

FRBNY BLACKBOOK

RESEARCH AND STATISTICS GROUP

FOMC Background Material

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FRBNY BLACKBOOK

September 2013

CONTENTS

1. Policy Recommendation and Rationale	2
2. Evolution of Outlook and Risks	4
2.1 Central Forecast	4
2.2 Alternative Scenarios and Risks	11
3. Forecast Comparison	12
3.1 Comparison with Private Forecasters	12
3.2 FRBNY-DSGE Model Forecast	13
<i>Forecast Comparison with the Tealbook</i>	15
4. Robustness of Policy Recommendation	16
4.1 Sensitivity to Alternative Scenarios and Policy Rules	16
4.2 Comparison to Market Expectations	17
5. Significant Developments	17
5.1 Economic Developments	17
<i>Summary of Key Economic Indicators</i>	18
5.2 Financial Markets	20
<i>Special Topic: U.S. Monetary Policy and Global Asset Prices</i>	24
5.3 Global Economic Policy	28

EXHIBITS

A. Significant Developments	30
B. FRBNY Forecast Details	39
C. FRBNY Forecast Distributions	47
D. FRBNY Fed Funds Rate Projections	50
E. FRBNY-DSGE Model	52

APPENDICES

1. Alternative Scenario Descriptions	54
2. Policy Rule Description	59

1. Policy Recommendation and Rationale

Summary:

In light of the economic and financial market developments since the July Blackbook Update, we recommend maintaining the current policy stance and not introducing policy changes which we judge as unwarranted and potentially destabilizing at this juncture. In particular, we recommend continuing the asset purchase program at the current pace until we are able to judge with confidence that the outlook for the labor market has improved substantially. The FOMC should reaffirm the current state-contingent forward guidance regarding the federal funds rate, and refrain at this time from introducing additional programs or modifying the statement language to support guidance. We favor identifying and assessing potential new tools to improve control of short term rates under conditions of a large Fed balance sheet.

Background:

- Recent domestic and foreign data releases have been mixed. The rise in mortgage rates has begun to have adverse effects on the housing market, and consumer spending indicators generally point to continued sluggish growth of household expenditures. Consequently, we and most forecasters have further reduced U.S. growth forecasts for the second half of the year. While PMI releases in the U.S. and a number of other countries have been positive, recent U.S. industrial production prints have been below expectations. Although recent data suggest that headwinds from the Euro area and China may have abated, at least temporarily, data in a number of major emerging market economies have been weak, suggesting the global economic outlook remains subdued. Finally, even though the unemployment rate has declined and payrolls have continued to rise in recent months, labor market conditions are still subdued. The labor force participation rate has continued to fall, the employment-to-population ratio has been flat, and all labor demand indicators have yet to show sustained improvement.
- There are new geopolitical risks associated with the possible military intervention in Syria. The rise in oil prices associated in part with these risks could have

- adverse consequences for the real activity outlook. In addition, concerns about possible conflicts about the U.S. fiscal budget and the debt ceiling portend greater uncertainty in the fall.
- Compromised communications in late spring and early summer regarding the monetary policy outlook, as well as the public discussion on the leadership transition and Committee changes at the FOMC also may have increased uncertainty and undermined credibility in the sustainability of the current policy stance.
 - Besides the downward drift in our near-term central forecast for real growth, we see greater downside risks to the outlook than we did in July.
 - Although it has stabilized, PCE inflation continues to run below the FOMC's 2% longer-run objective. The inflation outlook and risks thus have not changed substantially.

Our policy recommendation:

- 1) **No reduction at this time in the pace of asset purchases.** *Rationale:* The current state of the economy and the outlook for 2013Q3 and Q4, as well as less confidence in the outlook, are not consistent with a reduction in the pace of purchases. A reduction in the pace of purchases in such circumstances would be contrary to the state contingency of the policy, possibly increasing the uncertainty about other dimensions of policy (such as forward guidance). In the absence of pervasive evidence, it would be challenging to communicate the appropriateness of the tapering decision, thus compromising credibility. If signals from incoming data become less noisy and our degree of confidence in a sustained improvement in the outlook for the labor market increases significantly, tapering may be warranted as early as the end of the year.
- 2) **No change in forward guidance.** *Rationale:* Current thresholds and guidelines are consistent with an appropriate policy stance. Any changes to language or thresholds, or an introduction of new facilities over the near term to support or complement forward guidance would likely lack credibility.

- 3) **The FOMC should authorize the testing in size of an overnight reverse repo (RRP) facility, accelerating the pace of introduction of a full allotment facility if the program is deemed satisfactory.** *Rationale:* An overnight full allotment RRP facility could reduce costs associated with a large Fed balance sheet, alleviating concerns that could lead to a too-rapid reduction in the balance sheet. Also, by providing a firmer floor on short-term rates, a full implementation of an overnight RRP facility may reduce concerns associated with a reduction in the IOER, and thus increase the appeal of using IOER for enhancing accommodation in the near future if needed.

In the case that the FOMC decides nevertheless to reduce the pace of purchases at the upcoming meeting we recommend the following:

1. The rationale for a reduction in the purchase pace should be communicated as driven by our assessment of the improvement in the economic outlook since September.
2. An initial reduction in the pace of purchases should be implemented mainly through reducing Treasury purchases, which should help maintain the program's effectiveness and alleviate possible adverse effects on mortgage rates and the housing market.
3. To mitigate the potential adverse effect on credibility and communication challenges, the forward guidance language should not be changed nor should compensatory policy instruments be introduced. In particular, the activation of the RRP program should be postponed.
4. The FOMC statement should reaffirm that the forward guidance on the FFR is not affected by the change in the purchase program.

2. Evolution of Outlook and Risks

2.1 Central Forecast

Intermeeting Developments

Data released over the intermeeting period have continued to be mixed, resulting in very

little change in our projection of 2% (Q4/Q4) growth of real GDP for 2013. The second quarter growth rate was revised up to 2.5% (annual rate), more than we expected due to a surprising upward revision to the inventory growth contribution to 0.6 percentage points. This suggests that inventory investment will exert a drag of around 1/2 percentage point on third quarter growth of real GDP, which we now project at between 1 1/2% and 1 3/4% (annual rate). By the fourth quarter we expect the improved underlying fundamentals to begin to be more evident, with growth rising to around 2 1/2% (annual rate).

