

**FRBNY BLACKBOOK**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**September 2012**

**CONFIDENTIAL (FR) Class II FOMC**

# FRBNY BLACKBOOK

## September 2012

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## 1. Policy Recommendation and Rationale

The economic and financial market developments since the July Blackbook Update have been slightly better than expected on net, but have not materially impacted our outlook for inflation and real activity. Absent further policy action, we see the pace of the recovery remaining too slow to absorb in reasonable time the still-large amount of underutilized resources. Furthermore, risks to the outlook from the European situation and the potential fiscal cliff remain elevated. Against this backdrop, we maintain our three-fold policy recommendation from the July Blackbook Update: first, maintain the FFR target range at 0-0.25%; second, replace the Maturity Extension Program (MEP) with a new round of LSAP using a combination of Agency MBS and Treasury securities; and third, lower the IOER from 25 to 15 basis points. Furthermore, we recommend that these measures are communicated as part of an integrated policy strategy where forward guidance explicitly links the extent and duration of monetary policy accommodation to the convergence of the path of real variables and inflation to their long-run objectives.

### *Rationale—Outlook.*

On balance, the real activity releases since the July Blackbook Update came in somewhat stronger than expected. July payroll employment growth was above that of the previous three months, although not strong enough to generate any reduction in unemployment (*For comments on September 7<sup>th</sup>'s August labor market release, see the special topic box*); July retail sales were relatively robust, suggesting a modest improvement in consumer spending over the near term; and a number of indicators suggested that the housing market may be finally on a gradual recovery path. Other incoming data were, however, less positive: orders for nondefense capital goods excluding aircraft continued to decline in July, and the ISM and many regional Fed indexes signaled a subdued level of manufacturing activity. Based on the second estimate, real GDP grew at 1.7% (annual rate) in the second quarter of 2012, an upward revision to the advance estimate of 1.5% growth, but below the already weak growth rate of the first quarter. Given these developments, we continue to anticipate that real activity would remain sluggish under

current policy. Overall CPI and PCE inflation declined in recent months, largely due to the fall in energy prices. The more recent PCE release indicated that underlying inflation fell further below the 2% objective, and is likely to remain so under current policy.

*Rationale—Uncertainty and Risks.*

The situation in Europe and the probability of a considerable fiscal consolidation in the US (the so-called fiscal “cliff”) continue to be major sources of uncertainty and risks for the US and global economies. In the Euro area, large funding needs for Italy and Spain in the fall add to the fragility of the situation, while recent PMI data provide further evidence that much of Europe is in recession.

Under the policy path communicated in the August FOMC statement, we would have made very little change to our prior forecast distribution and thus would assess the risks to both real activity and inflation as skewed considerably to the downside. In part, our policy recommendation aims to mitigate those risks, and therefore the forecast distributions under our recommendation feature less downside risks.

*Policy Recommendation.*

Absent any further policy action, we anticipate that the pace of the recovery in the US will remain subdued, with growth picking up very gradually, and rising above its potential only in 2014; as a consequence, unemployment would remain around current elevated levels through 2013 and decline very slowly afterwards. In addition, the Fed will continue to miss on the inflation objective, with underlying inflation projected to remain well below mandate consistent rates.

With such a conditional forecast, and in light of the downside risks described above, we believe that more policy accommodation is needed, even if long-term Treasury yields and expectations of the FFR path remain low, and the Federal Reserve balance sheet is elevated by historical standards. We also see little reason to delay action that could provide insurance against those risks, given the sluggish state of the US economy. With policy constrained by the zero lower bound, we thus reiterate our July Blackbook recommendation of strengthening the forward guidance within a consistent strategic framework, which deploys several policy instruments to provide more accommodation.

First, we recommend announcing that the FOMC will maintain the FFR target range at 0-0.25% at least until the paths of real GDP and unemployment show clear progress toward their desired long-run values. This announcement would be most effective if it explicitly stated that the Committee would tolerate an inflation rate (as measured by the total PCE deflator) temporarily above target, provided that medium-run inflation projections remain consistent with an eventual return of inflation to the long-run goal of 2%. Under our assessment of current conditions, and with the balance of risks facing the economy, such a policy implies that the FFR should remain in this range at least until mid-2015. A special topic box in this Blackbook shows that extended forward guidance can have a sizable macroeconomic impact in the FRBNY DSGE model.

Second, we recommend replacing the existing MEP program with a new *open-ended* flow-based LSAP program, which will expand the Federal Reserve's balance sheet through purchases of a combination of Agency MBS and long-term Treasury securities. We would implement this plan by setting a monthly *pace* for increasing the Federal Reserve's holdings of MBS and Treasury securities, with the composition to be determined by market functioning considerations. The overall *duration* of the program and the eventual *size* of the Federal Reserve's balance sheet would thus be determined by the progress towards the stated objectives.

Third, we recommend reducing the IOER from the current 25bps to 15bps. Such a policy would likely ease short-term funding conditions by a few basis points, which would have at least a marginally beneficial effect on overall economic activity.

The extent of the accommodation provided by this combination of tools should be state-contingent; that is, it would remain in place until the recovery is well established. Under such a policy, the FOMC would continue to expand the Fed's balance sheet (and perhaps also adjust its maturity composition) and maintain the FFR in the 0-0.25% range as the economy strengthens, for as long as it takes to reach a self-sustaining recovery.

Moreover, the FOMC should make this strategy explicit by communicating under which conditions continued extraordinary accommodation will be warranted or lifted, including the variables it would monitor to assess whether the recovery is well established. Unlike

previous LSAPs, the new purchase program should be open-ended, preferably with the FOMC setting a pace for the purchases rather than an aggregate level. Combined with the state-contingent communication on the policy rate, this approach provides an integrated strategy that would provide assurance that the FOMC will maintain its accommodative stance at least until the economy is on a solid path to recovery.

There are implementation issues as well as risks in our recommendation. The implementation challenge is devising an easily-communicated state contingent rule to frame the policy stance. For the policy to be effective, the FOMC must be clear about how it would judge that a solid recovery is under way, providing the proper characterization of the inflation and labor market conditions that would prompt adjustments— continuation, escalation, or termination—of the policy. Providing such a characterization is difficult, but an obvious starting point is gauging economic progress relative to the objectives stated in the January 2012 statement of longer-run goals and policy strategy. For example, the FOMC could communicate in terms of the misses on the employment and price stability objectives by announcing that the purchases will continue until the *projected* gap between the unemployment rate and the FOMC's central estimate of the natural rate has narrowed to 1.5 or 2 percentage points (and is expected to continue to narrow), provided that *projections* for the inflation gap are no larger than 1 percentage point. More nuanced language could define policy not just in terms of *levels* relative to objectives, but also in terms of the *speed* at which those objectives are expected to be approached.

Even though the FOMC has defined the maximum employment goal in terms of the unemployment rate, the unemployment gap may not be an appropriate variable to use in our recommendation, as the unemployment rate may provide a less accurate measure of labor market conditions in the current environment. As an alternative, we would recommend that the FOMC refer to other measures of labor market conditions, such as the growth of payroll employment or the employment/population ratio.

Yet another alternative to frame the policy stance is to specify the objective in terms of a target for the level of nominal GDP, as discussed in past Blackbooks. The advantages of framing the Fed's reaction function in terms of nominal GDP targeting are two-fold.

First, based on plausible values of the target growth rate, there is still a significant “nominal GDP gap” in the US economy, indicating ample scope for accommodation. Second, a nominal GDP target reflects quite clearly both parts of the Fed’s dual mandate and therefore could be well understood by the public. If the FOMC were to adopt this strategy, it would announce a target path for nominal GDP and then condition accommodation to the closing of the gap between projected and targeted nominal GDP.

One risk in any strategy that conditions the removal of policy accommodation to the achievement of a real objective is that the FOMC may overestimate the “potential” of the economy, which could lead to unexpectedly higher inflation and unanchoring of inflation expectations. However, under a nominal GDP targeting policy, if most of the desired increase in nominal GDP were realized by higher inflation rather than by real growth, a removal of policy accommodation would occur “naturally” within the policy framework. Similarly, if the objective of accommodation is specified in terms of closing the unemployment gap, the inflation “tolerance” clause should mitigate the inflation risks involved in underestimating the natural rate of unemployment. In such situations, the FOMC would have the tools to tighten policy and would be expected to re-assess the unemployment rate consistent with price stability or the target growth rate of nominal GDP once it realized its misstep.

The open-ended nature of the proposed flow-based asset purchase program presents some risks. First, the potential of a large increase in the Fed’s balance sheet could lead to dysfunction in financial markets. Indeed, high volumes of purchases may not be feasible in the MBS market, and thus more purchases may have to be in longer-term Treasuries. However, current estimates suggest that there is considerable capacity along both dimensions. Then there is the risk of capital losses should the Fed have to liquidate its portfolio rapidly in a rising interest rate environment. For this latter risk, we continue advocating, as we have in the past, that the Fed accumulates some capital cushion to make up for possible future losses, or alternatively that it reaches a more formal arrangement with the Treasury about how such capital contingencies would be met.

Lowering the IOER also carries some risks in terms of market functioning, especially with respect to money market mutual funds. Such funds would see their profit

opportunities decline and thus might reduce their market presence. Too rapid a reduction in their participation then may lead to significant money market disruptions in the short run and to heightened uncertainty. These are short-run costs, however, that have to be weighed against long-run benefits, as well as the important signaling effects potentially provided by the IOER reduction.

Finally, a significant hurdle in making this policy strategy effective is the communication of the expected lift-off date. Even though our state-contingent policy does not need to carry a reference to a specific date, removing the date currently in the statement could be interpreted as a de facto tightening of policy. We believe that these particular risks are likely small, because the balance sheet action and the associated change in communication would speak clearly for the accommodative stance of policy, but we think the Committee could maintain a timeframe and therefore suggested above to move the expected lift-off date to mid-2015. It is important, however, that the extended forward guidance on the policy rate states that accommodation will remain in place until the progress towards closing the gaps from both objectives is well under way, rather than indicating an expectation that the recovery will still be anemic at that date. In essence, in the context of the integrated policy strategy that we recommend, the extended forward guidance should provide a contingent commitment, rather than a forecast of the path of the policy rate.

## Special Topic: The Macroeconomic Effects of Interest Rate Announcements

*Marco Del Negro, Marc Giannoni, and Christina Patterson*

*In this box, we quantify the macroeconomic effects of announcements about the future federal funds rate using the FRBNY DSGE model. We show that a commitment to lowering future rates below market expectations can have fairly strong effects on real economic activity, but has small effects on inflation.*

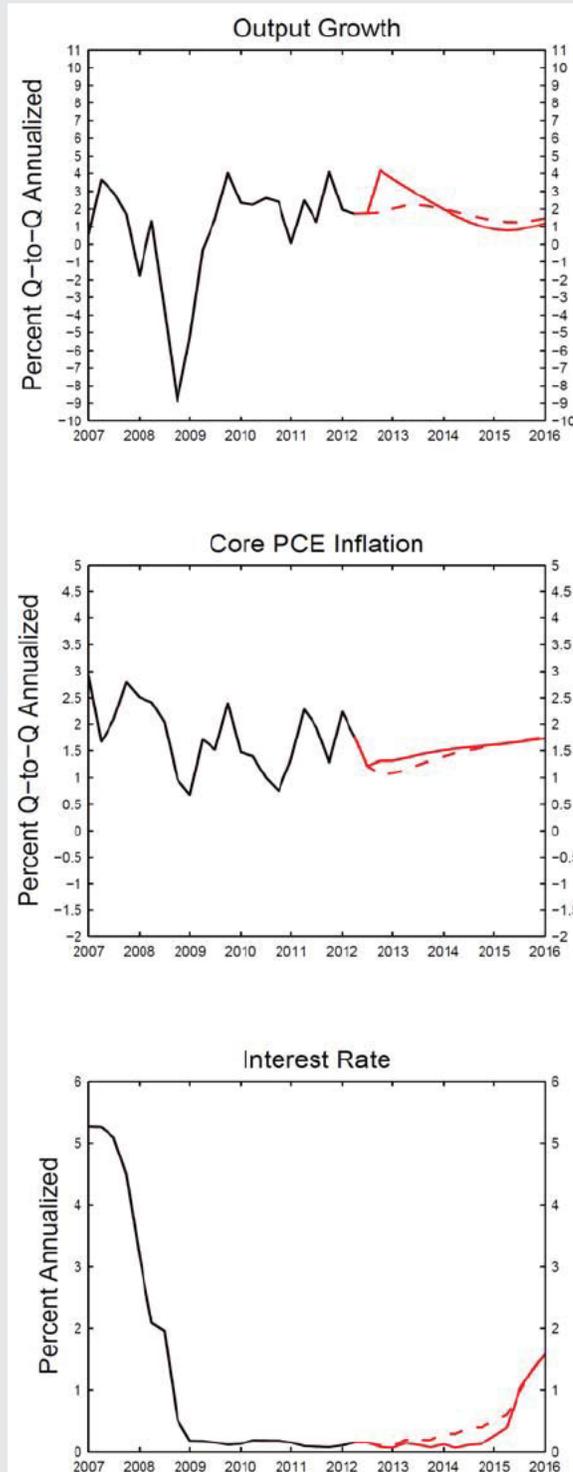
The model is estimated using seven quarterly data series: real GDP growth, core PCE inflation, the labor share, aggregate hours worked, the spread between Baa corporate bonds and 10-year Treasury yields, and the effective federal funds rate (FFR). Furthermore, we use the FFR (as measured by OIS rates) to incorporate market expectations for the period following the establishment of the near-zero interest rate policy in late 2008. Model parameters are estimated from 1984Q1 to the present using Bayesian methods.

Figure 1 shows the model's predictions for real GDP growth, core PCE inflation, and the FFR conditional on alternative assumptions regarding the interest rate. The solid black lines show the historical data. The dashed red lines show the FRBNY DSGE model's baseline forecast, which is based on data released through 2012Q2, augmented with observations on the FFR and the Baa spread for 2012Q3. The forecast is conditional on the market expectations of the FFR through 2015Q2 (11 quarters). After that, the FFR is assumed to be set according to the estimated historical policy rule. This forecast thus incorporates the current forward guidance, as interpreted by market participants. This results in an FFR at 0.4% at the end of 2014 and at 0.6% in mid-2015.

In this forecast, GDP growth is 1.9% in 2012 (Q4/Q4), rises to 2.2% in 2013, but remains mostly below 2% throughout the rest of the forecast horizon. Core PCE inflation is 1.6% in 2012 and is also expected to remain below 2% throughout the forecast horizon.

We then consider a counterfactual experiment in which the forward guidance on rates is extended by announcing a commitment to maintaining the FFR in the 0 to 0.25% range until 2015Q2, i.e., longer than the market expects. This experiment generates an unreasonably large stimulus, as shown in Table 1. Under this counterfactual, Q4/Q4 GDP growth would jump from 1.9 to 3.5% in 2012 and would reach almost 5% in 2013.

**Figure 1: The macroeconomic consequences of fixing the interest rate path**



Notes: The figure shows the model's predictions conditional on alternative assumptions regarding the FFR. The solid black lines show the historical data. The dashed red lines show the FRBNY DSGE model's baseline forecast. The solid red lines show the model's predictions in a counterfactual policy experiment in which more forward guidance is provided about the FFR such that the 10-year bond yield falls by 10 basis points.

What causes the arguably excessive response of the economy to the extension of forward guidance? The model allows us to decompose the transmission channel of interest rate announcements on the macroeconomy into two parts: 1) the effects of credible announcements about future short-term policy rates on long-term bond yields; and 2) the effects of the resulting change in long-term bond yields on economic activity and inflation. Therefore, we can investigate whether the excess response is due to an over-reaction of long-term bond yields to interest-rate announcements in the model, or alternatively, to an excess response of output and inflation to given changes in long-term yields.

**Table 1: The macroeconomic consequences of more forward guidance**

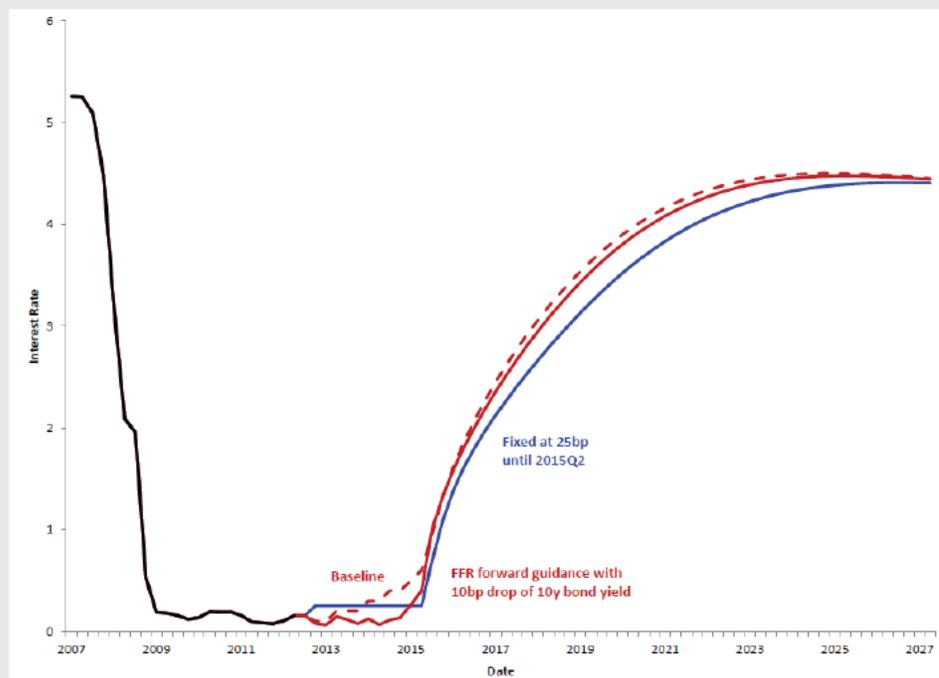
	2012 (Q4/Q4)	2013 (Q4/Q4)	2014 (Q4/Q4)	2015 (Q4/Q4)
<b><i>GDP growth</i></b>				
Baseline	1.9	2.2	1.7	1.3
FFR at 25bp	3.5	4.9	1.5	0.3
Forward guidance with constrained 10y yield	2.4	3.0	1.5	0.9
<b><i>Core PCE inflation</i></b>				
Baseline	1.6	1.2	1.5	1.6
FFR at 25bp	1.8	1.9	1.8	1.7
Forward guidance with constrained 10y yield	1.6	1.4	1.5	1.6
<b><i>Federal funds rate</i></b>				
Baseline	0.10	0.20	0.40	1.32
FFR at 25bp	0.25	0.25	0.25	1.09
Forward guidance with constrained 10y yield	0.08	0.08	0.13	1.32

Notes: The table reports the model's predictions conditional on alternative assumptions regarding the FFR: the baseline forecast, a counterfactual policy experiment in which the FFR is maintained at 25 basis points until 2015Q2, and a counterfactual policy experiment in which more forward guidance is provided about the FFR such that the 10-year bond yield falls by 10 basis points.

Our analysis shows that the problem is mostly in the reaction of long rates, as an extension of the forward guidance by two quarters leads to large declines in expected future short-term

rates in the model, as shown in Figure 2. In that figure, the solid blue line shows the short-term interest rates implied by the model far into the future for the counterfactual scenario in which the FOMC commits to keeping the FFR low until 2015Q2. As a result of this extended commitment, the short-term interest rate is expected to deviate substantially from that in the baseline scenario for many years. Consequently, the model predicts a drop of 16 basis points in the 5-year yield following the announcement, and an even larger decline, as much as 25 basis points, in the 10-year yield. These responses are much larger than past experience suggests is plausible. For instance, the statement released after the January 25, 2012 FOMC meeting reinforced the forward guidance about the FFR by announcing a postponement of the expected liftoff date. This extension resulted in a reduction in 5 and 10-year yields of 8 and 7 basis points respectively.

**Figure 2: FFR projections farther into the future**



Notes: The figure shows the model's predictions for the FFR farther into the future, conditional on three scenarios: the baseline forecast (red dashed line), a counterfactual policy experiment in which the FFR is maintained at 25 basis points until 2015Q2 (blue solid line), and a counterfactual policy experiment in which more forward guidance is provided about the FFR such that the 10-year bond yield falls by 10 basis points (red solid line).

This evidence suggests that a possible way to avoid an excessive response of the model economy to forward guidance is to constrain the reaction of the 10-year bond yield to be more in line with the empirical evidence. Based on the effect of the January announcement, we view 10 basis points as an upper bound for the response of the 10-year bond yield to an extension of the lift-off date by 2 quarters. Therefore, we choose an alternative expected FFR path following the announcement that results in a 10 basis point reduction in the 10-year bond yield. Since there exist many such paths, we choose one that minimizes deviations from market expectations before the announcement in the first few quarters following the change in policy, as the short rate is already in line with the desired path over that period. We also penalize deviations of the expected future short rate in the far years, since it is unlikely that the announcement of an extension of the forward guidance by two quarters would have large effects at that horizon.

The solid red lines in Figures 1 and 2 report the model's forecasts conditional on the proposed alternative policy path. The new policy reduces the expected FFR from 40 basis points to 13 basis points at the end of 2014 (see Table 1). According to the model, this alternative policy has a stimulative effect in 2012 and 2013, with an increase in real GDP growth of 1/2 a percentage point in 2012 (Q4/Q4) relative to the baseline, and of 0.8 percentage point in 2013. GDP growth is however somewhat lower than in the baseline scenario in 2014 and 2015, as the effects of the policy stimulus fade over time and GDP returns to the *level* that would have prevailed without the stimulus. The new policy also has little effect on core PCE inflation, with a 0.2 percentage point increase in 2013, but no change in other years.

In conclusion, the experiments conducted with the FRBNY DSGE model show that a policy-driven shift in FFR market expectations in the next few years would have sizable, though reasonable, effects on real GDP growth, but only a modest impact on inflation. It is important to note though that the effects of a reinforcement of the forward guidance are strong and positive only to the extent that they signal a commitment by the FOMC to maintain rates below what the market expects. The effects would instead be muted or even negative if the FOMC's announcement of a lower path for its short-term policy rate were perceived by markets as a response to a downgrade of the FOMC's economic outlook.

