarm business sector.

B. FRBNY Forecast Details

Exhibit B-4: Real GDP and Inflation Projections

	Q4/Q4 Growth Rates			Q4/Q4 Growth Contributions		
	2008	2009	2010	2008	2009	2010
OUTPUT						
Real GDP	-0.8 (-0.8)	-1.6 (-1.9)	2.6 (2.6)	-0.8 (-0.8)	-1.6 (-1.9)	2.6 (2.6)
Final Sales to Domestic Purchasers	-1.7 (-1.7)	-2.1 (-2.0)	2.6 (2.6)	-1.8 (-1.7)	-2.2 (-2.0)	2.7 (2.7)
Consumption	-1.5 (-1.5)	1.0 (1.0)	2.7 (2.7)	-1.1 (-1.1)	0.7 (0.7)	2.0 (2.0)
BFI: Equipment and Software	-11.0 (-11.2)	-24.0 (-22.7)	-2.7 (-2.7)	-0.8 (-0.8)	-1.6 (-1.5)	-0.1 (-0.1)
BFI: Nonresidential Structures	6.3 (7.3)	-15.9 (-14.6)	2.6 (2.6)	0.2 (0.3)	-0.6 (-0.6)	0.1 (0.1)
Residential Investment	-19.4 (-19.3)	-20.9 (-28.1)	8.7 (8.7)	-0.8 (-0.8)	-0.6 (-0.9)	0.2 (0.2)
Government: Federal	8.2 (8.2)	0.5 (1.6)	1.5 (1.5)	0.6 (0.6)	0.0 (0.1)	0.1 (0.1)
Government: State and Local	0.4 (0.5)	-0.9 (0.4)	3.1 (3.2)	0.0 (0.1)	-0.1 (0.1)	0.4 (0.4)
Inventory Investment	-- --	-- --	-- --	-0.2 (-0.1)	0.4 (0.1)	0.1 (0.1)
Net Exports	-- --	-- --	-- --	1.1 (1.0)	0.3 (0.1)	-0.3 (-0.3)
INFLATION						
Total PCE Deflator	1.9 (1.9)	0.6 (0.5)	1.7 (1.6)			
Core PCE Deflator	1.9 (1.9)	0.9 (0.7)	1.3 (1.4)			
Total CPI Inflation	1.5 (1.5)	0.3 (0.6)	1.7 (1.9)			
Core CPI Inflation	2.0 (2.0)	1.2 (1.2)	1.5 (1.7)			
GDP Deflator	2.0 (2.0)	0.6 (1.0)	1.3 (1.3)			

Note: Numbers in parentheses are from the previous Blackbook.

B. FRBNY Forecast Details

Exhibit B-5: Projections of Other Key Economic Variables

	Q4/Q4 Growth Rates		
	2008	2009	2010
INTEREST RATE ASSUMPTIONS			
Federal Funds Rate (End-of-Year)	0-0.25 (0-0.25)	0-0.25 (0-0.25)	0-0.25 (0-0.25)
10-Year Treasury Yield (Avg. Q4 Level)	3.3 (3.3)	3.0 (2.6)	3.4 (3.0)
PRODUCTIVITY AND LABOR COSTS*			
Output	-1.8 (-1.8)	-2.6 (-3.0)	2.9 (2.9)
Hours	-4.0 (-4.0)	-3.0 (-3.1)	1.9 (1.9)
Output per Hour	2.2 (2.2)	0.5 (0.1)	1.0 (0.9)
Compensation per Hour	4.1 (4.1)	2.0 (2.6)	1.6 (1.7)
Unit Labor Costs	1.8 (1.8)	1.5 (2.5)	0.6 (0.8)
LABOR MARKET			
Unemployment Rate (Avg. Q4 Level)	6.9 (6.9)	9.6 (9.6)	9.5 (9.5)
Participation Rate (Avg. Q4 Level)	65.8 (65.8)	65.4 (65.4)	65.5 (65.6)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-189 (-189)	-333 (-332)	127 (135)
INCOME			
Personal Income	2.2 (2.3)	0.4 (0.8)	2.8 (2.8)
Real Disposable Personal Income	0.8 (1.0)	2.7 (2.3)	0.5 (0.6)
Corporate Profits Before Taxes	-21.5 (-18.2)	-6.1 (-12.7)	2.7 (2.5)

Note: Numbers in parentheses are from the previous Blackbook.

*Nonfarm business sector.