The employment report for August was a prime example of the mixed nature of the recent data. Nonfarm payroll employment rose by 169,000 in August, somewhat below expectations, while the payroll gain in July was revised down to 104,000. The average of the two months, at 137,000, is quite a bit below the 195,000 per month average of the first half of 2013. Aggregate hours worked rose 0.4% in August, after falling 0.1% in July. At this juncture, it looks as though aggregate hours worked rose at about a 1% annual rate in the third quarter, down from 2% in the second quarter. With some further slowing of the rate of growth of average hourly earnings, nominal wage and salary accruals are on track for a 1 1/2% to 2% annual rate increase in the second quarter, down from 3 1/4% over the four quarters ending in 2013Q2.

The unemployment rate declined by 0.3 percentage points over July and August to 7.3% after being essentially unchanged over the entire second quarter. The labor force participation rate fell by 0.3 percentage points over the same period. The participation rate of 16 to 24 year olds fell 0.8 percentage points over those two months, while that of those 25 to 54 was down 0.1 percentage points and of those 55 and over was unchanged. The large decline in participation among those 16 to 24 years of age suggests potential seasonal adjustment problems as young people leave summer jobs and return to school.

Overall, the available data on consumer spending for the third quarter suggest that growth of real PCE will be near the 1.8% annual rate pace of the second quarter. Real PCE was essentially unchanged in July (+0.05%) with a 0.4% increase in spending on goods offset by a 0.14% decline in spending on services. While spending on household utilities fell for

the fourth consecutive month, there were declines in other categories of services as well, such as health care services, transportation services, and recreation services. Spending on consumer durable goods appears to be well maintained in August, with sales of light weight motor vehicles rising to 16.1 million (annual rate), the highest level since September of 2007. However, spending on services is anticipated to be sluggish again in August, due in part to the fact that it was another unusually cool month. The personal saving rate is likely to be near 4 ½% in the third quarter, the same as in 2013Q2.

In terms of impact on our forecast, perhaps the most important development of the past few months is the fact that single-family housing starts, which averaged 630,000 units (seasonally-adjusted annual rate) in 2013Q1—a 30% increase over 2012Q1—have averaged just 596,000 over the four months ending in July. Single-family residential construction put in place, which had been rising rapidly through the first quarter of the year, leveled off in recent months, as has employment in construction.

The leveling off of single-family housing starts appears to be due to the loss of momentum in sales of new single-family homes, which averaged 450,000 over the first half of 2013, but plunged to 394,000 in July. A similar though less dramatic loss of forward momentum has occurred in sales of existing homes. The National Association of Realtors' (NAR) Pending Home Sales Index, which tracks signed contracts for sales of existing homes, peaked in May and has fallen a cumulative 1.6% through July. Along with this cooling in sales of new and existing homes, the Mortgage Bankers Association of America's Purchase Mortgage Applications index has declined 12 ½% from its recent peak in early May. This stalling of the recovery of housing market activity appears to be in response to the roughly 100 basis point rise of mortgage interest rates since early May. Housing affordability, as measured by the NAR's index, has declined a record 25% over the six months ending in July.

Despite these developments, a Housing Market Index published monthly by the National Association of Home Builders has moved notably higher over the four months ending in August, reaching the highest level since late 2005. To construct this index, builders are

asked to rate current sales, sales in six months, and prospective buyer traffic at their building sites as either good or poor. Indices are constructed for each question by computing the percentage of “good” responses, then constructing the composite index as a weighted-average of those three sub-indices. (The weights are derived so as to produce the highest possible correlation between the composite index and single-family starts.) Past behavior of this index suggests that it can rebound much more sharply than either single-family starts or sales following periods in which the housing market has been in a slump.

Continuing on the theme of mixed signals, manufacturing output fell modestly (-0.1%) in July and has been essentially unchanged since last December. This sluggish behavior has been fairly broad based but most pronounced in the production of nondurable goods. The manufacturing capacity utilization rate was 75.8 in July, essentially unchanged for a year and a half. However, the July data on new orders was somewhat encouraging. While manufacturers’ new orders fell 2.4% in July to a level below the average of the second quarter, this was due to a 52% decline in new orders for nondefense aircraft. Excluding the volatile transportation category, new orders were up a respectable 1.2% in July after declining in the second quarter. On a year-over-year basis, new orders excluding transportation were up 4% in July, the strongest year-over-year gain since March 2012. In addition to year-over-year gains in new orders for nondurable goods, there were strong gains in new orders for machinery, an important US export. This more sanguine view of the recent orders data is consistent with the upturn of the ISM manufacturing index to 55.7 in August. The new orders component of that index rose to 63.2 in August from a recent low of 48.8 in May. However, the production component of the ISM manufacturing index has also moved higher, to 62.4 in August from 48.6 in May. We will get the August industrial production data on September 16 which may help resolve this discrepancy.

High frequency data pertaining to business fixed investment suggest some slowing of growth in this component of final expenditures in the third quarters. Nominal spending on nonresidential structures grew 1.3% in July, faster than the average monthly gain of

the second quarter. Spending in this sector appears to have resumed a gradual uptrend following a precipitous decline at the beginning of this year. The Architectural Billings Index has been modestly above 50 for most of this year, consistent with gradual expansion in investment in new nonresidential structures. However, shipments of nondefense capital goods excluding aircraft fell 1.7% in July on the heels of a 1% decline in June. Fortunately, new orders are somewhat above shipments, suggesting some upturn in shipments in coming months. But even taking that into account, third quarter growth of investment in equipment is likely to continue to be sluggish, as was the case over the first half of the year.

The trade data for July were generally upbeat. In real terms, exports of goods fell 1% following strong gains in the second quarter. But despite the decline, the July level of real exports was well above the second quarter average level, suggesting another decent quarterly increase in real export volumes. Real imports rose 1.6% in July, but this follows a fairly steep decline in June. Thus, the recent data suggest a slowing in the rate of growth of real imports. We have penciled in a 0.3 percentage point net export growth contribution for the third quarter, an improvement from the average of -0.15 percentage points over the first half of the year.