## Special Topic: August Labor Market Report

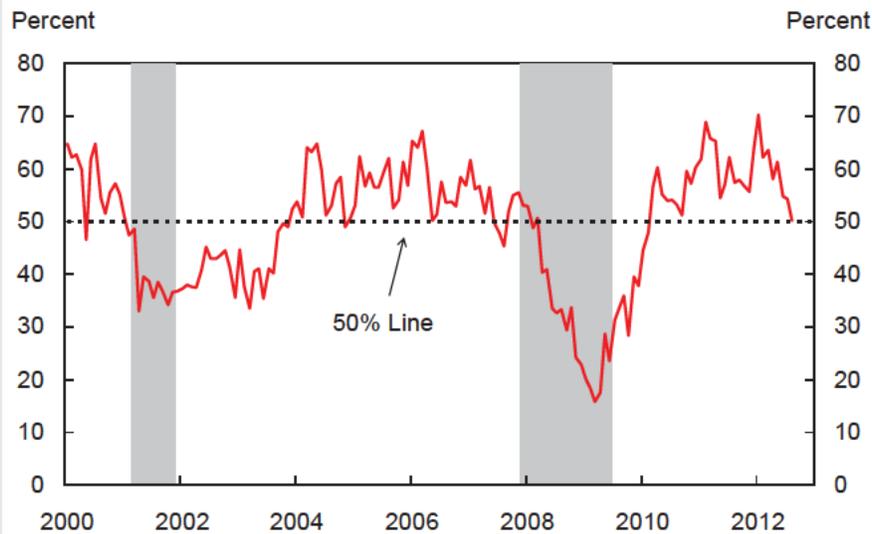
*Stefania Albanesi and Ayşegül Şahin*

- **The August labor market report overall showed that the slowdown in job creation that started in April continued into August.**
- **In August, nonfarm payrolls increased by 96,000 as private payroll employment increased by 103,000 and government payrolls declined by 7,000.**
- **Hours worked by all private sector employees went up by 0.1%.**
- **The unemployment rate declined from 8.25% to 8.11%. The employment-to-population ratio declined from 58.4% to 58.3% and the labor force participation rate decreased from 63.7% to 63.5%.**

**Nonfarm payroll employment** increased 96,000 in August while private payroll employment rose 103,000. These changes were worse than private sector expectations: The Bloomberg median forecast for the total employment change was +130,000. The revisions to the July and June payroll employment estimates were -22,000 and -19,000 respectively, resulting in a net revision of -41,000.

Employment in the goods-producing sector declined by 16,000 in August. Manufacturing employment went down by 15,000 jobs, following July's increase of 23,000. Within this sector, employment in motor vehicle and parts manufacturing declined by 7,500 after increasing by 14,000 in July. Since firms in the auto industry laid off fewer than usual workers in July, fewer workers were recalled back in August. This contributed to the seasonally adjusted increase in July and decrease in August causing little change in manufacturing employment relative to its June level. Employment in the private service-providing sector increased 119,000. Leisure and hospitality (+34,000), trade, transportation, and utilities (+29,000), professional and business services (+28,000; within this sector, employment at temporary help services declined 5,000), and education and health (+22,000), accounted for almost all the increase in services payroll employment. **Government employment** dropped by 7,000 with the decline more than accounted for by a fall in state and local government employment. The **one-month diffusion index**—reflecting the balance of industries increasing and decreasing employment over the month—was 50.2 in August, down from 54.3 in July. As the figure below shows this was the lowest value of the diffusion index since February 2010. The diffusion index in manufacturing was 36.4 in August down from 50.6 in July.

## Diffusion Index: 1 Month Span



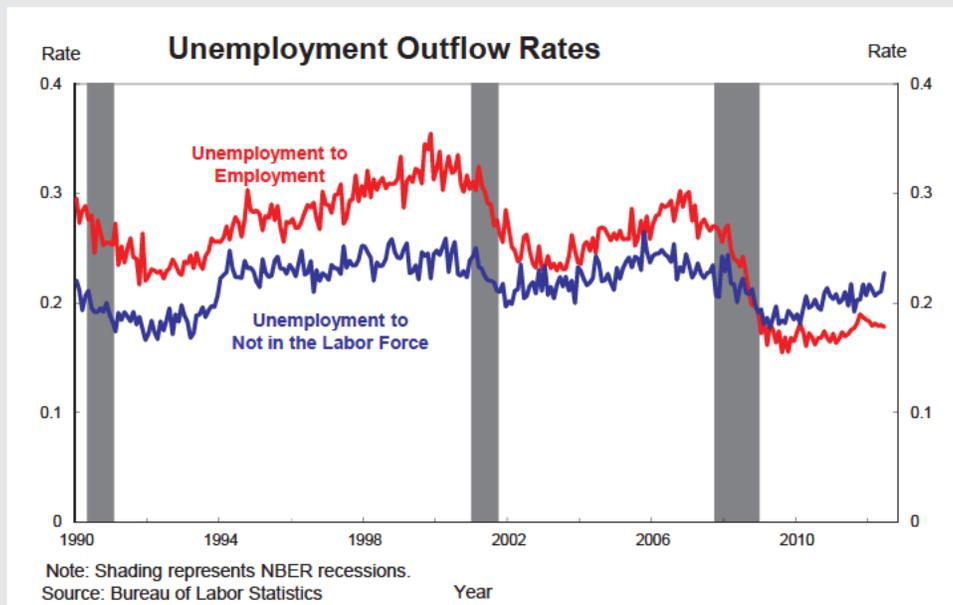
Source: Bureau of Labor Statistics

**Average weekly hours** remained unchanged at 34.4 hours. Average hours in manufacturing declined from 40.7 to 40.5 hours. **Aggregate hours** worked by all private employees rose 0.1% after declining 0.2% in July. **Average hourly earnings** was unchanged at \$23.52. The 12-month change in average hourly earnings was 1.7%, remaining within the narrow range that has generally prevailed since November 2009.

The **unemployment rate** declined from 8.25% to 8.11% in August. The unemployment rate remained unchanged at 7.0% for prime-age (age 25-54) men. The prime-age female unemployment rate declined from 7.4% to 7.1%. Household employment declined by 119,000. The employment-to-population ratio dropped from 58.4% to 58.3%. The decline in the employment-to-population ratio was mostly due to 16-24 year old workers and prime-age males. The employment-to-population ratio declined from 82.4% to 82.2% for prime-age males while it increased from 69.0% to 69.2% for prime-age females. The labor force participation rate decreased from 63.7% to 63.5%. The labor force participation rate has not been this low since 1983. Most of this decline in the labor force participation was due to young workers, as the participation rate for prime-age workers was unchanged. The labor force participation rate of 16-24 year old workers was 54.1% in August. Participation rate of this group has been trending down since 1980s and this decline continued at a faster pace in the last five years. Since 2007, this rate went down by more than 5 percentage points, bringing the participation rate of this group to its lowest value since 1960s. The median

duration of unemployment increased from 16.7 to 18 weeks while the percentage of unemployed workers unemployed 27 weeks or more edged down slightly from 40.7% to 40.0%. The fraction of unemployed who were job leavers increased to 7.5% from 6.9%. This ratio bottomed at 5.5% in September 2010 and despite some improvement, still lies below its pre-recession value of around 10-12%.

In August, the total unemployment outflow rate was 43.7%. The figure below shows the two components of the unemployment outflow rate: the U-to-E flow rate (the job-finding rate) and the U-to-N flow rate. In August, the U-to-E flow rate was 17.8% while the U-to-N flow rate was 22.7%. As the figure shows most of the recent improvement in the unemployment outflow rate is due to the increase at the rate that unemployed workers drop out of the labor force. The job-finding rate, one of the best measures of the strength of the labor market, remains subdued at historically low levels.



The August labor market report overall showed that the slowdown in job creation that started in April continued into August. Payroll employment increased an average of 87,000 per month since April, down from 225,000 in the first quarter of the year. The household survey also remained weak as the fall in the unemployment rate to 8.1% was a consequence of declining labor force participation, and the employment-to-population ratio remains at a low level. The August labor market report is consistent with continued sluggish growth in real activity and suggests that the weakness in the labor market is mostly due to the weakness in overall economic activity rather than structural factors.

## 2. Evolution of Outlook and Risks

### 2.1 Central Forecast

**Intermeeting developments.** Data released over the intermeeting period have been mixed, resulting in essentially no change in our assessment of the likely strength of the economy over the second half of 2012. The revision of the growth rate of real GDP for 2012Q2 from 1.5% (annual rate) to 1.7% did include a significant change in the mix of output in that quarter. Growth of final sales was revised up to 2.0% from the first estimate of 1.2%. At the same time, the growth contribution from inventory investment was revised down from +0.3 to -0.3 percentage points. This set the stage for a somewhat stronger rate of growth of real GDP in the third quarter than was assumed in the Blackbook Update prepared in late July. But at 1.9% (Q4/Q4), our current projection for growth of real GDP in 2012 is essentially unchanged from the 1.8% of the last Blackbook Update.

Recent data on consumer spending has been generally favorable, resulting in some nudging up of the expected rate of growth of real personal consumption expenditures (PCE) for the third quarter. For example, real PCE grew 0.4% in July (5% annual rate) after declining in May and June. Sales of light-weight motor vehicles rose slightly more than expected in August, to 14.5 million units (annual rate), the highest since August of 2009, when sales were boosted by the “cash for clunkers” tax credit. Some improvement in consumer spending was to be expected given the boost to real disposable income from falling energy prices. But consumers continue to exhibit a high degree of caution, using this windfall to boost their saving more than their spending. Indeed, both the Conference Board and Michigan surveys of consumer confidence for August saw further declines in consumers’ assessments of future economic conditions. Moreover, gasoline prices moved sharply higher in August, reversing much of the improvement in real income that occurred over the first half of the year. Food prices are expected to begin rising more rapidly later this year as the effects of the drought work their way through the system. Taking all of this information into account, our current projection for growth of real PCE over the second half of 2012 is essentially equal to the first half growth rate.

Similarly, recent data coming out of the housing market have been a bit better than expected. Total housing starts are now on a gradual uptrend, as are sales of both new and existing single-family homes. Nationally, home prices have stabilized after falling roughly 30% from their peak in 2006. While these developments are encouraging, residential investment now represents just 2 ½% of GDP, so even strong gains in this component provide only a relatively modest contribution to growth of overall GDP.

However, other indicators have been decidedly downbeat. New orders for nondefense capital goods excluding aircraft have fallen off quite sharply in recent months and are now below shipments. Similarly, the Architectural Billings Index, which provides leading information on business investment in new structures, has been at a level suggesting declining activity for four consecutive months through July. Combined, this information suggests that business investment spending is more likely to slow further over the second half of the year than it is to strengthen.

On the production side, a variety of indicators point to sluggish activity in the manufacturing sector. The ISM manufacturing composite index has been below 50 for three consecutive months as of August, something that has not happened since July of 2009. Several factors are contributing to this slowdown of manufacturing activity. After ramping up substantially over the second half of 2011, the rate of vehicle assemblies in the US has begun to level off. Growth of real exports has gradually slowed over the past year, and firms appear to want to slow their rate of inventory accumulation.

The recent labor market data have reinforced this view of sluggishness in the goods producing sector of the economy. The average monthly change in payroll employment in the goods producing sector was 4,000 for July and August following an average monthly change of -1,000 in the second quarter. There was corresponding weakness in hours worked and average hourly earnings. In contrast, employment gains in the private service-providing sector have strengthened somewhat in the third quarter, averaging 129,000 in July and August, up from 89,000 in the second quarter.

Total inflation, as measured by year-over-year changes of the PCE deflator, has slowed sharply in recent months, from a recent peak of 2.9% in September of 2011 to 1.3% in

July. The bulk of this movement has been due to energy prices, which were up 20% on a year over year basis last September, but are down 4.7% as of July. The rate of increase of food prices also slowed over that period. In contrast, core inflation has been running somewhat higher than we anticipated, averaging 2% (annual rate) over the first half of 2012 versus 1.6% over the second half of 2011. We suspect that this firmness is due to the effect of the steep increases in commodity and import prices in 2011 working their way through the system. In recent months nonpetroleum import prices have been declining, likely contributing to some slowing of core inflation. In July, the 12-month change of the core PCE deflator was down to 1.7%, with forward-looking inflation measures such as our Underlying Inflation Gauge indicating further slowing in the months ahead. Indeed, we have lowered our projection for core PCE deflator inflation over the second half of 2012 to 1.3% from 1.6% in the July Blackbook Update.

**Conditioning assumptions.** Our estimate of potential GDP growth is around 2 ¼%, reflecting trend growth of productivity of 1 ¼% and trend growth of hours worked of 1%. The Board staff estimates of potential for 2012, 2013, and 2014 are 1.8%, 2.0%, and 2.1%, respectively, all unchanged from the previous Tealbook.

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 persistence typically assumed in the Board staff forecasts. In our central scenario, inflation expectations remain well anchored. This assumption is key to our projection that core PCE deflator inflation will remain within the FOMC's objective of 1.5% to 2.0%. In contrast, the Tealbook forecast expects core PCE deflator inflation to trend downward over the forecast horizon.

Both the Tealbook and Blackbook projections of global real GDP growth in 2012 are unchanged at 1.8% (Q4/Q4) and 2.1%, respectively. For 2013 our forecast for global growth is essentially unchanged at 2.8% while the Board's forecast has been raised to 2.4% from 2.2%. In both cases some firming of growth in 2013 is expected as the euro area begins a gradual recovery from recession and emerging economies respond to policy easing. In 2014, we anticipate global growth to remain near the 2013 pace while the Board staff anticipates a strengthening to 2.9%.

Since peaking in early June, the exchange value of the dollar has been on a downward trend, leading to a lowering of the expected change for all of 2012. The Board expects the exchange rate to rise 1.2% in 2012 versus 3.1% in the last Tealbook. Similarly, we expect the dollar to rise 0.2% versus 1.2%. For 2013 and 2014 we anticipate depreciation of 2.5% in each year. The Tealbook assumption is a depreciation of 1.3% in 2013 and 2.1% in 2014.

Reflecting intermeeting developments, our assumed path of WTI oil prices, based on recent futures quotes, has moved up. We now expect a price of \$96.50 for 2012Q4, up from \$89, and a price of \$96 for 2013Q4, up from \$89.50. The WTI price per barrel is then expected to ease to \$92 by 2014Q4. The Board's projected path is quite similar to ours.

As is our standard practice, we adopt the same federal fiscal assumptions as in the Tealbook, which are unchanged from late July. For 2013, those assumptions include the expiration of the payroll tax cut and Emergency Unemployment Compensation (EUC) as well as the spending restraint resulting from the discretionary spending caps enacted last August. In contrast, the 2001-2003 tax cuts that are set to expire at the end of 2012 are assumed to be extended. In addition, the further cuts in spending mandated by the automatic sequestration provisions of the Budget Control Act are assumed to be replaced with a much more gradual spending reduction program. These changes in policy exert a fiscal drag of 1.2 percentage points of GDP in 2013, declining to 0.5 percentage points in 2014.

We also adopt the Tealbook assumptions regarding equity and home prices. While equity prices are not expected to rise much from current levels over the remainder of this year, they are expected to rise at a 9% rate in both 2013 and 2014. As of July, the CoreLogic national home price index has increased for seven consecutive months and is now up 3.6% from year ago levels. The rate of increase of this index is expected to slow over the remaining months of this year as an increased supply of distressed properties comes onto the market. For all of 2012 the index is expected to increase 6%. In 2013 and 2014 the rate of increase is expected to moderate to 2%.

**The Outlook.** Both in absolute terms and relative to expectations at the beginning of the year, the performance of the US economy over the first half of 2012 was disappointing. Growth of real GDP averaged a little under 2% (annual rate) over the first two quarters, down from 2.7% over the second half of 2011. As a result, progress in reducing unemployment stalled, with the unemployment rate edging up again after reaching 8.1% in April. As mentioned above, growth of around 2% (annual rate) is what is expected for the second half of the year.

So why is it, three years after the official end of the “Great Recession,” that the economy continues to languish? Several factors appear to be restraining the economy at the present time.

- In the aggregate, the deleveraging process among US households continues to restrain spending on housing and consumer durables. This reflects both demand and supply factors. Access to credit remains impaired, especially for those households with less than sterling credit histories. This fact is most evident in the housing market, where lower home prices and low mortgage interest rates have combined to push cash flow affordability to near record levels. Under these conditions, one would expect both home sales and refinancing of existing mortgages to be much stronger than current levels. In part, this is due to the fact that roughly one in four homeowners with a mortgage is underwater.
- Spending by state and local governments has been contracting for over two and a half years. Spending at the federal level has also been declining since late 2010. Even after this contraction, these two sectors represent 20% of GDP, far bigger than residential investment.
- Consumers and businesses are confronted with an unusual degree of uncertainty regarding the strength of the economy in the near future, particularly in regard to the sovereign debt crisis in the euro area and the possibility of substantial additional fiscal drag beginning in 2013. There is no doubt that this uncertainty has resulted in the postponement of purchases by consumers and hiring and investment by businesses.

- Export growth has gradually slowed over the past year as global growth has weakened.

Going forward, our expectation is that factors such as deleveraging and access to credit will gradually subside as forces restraining growth. The improvement in home prices that we have seen this year, and which we expect to continue, will certainly help on this front. In addition, uncertainty about the US fiscal path is likely to diminish somewhat after the election when the government begins to set forth its agenda. World growth is expected to pick up in 2013 as the Euro area emerges from recession. Combined with our assumptions for monetary policy, we expect some firming of growth in 2013 and 2014. However, growth in 2013 is likely to be held back to just around 2 ½%, with only a relatively modest decline of the unemployment rate, due to the fiscal policy assumptions outlined above. In fact, recent analysis suggests that the dampening effect on growth could be larger than generally expected as the impacts of fiscal policy changes are magnified when monetary policy is constrained by the zero lower bound. Thus, risks to projected growth next year are skewed to the downside. But as we enter 2014, fiscal drag is expected to be greatly diminished, allowing the full force of monetary accommodation and the natural healing of the economy to be realized. In 2014, we therefore expect growth of around 4%, with the unemployment rate declining more substantially even though the participation rate begins to move gradually higher.

As mentioned above, total inflation has slowed significantly over the past several months, with the total PCE deflator up just 1.3% over the 12 months ending in July, down from 2.9% last September. Given the recent rise of energy prices, year-over-year changes are expected to begin rising again, reaching around 1 ¾% by the end of the year. While this projection also includes more rapid increases in food prices later this year as the effects of the drought work their way through the distribution network, the exact magnitude of those price increases is highly uncertain at this time. Our projection for core PCE deflator inflation for the second half of 2012 has been lowered to just 1.3% (annual rate), based on recent data and forward looking indicators such as our Underlying Inflation Gauge. This brings the 2012 Q4/Q4 change of the core PCE deflator to 1.7% versus 1.8% in the previous Blackbook.

In 2013 and 2014, as the economy begins to establish greater forward momentum, we expect both total and core inflation to move gradually higher, with total PCE deflator inflation moving to around 2% in 2013 and 2 ¼% in 2014. The expected decline of the exchange value of the dollar and resulting more rapid increase of nonpetroleum import prices contributes to this increase.

## 2.2 Alternative Scenarios and Risks

The assessment of risks to our outlook in the current environment is dependent upon the assumed path of policy. Under our policy recommendation, the downside risks to real activity and inflation are mitigated, as the policy stance provides insurance against negative outcomes, and upside risks are enhanced somewhat. Consequently, we have shifted our assessment of the balance of risks for real activity and inflation upward from those in the July Blackbook Update, with inflation risks now roughly balanced. In contrast, under the policy path indicated in the August FOMC statement, our assessment of the balance of risks would be similar to that in the July Blackbook Update, with predominant downside risks.

Beyond its effects on the modal outlook, one benefit we see from our policy recommendation is that it should provide insurance against realizations of negative shocks. In particular, a policy stance that commits to accommodation until a recovery is well established should guard against spillovers associated with the European debt crisis or the U.S. fiscal situation. As a result, under our policy recommendation, we have reduced significantly the probabilities of the *Global Credit Crunch* and *Global Deflation* scenarios, and have reduced more modestly the probability of the *Fiscal Consolidation* scenario [Exhibit C-1]. Even with the reduction in its probability, *Fiscal Consolidation* remains the most likely alternative scenario. The recommended policy stance should also increase the probability of more typical recovery dynamics. Therefore, we also have raised the weight on the *Faster Growth* scenario, which is the second most likely alternative scenario. Changes in the other scenarios are relatively small.

The forecasts under the *Central* scenario over the medium term have changed only modestly from those in the last Blackbook Update. Because the paths under the

alternative scenarios are defined relative to the Central scenario outlook, they also have changed relatively little from the Blackbook Update [Exhibit C-2].

With the changes in the scenario probabilities, there has been a reduction in the downside inflation risks and a small increase on the upside [Exhibit C-3]. As a result, the overall inflation risks, as measured by the difference between the central forecast and the expected value from the forecast distribution, now appear to be roughly balanced, particularly at nearer-term horizons. The changes in the scenario probabilities also reduced the downside risks for real activity. Nevertheless, the balance of risks to real activity remains to the downside, although less so than in the Blackbook Update. This forecast distribution implies that the probability of a recession through the end of 2013 is less than in July (51.7 vs. 63.2%) and the near-term probability of a negative-growth quarter is lower than in July [Exhibit C-5].

Exhibit C-3 also displays the baseline forecasts from the FRBNY-DSGE model (orange line). The DSGE forecasts are near the expected values over near-term horizons, but are notably below the expected values in 2014-15, particularly for real GDP growth.

To illustrate the impact of our policy recommendation on the forecast distribution, Exhibit C-6 presents the forecast distributions under the policy path implied by the August FOMC statement. Because that statement does not communicate that policy will remain accommodative to achieve the policy goals, the implied policy stance does not provide the insurance benefits that our policy recommendation does. Consequently, the probabilities of the alternative scenarios would have changed only marginally relative to those in the Blackbook Update, given the limited effect on our medium-term outlook of the developments over the intermeeting period. The forecast distributions also would be similar to those in the July Blackbook Update, leaving the balance of risks for inflation and real activity significantly to the downside.

### 3. Forecast Comparison

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

**Real GDP Growth.** The FRBNY projection for real GDP growth is slightly higher than that of private forecasters for 2012Q3, and largely in line with private forecasters for 2012Q4. On a year-to-year basis, the FRBNY growth projections for 2012 and 2013 were upgraded relative to the previous Blackbook, whereas those of private forecasters were downgraded in both 2012 and 2013. FRBNY estimates of 1.9% and 2.5% growth in 2012 and 2013, respectively, are now close to the range of private forecasts for both years.

**Inflation.** The FRBNY year-to-year inflation projections for 2012 and 2013 are slightly lower than those of private forecasters for both core PCE inflation and core CPI inflation, following downward revisions to the FRBNY projections since July. In the near term, the FRBNY core CPI forecast was revised down, to 1.9% for both 2012Q3 and Q4, while private forecasts remained unchanged. The near-term core PCE forecast is significantly below private forecasters for 2012Q3 and Q4, and for 2012Q4/Q4, though FRBNY forecasts for 2013Q4/Q4 are close to those of private forecasters. The near term FRBNY forecast for CPI inflation was revised upward and is sizably above private forecasts, which were revised downwards. Upward revisions to the year-to-year FRBNY forecasts were more modest, with projected CPI inflation at 2.2% for 2012Q4/Q4 and 2.4% for 2013Q4/Q4, though these values still exceed those of private forecasters.