B. FRBNY Forecast Details

Exhibit B-6: FRBNY and Greenbook Forecast Comparison

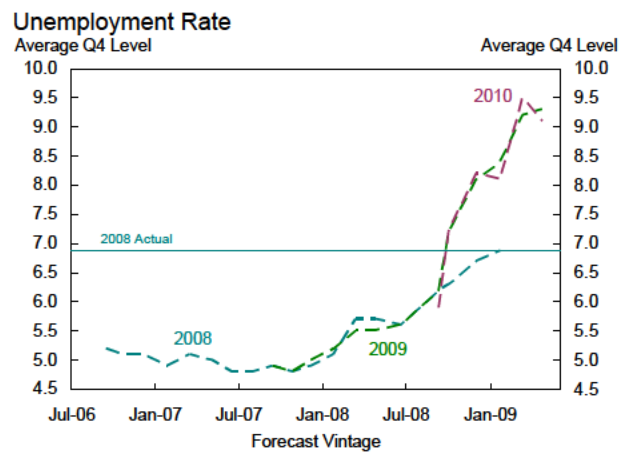
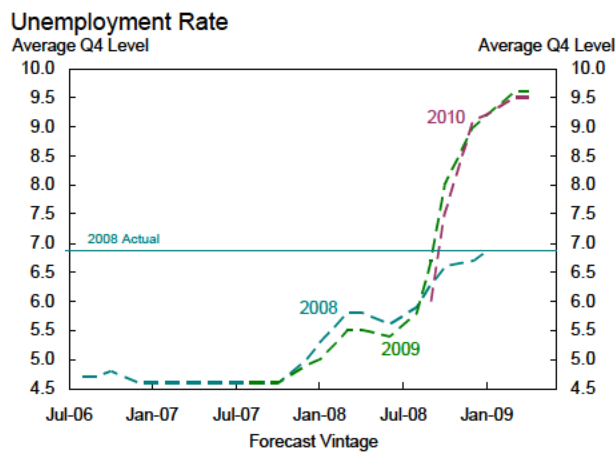
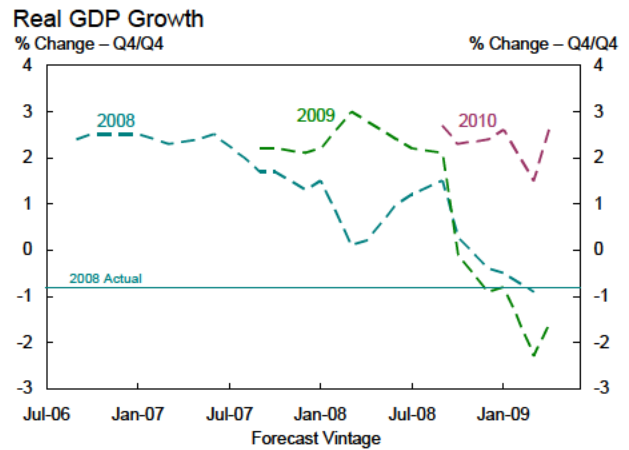
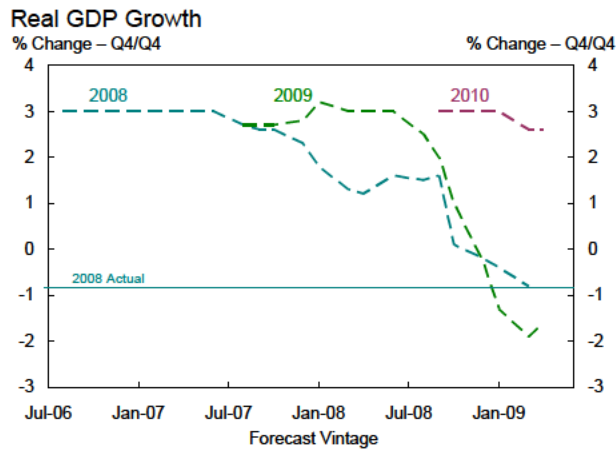
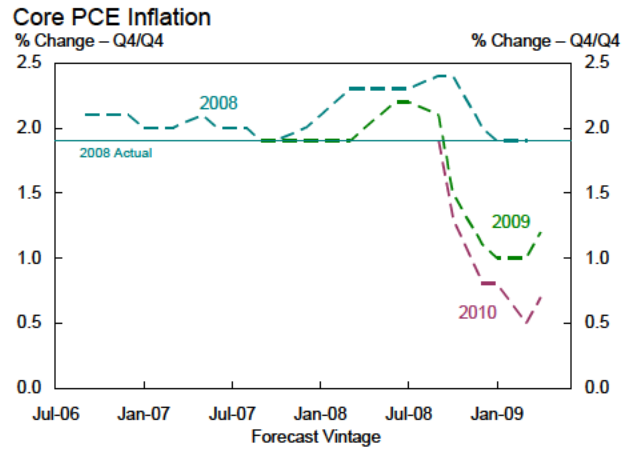
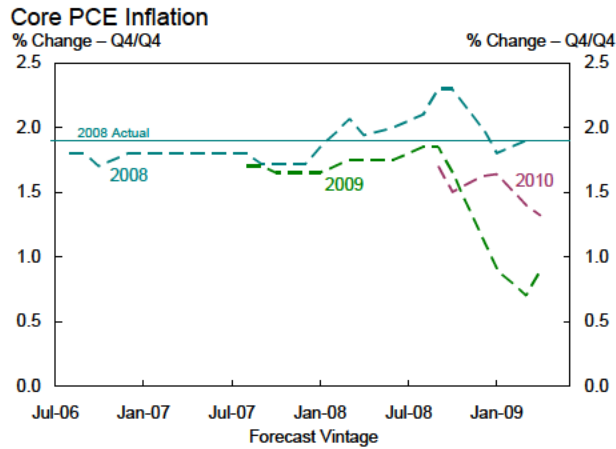
	FRBNY			Board		
	2008	2009	2010	2008	2009	2010
OUTPUT						
Real GDP	-0.8 (-0.8)	-1.6 (-1.9)	2.6 (2.6)	-0.8 (-0.9)	-1.6 (-2.3)	2.6 (1.5)
GDP Growth Contributions						
Final Sales to Domestic Purchasers	-1.8 (-1.7)	-2.2 (-2.0)	2.7 (2.7)	-1.9 (-1.9)	-1.9 (-2.2)	2.9 (1.9)
Consumption	-1.1 (-1.1)	0.7 (0.7)	2.0 (2.0)	-1.1 (-1.1)	0.4 (0.3)	1.9 (1.4)
BFI	-0.6 (-0.6)	-2.2 (-2.1)	0.0 (-0.0)	-0.6 (-0.6)	-2.2 (-2.4)	0.3 (-0.1)
Residential Investment	-0.8 (-0.8)	-0.6 (-0.9)	0.2 (0.2)	-0.8 (-0.8)	-0.6 (-0.8)	0.3 (0.2)
Government	0.6 (0.6)	-0.1 (0.2)	0.5 (0.6)	0.6 (0.6)	0.5 (0.7)	0.4 (0.4)
Inventory Investment	-0.2 (-0.1)	0.4 (0.1)	0.1 (0.1)	-0.2 (-0.2)	0.1 (0.2)	0.3 (0.1)
Net Exports	1.1 (1.0)	0.3 (0.1)	-0.3 (-0.3)	1.1 (1.0)	0.1 (-0.3)	-0.5 (-0.4)
INFLATION						
Total PCE Deflator	1.9 (1.9)	0.6 (0.5)	1.7 (1.6)	1.9 (1.9)	0.7 (0.4)	1.0 (0.8)
Core PCE Deflator	1.9 (1.9)	0.9 (0.7)	1.3 (1.4)	1.9 (1.9)	1.2 (1.0)	0.7 (0.5)
INTEREST RATE ASSUMPTION						
Fed Funds Rate (End-of-Year)	0-0.25 (0-0.25)	0-0.25 (0-0.25)	0-0.25 (0-0.25)	0-0.25 (0-0.25)	0-0.25 (0-0.25)	0-0.25 (0-0.25)
PRODUCTIVITY AND LABOR COSTS*						
Output per Hour	2.2 (2.2)	0.5 (0.1)	1.0 (0.9)	2.2 (2.1)	1.3 (0.9)	2.1 (2.0)
Compensation per Hour	4.1 (4.1)	2.0 (2.6)	1.6 (1.7)	4.1 (4.1)	2.3 (2.2)	1.3 (1.1)
Unit Labor Costs	1.8 (1.8)	1.5 (2.5)	0.6 (0.8)	1.8 (1.9)	1.0 (1.3)	-0.7 (-0.8)
LABOR MARKET						
Unemployment Rate (Avg. Q4 Level)	6.9 (6.9)	9.6 (9.6)	9.5 (9.5)	6.9 (6.9)	9.3 (9.2)	9.1 (9.5)
Participation Rate (Avg. Q4 Level)	65.8 (65.8)	65.4 (65.4)	65.5 (65.6)	65.9 (65.9)	65.3 (65.3)	65.1 (65.1)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	-189 (-189)	-333 (-332)	127 (135)	-192 (-192)	-342 (-342)	125 (0)
HOUSING						
Housing Starts (Avg. Q4 Level, Thous.)	660 (661)	600 (600)	800 (800)	700 (700)	600 (500)	900 (600)