Projecting current quarter growth of real federal consumption expenditures and gross investment is always problematic due to the lack of relevant high frequency data. Nominal defense outlays in July were somewhat above the average of the second quarter. But we have penciled in a 4% annual rate decline in federal spending in 2013Q3 following the relatively modest 1.6% decline of the second quarter. We have a somewhat clearer idea of the expected decline for the entire calendar year than for individual quarters based on analysis of the federal budget prepared each year by the BEA. Spending at the state and local level is expected to increase modestly in the third quarter after a protracted period of decline. State and local construction spending now appears to be on an uptrend, as is employment at the local government level.

The July price data suggest that the slowing of both total and core inflation has ended, at

least for now, but with both measures below the FOMC's target. The year-over-year change of the total PCE deflator was 1.4% in July, up from a recent low of 0.9% in April. Energy prices increased at a brisk pace in June and July, and an additional, though more modest, increase appears to have occurred in August. The year-over-year change of the core PCE deflator was 1.2% in July, the same as in the preceding three months. The year-over-year gain in prices of core services has been relatively stable, while the rate of inflation of core goods prices has moved higher in recent months due largely to rapid increases in prices of apparel and medical commodities. It is doubtful that the higher rate of increase of core goods prices will be sustained, however, as nonpetroleum import prices continue to decline.

The Outlook.

We expect growth of the US economy to begin to strengthen later this year and then move to above potential growth in 2014 (3 ¼% Q4/Q4) and 2015 (3 ¾%). The logic of this outlook is that the private sector of the economy has made substantial progress in repairing its balance sheets and working off excesses and is now ready to move to a higher level of activity. However, this transition to higher growth has been delayed by a series of negative shocks. Federal fiscal policy became quite contractionary in 2013 as the payroll tax holiday was ended, income taxes on high-income taxpayers were increased, and the sequester introduced additional restraint on spending. In addition, global growth slowed, led by a protracted recession in the Euro Area and weaker growth in many of the major developing economies.

One can cite several ongoing developments supportive of this view. Key measures of household financial conditions are the best they have been in well over a decade. Household net worth, expressed as a percent of disposable income, has returned to its average of the previous decade, reflecting rising equity and home prices and declining liabilities. Credit standards are beginning to ease somewhat, such that we are now experiencing a fairly typical cyclical recovery of consumer spending on durable goods. Similarly, after five years in which housing production was well below what is consistent with underlying demographic trends, it now appears that we have worked off the excess

supply of housing built up during the boom years of the last decade. In addition, it appears that the worst of the downturn in economic activity in the Euro Area is behind us, as is the contraction in spending by state and local governments. Federal fiscal drag is likely to reach its maximum in the second half of 2013 and then begin to subside.

As the economy moves into higher gear, the unemployment rate is projected to fall to between 6 ¼% and 6 ½% by 2014Q4 and then to 5 ¼% by the end of 2015. With the gradual reduction of slack, a decline of the dollar, a firming in global demand, and the upward pull of anchored inflation expectations, inflation as measured by the PCE deflator is expected to move back up to the mandate consistent range of by the end of 2014 and may exceed 2% temporarily in 2015.

There have been some positive developments consistent with our forecast, including the improvement in consumer confidence, the ongoing recovery of motor vehicle sales, improvement in manufacturers' orders, and more positive news out of the Euro Area and China. Moreover, home prices continue to recover and, while off recent highs, equity prices have risen substantially this year, both of which are likely to provide an additional boost to household net worth which could, in turn, prompt some decline of the personal saving rate.

There has, however, been one significant development generally inconsistent with our forecast—the steep rise of mortgage interest rates and resulting leveling off of housing starts. There have been past episodes in which long-term interest rates have moved up in anticipation of the beginning of the process of normalization of monetary policy. We suspect, however, that in the current case the movement upward is more than is consistent with underlying fundamentals. Our modal forecast presumes that the recovery of housing starts will resume later in 2013 and continue in 2014, as we expect some of the increase in long rates to be reversed in the months ahead. Moreover, in an absolute sense, mortgage interest rates are still quite low by the standards of the past 50 years. However, the possibility that housing market activity does not recover as envisioned represents a notable downside risk to the forecast.

2.2 Alternative Scenarios and Risks

Our assessment of risks to the growth outlook has modestly changed since the July Blackbook Update. The balance of risks to growth is now slightly skewed to the downside at medium-term horizons. Risks to inflation, however, remain roughly balanced. [Exhibit C-3]

These small changes in the overall risk profile reflect a decline in the likelihood of a *Productivity Boom* scenario, which is now associated with roughly a 10% probability, and a rise in the likelihood of the *Fiscal Consolidation* scenario (which has approximately 35% probability) [Exhibit C-1]. These adjustments mainly stem from the slowing of productivity growth and possible headwinds from approaching federal budget deficit and debt ceiling issues, as well as the emergence of geopolitical risks.

Exhibit C-3 also displays the baseline forecasts from the FRBNY-DSGE model (orange line). The DSGE forecast for both core PCE inflation and real GDP growth is well below the mean and modal forecasts both in the near-term and in 2014-15, confirming the tendency in the July Blackbook Update. There has been little change in the forecast distribution for both core PCE inflation and real GDP growth.

Finally Exhibit C-4 displays the evolution of the inflation and output forecast distributions over the past year. There has been a drop, relative to the September 2012 Blackbook, in the forecast of both core PCE inflation and real GDP growth for the second half of 2013 and the first half of 2014, whereas the forecasts are slightly stronger at later dates.