#### 3.2 FRBNY-DSGE Model Forecast

The FRBNY-DSGE model forecast is obtained using data released through 2012Q2, augmented for 2012Q3 with the FRBNY staff forecast for real GDP growth, core PCE inflation, and growth in total hours, and with values of the federal funds rate and the spread between Baa corporate bonds and 10-year Treasury yields based on 2012Q3 observations up to August 20. Moreover, the expected future interest rates are constrained to equal market expectations for the federal funds rate, as measured by the OIS rates, through 2015Q2.

<sup>1</sup> The details of the forecast comparison are in Exhibit B-8. Quarterly numbers are SAAR.

Output growth in 2012Q2 and 2012Q3 (as estimated by FRBNY staff) is in line with the forecasts in the June Blackbook [Exhibit E-1], while the projection for 2012Q3 core PCE inflation is stronger than forecasted by the DSGE model in June. As a consequence, the projections for output are similar to those presented in June, while those for inflation are more sanguine through mid-2013, but similar afterwards. In essence, the model still projects a lackluster recovery in economic activity, with output growth in the neighborhood of 2 percent throughout the forecast horizon, and core PCE inflation below the FOMC long-run goal of 2 percent. Output growth forecasts for 2012, 2013, and 2014 (Q4/Q4) are 2.0, 2.4, and 1.8 percent, respectively [Exhibit B-8], compared to 2.2, 2.3, and 1.8 percent in June. Relative to the FRBNY central forecast, the DSGE model is slightly more optimistic through mid-2013, but more pessimistic afterwards. Core PCE inflation projections for 2012, 2013 and 2014 (Q4/Q4) are 1.7, 1.3, and 1.5 percent, respectively, compared to 1.4, 1.0, and 1.4 percent in June. These forecasts are about 50 basis points below the FRBNY staff forecasts throughout the forecast horizon.

There is significant uncertainty around real GDP forecasts, with 68 percent bands covering the interval 1.3 to 2.5 percent in 2012 (Q4/Q4), and -0.9 to 4.6 percent in 2013 (Q4/Q4). The forecast distribution for inflation moved up relative to June, but the 68 percent probability bands are within the 0.5-2.1 percent interval throughout 2014. The uncertainty around the real activity forecast in the DSGE model, as measured by the width of the 90% probability interval, is lower through 2013 relative to the FRBNY forecast distribution, but has more downside risk in 2014. Uncertainty around the inflation forecast is also lower through 2013 relative to the FRBNY forecast distribution. In 2014, the DSGE forecast distribution is essentially shifted down relative to FRBNY, reflecting the difference in the mean forecasts.

The FRBNY forecast is driven by two main factors. On the one hand, the headwinds from the financial crisis, as captured by the effect of both spread and MEI (marginal efficiency of investment) shocks, result in a subdued recovery, low real marginal costs, and consequently low inflation. The impact of these shocks on the recovery is long-lasting and starts to wane only in mid-2013. On the other hand, accommodative monetary policy, and particularly the forward-looking language, plays an important role in

counteracting the financial headwinds, and lifts up output and inflation. Monetary policy plays a stronger role in the current forecast than in June, as we now extend by four quarters the horizon for which we constrain FFR model expectations to coincide with market expectations. We do such extension in order to incorporate in the forecasts the possibility of further policy accommodation as captured by market expectations. The impact of policy on the *level* of output starts to wane by the end of 2012, which implies that the effect of policy on *growth* is actually negative after that. This largely explains why growth is still below trend by the end of the forecast horizon.

The model views the federal funds rate at the zero lower bound as mostly driven by the endogenous response of policy to the weak economy. In fact, by the end of 2012 the historical rule would imply a rate that is slightly lower than 25 basis points. However, by the end of the forecast horizon the policy accommodation provided by the forward-looking language becomes noticeable, implying a deviation from the historical rule of about one percentage point.

## 4. Robustness of Policy Recommendation

### 4.1 Sensitivity to Alternative Scenarios and Policy Rules

With the changes in this Blackbook, our policy recommendation now implies a target range for the federal funds rate at 0 – 0.25% until mid-2015, about two quarters later than in the last FOMC cycle. This period of maintaining a low FFR target goes beyond the prescriptions of the *Baseline* policy rule under all of our alternative scenarios [Exhibit D-1]. This pattern reflects our assessment that when policy is constrained by the zero lower bound, standard Taylor-type rules are not good approximations of optimal policy. Instead, a commitment to maintain rates at a low level for longer than prescribed by standard rules is necessary to provide the appropriate level of accommodation.

Exhibit D-2 shows the prescriptions of various policy rules using the expected value of the forecast distribution as an input. Consistent with the July Blackbook Update, the path implied by the *Baseline* policy rule shows a liftoff in the second half of 2013. The *Nutter* rule, which puts weight on inflation only, is the only rule prescribing a liftoff prior to

2013Q3. Exhibit D-2 also shows the implied nominal FFR under the *Outcome-based* rule ignoring the zero bound constraint. Under the expected value of the forecast distribution, the unconstrained nominal FFR declines to almost -6% by the end of 2013.

Exhibit D-3 displays the prescriptions from alternative policy rules under the various alternative scenarios. FFR paths under the *Asymmetric Price Targeting* rule continue to be at the lower bound (0.25%) throughout the forecast horizon. The *Nutter* rule prescribes a liftoff in 2012 under most scenarios, including the Central scenario, and before mid-2013 even under the low-inflation Global Credit Crunch scenario. For the *Outcome-based* rule, which ignores the zero lower bound, the paths are at or below zero through the end of 2015 for most scenarios; the notable exception is the Faster Recovery scenario, where the path moves above zero at the end of 2014.

## 4.2 Comparison to Market Expectations

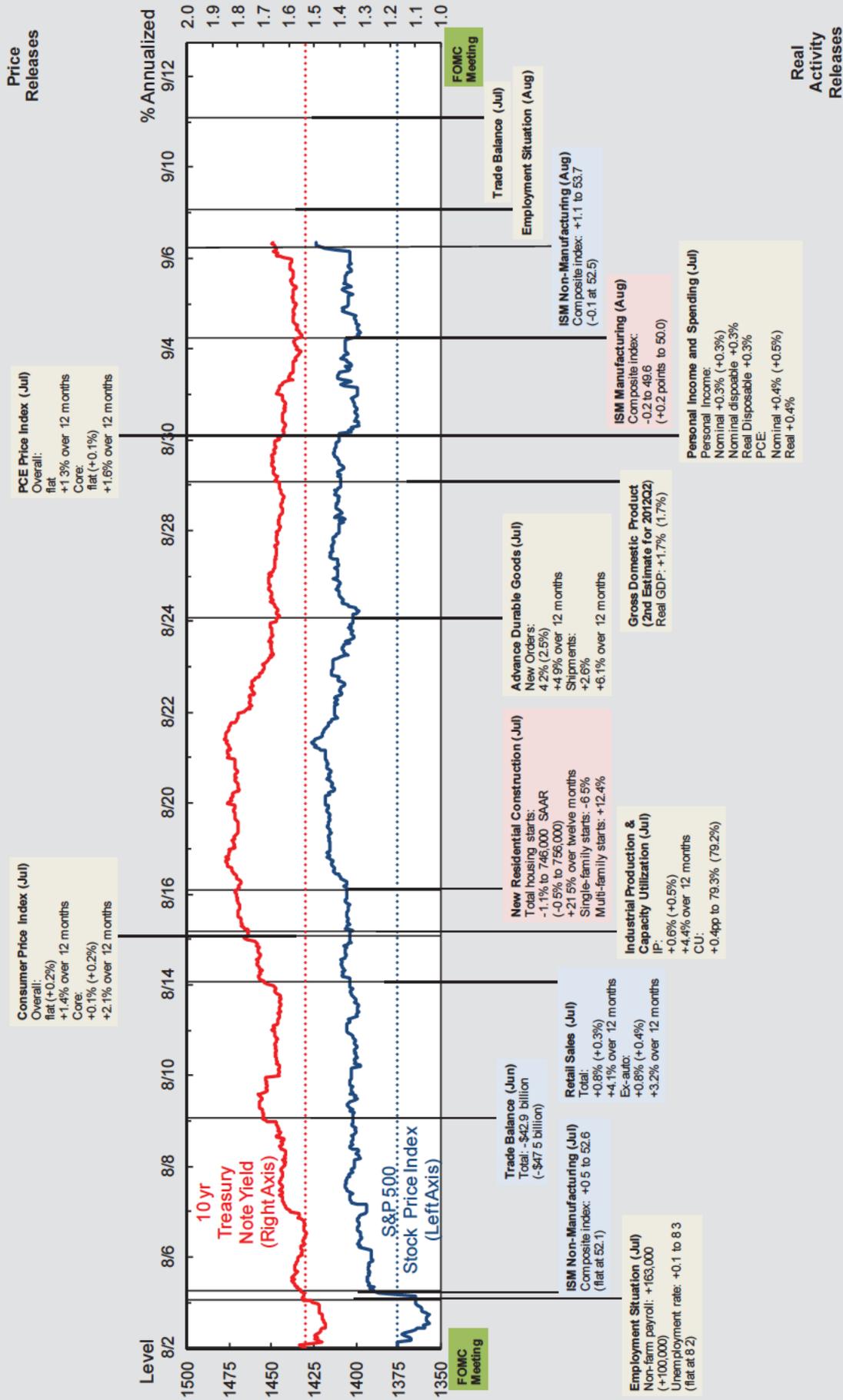
The expected FFR path derived from overnight index swaps (OIS) quotes was little changed on net during the latest intermeeting period, but was below that recorded at the time of the June Blackbook. The median of the modal forecasts from the Primary Dealers Survey for the timing of the first increase in the FFR target is now 2015Q2, about two quarters later than in the previous survey. The aggregate distribution of the timing of the first increase in the FFR target shifted toward later dates, with the mode of the distribution in 2015H2 at nearly 25%. About 20% probability was placed on 2015H1, and more than 20% was placed on dates in 2016 or later. In regard to additional accommodation of any type (forward guidance, asset purchases, IOER reduction, SOMA duration increase, or other new unspecified tools), the median probability for the upcoming meeting was 80%, and the median probability over the next year was 90%.

## 5. Significant Developments

### 5.1 Economic Developments

**Foreign Data Releases.** *Euro Area:* Output contracted 0.7 percent (saar) in Q2, after no growth in Q1. The composite PMI increased slightly in June, July, and August, but the level of the index remains consistent with another drop in output in Q3. The economic

# Key Data Releases



**Source:** Bloomberg  
 On-the-run securities: 8:00AM - 4:00PM.  
 S&P 500 Stock Price Index: 9:30AM - 4:00PM.

**Note**  
 Blue shading: Data release better than expected.  
 Red shading: Data release worse than expected.  
 Numbers in parentheses are the median of the Bloomberg survey.

sentiment index deteriorated in August, putting it at a three-year low. The euro area unemployment rate was 11.3 percent in July.

*Japan:* Growth slowed from 5.5 percent in Q1 to 1.4 percent in Q2 as consumption eased from an unsustainably strong pace at the beginning of the year and exports stalled. July production fell 1.2 percent relative to June, and survey data suggest a continued decline in manufacturing through September. The inventory-to-sales ratio rose to its highest level since June 2009 on both falling shipments and growing inventories. July export sales to Europe and China were down significantly over the year.

*Asia:* China activity data and the manufacturing PMI were weak in August. A downturn in housing investment is being offset by government-directed infrastructure spending. Exports slowed to a standstill in July, with near-term prospects dampened by flagging export orders. The labor market remains relatively strong. Soft trade and production data are evident in the rest of Asia, although there are signs of strong domestic demand-led growth in Indonesia, Malaysia, and the Philippines.

*Latin America:* Brazil's growth was tepid in the second quarter though data are pointing to a tentative recovery in Q3. Tax relief measures targeting the auto sector led to a spike in June and July auto sales, eliminating much of the inventory overhang that had been weighing on vehicle production. Job creation in July was the strongest in more than a year and retail sales (excluding durables) grew 1.5 percent in June. In Mexico, robust production and retail sales data indicate that growth remains firm.

## 5.2 Financial Markets

**Domestic Financial Markets.** *Nominal Interest Rates.* Treasury bond yields increased substantially in the period between the last FOMC meeting and mid-August, with 10-year yields rising more than 30 basis points, partly as a result of better than expected readings on domestic economic activity. Since mid-August, Treasury yields have retraced much of their initial rise, in anticipation of further central bank action. 10-year Treasury yields are now trading at 1.57%, up approximately 10 basis points from the last FOMC meeting. Shorter dated yields were little changed in the inter-meeting period, owing to the maintained forward policy guidance in the FOMC statement.

Option implied volatilities in Treasury and swap markets as measured by the 3-month MOVE and SMOVE indices are modestly below their level at the time of the last FOMC meeting and have now stabilized close to the recent lows seen in May 2012. [Exhibit A-3: Treasury Yields]

*Inflation Compensation:* Long- and short-dated TIPS implied measures of inflation compensation rose slightly since the last FOMC meeting. Near-term breakevens increased modestly, with inflation compensation over the next 5 years rising from 1.97% on July 31 to 2.07% on September 4. Meanwhile, 5- to 10-year inflation compensation declined slightly to 2.43% from 2.48% over the same period. Both measures remain close to their recent historical averages (excluding the crisis period), thus suggesting that inflation expectations remain well-anchored. [Exhibit A-4: Real Yields and Inflation Compensation]

*Expected Policy Path and Short-term Funding Markets:* The expected path of the federal funds rate as inferred from market data was little changed, on balance, since the last FOMC meeting. Consistent with the “late-2014” forward policy guidance in the FOMC statement, market quotes imply that the federal funds rate will remain in the current range until the end of 2014.

Survey responses from the Blue Chip Financial Forecasts’ July 2012 panel (survey period: August 27-28) were approximately in line with the market implied expectations. Indeed, according to the median forecast, the federal funds rate is expected to trade in its current range until at least the end of 2013, which is the end of the forecast horizon in the survey. [Exhibit A-5: Policy Expectations]

*Equity Markets:* Broad stock market indices have been moving slightly higher since the last FOMC meeting, with the S&P500 rising from 1379 to 1405 as of September 4. Overall, the index has risen appreciably since the fall of last year, up from a recent low of about 1100 in 2011.

Over the same period, implied equity volatility, as measured by the VIX, moved from about 19 on July 31, to about 18 on September 4, but briefly dipped below 14 in mid-

August. On the whole, the VIX is substantially lower than the levels observed in the late summer and early fall of last year. This slight fall in US equity realized and implied volatility was generally attributed to the stronger than expected US data and market speculation about impending central bank action in the US and Europe. [Exhibits A-6: Equity]

*Credit Spreads:* Broad measures of corporate credit spreads remained roughly unchanged over the intermeeting period. The overall levels remain low compared to post-crisis averages. High-yield corporate bond spreads to comparable maturity Treasuries decreased 17 bps since the last FOMC meeting and are now at 594 bps. Meanwhile, investment-grade corporate bond spreads decreased modestly over the same period and now stand at 185 basis points. [Exhibit A-7: Credit]

**Foreign Financial Markets.** *Euro Area:* Over the intermeeting period, market participants focused mainly on highly anticipated actions by the ECB, largely based on earlier comments by ECB President Draghi in late July and at the August ECB policy meeting, which set the stage for the September 6 announcements. Since then, Spanish and Italian 2-year yields have fallen by 200 and 150 basis points, respectively, Spanish and Italian equities indices are higher by 25 and 20%, and the euro appreciated about 3% relative to the U.S. dollar.

*Japan:* Better-than-expected U.S. employment and retail sales data contributed to a modest rise in the benchmark 10-year Japanese government bond yield in mid-August, as well as to a slight depreciation of the Japanese yen against the U.S. dollar and to a moderate improvement in Japanese equity markets. However, these moves were largely reversed following the release of the August FOMC meeting minutes, which were viewed as more accommodative than expected. Overall, Japanese asset prices remained broadly unchanged over the intermeeting period.

*Emerging Asia:* EM Asian shares declined by 1% on ongoing uncertainty about the pace of the Chinese slowdown, with Chinese equity markets leading this decline with an 8% fall. Emerging Asian currencies were modestly softer against the U.S. dollar, following weaker-than-expected trade and manufacturing data releases for the region. The Chinese

yuan was a notable exception, appreciating 0.3% against the U.S. dollar over the intermeeting period. However, the yuan remains nearly 1% weaker against the dollar on the year.

*Latin America:* Since the last FOMC meeting, Brazilian local currency yields rose 15 to 10 basis points along the 2- to 5-year sector even as the central bank reduced the policy rate by 50 basis points at its August meeting. The Brazilian real appreciated modestly against the dollar, but the corresponding realized and implied volatility declined notably. Similarly, the Mexican peso rose 2% against the dollar while real and implied volatility fell.

### 5.3 Global Economic Policy

*Euro Area:* After cutting its policy rate by 25 basis points to 0.75% at its July meeting, the ECB kept it unchanged at its August and September meetings. However, the ECB did announce a new Outright Monetary Transactions (OMTs) program after the September meeting. Under this program, the ECB will conduct outright purchases of the sovereign debt of those EMU member states that have entered into fiscal support arrangements with the ESFS/ESM, but only as long as they remain in compliance with conditions required by these arrangements. These purchases will be at maturities of up to three years and concentrated in the one to three year sector. The outright debt purchases will be unlimited, but sterilized, and the ECB will not claim seniority over private creditors. The Securities Market Program will be terminated, but current holdings will be held to maturity, and will continue to be sterilized. The ECB also decided on two collateral framework changes. First, it will suspend minimum ratings thresholds for sovereign bonds and sovereign-backed credit claims for countries eligible for OMTs. Also, it decided to make eligible for open market operations foreign currency-denominated assets issued in the euro area, as it did in October 2008.

*Japan:* The Bank of Japan kept its policy rate in a range of 0.0-0.10 percent at its July and August policy meetings and will continue to do so until its official projections suggest price stabilization in the near-to-medium term. Also the size of its Asset

Purchase Program remained unchanged after the August meeting; the Bank of Japan had decided at the July meeting to expand it by ¥5 trillion, to ¥45 trillion.

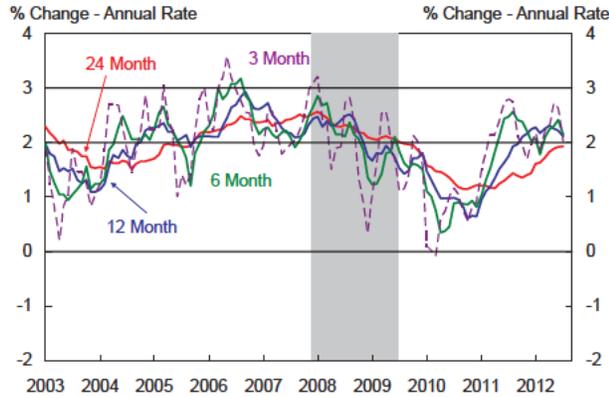
*EM Asia:* Monetary policy in EM Asia remained largely on hold since the last FOMC meeting. In China, monetary authorities cut benchmark interest rates in July, but are reluctant to pursue more aggressive rate cuts out of fear that this would undermine efforts to moderate property prices. Overall, the easing in the region has remained modest with a weighted-average of policy rates down 45 basis points from its peak last fall. Markets are currently pricing in only incremental easing for the remainder of the year. Asian central banks resumed foreign exchange purchases in July after net sales in June and May, but the pace of purchases remained subdued.

*Latin America:* Mexico's central bank kept its policy rate at 4.5% at its June policy meeting and analysts expect no rate change in 2012. In Brazil, the central bank delivered a 50 basis points rate cut at its August meeting, after a similar rate cut in July, bringing the policy rate to a historic low of 7.5% and cumulative rate cuts to 500 basis points since August 2011. The accompanying policy statement suggested that the easing cycle may be near its end. Analysts now expect at most a 25 basis points cut at the October meeting. The Brazilian central bank also bought forward dollar liquidity in late August, its first dollar purchase since April.

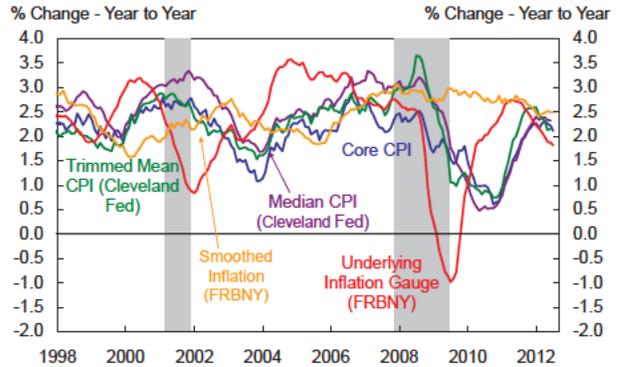
## A. Significant Developments

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

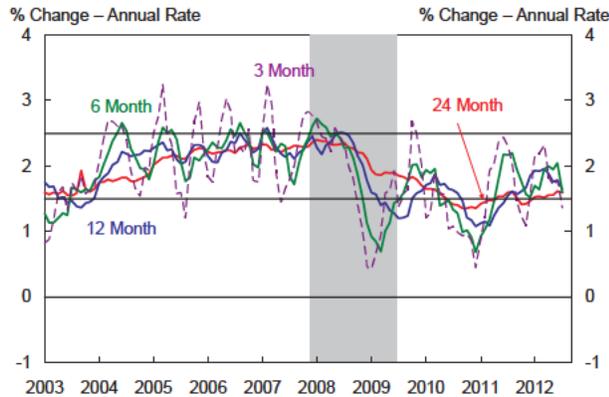
**Core CPI Inflation over Various Horizons**



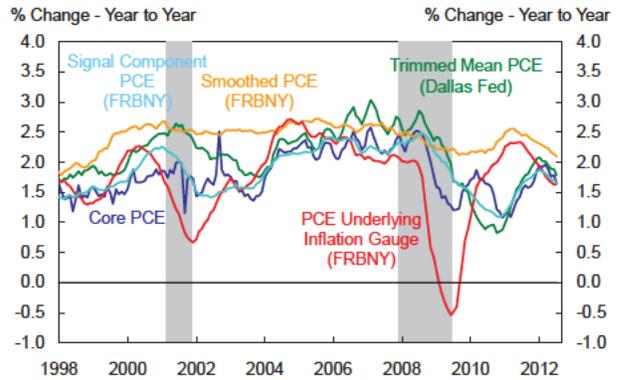
**Alternative Measures of CPI Inflation**



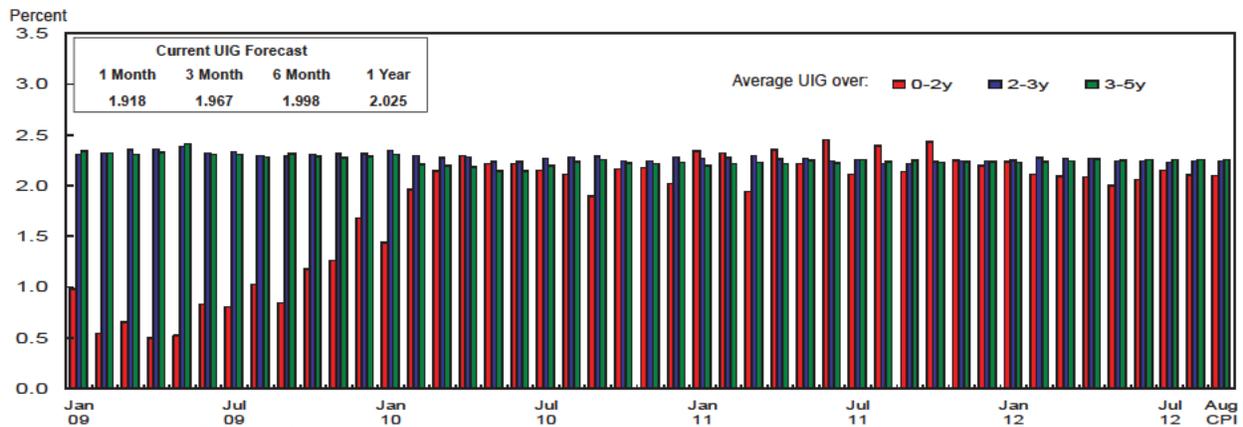
**Core PCE over Various Horizons**



**Alternative Measures of PCE Inflation**



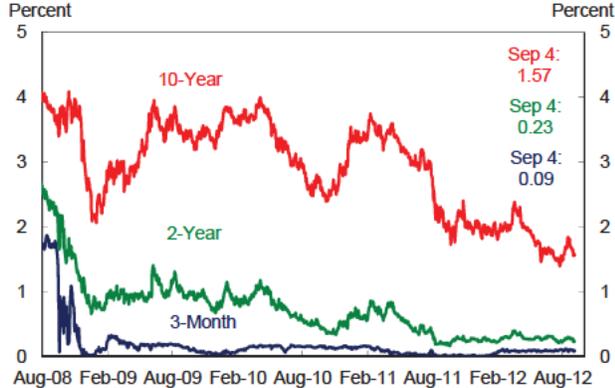
### Exhibit A-2: Underlying Inflation Gauge (UIG)



## A. Significant Developments

Exhibit A-3:  
Treasury Yields

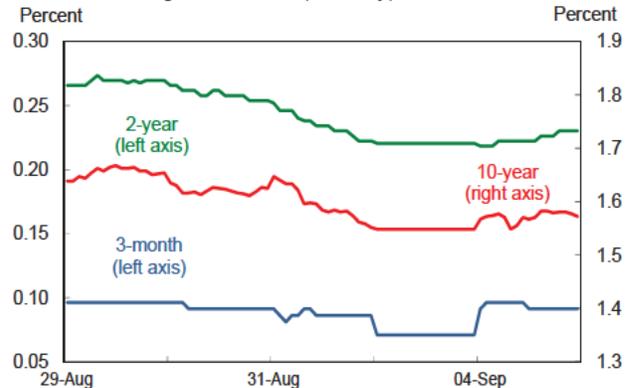
Short- and Long-Term Rates



Source: Bloomberg

Note: Yields of on-the-run securities.