B. FRBNY Forecast Details

**Exhibit B-7: Evolution of FRBNY
and Board Forecasts since Mid-2006**

FRBNY

Board



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

B. FRBNY Forecast Details

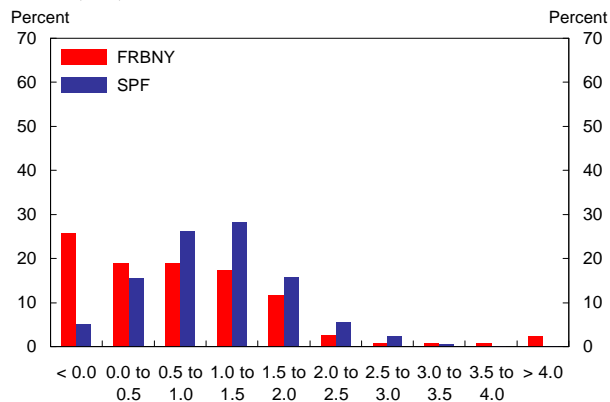
Exhibit B-8: Alternative GDP and Inflation Forecasts

Real GDP Growth					
	Release Date	2009Q1	2009Q2	2009 Q4/Q4	2010 Q4/Q4
FRBNY	4/24/2009	-6.2 (-6.3)	-1.2 (-2.4)	-1.6 (-1.9)	2.6 (2.6)
PSI Model	4/21/2009	-3.8 (-4.4)	-2.8 (-2.1)	-- --	-- --
Blue Chip	4/10/2009	-5.1 (-5.3)	-2.1 (-2.0)	-1.3 (-1.3)	2.7 (2.8)
Median SPF	2/13/2009	-5.2 (-1.1)	-1.8 (0.8)	-1.1 --	-- --
Macro Advisers	4/24/2009	-5.3 (-5.0)	-0.6 (-0.5)	-0.9 (-0.9)	3.0 (3.5)
Core PCE Inflation					
	Release Date	2009Q1	2009Q2	2009 Q4/Q4	2010 Q4/Q4
FRBNY	4/24/2009	1.5 (0.6)	0.6 (0.5)	0.9 (0.7)	1.3 (1.4)
Median SPF	2/13/2009	0.7 (1.6)	1.1 (1.8)	1.1 (1.7)	1.5 (1.8)
Macro Advisers	4/7/2009	1.4 (0.7)	0.8 (0.4)	0.8 (0.5)	0.2 (0.0)
CPI Inflation					
	Release Date	2009Q1	2009Q2	2009 Q4/Q4	2010 Q4/Q4
FRBNY	4/24/2009	-2.4 (-2.1)	0.8 (1.4)	0.3 (0.6)	1.7 (1.9)
Blue Chip	4/10/2009	-1.7 (-2.3)	0.6 (0.3)	0.4 (0.2)	1.9 (1.9)
Median SPF	2/13/2009	-2.7 (0.8)	0.8 (1.8)	0.2 (1.7)	1.9 (2.3)
Macro Advisers	4/7/2009	-2.3 (-2.3)	0.5 (0.5)	0.0 (-0.1)	0.5 (0.3)
Core CPI Inflation					
	Release Date	2009Q1	2009Q2	2009 Q4/Q4	2010 Q4/Q4
FRBNY	4/24/2009	1.5 (1.1)	1.1 (1.0)	1.2 (1.2)	1.5 (1.7)
Median SPF	2/13/2009	0.6 (2.0)	1.2 (2.0)	1.2 (2.0)	1.6 (2.0)
Macro Advisers	4/7/2009	1.4 (1.1)	0.8 (0.8)	0.8 (0.7)	0.3 (0.0)

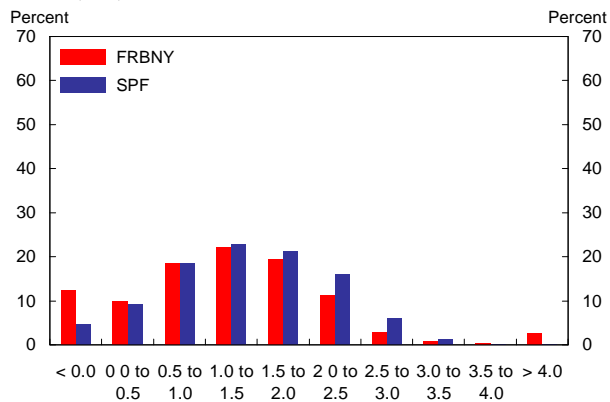
B. FRBNY Forecast Details

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

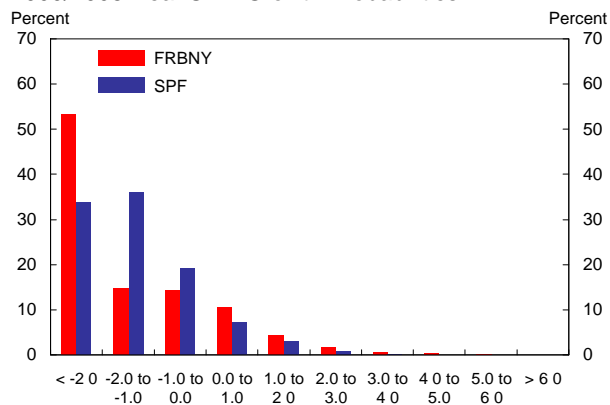
2009Q4/Q4 Core PCE Inflation Probabilities



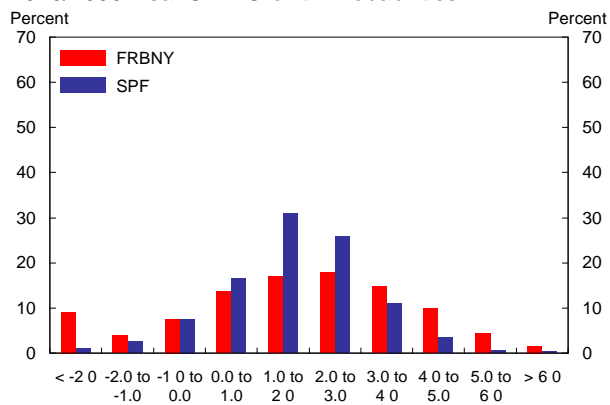
2010Q4/Q4 Core PCE Inflation Probabilities