3. Forecast Comparison

3.1 Comparison with Private Forecasters¹

Real GDP Growth. The FRBNY projection for real GDP growth is below the range of private forecasts for 2013Q2 but falls within that range for Q3. We have substantially revised down our forecast for the current quarter, whereas Macro Advisers and the Median SPF have printed only marginal reductions. We have also reduced GDP growth in the fourth quarter by a greater amount than Macro Advisers and the Median SPF. The Blue Chip forecast is unchanged for both Q2 and Q3. On a year-over-year basis, the FRBNY growth projection for 2013 is down to 2.0% (from 2.3%), in the high range of private forecasts. Our estimate of 3.2% growth in 2014 (revised up from 3.0%) is in line with Macro Advisers' forecast but higher than the Blue Chip's forecast.

Inflation. The FRBNY year-over-year forecast of core CPI inflation for 2013 was revised up from 1.7% in July to 1.8%, above Macro Advisers and in line with the Median SPF. Our projection for 2014 was reduced by 0.3 percentage points to 2.1%---in line with the corresponding private forecasts. The FRBNY year-over-year projection for core PCE inflation in 2013 was constant 1.1%---slightly below Macro Advisers' (1.2%) and the Median SPF (1.3%). The FRBNY projection for core PCE inflation in 2014 was also constant at 1.8%, consistent with the Median SPF but above Macro Advisers (1.5%). The near-term FRBNY core PCE inflation projections for 2013Q3 and 2013Q4 are now 1.1% (down from 1.2% in July) and 1.7% (stable), respectively. The Q3 projection is below the private forecasters' range, while the Q4 projection is above the high end of that range. Our projections for CPI inflation in 2013Q3 have been significantly revised upward, from 1.8% to 2.9%. This number is in the range of private forecasts. Our forecast for 2013Q4 (2.1%) has been revised up by 0.3 percentage point and is well above the range of private forecasters' projections [1.2%,1.9%]. On a year-over-year basis, our forecast of CPI inflation for 2013 was revised up 0.3 percentage point to 1.6%, below private forecasters' (all at 1.4%). Our forecast for 2014 was revised down from 2.7% to 2.2%--- above the range of private forecasters [1.4%,2.0%].

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

3.2 FRBNY-DSGE Model Forecast

The FRBNY-DSGE model forecasts are obtained using data released through 2013Q2, augmented for 2013Q3 with the FRBNY staff forecasts 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 2013Q3 observations. The expected future federal funds rates are constrained to equal market expectations, as measured by the OIS rates, through 2015Q2, using anticipated policy shocks. The standard deviations of these shocks are estimated using federal funds rate expectations since 2008Q4, the beginning of the zero bound period. The 2013Q3 staff projections and OIS rates are those available on September 12, 2013.

Concerning the model projections for output growth, the July comprehensive NIPA revision didn't have a notable effect on the forecast. Despite the fact that 2013Q3 growth (as projected by the FRBNY staff) turned out to be somewhat below the June DSGE model forecast, the current model projections for output growth are roughly in line with those obtained in June [Exhibit E-1].

The model continues to project a lackluster recovery in economic activity, with output growth in the neighborhood of 2 percent throughout the forecast horizon. Growth forecasts for 2013 and 2014 (Q4/Q4) are both at 1.9 percent, compared to the projected rates of 1.9 and 1.8 percent reported in June [Exhibit B-8]. The forecasts for output growth are weaker than the FRBNY central forecast throughout the forecast horizon, with the exception of the very short run.

Core PCE inflation in 2013Q3 (again, as projected by the staff) turned out significantly higher than the June DSGE model projections. As a result, inflation forecasts for 2013 are somewhat above those in June, while the inflation forecast for 2014 is unchanged. As it has been for quite some time, mean and modal core PCE inflation projections are below the FOMC longer-run goal of 2 percent throughout the forecast horizon. Specifically, the inflation forecasts for 2013 and 2014 (Q4/Q4) are both at 1.2 percent, compared to 0.9

and 1.2 percent in June, and imply a slower return to the FOMC longer-run goal than the FRBNY staff forecasts.

As in the June Blackbook, there is significant uncertainty around real GDP forecasts from the DSGE model, with 68 percent probability bands covering the interval 1.2 to 2.3 percent in 2013 (Q4/Q4) and -1.2 to 4.0 percent in 2014 (Q4/Q4). The forecast distribution for inflation has also not changed significantly relative to June, with the 68 percent probability bands within the 0.6 to 2.2 percent interval throughout 2015. Reflecting the differences in the modal forecasts, the DSGE forecast distribution is shifted downward relative to the FRBNY forecast distribution.

The FRBNY-DSGE forecast is driven by two main factors. On the one hand, the headwinds from the financial crisis, as captured by the effect of shocks to credit spreads and to the marginal efficiency of investment (MEI), result in low real activity, low real marginal costs, and consequently, low inflation. The economy experienced large spreads shocks during the Great Recession and a sequence of adverse MEI shocks afterwards. Given that these shocks have persistent effects on output growth and inflation, financial headwinds continue to negatively affect the forecasts for real activity and inflation throughout the end of the forecast horizon. On the other hand, accommodative monetary policy, particularly in the form of forward guidance, has played an important role in counteracting these headwinds, and has had some positive effect on output and inflation. However, the impact of past forward guidance on the *level* of output has begun to wane by now, according to the model. This implies that the effect of policy on *growth* forecasts is actually negative, particularly toward the end of the forecasting horizon. This largely explains why output growth is still below trend by the end of 2015.

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, throughout 2013 the historical rule would imply the policy rate at about 25 basis points. However, by early 2015, the policy accommodation provided by the forward guidance becomes more noticeable, implying a federal funds rate path below the historical rule by about 75 basis points.