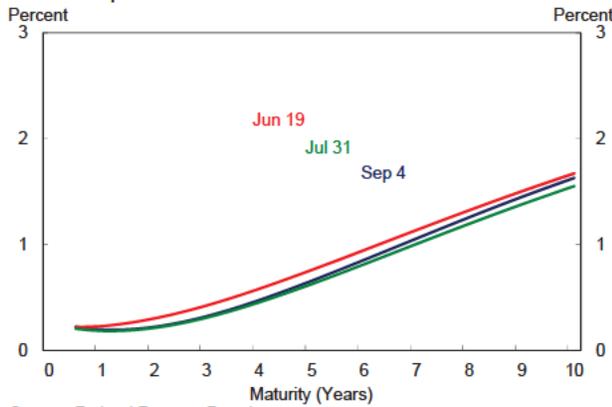
Short- and Long-Term Rates (Intraday)



Source: Bloomberg

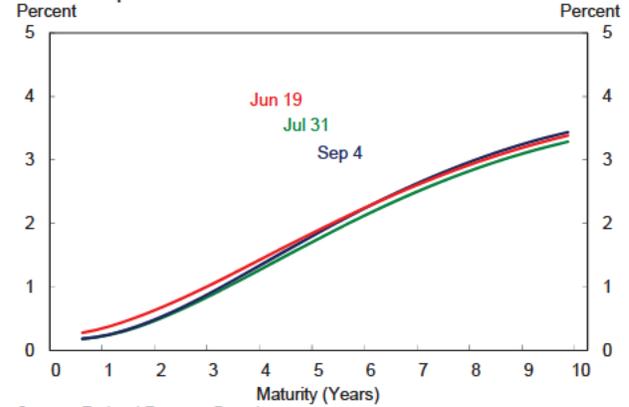
Note: On-the-run securities, 8:00 am to 4:00 pm.

Zero Coupon Yield Curves



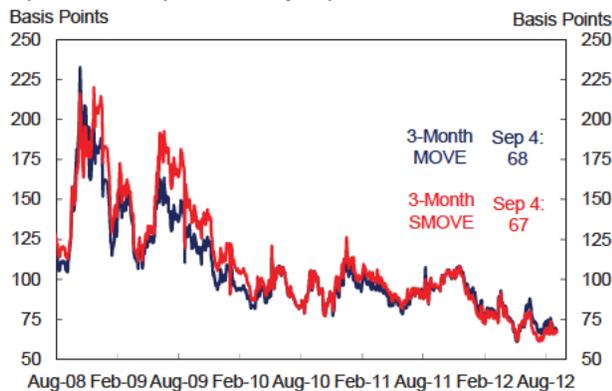
Source: Federal Reserve Board

Zero Coupon Yield Curves: One-Year Forward Rates



Source: Federal Reserve Board

Option and Swaption Volatility Expectations



Source: Federal Reserve Board, Barclays, and FRBNY staff

10-Year Treasury and Term Premia

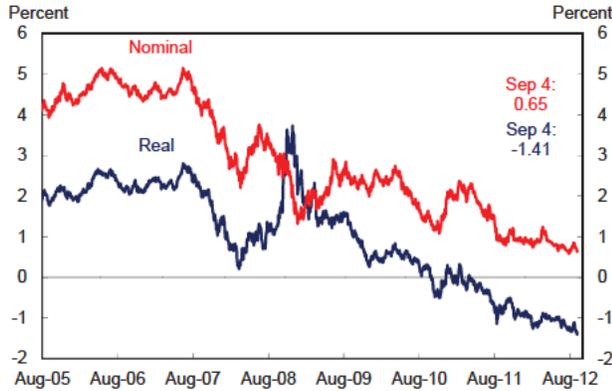


Source: FRBNY calculations, Federal Reserve Board

# A. Significant Developments

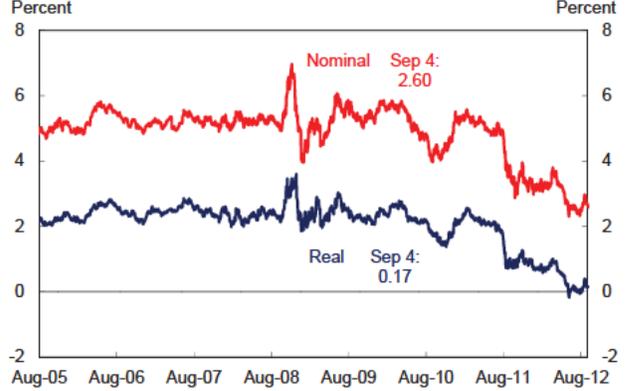
## Exhibit A-4: Real Yields and Implied Inflation

5 Year Spot Rate



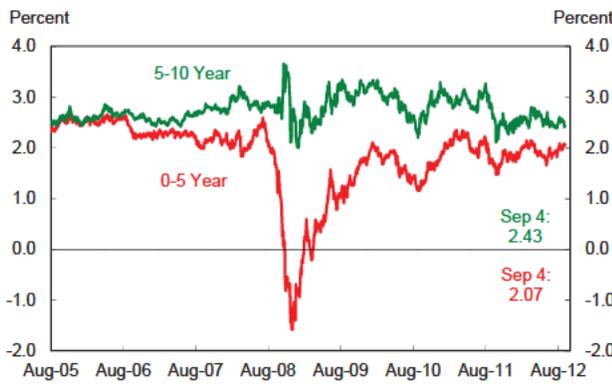
Source: Federal Reserve Board

5-10 Year Forward Rates



Source: Federal Reserve Board

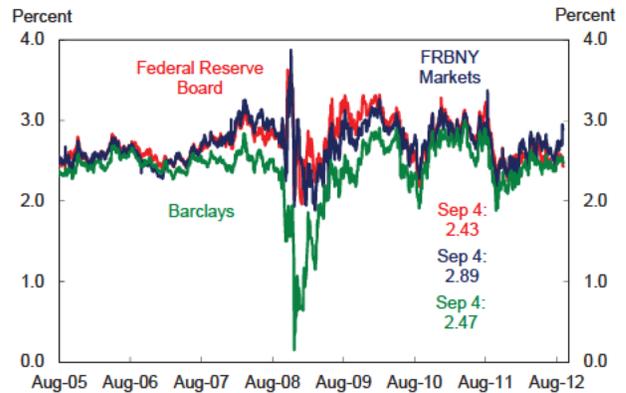
TIPS Implied Inflation Compensation: 0-5, 5-10 Year Horizons



Source: Federal Reserve Board

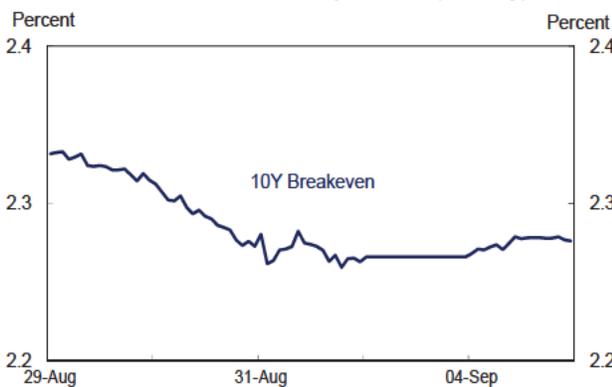
Note: Carry-adjusted.

Alternative Measures of 5-10 Year Implied Inflation Compensation



Source: Federal Reserve Board, Barclays, and FRBNY calculations

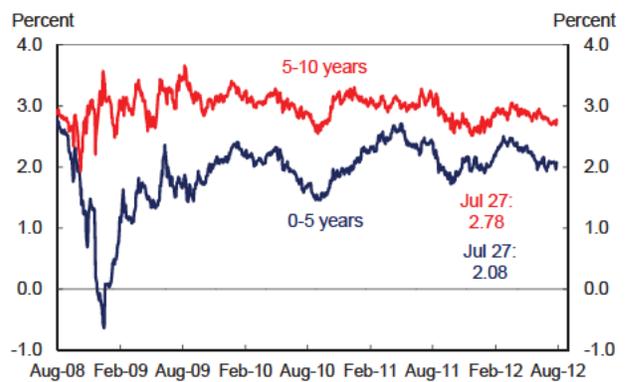
10-Year Breakeven Inflation Compensation (Intraday)



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

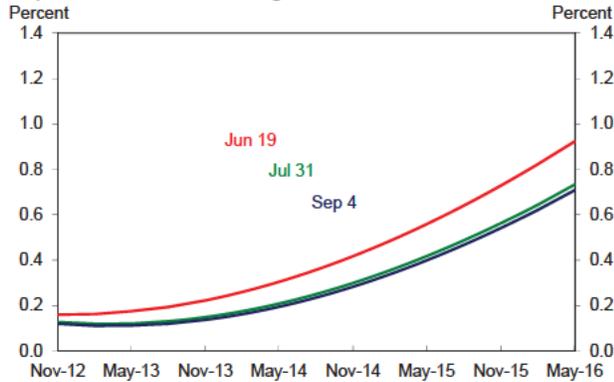


Source: Barclays

## A. Significant Developments

**Exhibit A-5:  
Policy Expectations**

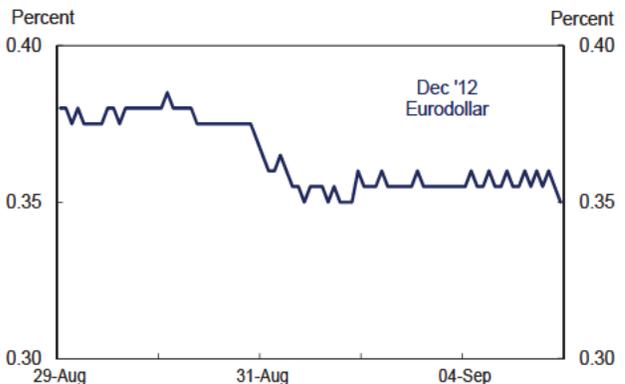
**Expected Fed Funds Target Rate**



Source: Federal Reserve

Note: Estimated using OIS quotes.

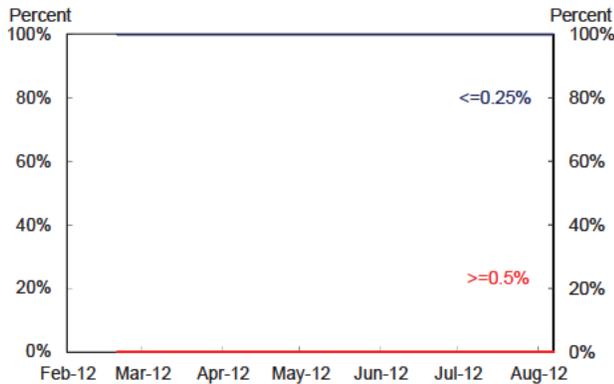
**Implied Eurodollar Rates (Intraday)**



Source: Bloomberg

Note: 8:00 am to 4:00 pm.

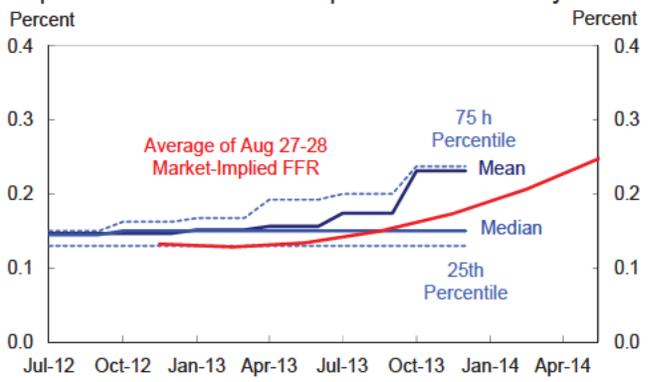
**Fed Funds Probabilities December 2012**



Source: Bloomberg

Note: Estimated from Fed Funds Futures

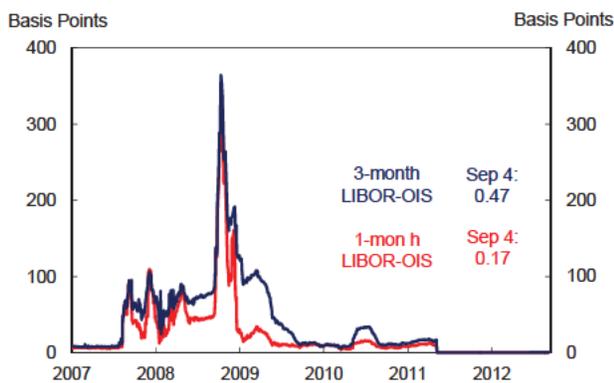
**Expected Fed Funds from September 2012 Survey**



Source: The Blue Chip Financial Forecast conducted on Aug 27-28.

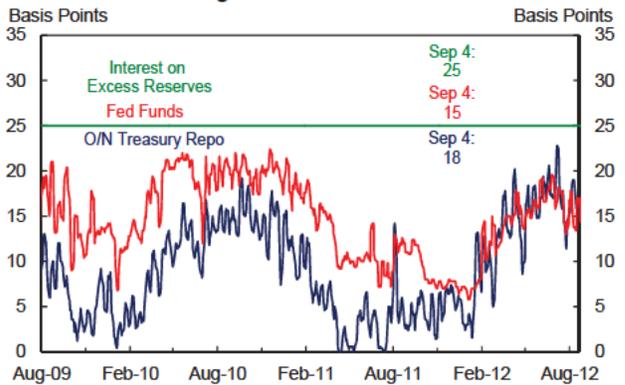
Note: Implied FFR estimated from OIS quotes.

**Libor-OIS Spreads**



Source: Bloomberg

**Short Term Funding Rates**



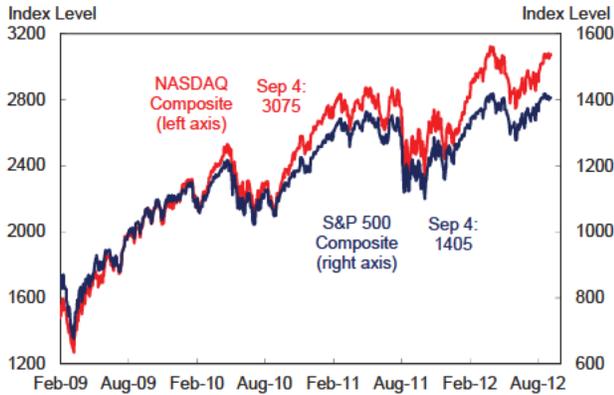
Source: Bloomberg, FRBNY calculations

Note: 1-week moving averages.

# A. Significant Developments

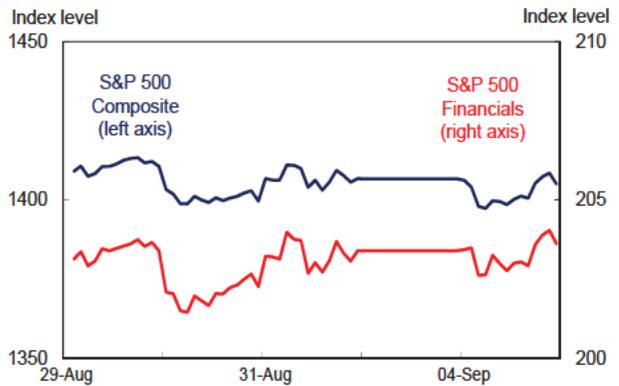
Exhibit A-6:  
Equity

Equity Index Levels



Source: Bloomberg

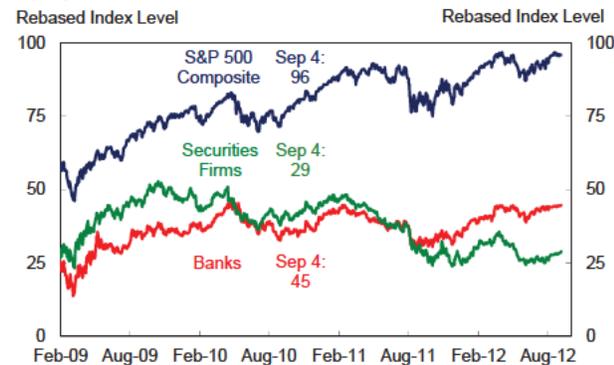
S&P 500 Indices (Intraday)



Source: Bloomberg

Note: 9:30 am to 4 00 pm.

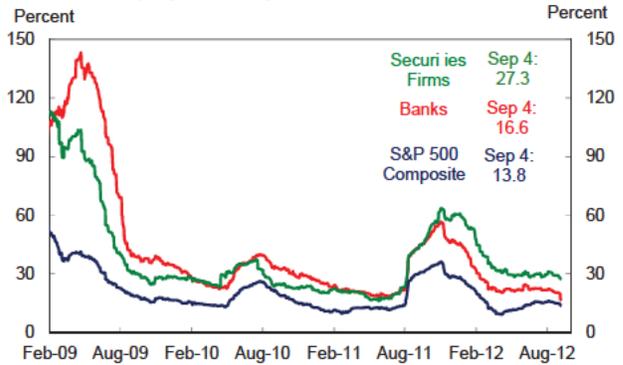
Equity Performance



Source: Bloomberg

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.

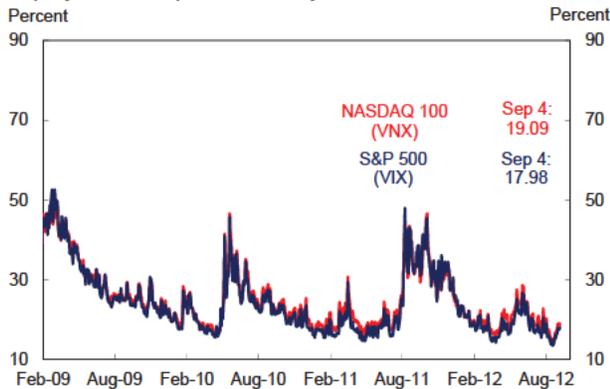
Historical Equity Volatility



Source: Bloomberg

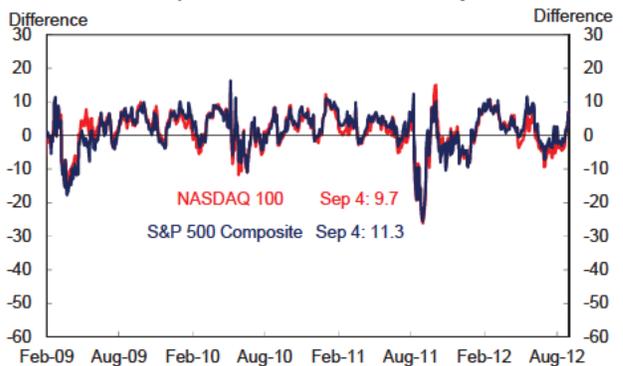
Note: Annualized rolling 3-month standard deviation of daily returns. Banks series is S&P 500 Banks index. Securities Firms series is S&P 500 Investment Banks and Brokerages index.

Equity Index Implied Volatility: 1-Month



Source: Bloomberg

Difference of Implied and Realized Volatility



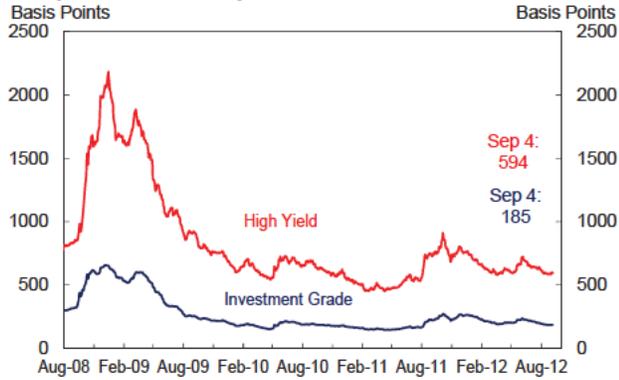
Source: Bloomberg

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

## A. Significant Developments

### Exhibit A-7: Credit

#### Corporate Credit Spreads



Source: Merrill Lynch

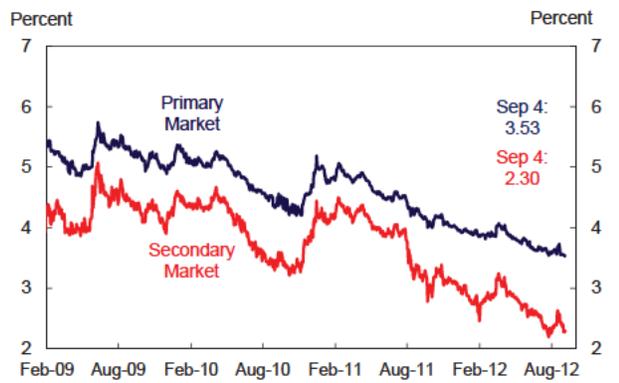
Note: Option-adjusted spreads.