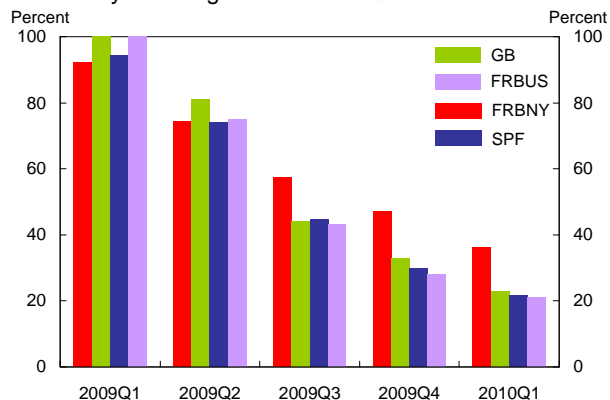
2009/2008 Real GDP Growth Probabilities



2010/2009 Real GDP Growth Probabilities

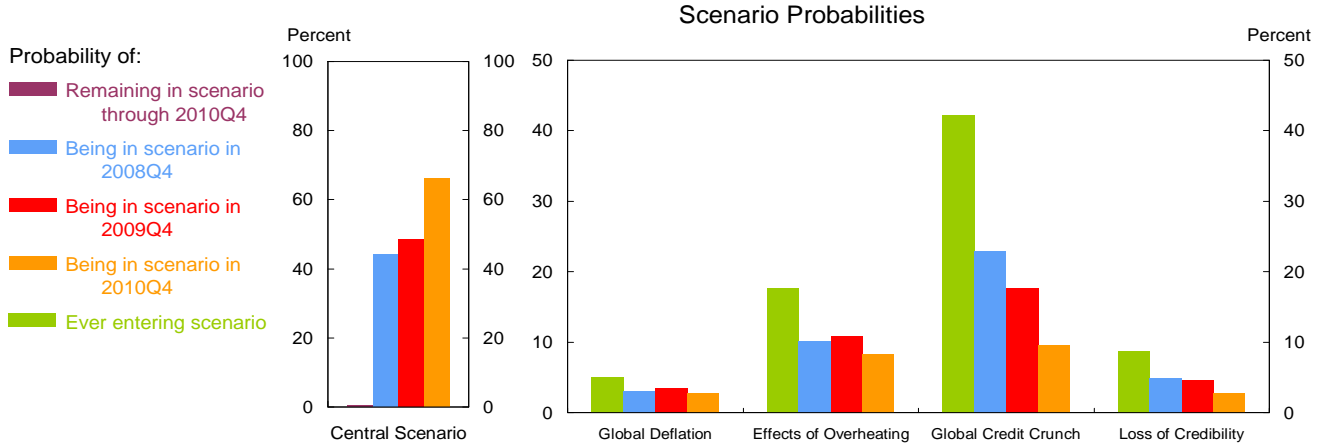


Probability of a Negative-Growth Quarter

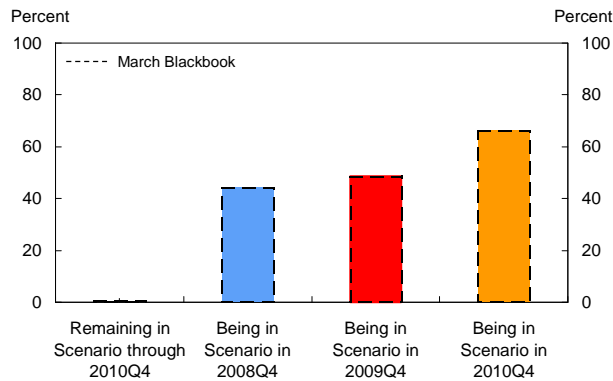


C. FRBNY Forecast Distributions

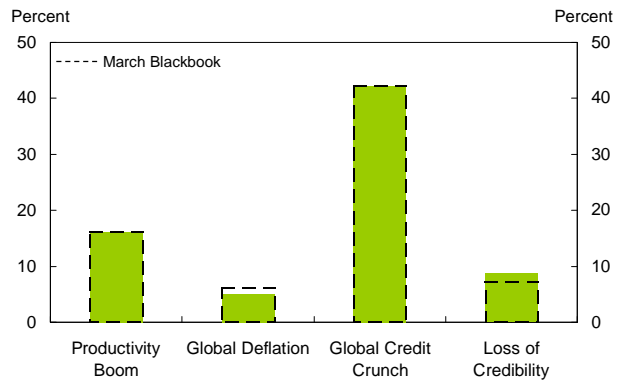
Exhibit C-1: Risks



Change in Central Scenario Probabilities



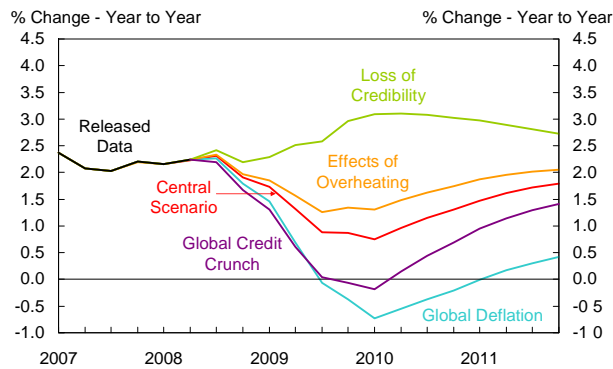
Change in Alternative Scenario Probabilities*



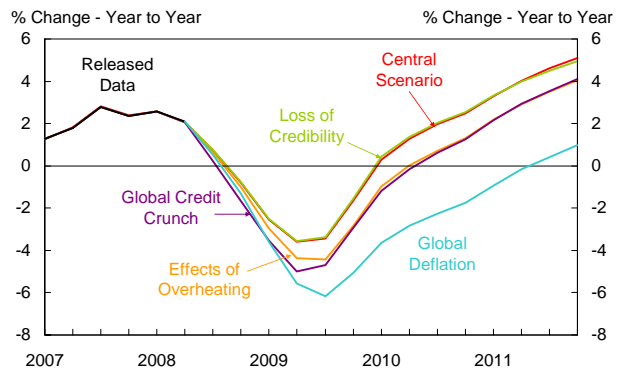
*Probability of ever reaching scenario

Exhibit C-2: Projections under Alternative Scenarios

Core PCE Inflation under Alternative Scenarios



Real GDP Growth under Alternative Scenarios

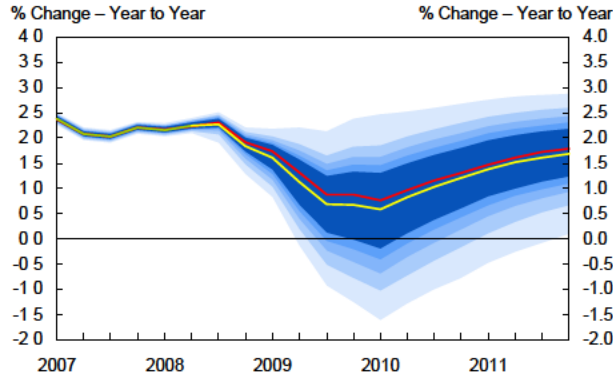


Source: MMS Function (FRBNY)