Forecast Comparison with the Tealbook

- *Tealbook policy assumption:* the policy assumptions have not changed since the July Tealbook.
- The Tealbook forecasts for real GDP growth for 2013 and 2014 were reduced to 2.3% and 3.1%, respectively [Exhibit B-6], slightly above those in the Blackbook. More importantly, the projected paths of some of the spending components in the Tealbook are quite different from those in the Blackbook:
 - The Board staff slightly lowered its forecast for consumption expenditure in 2013 relative to the July Tealbook, but continues to anticipate a very strong rebound in 2014, with a growth contribution (Q4/Q4) of 2.5 percentage points. The rebound is supported by the continuing increase in both equity and house prices, which have strong wealth effects on consumption. In our staff forecast, by contrast, consumption expenditure remains subdued, with a growth contribution of 1.9 percentage points for 2014, down from 2.0 percentage points in the previous Blackbook.
 - Conversely, while the Blackbook expects business fixed investment to pick-up in 2014, with a growth contribution of 1.0 percentage point (up from 0.3 percentage point for 2013), the Tealbook expects business fixed investment to remain equally subdued in 2013 and 2014, with growth contributions of 0.3 percentage point and 0.6 percentage point, respectively.
- Both the Tealbook forecast and the Blackbook forecast for the path of productivity growth have increased relative to July. The Board's forecast of productivity growth in 2013 is now 1.1%, up from 0.3% in the July Tealbook, while our staff's forecast has increased from 0.3% to 0.9%. Both the Board and our staff project a further increase in productivity growth in 2014 to 1.4% and 1.5%, respectively.
- The Board and our staff have the same forecast of 7.2% for the unemployment rate in 2013, and there is only a small divergence in the forecast for 2014, which is 6.3% for our staff and 6.6% for the Board.

4. Robustness of Policy Recommendation

4.1 Sensitivity to Alternative Scenarios and Policy Rules

Our current policy recommendation implies a target range for the federal funds rate of 0 – 0.25% until mid-2015 under our central scenario. There has been little change in the path of the FFR implied by the central scenario since the June Blackbook, the last time we conducted this analysis, whereas the market implied path has risen substantially for the second half of 2014 and beyond [Exhibit D-1]. Under the fiscal consolidation scenario, liftoff does not occur before the end of 2016, while under the faster growth scenario, liftoff occurs by 2014Q1. The liftoff date in the market implied FFR path is also 2014Q1. It is important to keep in mind, however, that standard Taylor-type rules do not necessarily provide good approximations of optimal policy when policy is constrained by the zero lower bound, as a commitment to maintain rates at a low level for longer than prescribed by standard rules may be necessary to provide the appropriate level of accommodation. In both the central scenario and the fiscal consolidation scenario, the real FFR remains well below zero at the end of 2016, while it becomes positive by early 2016 in the faster growth scenario.

In Exhibit D-2, we report the projected liftoff probabilities over the next six quarters from the FRBNY forecast and the FRBNY DSGE model. The path projected by the FRBNY forecast shows that the liftoff probability has risen substantially since the June Blackbook. The probability is close to zero in 2013Q3 and Q4. In 2014Q1, it rises to approximately 3%, similar to the June Blackbook. It continues to rise to 10% in 2014Q2, to 15% in 2014Q3, and to close to 20% by 2014Q4. The corresponding DSGE model probabilities are much higher, though they have not risen as much since the June Blackbook, and the probability for 2013 Q3 has actually declined. For example, in 2014Q1, the DSGE model estimates a slightly higher than 20% probability of liftoff, little changed from the June Blackbook estimate. We also compare the market implied forecasts for the liftoff probability to the baseline and the DSGE probabilities for 2013Q4 and 2014Q4. The market probability is zero for 2013Q4 but rises to 20% for 2014Q4,

more than double the market forecast probability for the June Blackbook.

4.2 Comparison to Market Expectations

The expected FFR path derived from overnight index swaps (OIS) moved up relative to the July Blackbook (Exhibit A-5). The path is now consistent with a lift-off in 2014Q1, one quarter earlier than in the July Blackbook. The Survey of Primary Dealers, however, reveals no change in the median of the modal lift-off expectations, with the first rate hike projected to occur in 2015Q3.

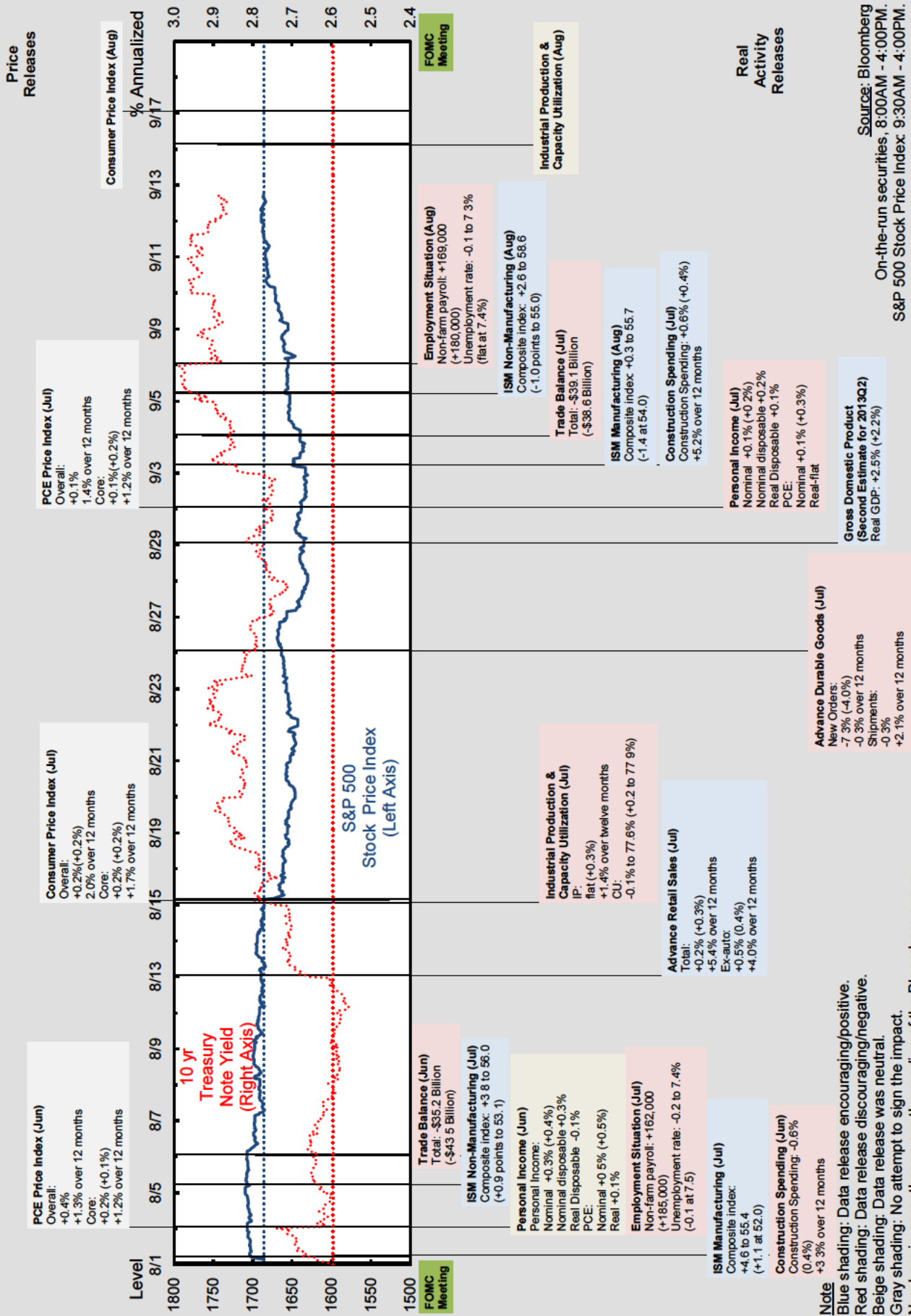
Dealers placed a higher probability on the first cut in the asset purchase program being announced in September than they did in the last survey. Sixteen dealers expect the FOMC to announce a reduction of asset purchases at the September meeting, with a median reduction size of \$10 billion in Treasuries and \$5 billion in MBS among this subset. The overall size of asset purchases as derived from the median of dealers' implied SOMA paths now stands at \$1.37 trillion, including 2012 purchases. Measures of uncertainty and disagreement around the overall level of the SOMA portfolio in 2014 continue to decline.