#### CDS Spreads



Source: Bloomberg

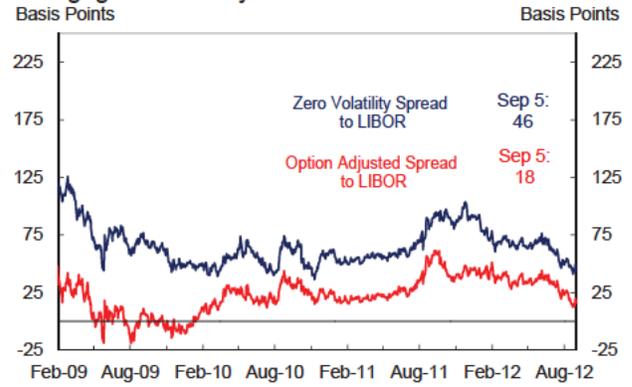
#### Mortgage Market Rates



Source: Bloomberg

Note: 30-year fixed mortgage rate and Fannie Mae current coupon yield.

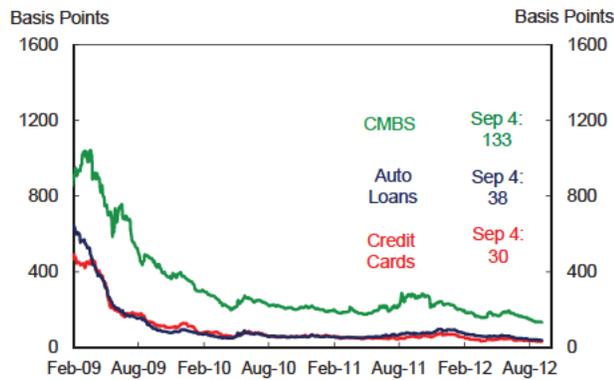
#### Mortgage Secondary Market



Source: J.P. Morgan

Note: 30 year current coupon Fannie Mae MBS.

#### AAA-Rated ABS/CMBS Spreads



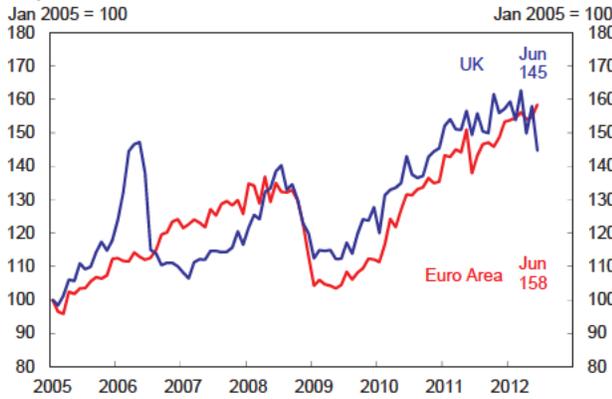
Source: Merrill Lynch

Note: Option-adjusted spreads.

## A. Significant Developments

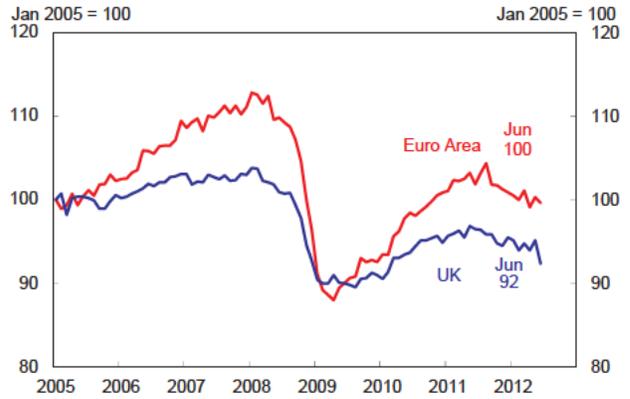
### Exhibit A-8: Exports and Industrial Production

#### Exports



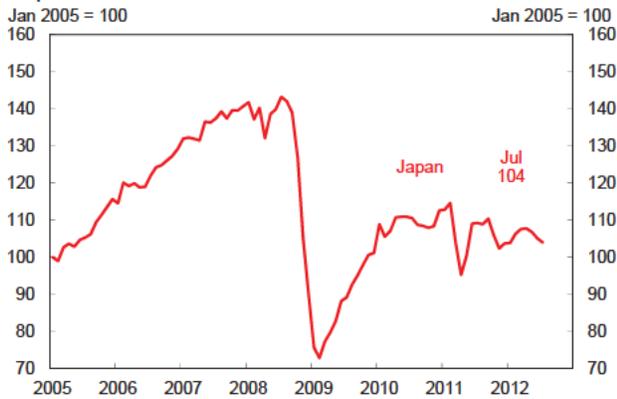
Source: Haver

#### Industrial Production



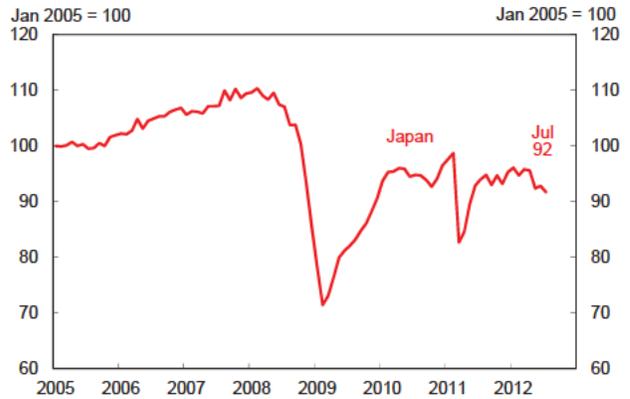
Source: Haver

#### Exports



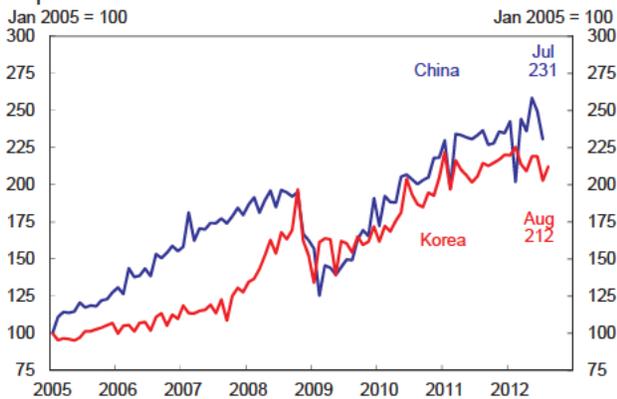
Source: Haver

#### Industrial Production



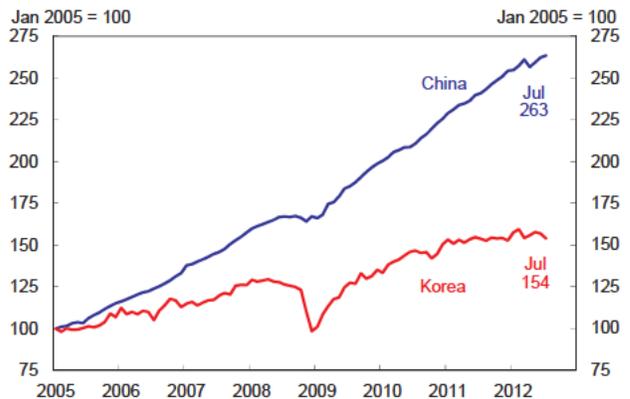
Source: Haver

#### Exports



Source: Haver

#### Industrial Production

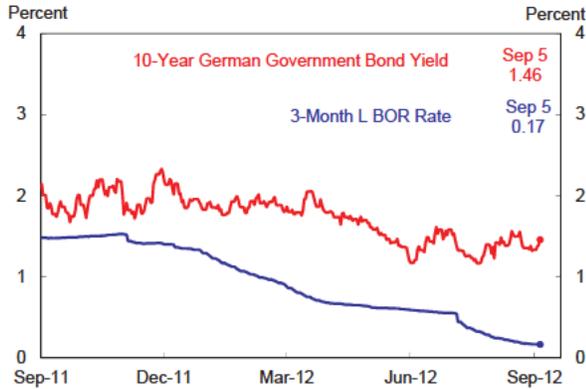


Source: Haver

## A. Significant Developments

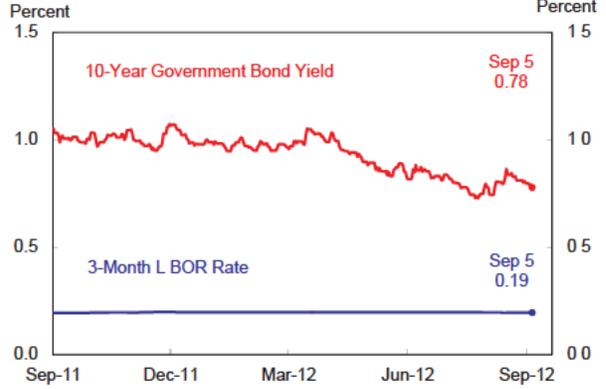
**Exhibit A-9:  
Global Interest Rates and Equity Markets**

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



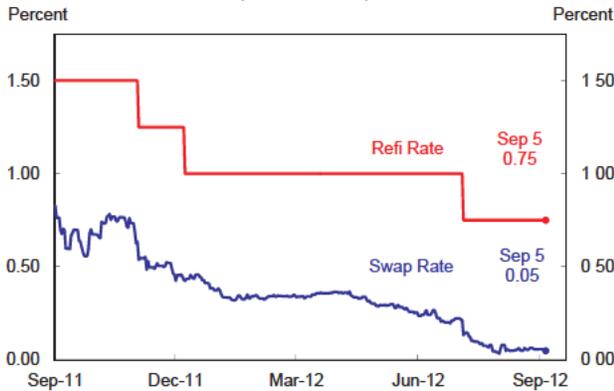
Source: Bloomberg

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



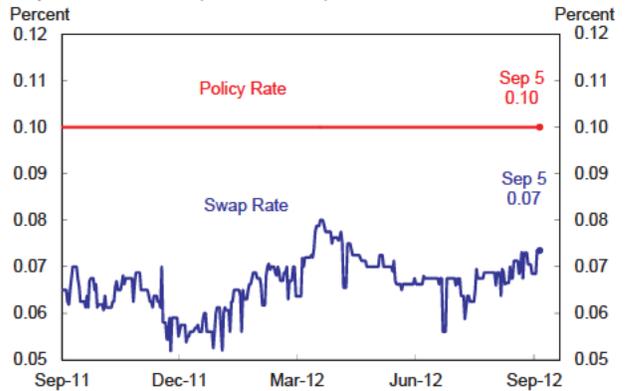
Source: Bloomberg

**Euro Area: OIS Rate (Six Months)**



Source: Bloomberg

**Japan: OIS Rate (Six Months)**



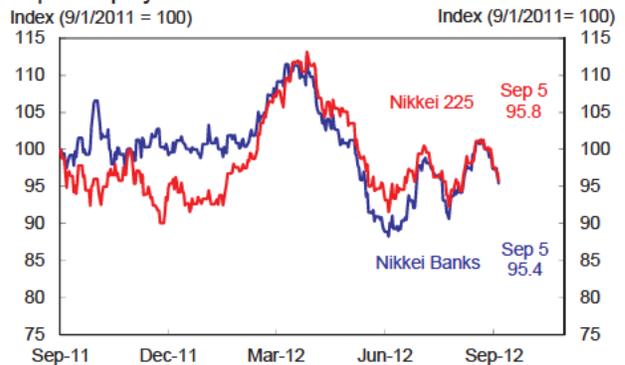
Source: Bloomberg

**Euro Area Equity Price Indices**



Source: Bloomberg

**Japan Equity Price Indices**

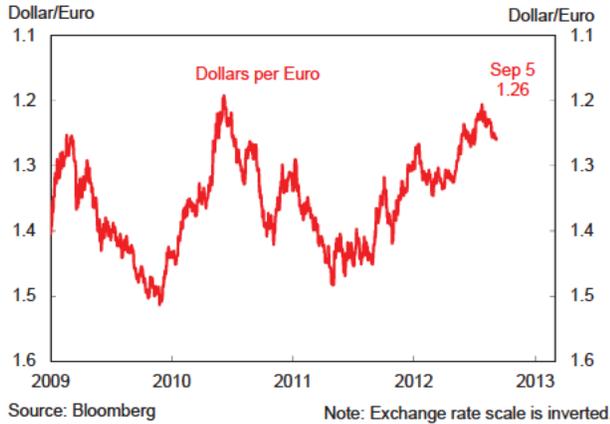


Source: Bloomberg

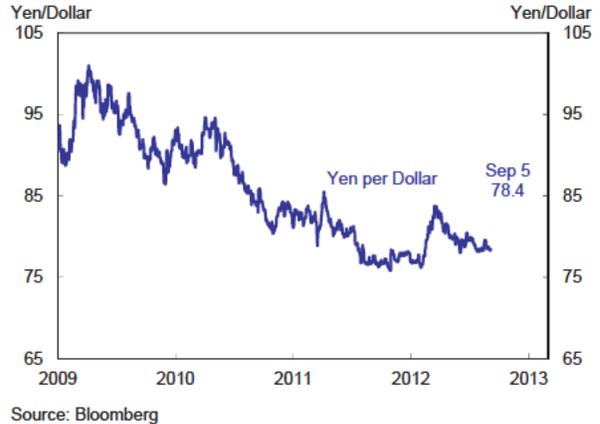
## A. Significant Developments

Exhibit A-10:  
Exchange Rates

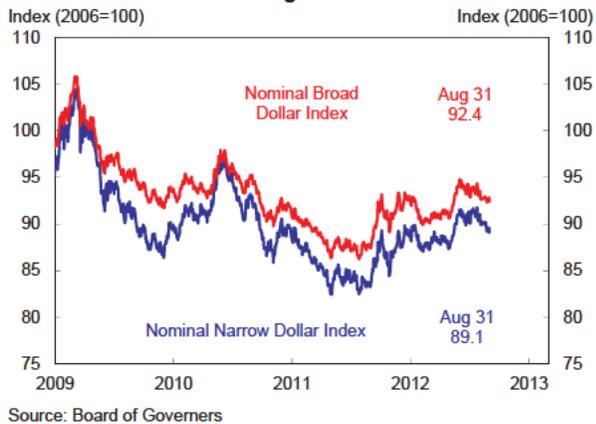
Dollar-Euro Exchange Rate



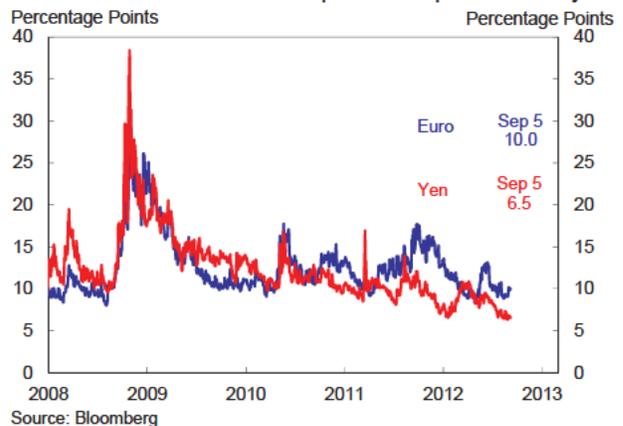
Yen-Dollar Exchange Rate



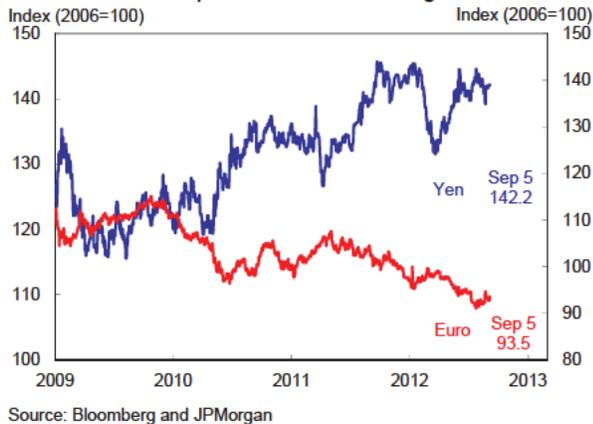
Nominal Effective Exchange Rates



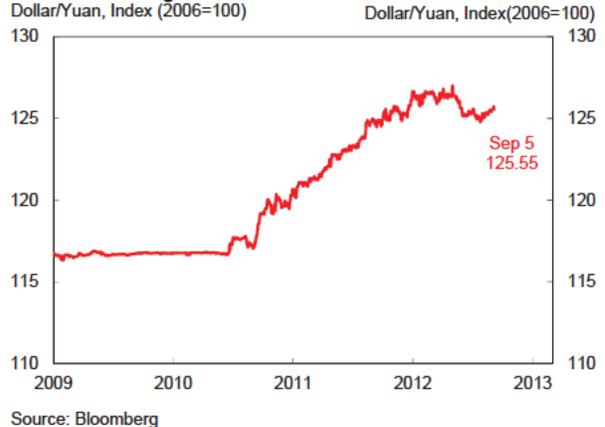
Euro and Yen One-Month Implied FX Option Volatility



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**		
	Jun	Jul	Sep	Jun	Jul	Sep	Jun	Jul	Sep	Jun	Jul	Sep
<b>2012</b>												
Q1	2.1	2.2	2.2	1.9	2.0	2.0	8.3	8.3	8.3	0-0.25	0-0.25	0-0.25
Q2	1.8	1.7	1.8	1.9	1.5	1.7	8.2	8.2	8.2	0-0.25	0-0.25	0-0.25
Q3	1.7	1.6	1.2	2.1	1.1	2.0	8.1	8.3	8.2	0-0.25	0-0.25	0-0.25
Q4	1.7	1.7	1.4	2.5	2.1	2.0	8.0	8.2	8.2	0-0.25	0-0.25	0-0.25
<b>2013</b>												
Q1	1.7	1.7	1.6	2.1	1.8	2.1	7.9	8.1	8.3	0-0.25	0-0.25	0-0.25
Q2	1.8	1.8	1.7	2.5	2.5	2.4	7.8	8.0	8.1	0-0.25	0-0.25	0-0.25
Q3	1.8	1.8	1.8	3.1	2.6	2.7	7.6	7.8	7.8	0-0.25	0-0.25	0-0.25
Q4	1.9	1.9	1.9	2.9	2.5	2.9	7.5	7.6	7.5	0-0.25	0-0.25	0-0.25
<b>2014</b>												
Q1	-	-	1.9	-	-	3.8	-	-	8.3	-	-	0-0.25
Q2	-	-	2.0	-	-	3.5	-	-	8.1	-	-	0-0.25
Q3	-	-	2.1	-	-	4.1	-	-	7.8	-	-	0-0.25
Q4	-	-	2.1	-	-	4.1	-	-	7.5	-	-	0-0.25
<b>Q4/Q4</b>												
2011	1.8	1.7	1.7	1.6	2.0	2.0	-1.3	-1.3	-1.3	0.0	0.0	0.0
2012	1.8	1.8	1.6	2.1	1.7	1.9	-0.8	-0.8	-0.8	0.0	0.0	0.0
2013	1.8	1.8	1.8	2.6	2.4	2.5	-0.5	-0.3	-0.2	0.0	0.0	0.0
2014	-	-	1.8	-	-	2.5	-	-	-0.2	-	-	0.0

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

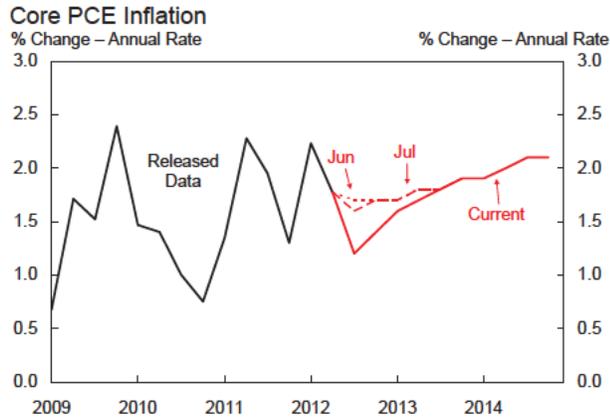
\*Quarterly values are the average rate for the quarter. Yearly values are the difference between Q4 of the previous year and Q4 of the listed year.

\*\*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.