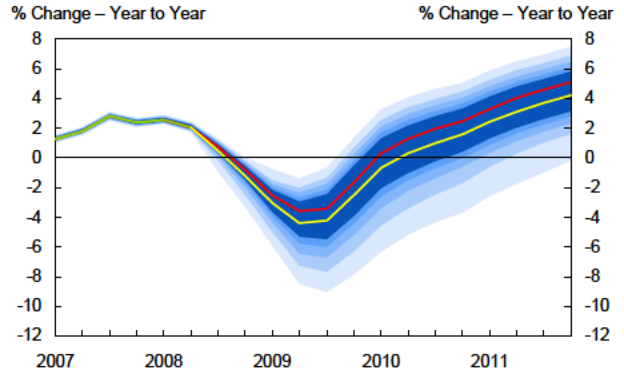
C. FRBNY Forecast Distributions

Exhibit C-3: Inflation and Output Forecast Distributions

Core PCE Inflation Forecast Distribution

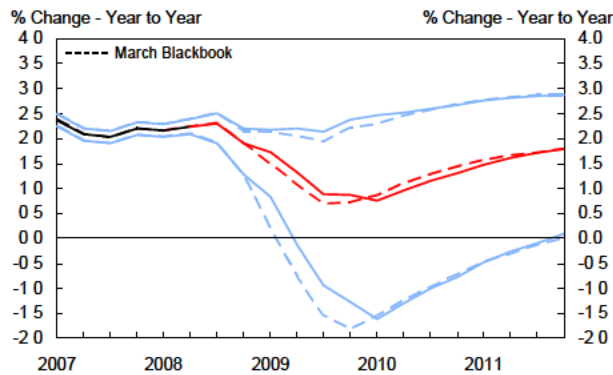


Real GDP Growth Forecast Distribution

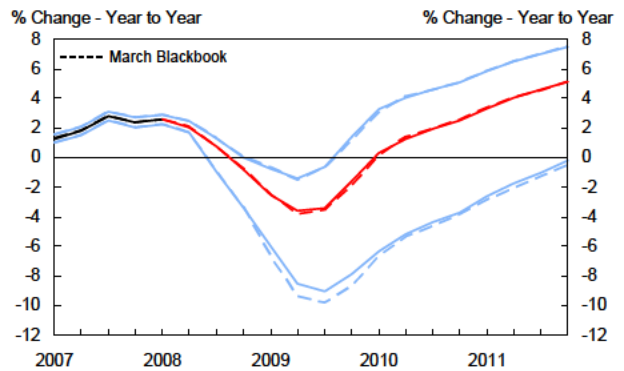


The yellow line is the expected value of the forecast distribution, the red line is the central scenario projection, and the green line is released data. The shading represents the 50, 60, 70, 80, and 90 percent chance that the four-quarter change will be within the respective range.

Change in Core PCE Inflation Forecast Distribution

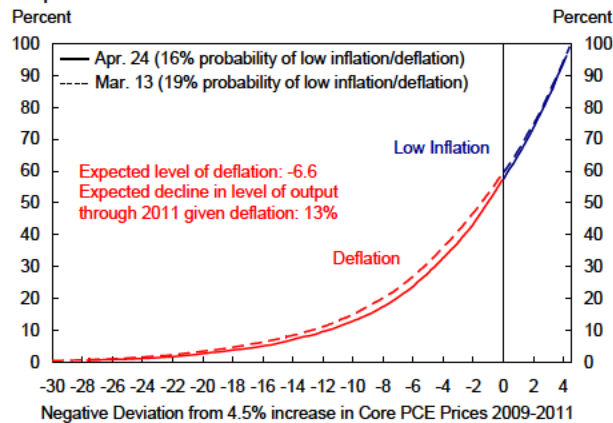


Change in Real GDP Growth Forecast Distribution

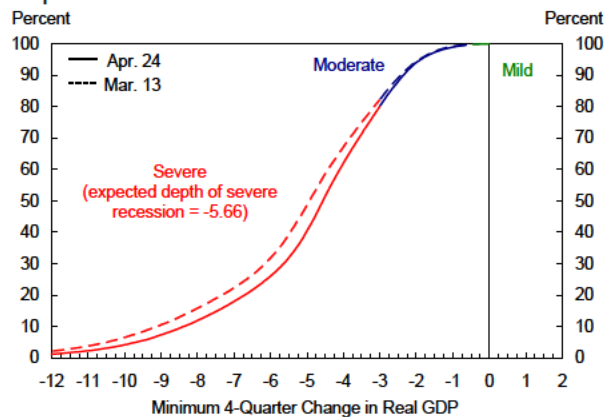


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from previous Blackbook.

Depth of Deflation



Depth of Recession

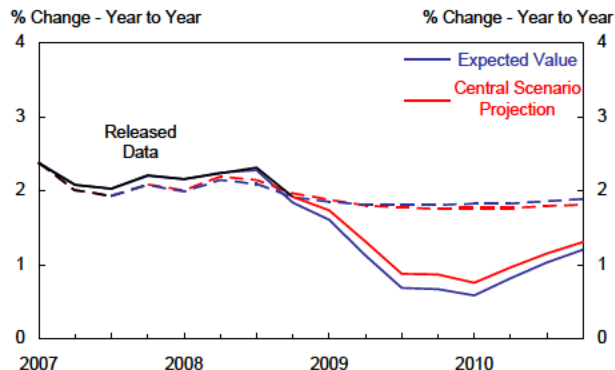


Source: MMS Function (FRBNY)

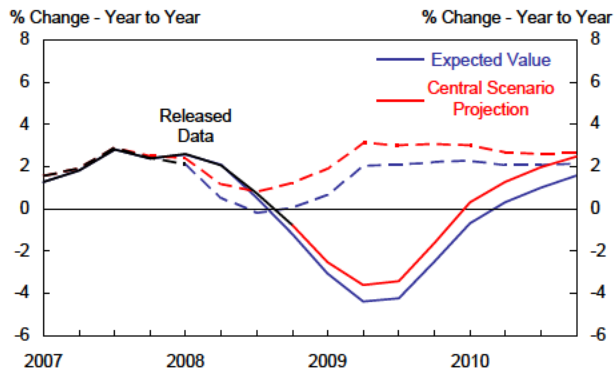
C. FRBNY Forecast Distributions

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

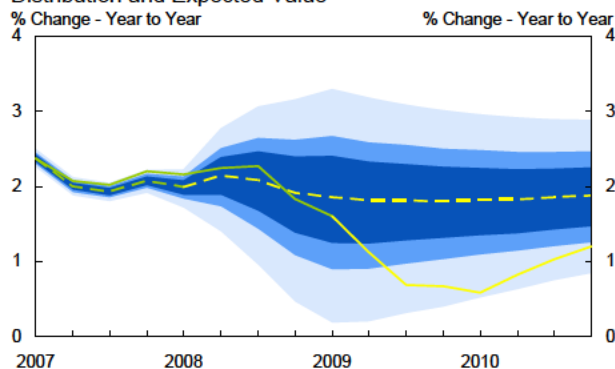
One-Year Comparison of Core PCE Inflation Forecast