5. Significant Developments

5.1 Economic Developments

Foreign Data Releases. *Europe:* The euro area recession ended in Q2, with GDP increasing 1.2% (saar). Consumption and exports were major contributors to growth, while investment spending was flat, and inventories were a drag. Government consumption was notable for adding 0.4 percentage point to growth, a turnaround from the steady decline in government spending since 2010. Consumer confidence moved higher in August, a trend that started at the beginning of the year. The composite PMI readings improved over the course of Q2, and they were above the threshold that signals growth in July and August. The unemployment rate was 12.1 percent in July, near where it has been for the year.

Key Data Releases



The United Kingdom grew 2.9% in Q2, supported by exports and consumption. The August manufacturing PMI hit a two and a half year high. Industrial production dropped in July, undoing the June gain. Still, it was the first year-over-year increase since early 2011.

Japan: GDP rose 3.8% in Q2, following 4.1% growth in Q1. Manufacturing rebounded in July, putting the index above the Q2 level, but unchanged over the year as the substantial improvement in 2013 just offset the steep drop in the second half of last year.

Consumption is being supported by an increase in bonuses and the lowest unemployment rate since 2008. June and July retail sales data, however, point to some moderation after very strong numbers in the first half of the year. Weak export volume data for July and PMI readings for export orders in August suggest a slowdown in foreign sales growth in Q3. The August PMI headline reading recovered to a relatively high level after falling in July. The July CPI index excluding food and energy was down only 0.1% compared to its level last year. Non-oil import prices are up 12% since the beginning of the year.

Emerging Asia: China's data for production, investment spending, retail sales, and PMI have been stronger than expected. In addition, the solid export performance in August suggested a modest recovery in external demand. GDP growth in Q2 was stronger than expected in Singapore and Hong Kong, while weaker than expected in Thailand and Malaysia.

Latin America: Brazil had solid growth in Q2, but Q3 activity looks to be weaker due to summer protests and volatility in domestic financial markets. Inflation slowed year-over-year in August to 6.1%, but accelerated sequentially. Mexico's output fell unexpectedly in Q2. The drop was led by construction amid policy changes that buffeted homebuilders. Services activity decelerated notably. Survey data for Q3 have been subdued, with the manufacturing PMI for August rising, but not by enough to move it out of contractionary territory. Core inflation remains low (2.4%) and on a declining trend.

5.2 Financial Markets

Domestic Financial Markets.

Nominal Interest Rates: Interest rates have continued to rise since the end of July. The two-year Treasury yield now stands at 0.45 percent — the highest level since mid-2011. Over the same period, the ten-year Treasury yield has risen by about 30 basis points to 2.91 percent. The increase was accompanied by an increase in mortgage market rates. Survey-implied expectations of the future path of short-term rates are largely unchanged over the past few months, implying that the increase in yields is attributable to a corresponding increase in term premia. This is consistent with estimates from the New York Fed staff term-structure model. Meanwhile, option-implied volatilities in Treasury and swap markets, as measured by the 3-month MOVE and SMOVE indices, have also increased from all-time lows observed at the beginning of May. However, these indices remain well below levels observed during the financial crisis. [Exhibit A-3: Treasury Yields]

Inflation Compensation: Breakeven inflation rates have fallen only modestly since the end of July as the bulk of the rise in nominal yields has been matched by a rise in real yields. The current level of breakeven inflation rates are close to their historical averages, suggesting that market-implied measures of inflation expectations are well anchored. Similarly, survey-implied measures of inflation expectations remain stable. Respondents from the third-quarter Survey of Professional Forecasters expect the price index for personal consumption expenditures to increase 2 percent on average over the next 10 years. This is identical with the FOMC's explicit definition of its price stability mandate that was announced on January 25, 2012. [Exhibit A-4: Real Yields and Implied Inflation]

Expected Policy Path: The expected path of the federal funds rate, as inferred from market data, has shifted significantly upwards since the end of July. Expectations now seem to suggest an earlier liftoff date with a faster pace of tightening thereafter. Market quotes derived from Overnight Indexed Swaps (OIS) imply that the federal funds rate is expected to be above the current range of 0 to 0.25 percent in the second half of 2014 and

above 1 percent by the end of 2015. Meanwhile, survey-implied expectations for the future path of the federal funds rate suggest a later date for the first tightening. The average survey response from the Blue Chip Financial Forecasts' September 2013 panel (conducted on August 26-27) is consistent with a continuation of the current target range for the federal funds rate through the end of 2014. About 60% of survey respondents expect the first federal funds rate rise to occur after the first quarter of 2015. [Exhibit A-5: Policy Expectations]