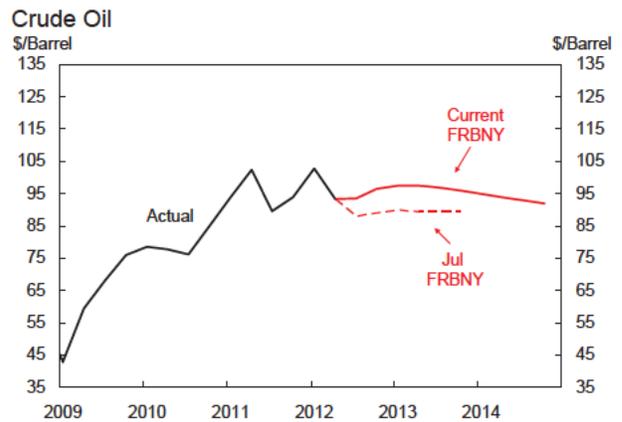
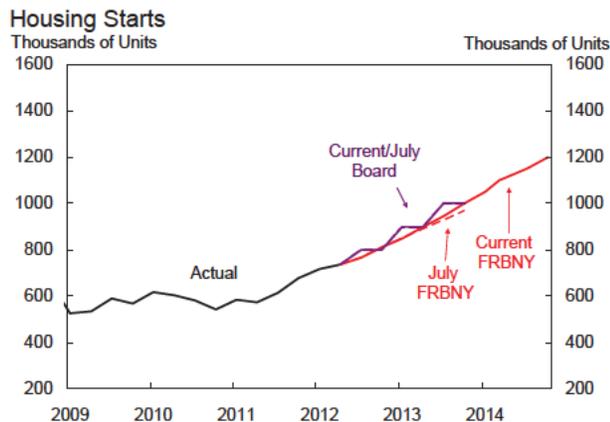
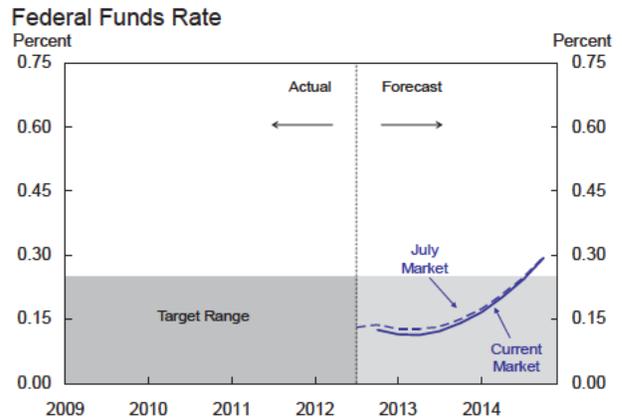
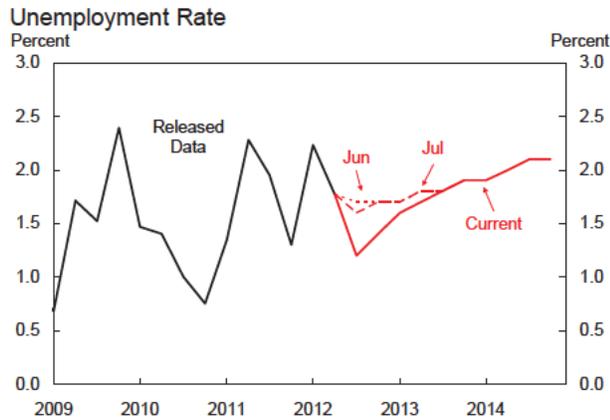
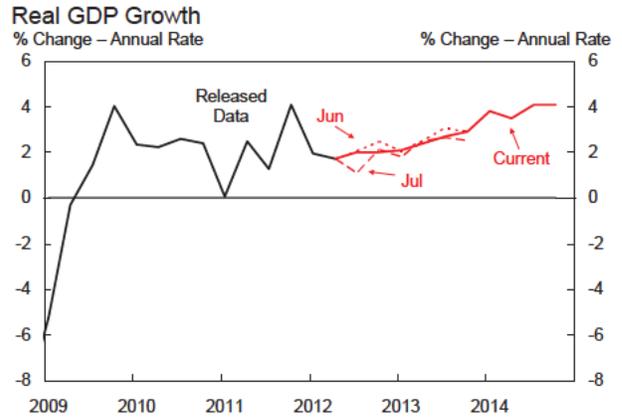
## B. FRBNY Forecast Details

**Exhibit B-2: Evolution of Projected Quarterly Paths**

### Key Indicators



### Forecast Assumptions



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

## B. FRBNY Forecast Details

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

	Quarterly Growth Rates (AR)		Quarterly Growth Contributions (AR)	
	2012Q3	2012Q4	2012Q3	2012Q4
<b>OUTPUT</b>				
<b>Real GDP</b>	2.0 (1.1)	2.0 (2.1)	2.0 (1.1)	2.0 (2.1)
<b>Final Sales to Domestic Purchasers</b>	1.8 (1.4)	1.7 (1.7)	1.9 (1.5)	1.7 (1.8)
<b>Consumption</b>	2.3 (1.8)	1.9 (1.9)	1.6 (1.3)	1.4 (1.4)
<b>BFI: Equipment and Software</b>	5.0 (4.0)	5.0 (6.0)	0.4 (0.3)	0.4 (0.4)
<b>BFI: Nonresidential Structures</b>	0.0 (4.0)	4.0 (4.0)	0.0 (0.1)	0.1 (0.1)
<b>Residential Investment</b>	12.0 (12.5)	16.0 (12.5)	0.3 (0.3)	0.4 (0.3)
<b>Government: Federal</b>	-2.4 (-3.2)	-3.2 (-3.2)	-0.2 (-0.2)	-0.2 (-0.2)
<b>Government: State and Local</b>	-2.0 (-2.3)	-2.0 (-1.8)	-0.2 (-0.3)	-0.2 (-0.2)
<b>Inventory Investment</b>	-- --	-- --	-0.5 (-0.8)	-0.1 (-0.1)
<b>Net Exports</b>	-- --	-- --	0.6 (0.4)	0.4 (0.4)
<b>INFLATION</b>				
<b>Total PCE Deflator</b>	1.5 (0.8)	2.4 (1.6)		
<b>Core PCE Deflator</b>	1.2 (1.6)	1.4 (1.7)		
<b>PRODUCTIVITY AND LABOR COSTS*</b>				
<b>Output per Hour</b>	1.5 (1.1)	1.5 (1.5)		
<b>Compensation per Hour</b>	1.4 (1.4)	1.6 (1.6)		
<b>Unit Labor Costs</b>	-0.1 (0.3)	0.1 (0.1)		

Note: Numbers in parentheses are from the previous FOMC meeting.

\*Nonfarm business sector.

## B. FRBNY Forecast Details

### Exhibit B-4: Medium-Term Projections

	Q4/Q4 Growth Rates			Q4/Q4 Growth Contributions		
	2012	2013	2014	2012	2013	2014
<b>OUTPUT</b>						
<b>Real GDP</b>	1.9 (1.7)	2.5 (2.4)	3.9 --	1.9 (1.7)	2.5 (2.4)	2.5 --
<b>Final Sales to Domestic Purchasers</b>	1.8 (1.7)	2.0 (2.0)	4.0 --	1.9 (1.8)	2.1 (2.1)	2.1 --
<b>Consumption</b>	2.1 (1.9)	1.7 (1.7)	2.8 --	1.5 (1.4)	1.2 (1.2)	1.2 --
<b>BFI: Equipment and Software</b>	5.0 (5.6)	9.0 (9.5)	15.5 --	0.4 (0.4)	0.7 (0.7)	0.7 --
<b>BFI: Nonresidential Structures</b>	4.8 (5.3)	6.0 (7.0)	13.0 --	0.1 (0.2)	0.2 (0.2)	0.2 --
<b>Residential Investment</b>	14.3 (13.8)	16.5 (10.0)	16.0 --	0.3 (0.3)	0.4 (0.3)	0.4 --
<b>Government: Federal</b>	-2.5 (-2.7)	-4.0 (-3.5)	-2.5 --	-0.2 (-0.2)	-0.3 (-0.3)	-0.3 --
<b>Government: State and Local</b>	-1.9 (-2.1)	-0.5 (-0.0)	2.2 --	-0.2 (-0.2)	-0.1 (-0.0)	-0.1 --
<b>Inventory Investment</b>	-- --	-- --	-- --	-0.3 (-0.3)	0.1 (0.1)	0.1 --
<b>Net Exports</b>	-- --	-- --	-- --	0.3 (0.2)	0.3 (0.2)	0.3 --
<b>INCOME</b>						
<b>Personal Income</b>	4.6 (4.4)	3.5 (3.2)	5.9 --			
<b>Real Disposable Personal Income</b>	2.5 (2.6)	0.9 (0.8)	3.4 --			
<b>Personal Saving Rate</b>	3.8 (4.0)	3.0 (2.9)	3.7 --			
<b>Corporate Profits Before Taxes</b>	0.1 (-3.6)	2.5 (0.7)	3.8 --			

Note: Numbers in parentheses are from the previous FOMC meeting.

## B. FRBNY Forecast Details

### Exhibit B-5: Medium-Term Projections, Continued

	Q4/Q4 Growth Rates		
	2012	2013	2014
<b>INFLATION</b>			
<b>Total PCE Deflator</b>	1.8 (1.4)	2.1 (1.9)	2.2 --
<b>Core PCE Deflator</b>	1.6 (1.8)	1.8 (1.8)	2.0 --
<b>Total CPI Inflation</b>	2.2 (1.6)	2.4 (2.3)	-- --
<b>Core CPI Inflation</b>	2.1 (2.3)	2.0 (2.3)	-- --
<b>GDP Deflator</b>	2.0 (2.0)	2.0 (1.7)	2.2 --
<b>PRODUCTIVITY AND LABOR COSTS*</b>			
<b>Output</b>	2.6 (2.3)	3.1 (3.1)	5.2 --
<b>Hours</b>	1.4 (1.5)	1.6 (1.6)	3.2 --
<b>Output per Hour</b>	1.2 (0.8)	1.5 (1.5)	2.0 --
<b>Compensation per Hour</b>	3.1 (1.2)	2.1 (1.9)	2.7 --
<b>Unit Labor Costs</b>	1.9 (0.4)	0.6 (0.4)	0.7 --
<b>LABOR MARKET</b>			
<b>Unemployment Rate (Avg. Q4 Level)</b>	8.2 (8.2)	7.5 (7.6)	6.5 --
<b>Participation Rate (Avg. Q4 Level)</b>	63.7 (63.7)	63.7 (63.7)	64.0 --
<b>Avg. Monthly Nonfarm Payroll Growth (Thous.)</b>	141 (143)	184 (181)	293 --

Note: Numbers in parentheses are from the previous FOMC meeting.

\*Nonfarm business sector.

## B. FRBNY Forecast Details

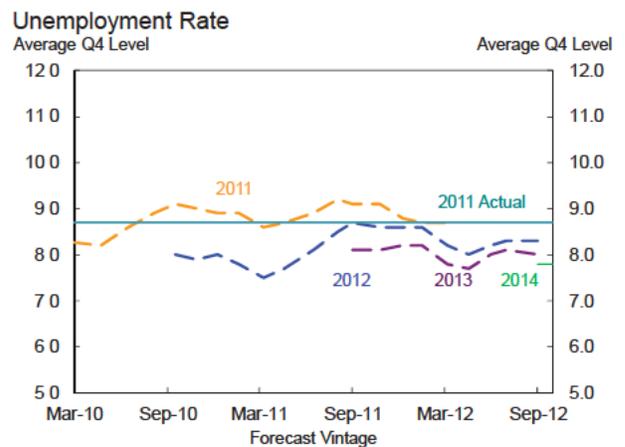
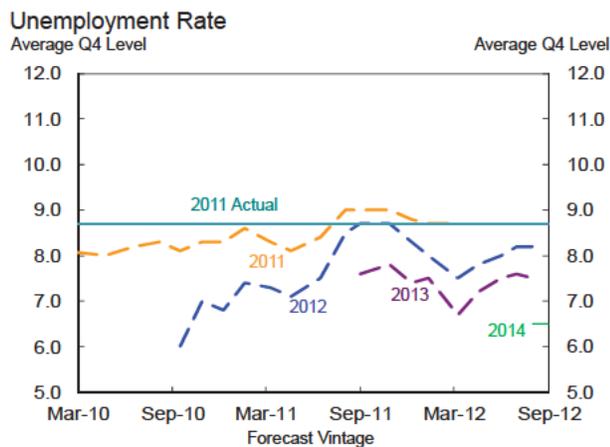
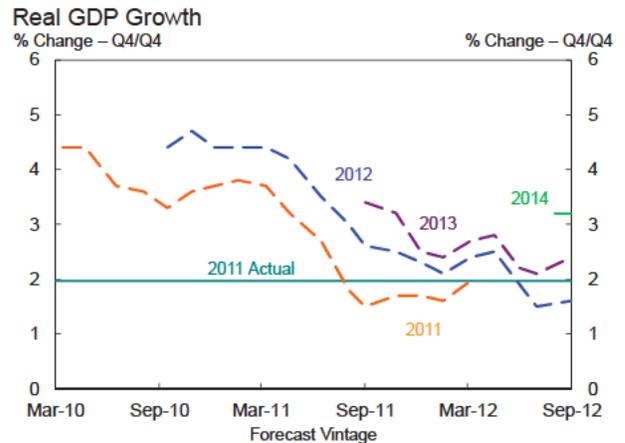
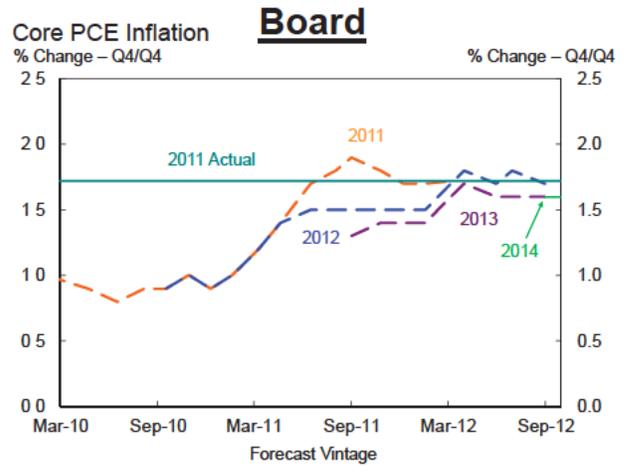
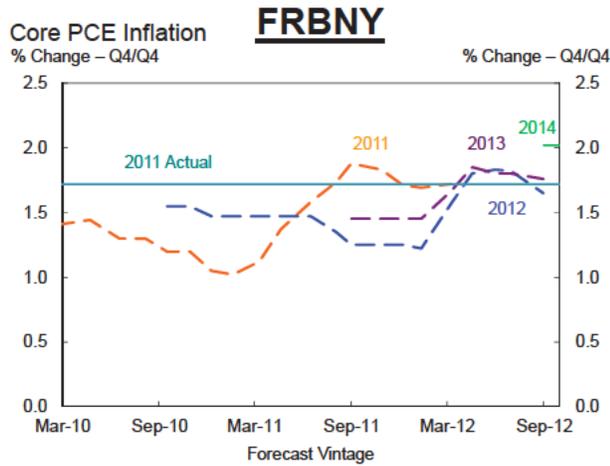
### Exhibit B-6: FRBNY and Tealbook Forecast Comparison

	FRBNY (Q4/Q4)			Board (Q4/Q4)		
	2012	2013	2014	2012	2013	2014
<b>OUTPUT</b>						
<b>Real GDP</b>	1.9 (1.7)	2.5 (2.4)	3.9 --	1.6 (1.5)	2.4 (2.1)	-- --
<b>GDP Growth Contributions</b>						
<b>Final Sales to Domestic Purchasers</b>	1.9 (1.8)	2.1 (2.1)	4.1 --	1.7 (1.4)	2.1 (1.9)	-- --
<b>Consumption</b>	1.5 (1.4)	1.2 (1.2)	2.0 --	1.5 (1.4)	1.7 (1.6)	-- --
<b>BFI</b>	0.5 (0.6)	0.8 (0.9)	1.6 --	0.3 (0.3)	0.4 (0.4)	-- --
<b>Residential Investment</b>	0.3 (0.3)	0.4 (0.3)	0.5 --	0.2 (0.2)	0.3 (0.2)	-- --
<b>Government</b>	-0.4 (-0.5)	-0.4 (-0.3)	0.1 --	-0.3 (-0.5)	-0.3 (-0.3)	-- --
<b>Inventory Investment</b>	-0.3 (-0.3)	0.1 (0.1)	0.3 --	0.1 (0.2)	0.3 (0.3)	-- --
<b>Net Exports</b>	0.3 (0.2)	0.3 (0.2)	-0.6 --	0.0 (-0.2)	-0.1 (-0.2)	-- --
<b>INFLATION</b>						
<b>Total PCE Deflator</b>	1.8 (1.4)	2.1 (1.9)	2.2 --	1.7 (1.4)	1.4 (1.5)	-- --
<b>Core PCE Deflator</b>	1.6 (1.8)	1.8 (1.8)	2.0 --	1.7 (1.8)	1.6 (1.6)	-- --
<b>INTREST RATE ASSUMPTION</b>						
<b>Fed Funds Rate (End-of-Year)</b>	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
<b>PRODUCTIVITY AND LABOR COSTS*</b>						
<b>Output per Hour</b>	1.2 (0.8)	1.5 (1.5)	2.0 --	0.8 (0.4)	1.3 (1.5)	-- --
<b>Compensation per Hour</b>	3.1 (1.2)	2.1 (1.9)	2.7 --	3.5 (1.9)	2.7 (2.6)	-- --
<b>Unit Labor Costs</b>	1.9 (0.4)	0.6 (0.4)	0.7 --	2.6 (1.4)	1.4 (1.1)	-- --
<b>LABOR MARKET</b>						
<b>Unemployment Rate (Avg. Q4 Level)</b>	8.2 (8.2)	7.5 (7.6)	6.5 --	8.3 (8.3)	8.0 (8.1)	-- --
<b>Participation Rate (Avg. Q4 Level)</b>	63.7 (63.7)	63.7 (63.7)	64.0 --	63.7 (63.8)	63.7 (63.7)	-- --
<b>Avg. Monthly Nonfarm Payroll Growth (Thous.)</b>	141 (143)	184 (181)	293 --	150 (133)	150 (117)	-- --
<b>SAVING</b>						
<b>Personal Saving Rate (Avg. Q4 Level)</b>	3.8 (4.0)	3.0 (2.9)	3.7 --	4.1 (4.6)	3.7 (4.0)	-- --
<b>HOUSING</b>						
<b>Housing Starts (Avg. Q4 Level, Thous.)</b>	810 (780)	1000 (925)	1200 --	700 (800)	800 (1000)	-- --

Note: Numbers in parentheses are from the previous FOMC meeting.

## B. FRBNY Forecast Details

**Exhibit B-7: Evolution of FRBNY and Board Forecasts since the end of 2009**



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	2012Q3	2012Q4	2012 Q4/Q4	2013 Q4/Q4
FRBNY	9/6/2012	2.0 (1.1)	2.0 (2.1)	1.9 (1.7)	2.5 (2.4)
Blue Chip	8/10/2012	1.7 (2.1)	1.9 (2.3)	1.8 (2.0)	2.5 (2.5)
Median SPF	8/10/2012	1.6 (2.5)	2.2 (2.6)	1.8 (2.3)	- -
Macro Advisers	8/15/2012	1.6 (2.4)	2.1 (2.5)	1.9 (2.1)	2.2 (3.0)
FRBNY-DSGE	7/27/2012	2.0 (1.4)	2.3 (1.7)	2.0 (1.6)	2.4 (1.9)

		Core PCE Inflation			
	Release Date	2012Q3	2012Q4	2012 Q4/Q4	2013 Q4/Q4
FRBNY	9/6/2012	1.2 (1.6)	1.4 (1.7)	1.6 (1.8)	1.8 (1.8)
Median SPF	8/10/2012	1.9 (1.7)	1.8 (1.7)	1.9 (1.8)	2.0 (1.9)
Macro Advisers	8/15/2012	1.8 (1.7)	1.7 (1.7)	1.9 (1.8)	1.8 (1.8)
FRBNY-DSGE	7/27/2012	1.7 (1.1)	1.3 (1.0)	1.7 (1.5)	1.3 (1.1)

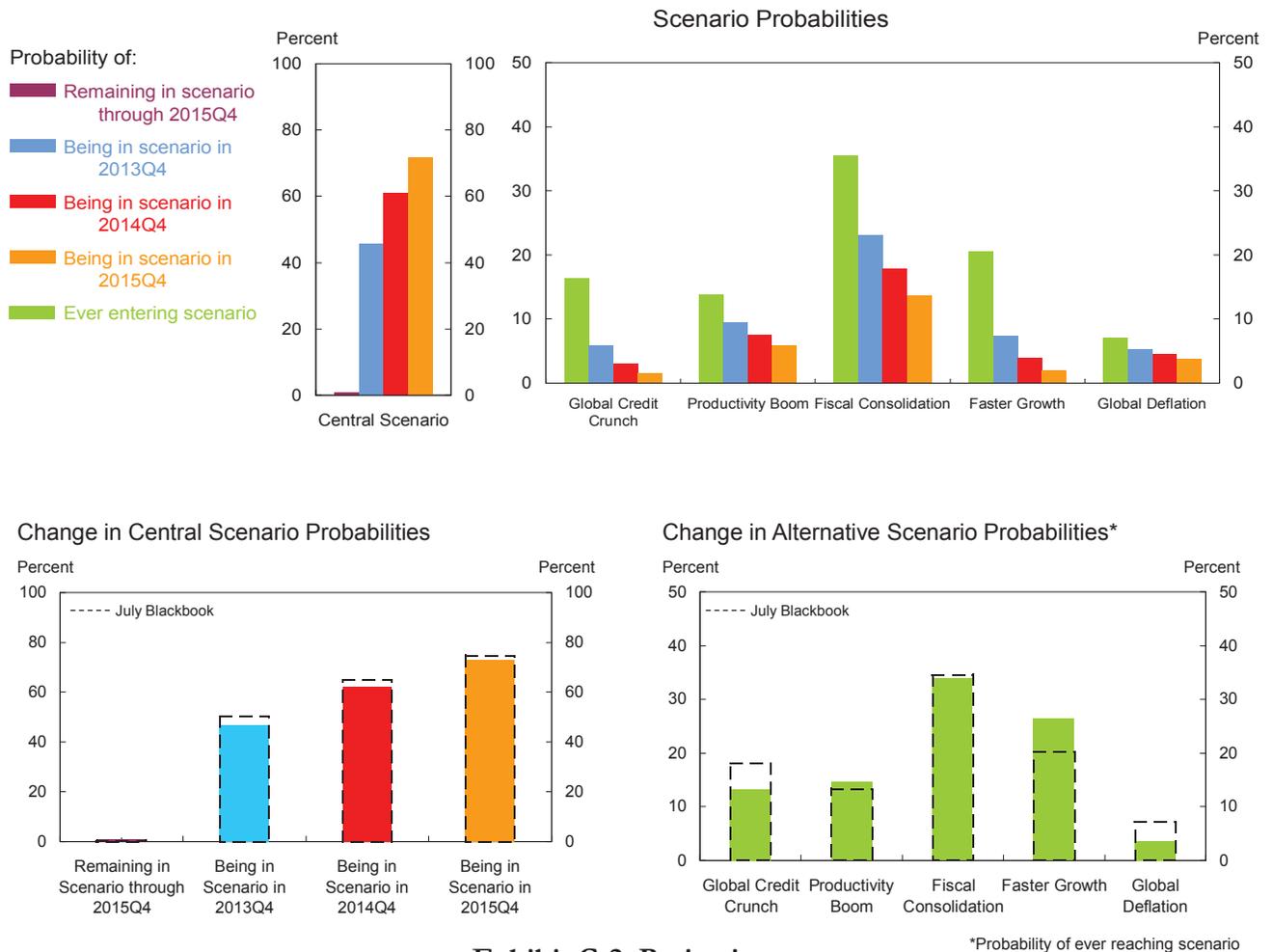
		CPI Inflation			
	Release Date	2012Q3	2012Q4	2012 Q4/Q4	2013 Q4/Q4
FRBNY	9/6/2012	2.2 (1.0)	3.5 (2.3)	2.2 (1.6)	2.4 (2.3)
Blue Chip	8/10/2012	1.6 (2.3)	1.9 (1.8)	1.7 (1.7)	2.1 (2.2)
Median SPF	8/10/2012	1.5 (2.3)	2.0 (2.1)	1.8 (2.3)	2.2 (2.1)
Macro Advisers	8/15/2012	1.7 (1.6)	2.1 (1.8)	1.8 (1.8)	2.0 (2.1)

		Core CPI Inflation			
	Release Date	2012Q3	2012Q4	2012 Q4/Q4	2013 Q4/Q4
FRBNY	9/6/2012	1.9 (2.4)	1.9 (2.3)	2.1 (2.3)	2.0 (2.3)
Median SPF	8/10/2012	2.2 (2.0)	2.0 (2.0)	2.2 (2.0)	2.0 (2.0)
Macro Advisers	8/15/2012	2.1 (2.0)	2.0 (1.9)	2.2 (2.1)	1.9 (2.1)

\*Note: Numbers in gray are from the previous FOMC meeting.