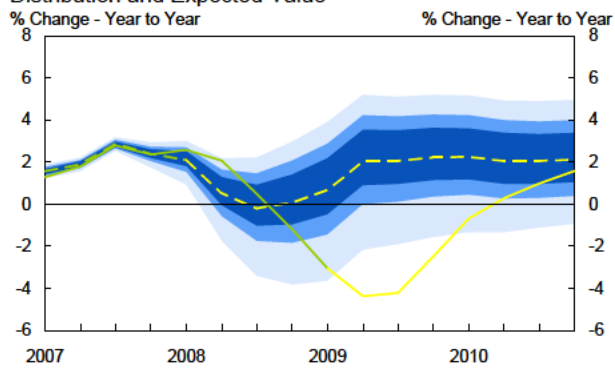
One-Year Comparison of Real GDP Growth Forecast



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



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



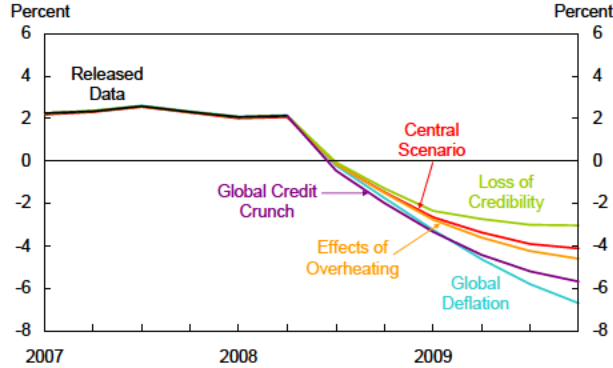
The solid yellow line is the **current** expected value of the forecast distribution, while the dashed yellow line is the **April 2008** expected value. The shading represents the 50, 70 and 90 percent probability intervals from the **April 2008** forecast. The green lines are released data.

Source: MMS Function (FRBNY)

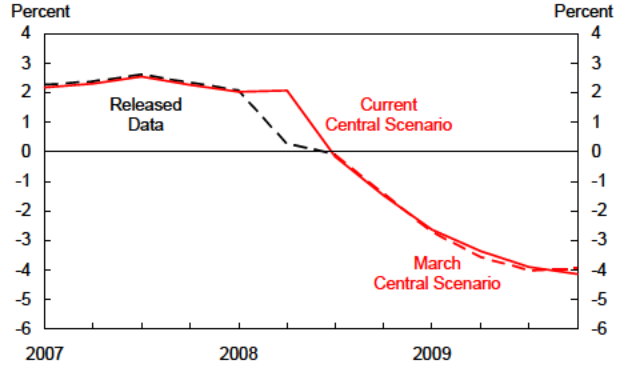
D. FRBNY Fed Funds Rate Projections

Exhibit D-1: *Baseline* Policy Rule Analysis

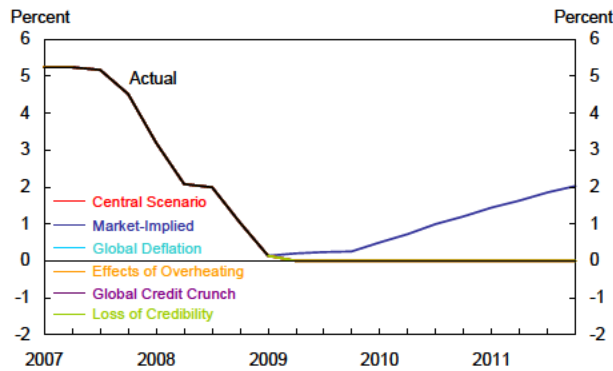
Real FFR under Alternative Scenarios



Change in Central Scenario Real FFR



Nominal FFR under Alternative Scenarios



Change in Central Scenario and Market-Implied Nominal FFR

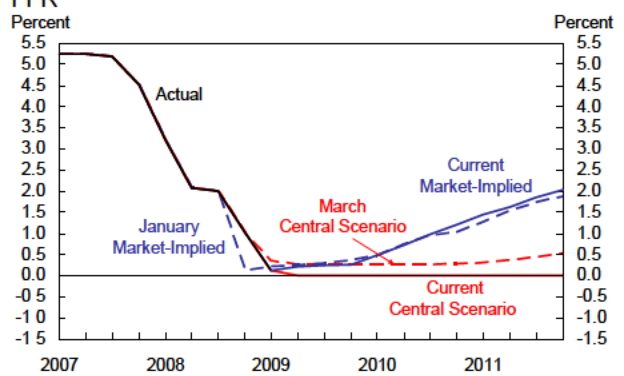
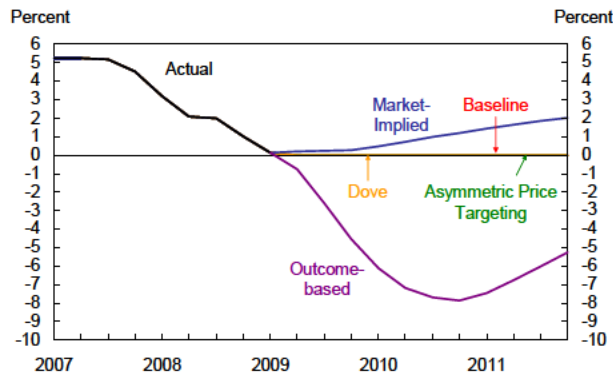


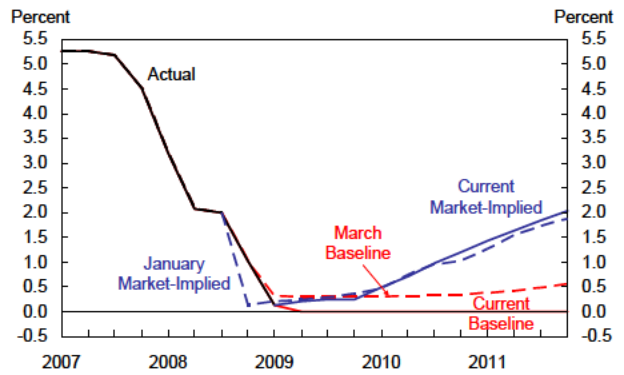
Exhibit D-2: Alternative Policy Rules under Expected Value of Forecast Distribution