Equity Markets: While interest rates have continued to rise, the S&P 500 index is largely unchanged since the end of July. The index now stands at 1672 which is about 7 percent above the peak attained at the end of the previous cycle in October 2007 and about 17 percent above the level observed at the end of 2012. Equity valuations are likely supported by a more optimistic domestic outlook, higher earnings expectations, and relatively low Treasury yields. Implied equity volatility, as measured by the VIX, has risen only modestly since the end of July. The index now stands at 15.6 which is well below the recent spike observed in the summer of 2011 during the debt-ceiling debate. [Exhibit A-6: Equity]

Credit Spreads: Broad measures of corporate credit spreads were largely unchanged since the end of July; however, levels remain toward the low end of the range observed in the post-crisis period. Investment grade corporate bond spreads to comparable maturity Treasuries now stand at 155 basis points, which is very near the level observed at the end of 2012. Meanwhile, high yield corporate bond spreads to comparable maturity Treasuries now stand at 466 basis points, which is 65 basis points below the level observed at the end of 2012. Primary and secondary mortgage market rates have increased since the end of July and currently stand at 4.56 percent and 3.66 percent, respectively. However, because both rates rose by about 20 basis points the primary-secondary mortgage rate spread is largely unchanged over the period and remains well below its peak of 173 basis points observed after the September 2012 FOMC meeting. [Exhibit A-7: Credit]

Foreign Financial Markets.

Euro Area: Improved economic data, for the euro area as well as for the U.S and the U.K., combined with increased expectations for the Federal Reserve to reduce the pace of asset purchases led to steeper euro area sovereign debt curves. German and French 2-year yields increased 10 basis points over the intermeeting period, and 10-year yields were up by 30 basis points. Peripheral euro area sovereign spreads continued to narrow, with the exception of Portuguese and shorter-dated Italian sovereign spreads. Portugal's Constitutional Court rejected measures to meet the country's fiscal consolidation program targets, raising investors' fears that Portugal may not qualify for the next tranche of aid funding. Two-year Portuguese sovereign spreads were up by 165 basis points amid limited liquidity. Political uncertainty in Italy also returned after a tax fraud conviction against former Prime Minister Berlusconi was upheld in court. Two-year Italian spreads widened by 40 basis points over the period, largely due to Berlusconi's threat to withdraw support from the governing coalition. Since the last FOMC meeting, the euro was roughly unchanged against the dollar, whereas equities have risen by 1 percent.

Japan: Concerns over the status of the country's planned consumption tax hike, scheduled to be implemented in 2014 and 2015, resulted in modest volatility in foreign exchange and Japanese equity markets. At the end of the period, the upward revision of Q2 GDP along with Tokyo winning the bid for the 2020 Olympics supported risk sentiment. Over the period, Japanese equities increased 4 percent, while the yen depreciated 2 percent against the dollar.

Emerging Asia: Shifting expectations about monetary policy in the U.S. and heightened investors' concerns regarding economies with large current account deficits resulted in EM Asian currencies that were, on average, 1 percent weaker against the dollar over the intermeeting period. In particular, the Indian rupee and the Indonesian rupiah lost a lot of ground, as they have been among the EM Asian economies with the most persistent current account deficits. EM Asia 5-year bond yields rose by 30 basis points, led by an 80 basis points increase in Indonesian bond yields. Equities in the region advanced 2

percent on average, with Chinese shares up sharply as recent data releases are showing signs of a stabilization of the Chinese economy.

Latin America: The Brazilian real was under heavy pressure through end-August. However, the central bank's offer to provide foreign exchange liquidity through year-end helped the currency retrace some of its declines towards the end of the intermeeting period. Brazilian bond yields, meanwhile, rose amid ongoing monetary policy tightening. Very weak activity data weighed on the Mexican peso, while Mexican bond yields were unchanged over the intermeeting period after initially declining in the wake of an unexpected central bank rate cut.

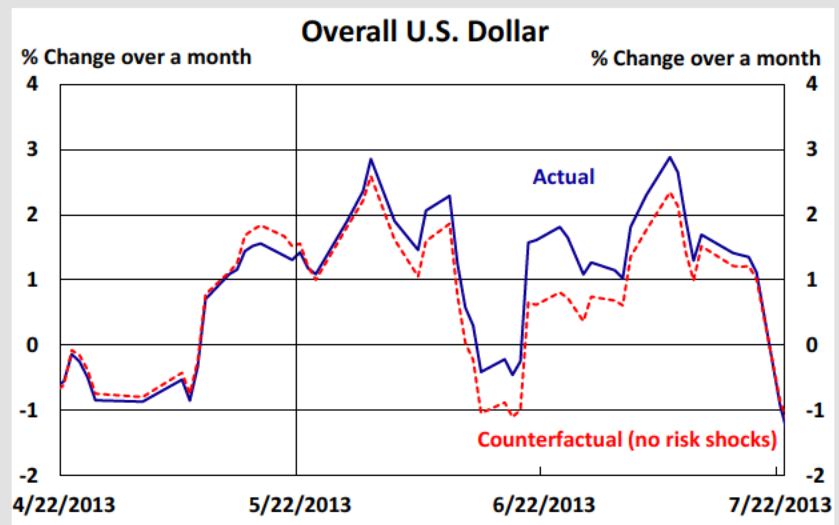
Special Topic: U.S. Monetary Policy and Global Asset Prices

Jan Groen

The recent global asset sell-off of emerging market (EM) equities and currencies of countries with high interest rates (“carry trade” currencies) is attributed to changes in the outlook of U.S. monetary policy. Evidence for this assertion is that the sell-off is dated back to comments made by Chairman Bernanke on May 22 concerning the future course of the asset purchase program.