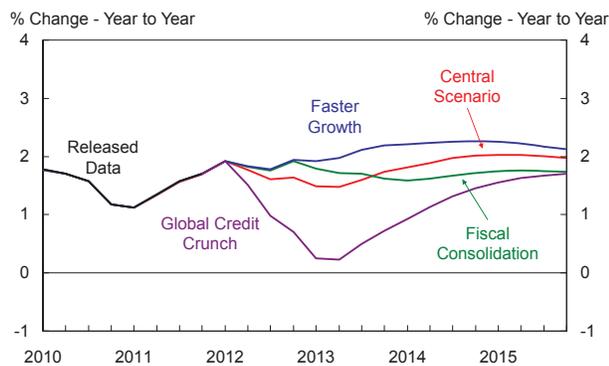
## C. FRBNY Forecast Distributions

**Exhibit C-1:  
Risks**

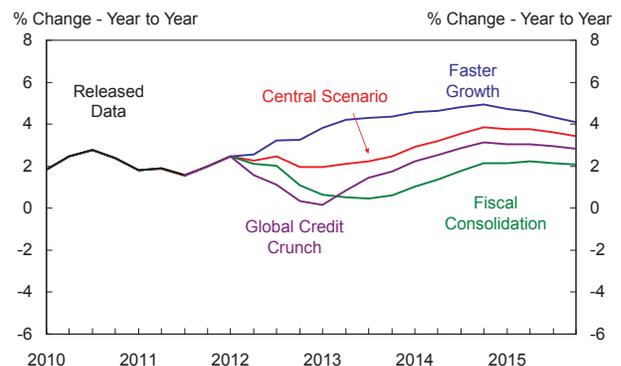


**Exhibit C-2: Projections  
under Alternative Scenarios**

**Core PCE Inflation under Alternative Scenarios Selected**



**Real GDP Growth under Alternative Scenarios Selected**

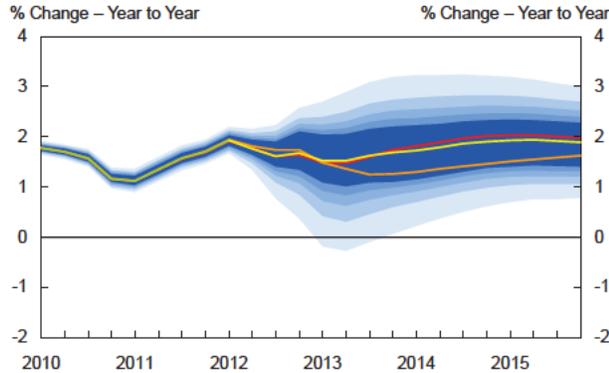


Source: MMS Function (FRBNY)

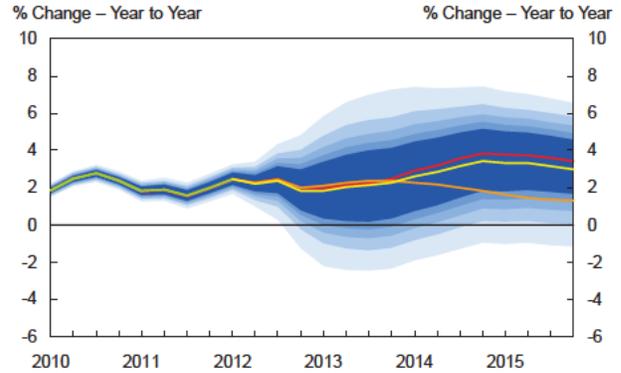
## C. FRBNY Forecast Distributions

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

**Core PCE Inflation Forecast Distribution**

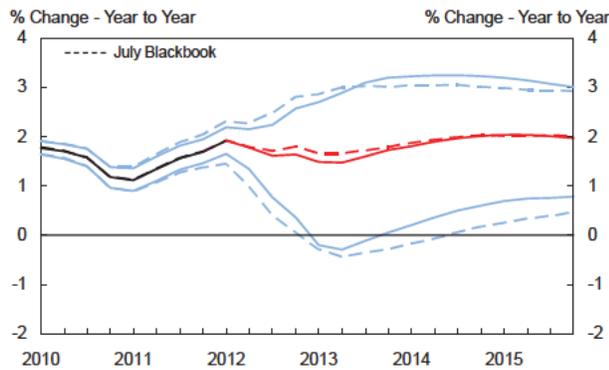


**Real GDP Growth Forecast Distribution**

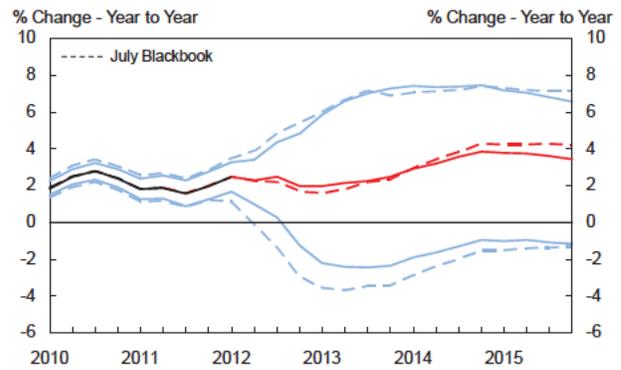


The yellow line is the expected value of the forecast distribution, the red line is the FRBNY central projection, the orange line is the DSGE forecast, and the green line is released data. The shading represents the 50, 60, 70, 80 and 90 percent probability that the four-quarter change will be within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

**Change in Core PCE Inflation Forecast Distribution**

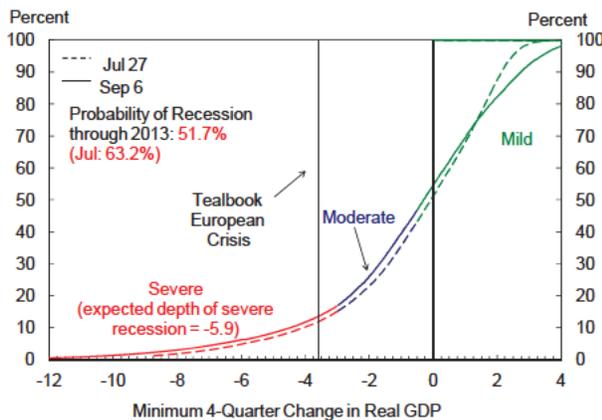


**Change in Real GDP Growth Forecast Distribution**

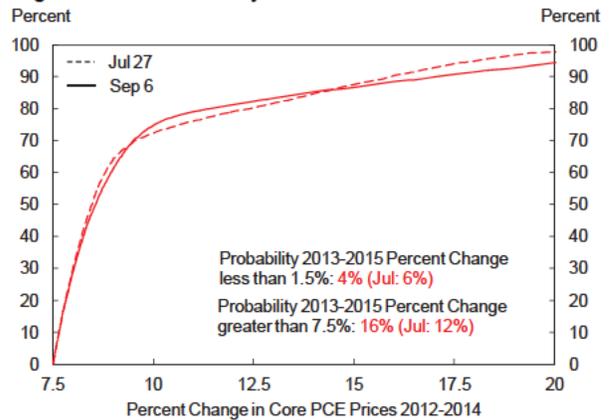


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from the previous Blackbook.

**Depth of Recession**



**High Inflation Probability and Distribution**

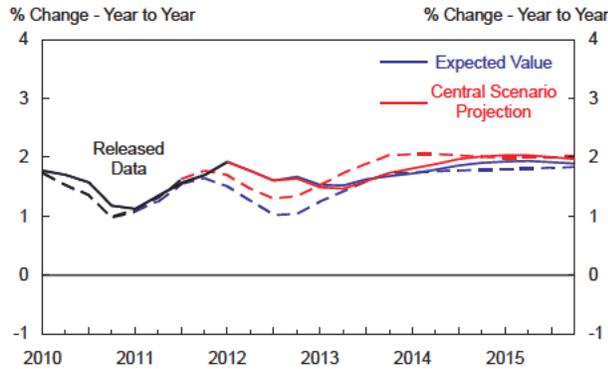


Source: MMS Function (FRBNY)

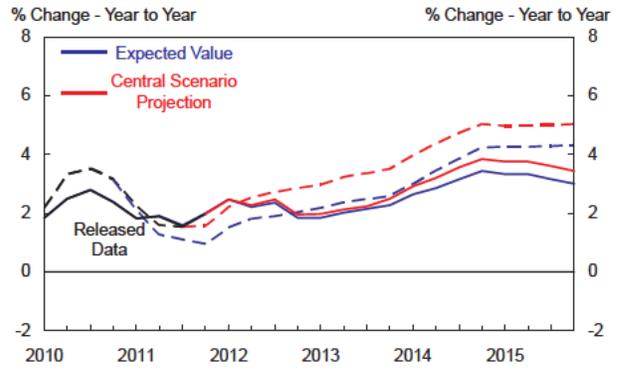
## C. FRBNY Forecast Distributions

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

One-Year Comparison of Core PCE Inflation Forecast

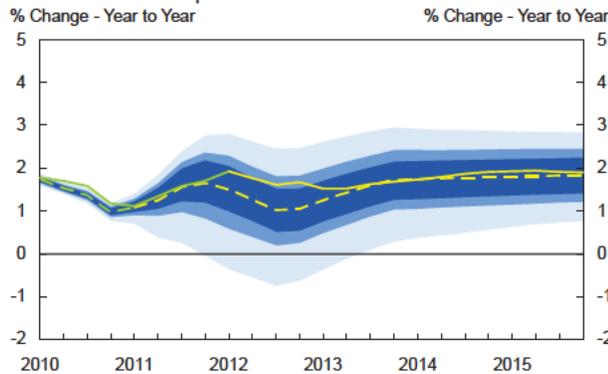


One-Year Comparison of Real GDP Growth Forecast

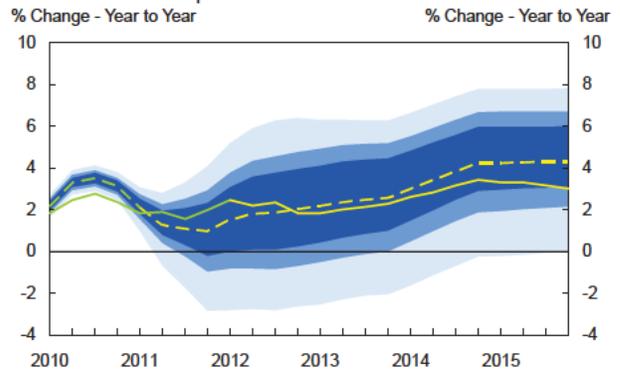


The solid lines represent the current central scenario projection and expected value, while the dashed lines represent those from the year-ago Blackbook.

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



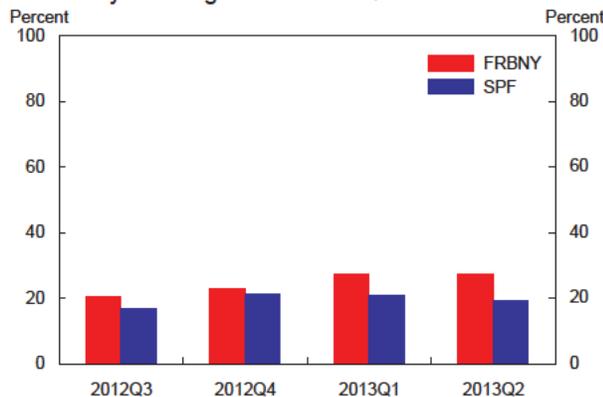
One-Year Comparison of Real GDP Growth Forecast Distribution and Expected Value



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

### Exhibit C-5: Probability of a Negative Growth Quarter

Probability of a Negative-Growth Quarter

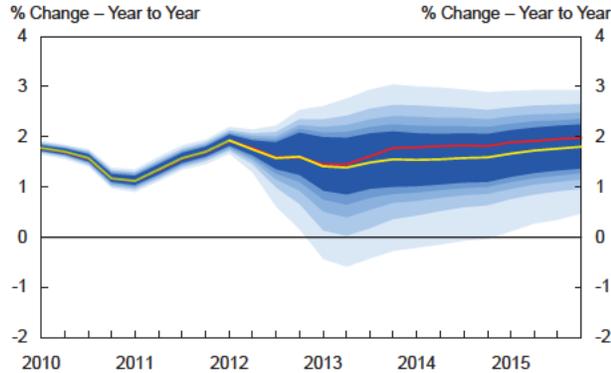


Source: MMS Function (FRBNY)

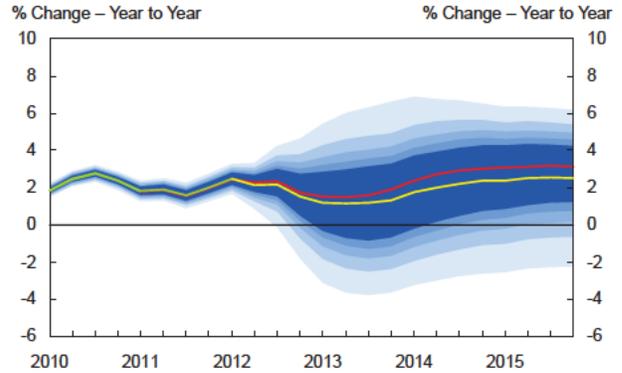
## C. FRBNY Forecast Distributions

### Exhibit C-6: Alternative Forecast Distributions and Risks

**Core PCE Inflation Forecast Distribution**

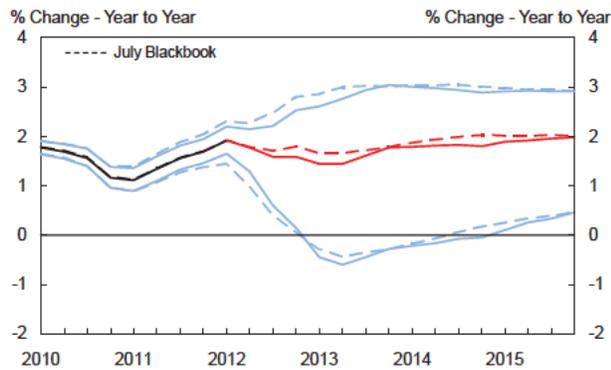


**Real GDP Growth Forecast Distribution**

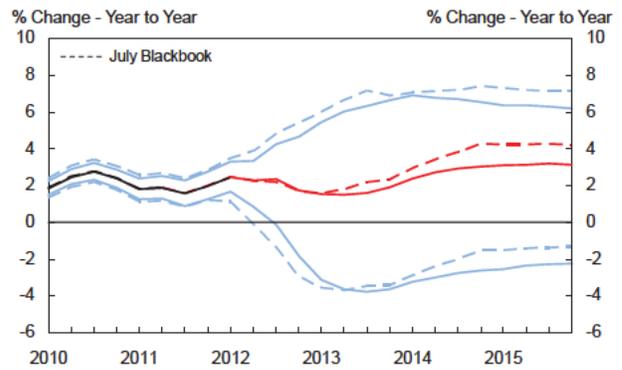


The yellow line is the expected value of the forecast distribution, the red line is the FRBNY central projection, and the green line is released data. The shading represents the 50, 60, 70, 80 and 90 percent probability that the four-quarter change will be within the respective range.

**Change in Core PCE Inflation Forecast Distribution**

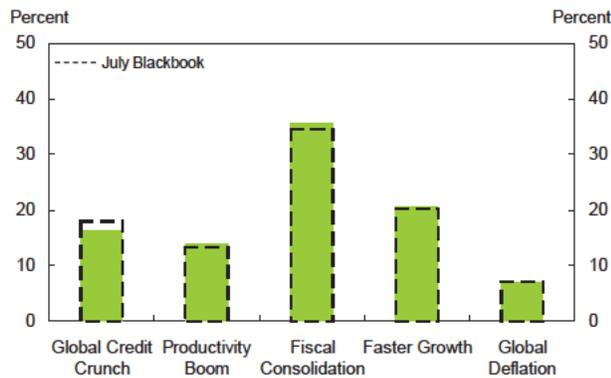


**Change in Real GDP Growth Forecast Distribution**



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 the previous Blackbook.

**Change in Alternative Scenario Probabilities\***



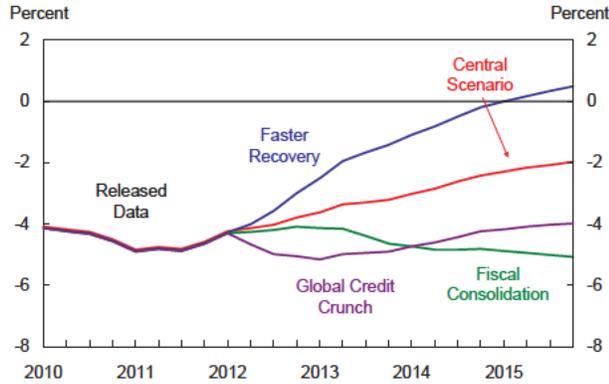
\*Probability of ever reaching scenario

Source: MMS Function (FRBNY)

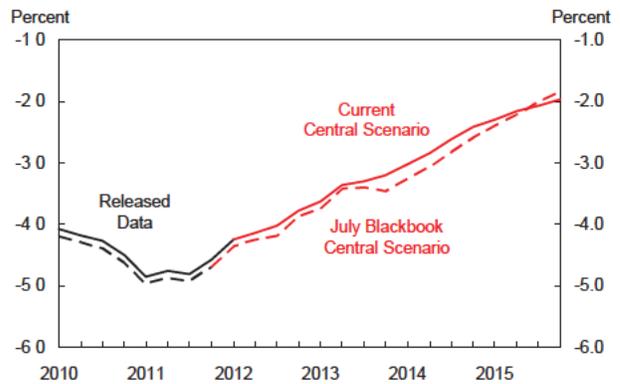
## D. FRBNY Fed Funds Rate Projections

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

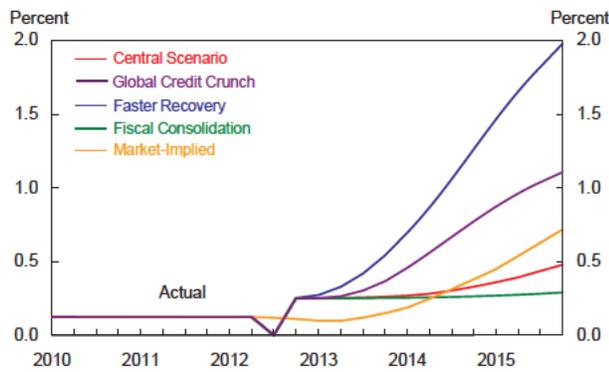
**Real FFR under Alternative Scenarios**



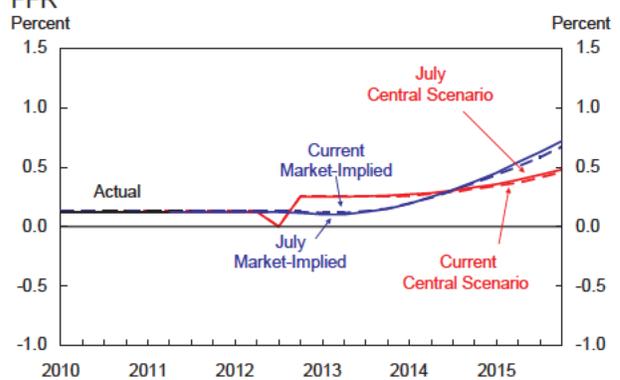
**Change in Central Scenario Real FFR**



**Nominal FFR under Alternative Scenarios**

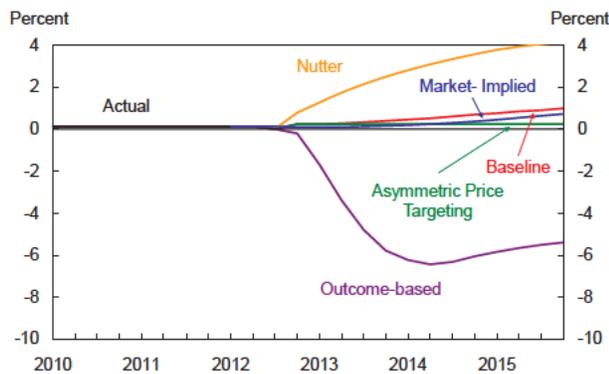


**Change in Central Scenario and Market-Implied Nominal FFR**



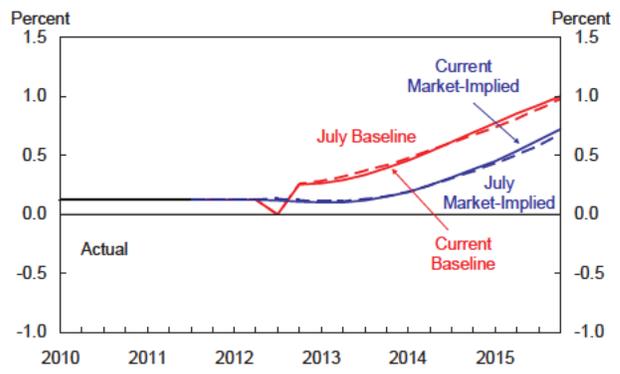
**Exhibit D-2: Alternative Policy Rules under  
Expected Value of Forecast Distribution**

**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

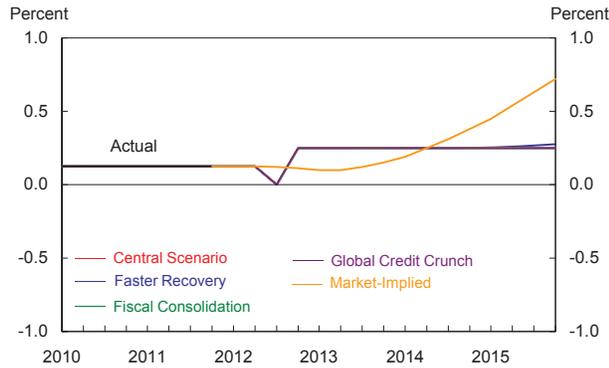
Source: MMS Function (FRBNY)

## D. FRBNY Fed Funds Rate Projections

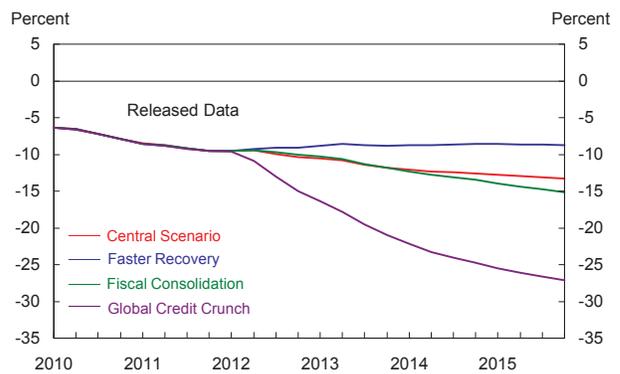
### Exhibit D-3: Alternative Policy Rule Analysis