Nominal FFR using Alternative Policy Rules*



*Evaluated using yellow line from C-3

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



*Evaluated using yellow line from C-3

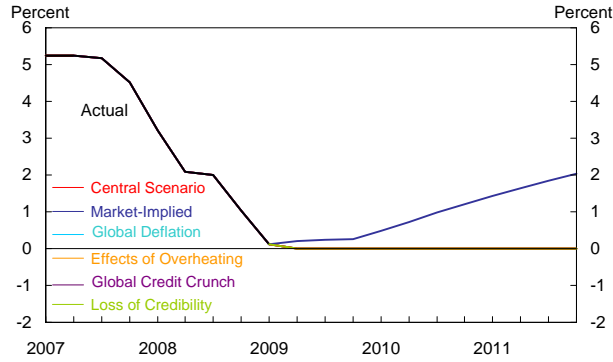
Source: MMS Function (FRBNY)

D. FRBNY Fed Funds Rate Projections

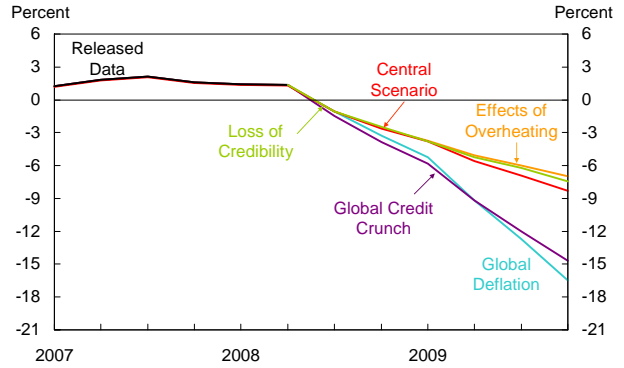
Exhibit D-3: Alternative Policy Rule Analysis

Policy Rule: *Asymmetric Price Targeting*

Nominal FFR under Alternative Scenarios

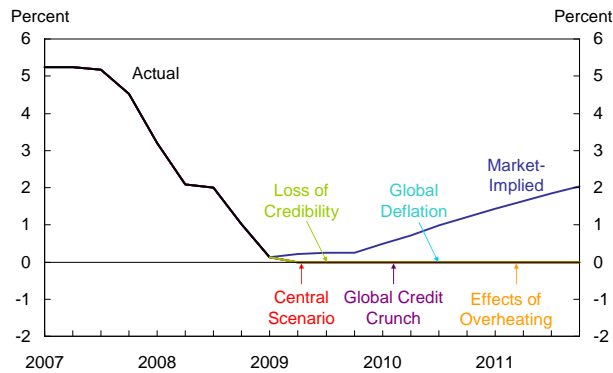


Real FFR under Alternative Scenarios

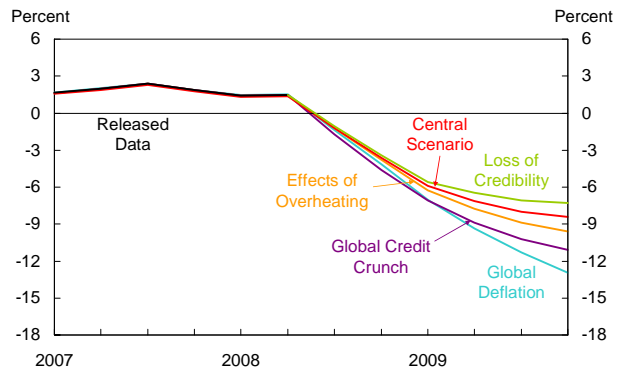


Policy Rule: *Dove*

Nominal FFR under Alternative Scenarios

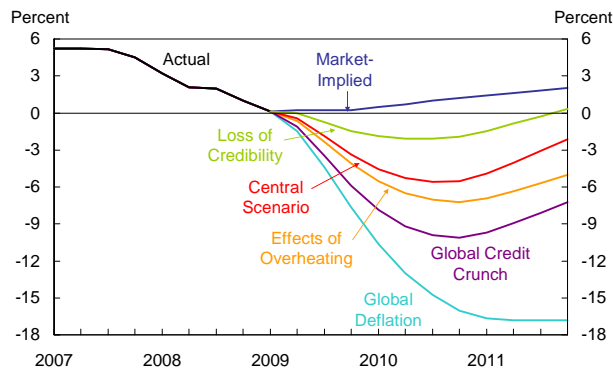


Real FFR under Alternative Scenarios

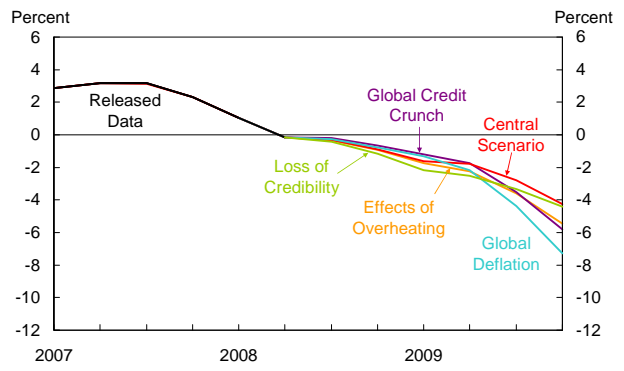


Policy Rule: *Outcome-based*

Nominal FFR under Alternative Scenarios



Real FFR under Alternative Scenarios



Source: MMS Function (FRBNY)