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

Nominal FFR under Alternative Scenarios

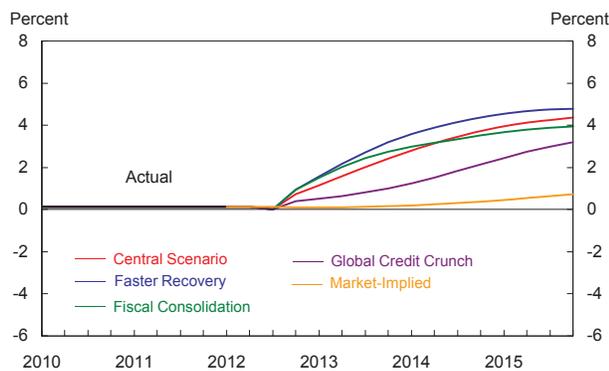


Real FFR under Alternative Scenarios

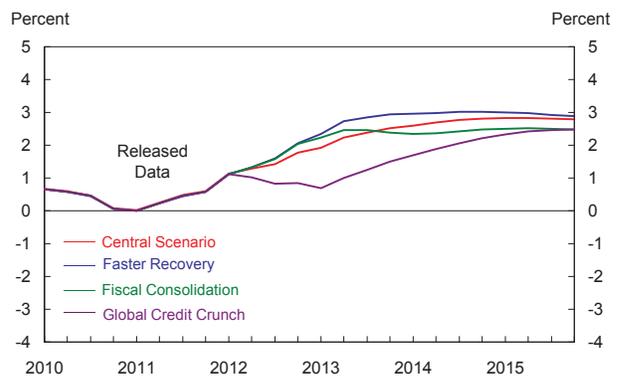


#### Policy Rule: *Nutter*

Nominal FFR under Alternative Scenarios

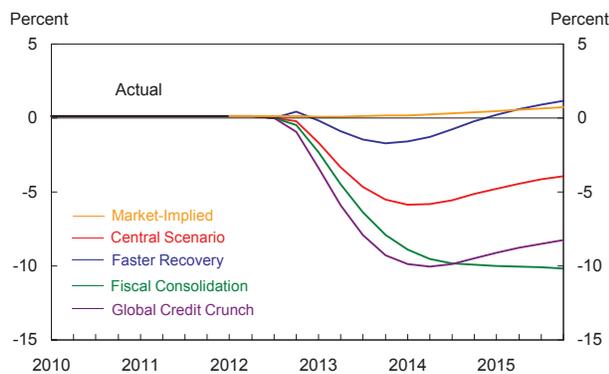


Real FFR under Alternative Scenarios

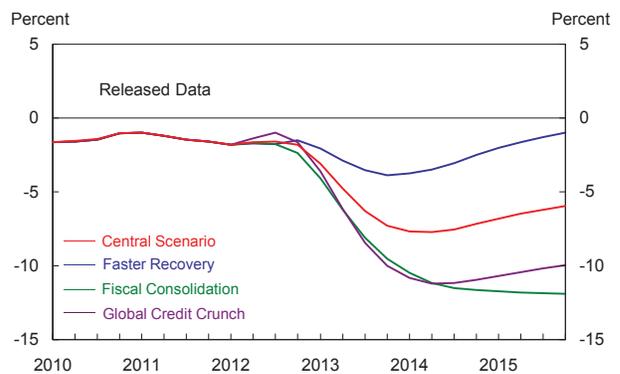


#### Policy Rule: *Outcome-based*

Nominal FFR under Alternative Scenarios



Real FFR under Alternative Scenarios

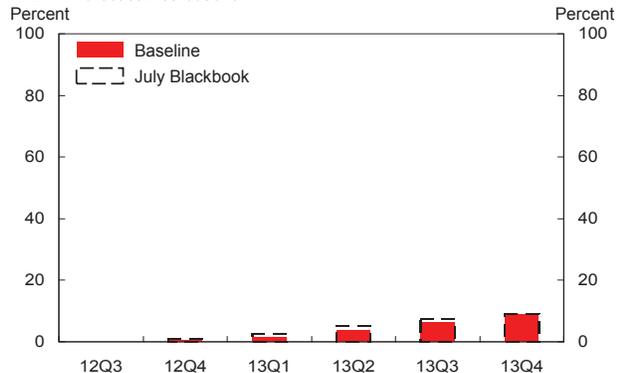


## D. FRBNY Fed Funds Rate Projections

### Exhibit D-4: FFR Probabilities

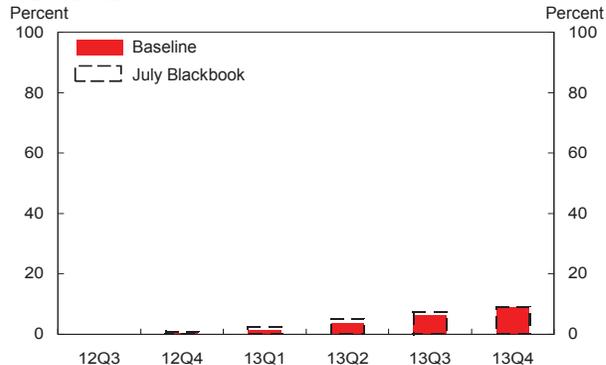
Probability of FFR above 0.5% for Next Year

FRBNY Forecast Distributions

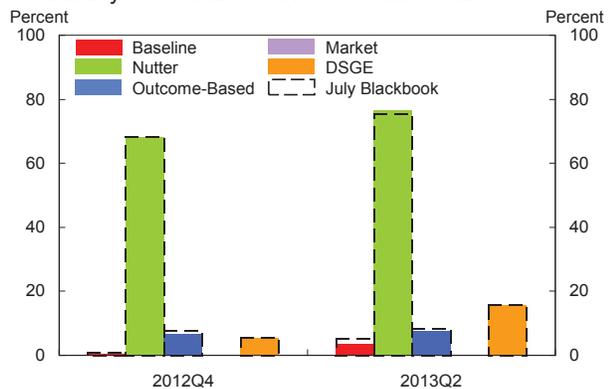


Probability of FFR above 0.5% for Next Year

FRBNY DSGE Model



Probability of FFR above 0.5% for Next Year

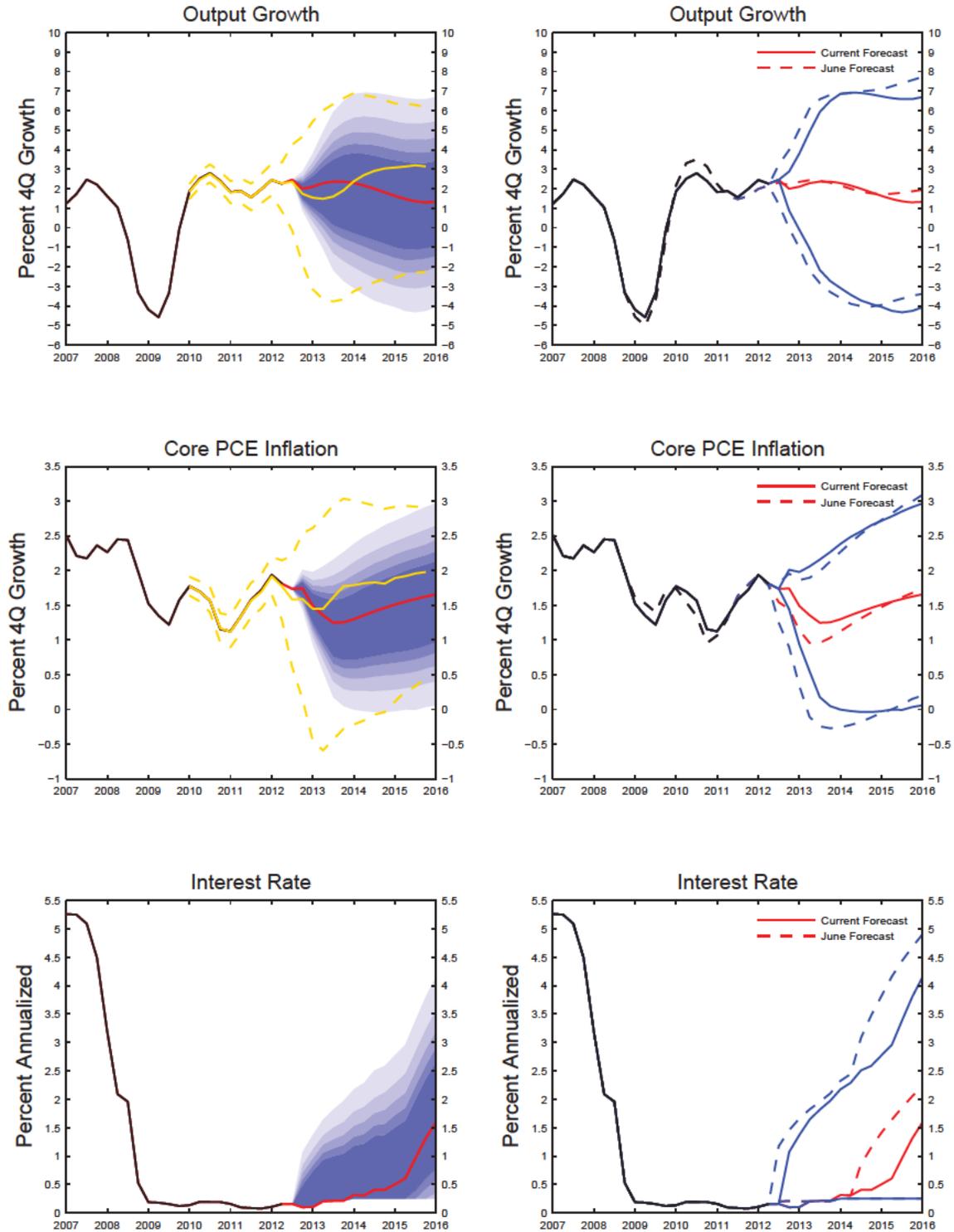


Note: Probability displayed is probability of FFR being above 0.5% in quarter noted and remaining above 0.5% in subsequent four quarters. DSGE results are shown for model including zero bound restriction.

Source: MMS Function (FRBNY)

## E. FRBNY-DSGE Model

Exhibit E-1: FRBNY-DSGE Forecasts

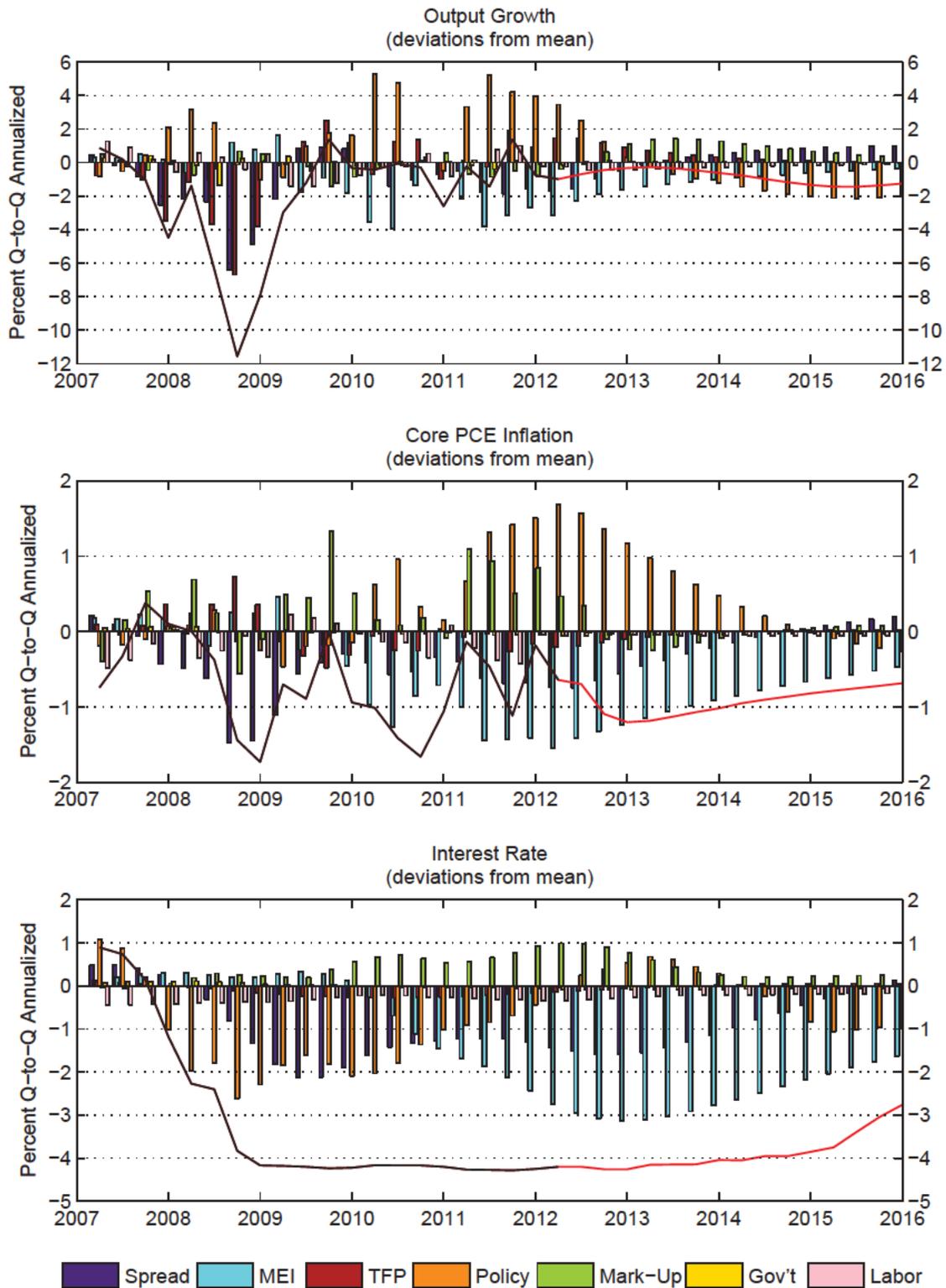


Note: Black lines indicate data, red lines indicate mean forecasts, and shaded areas mark the parameter and shock uncertainty associated with our forecast as 50, 60, 70, 80, and 90 percent probability intervals. For comparison, we report the FRBNY Central Projection for output growth and inflation (solid yellow line) and the 90 percent bands for the FRBNY forecast distribution (dashed yellow lines). Blackbook forecast comparisons (right-hand side charts) display 90 percent bands.

Source: MMS Function (FRBNY)

## E. FRBNY-DSGE Model

### Exhibit E-2: FRBNY-DSGE Shock Decomposition



Note: The solid lines (black for realized data, red for mean forecast) show each variable in deviation from its steady state. The bars represent the shock contributions; specifically, the bars for each shock represent the counterfactual values for the observables (in deviations from the mean) obtained by setting all other shocks to zero.

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 alternative scenario considers the impact of above-trend productivity growth. Our current assumption of trend productivity growth is around 1.75% on a nonfarm business sector basis. Sustained productivity growth above this assumption would have important consequences for the economy. Typically, because below-trend productivity growth also has important consequences, we have included an alternative scenario that incorporates that assumption (*Productivity Slump*). However, because the near-term consequences of that scenario and the *Fiscal Consolidation* scenario are similar, we have combined those two scenarios into a single revamped *Fiscal Consolidation* scenario, which allows us to add a new scenario (*Faster Growth/Recovery*). We also currently consider four additional scenarios. In one (*Faster Growth/Recovery*), the recent “headwinds” subside more quickly than expected, leading to stronger aggregate demand effects from monetary and fiscal policy. In another (*Loss of Credibility*), the public and investors lose confidence in the current stances of monetary and fiscal policy. In the other two (*Global Credit Crunch* and *Global Deflation*), the recent stresses in global financial and economic conditions continue to have an impact on U.S. economic conditions; the differences between the two mainly reflect differing assessments of how protracted the negative effects could be.

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

After a lull in the mid-2000s, productivity growth has been robust and above our current estimate of trend productivity growth. This rapid growth raises 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 previous post-WWII periods of high productivity growth (pre-1973 and the mid-1990s through the mid-2000s). As such, we could see persistent productivity growth above our assumed trend, implying a higher potential growth rate for output and thus expected real output growth that is higher

than our current estimate. (A higher potential growth rate may also imply that the output gap that opened during the 2007-2009 recession is larger than we currently estimate). Strong productivity growth would also limit labor cost pressures and thereby help to subdue inflation.

**Alternative 2: *Fiscal Consolidation***

Events in Europe in 2010 and so far in 2011 concerning the fiscal position of several euro zone countries raise issues about the possible economic consequences if similar concerns were to develop about the sustainability of the U.S. government's fiscal position. The *Fiscal Consolidation* scenario envisions a situation in which concerns on the part of investors about the fiscal sustainability of the United States leads to an increase in long term interest rates and term premia that contribute to a decline in output growth below that of the central forecast. As the U.S. government responds to those concerns by reducing government spending and/or raising taxes, the consequent decline in aggregate demand would imply that growth of real activity continues to be weak. In this scenario inflation temporarily rises above the central forecast, in part due to a likely depreciation of the dollar and possible increases in inflation expectations<sup>2</sup>. [As stated earlier, the near-term implications of this scenario are similar to those of a supply shock or productivity slump, which is one reason we have folded in the weight of the old *Productivity Slump* scenario into this scenario.] However, after several quarters, with the government embarking on a credible fiscal consolidation, inflation declines below the central forecast as a consequence of the drop in aggregate demand and output growth.

**Alternative 3: *Faster Growth/Recovery***

The recovery from the 2007-09 recession has been quite weak, especially given the severe drop in real activity during the recession. Factors behind the slow pace of recovery include the continued stress faced by financial markets and institutions as they slowly mend from the financial crisis and a slow process of repairing household balance sheets damaged in the financial crisis and recession. However, the relative strength in recent real PCE and other aggregate demand indicators raise the possibility that the

<sup>2</sup> Some economic models imply that if the public and investors see the fiscal situation as unsustainable, they could raise inflation expectations because of the possibility that part of the long-term fiscal budget gap is closed through higher inflation.

process of mending may be beginning to reach an end. The *Faster Growth/Recovery* scenario envisions a situation where these factors that have inhibited growth subside more quickly than anticipated by policymakers. In particular, the diminution of these factors would lead to a stronger impact from accommodative monetary policy and from the fiscal stimulus associated with the fiscal agreement passed in December 2010, leading to faster growth in aggregate demand. In that case, real GDP growth could be higher than anticipated, and inflation pressures could materialize more quickly.

**Alternative 4: *Loss of Credibility***

In the wake of the monetary and fiscal stimulus used to combat the 2007-2009 recession, some commentary has focused on the possibility that these policies could lead to higher inflation expectations and eventually to higher inflation. The continued elevated levels of some commodity prices are consistent with such commentary. Even though the FOMC has made its commitment to low rates contingent on “subdued inflation trends” and “stable inflation expectations,” it is possible that market participants may begin to believe that the FOMC is not credibly committed to keeping inflation around the presumed implicit target level, especially if the unemployment rate remains high. In addition, concerns about the possible influence of continued high fiscal deficits on monetary policy could lead investors and the public to question FOMC credibility on inflation: FRBNY survey evidence suggests that, for at least some market participants, increases in government debt lead to higher inflation expectations, regardless of the reason for the increased debt. If the concerns about credibility were to become widespread, they would likely cause a rise in inflation and inflation expectations above forecast.

**Alternative 5: *Global Credit Crunch***

Although financial markets are generally notably healthier than they were during the most extreme periods of the financial crisis, continued impairments in some markets as well as general economic uncertainty may be keeping credit availability very tight. In addition, consumers suffered wealth losses during the crisis, of which only a small part has been recovered, and volatility in equity markets is still elevated. Most central banks are maintaining what would appear to be very accommodative policy stances. This combination of factors suggests that the neutral rate is still lower than it was 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 well below our lower estimate of the neutral rate, tight credit conditions, continued stresses in global financial markets, and a still-significant chance of a further deterioration in global economic conditions create a risk that output growth will fall significantly below the level projected in the central forecast; this development would likely be accompanied by inflation below the level in the central forecast. Nevertheless, under this scenario we assume that financial markets will begin to function more normally and that, as they do, the economy will exit the *Global Credit Crunch* scenario and begin growing faster than its potential growth rate. The strong output growth experienced when the economy leaves the scenario should result in a closing of the output gap over time.

**Alternative 6: *Global Deflation***

Recent price level indicators point to low inflation in many regions of the world. With inflation at such levels, sluggish growth in some parts of the world, concerns about the future of the euro zone, and continued financial market uncertainty suggest that there is some risk of global deflation going forward. This possibility is further exacerbated as many central banks around the world have their policy rates at or very near 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, resulting in both inflation and output growth far below the levels projected in the central forecast. Because of the difficulty of exiting such a situation, we see the *Global Deflation* scenario as quite persistent. Unlike the *Global Credit Crunch* scenario, the economy does not generally “bounce back” from *Global Deflation* to close the output gap. Instead, the U.S. is much more likely to experience a prolonged period of essentially no growth, and in many simulations in which the economy enters the *Global Deflation* scenario the level of output in 2013 does not surpass the 2009Q2 peak.

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. *Fiscal Consolidation*: inflation initially above and then below central forecast,

- output below central forecast.
3. *Faster Growth/Recovery*: inflation above central forecast, output above central forecast.
  4. *Loss of Credibility*: inflation far above central forecast, output slightly below central forecast.
  5. *Global Credit Crunch*: inflation below central forecast, output significantly 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 (except for the *Nutter* rule, which ignores output deviations), while incorporating some degree of inertia. For each of the FFR paths and each of the policy rules, we determine these deviations using the inflation and output paths generated in Exhibit C.

*Baseline Policy Rule Specification:*

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

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

$i^* = 3.75$  in short - term, moving to 4.25 (neutral FFR)

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

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

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

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

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

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

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

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

inflation is greater than 1.5% per year, the policy rule reverts to targeting the gap between four-quarter changes in inflation and the inflation objective, just as in the *Baseline* rule.

The *Nutter* rule reacts more strongly than the *Baseline* rule to changes in inflation. Specifically, the *Nutter* rule increases the weight on deviations of core PCE inflation from the target ( $\varphi_\pi = 2$  instead of 1.5). The *Nutter* rule does not react to changes in the output gap.

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

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

Using a weighting scheme, it is possible to combine the *Baseline* and the two variants into an *Average* rule that may better reflect market beliefs about FOMC preferences and views of the structure of the economy than does any individual rule. (That is, we can think of the market-implied path as reflecting an amalgam of different perceived FOMC preferences, etc.) Each cycle we construct the *Average* rule by taking the weighted average of the *Baseline* rule and the two FRBNY-derived variants that matches the

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

market-implied path as closely as possible. (We do not currently display the *Average* rule or the weights used to calculate the *Average* rule in the Blackbook). Examining the change in the weights used to construct the *Average* rule from one cycle to the next can provide insight into the reasons behind shifts in the market path not explained by changes in the outlook.