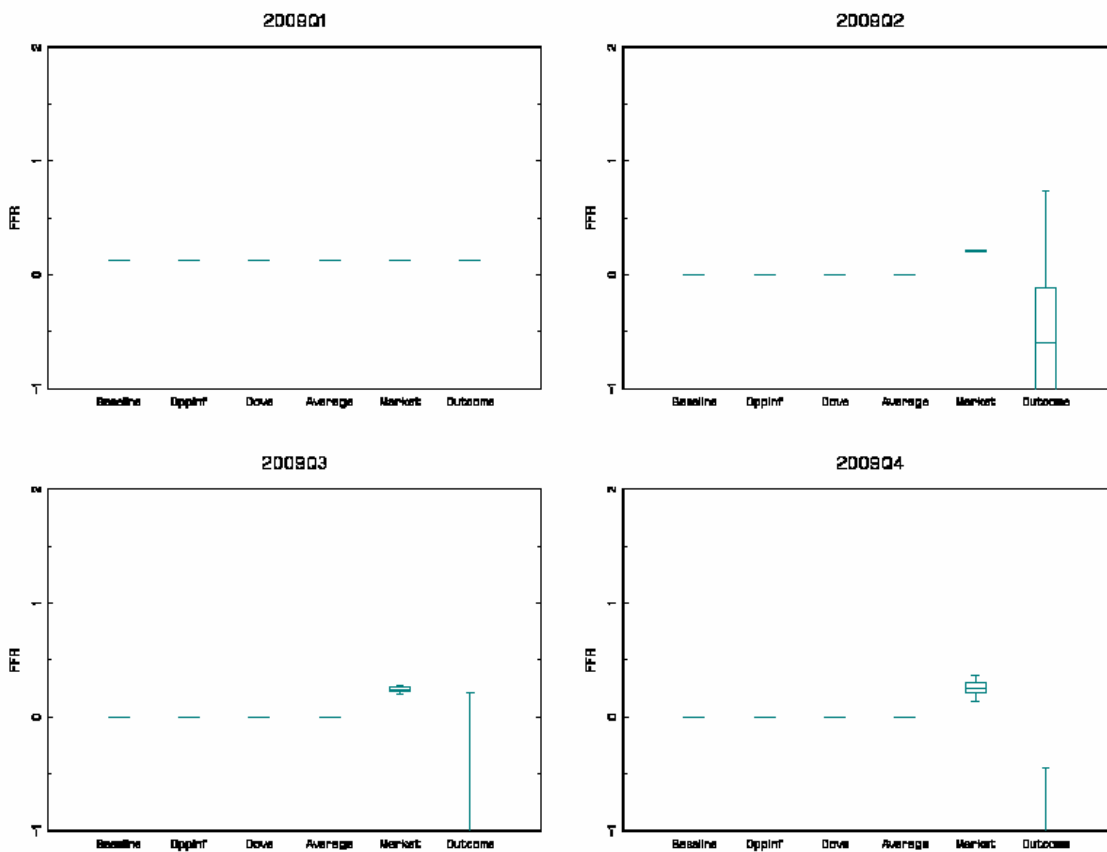
D. FRBNY Fed Funds Rate Projections

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

“Average” Weights:

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

Exhibit D-5: FFR Distributions



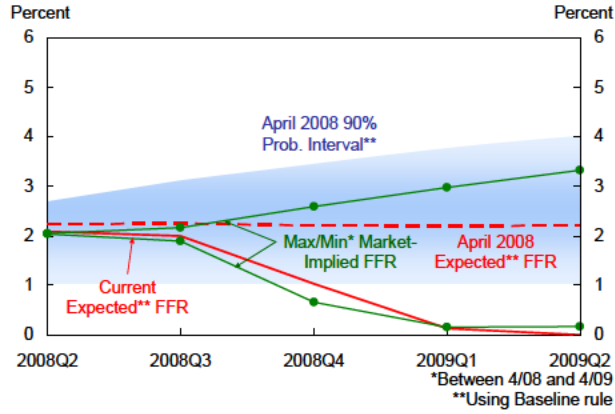
Note: The box represents the 50% probability interval, the line in the box the median, and the tails the 90% probability interval.

Source: MMS Function (FRBNY)

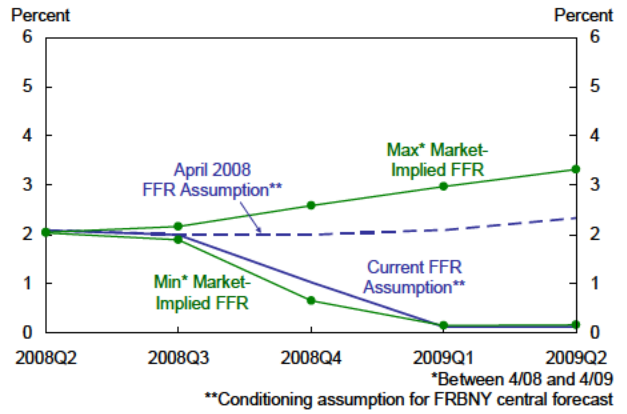
D. FRBNY Fed Funds Rate Projections

Exhibit D-6: Evolution of FFR Expectations and Assumption

FFR Forecast Distribution and Market-Implied FFR



FFR Conditioning Assumption and Market-Implied FFR



Source: MMS Function (FRBNY)

Alternative Scenario Descriptions

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

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

Alternative 1: *Productivity Boom*

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

Alternative 2: *Productivity Slump*

The recent surge in productivity growth may reflect a new cyclical pattern whereby firms protective of their profit margins reduce labor input in anticipation of slower profit growth. Furthermore, it is possible that the longer-term upswing in productivity that began in the mid-1990s has ended as the IT-driven surge has run its course. If so, there

could be an extended period of productivity growth below the trend in our central forecast. In addition, the increase in the level and volatility of energy and commodity prices could continue and lead to lower productivity growth, as occurred in the 1970s. Below-trend growth would not only imply a lower estimate of potential growth, but would also push inflation above the level projected in our central forecast.

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

Alternative 3: *Effects of Overheating*

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

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

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

Alternative 4: *Global Credit Crunch*

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

Alternative 5: *Loss of Credibility*

One interpretation of recent higher inflation, higher financial market inflation compensation, higher commodity prices, and dollar depreciation is that inflation expectations have risen despite the FOMC continuing to state its price stability mandate, raising concern that the FOMC has started to lose its credibility on inflation. Although some FOMC communications have placed more emphasis on the upside inflation risks, the FOMC also has communicated continued concern about growth risks, thus providing signals that the FFR may remain low that have further fueled such concerns. It is possible that these statements and actions of the FOMC may lead to further increases in

inflation and inflation expectations, such that firms and households begin to see the FOMC as not credible in regard to inflation. Such developments are likely to cause further rises in inflation and inflation expectations above forecast.

Alternative 6: *Global Deflation*

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

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

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

Policy Rule Descriptions

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

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

Policy Rule – Baseline Specification:

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

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

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

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

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

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

π_t : core PCE, 4 - quarter average

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

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

The two variants of the *Baseline* rule that we use are the *Asymmetric Price Targeting* and *Dove* rules. The *Asymmetric Price Targeting* rule is designed to combat deflation by instituting price-level targeting. This rule reacts more slowly than the *Baseline* rule to initial increases in inflation, maintaining a lower policy rate for a longer period of time.³ In each quarter over the forecast horizon, the rule reacts to the cumulative gap between a 1.5% price level path and the actual path on the downside; the rule is asymmetric because price-level targeting is only implemented on the downside. When the cumulative gap in inflation is greater than 1.5% per year, the policy rule reverts to targeting the gap between four-quarter changes in inflation and the inflation objective, just as in the *Baseline* rule.

³ All of the policy rules are subject to an effective lower bound of 0.25%.

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

In addition to the Baseline rule and the two variants, we also consider the FFR paths generated by the Board staff's Outcome-based rule. The most significant difference between the three FRBNY rules and the Outcome-based rule is that the FRBNY rules offer a prescription for future behavior based on policymaker preferences and views of the economy, whereas the Outcome-based rule is a statistical description of the average of past FOMC behavior. Specifically, the Outcome-based rule calculates an FFR for a given quarter as a function of the FFR in the previous two quarters, the current quarter's four-quarter core PCE inflation, and the output gap for the current and the previous quarter using parameters estimated from real-time historical data (1988-2006)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 Exhibits D-4 and D-5, we construct a distribution for the market-implied path by assuming it has a normal distribution centered at the standard, market-implied path, with a standard deviation derived from options markets (pictured in Exhibit A-6).

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