This note measures how changes in risk aversion affected carry trade currencies and EM equities since May. The impact of changes in risk aversion on asset prices is estimated with a vector autoregressive (VAR) model using data for United States, euro area, Japanese and EM equity markets, the U.S. and euro area bond markets, commodities, and two currency variables. Shocks to risk aversion are derived by shifts in the correlations across the VAR residuals when there are very large changes in implied volatility across equity, bond and currency markets.

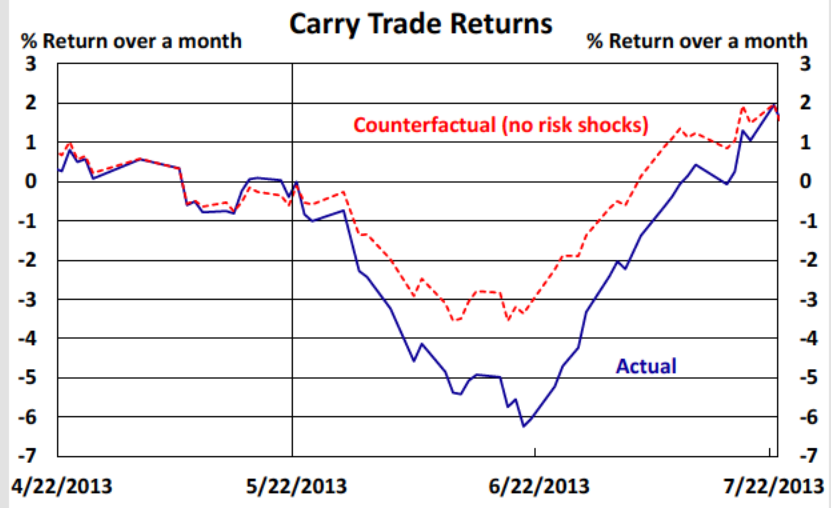
The chart on the right is for the percent change on a given day over the previous month for an index of 45 dollar exchange rates. The blue line is actual data and the red line is the counterfactual version where the VAR model removes the effect of shocks to global risk aversion on the



index. The red line thus reflects counterfactual prices with no change in risk aversion. The model suggests that the dollar has been supported by increased risk aversion since May.

The following chart considers carry trade currencies. These currencies are those amongst the sample of 45 dollar pairs that have the largest interest rate differential with one-month U.S. rates. The non-carry trade currencies are those with interest rates that are similar or lower than U.S. rates. The carry trade return is

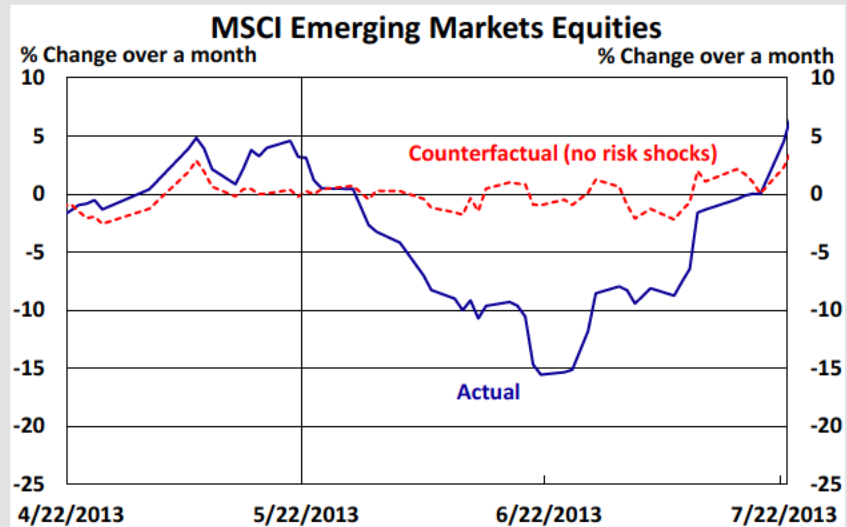
how much the basket of carry trade currencies appreciated relative to non-carry trade currencies. The model results indicate the drop in carry trade currencies has been accentuated by the increase in global risk aversion since May.



The chart on the right is for EM equity prices and attributes essentially all of the percent changes in June and July to the increase in global risk aversion.

Note that by August, risk aversion shocks are no longer affecting prices according to

the model as the actual and counterfactual series converge in all three charts.



The changes in risk aversion since May are similar to previous episodes during which Fed policy shifted to a tightening stance after prolonged periods of easing:

- In June 2004, the FOMC announced a 25 basis points increase in its fed funds target which had been at 1 percent since June 2003. The hike had been signaled at the

previous meeting (May 5).

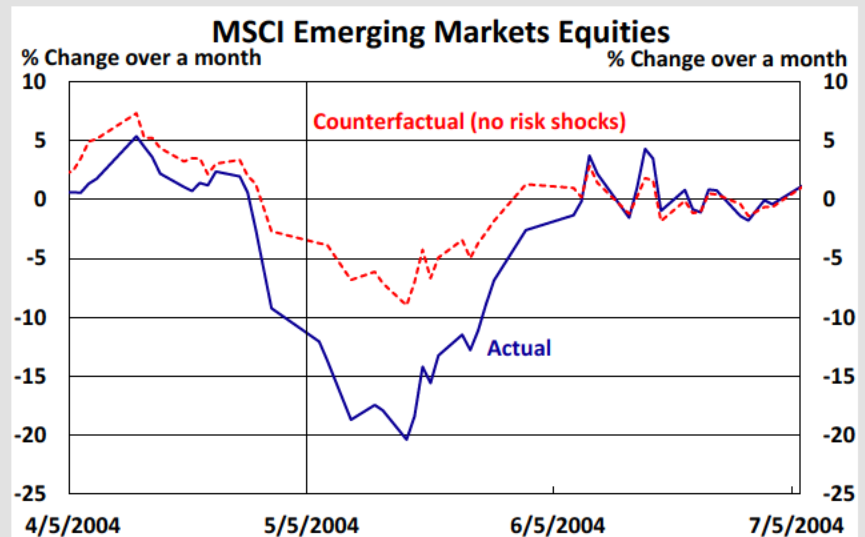
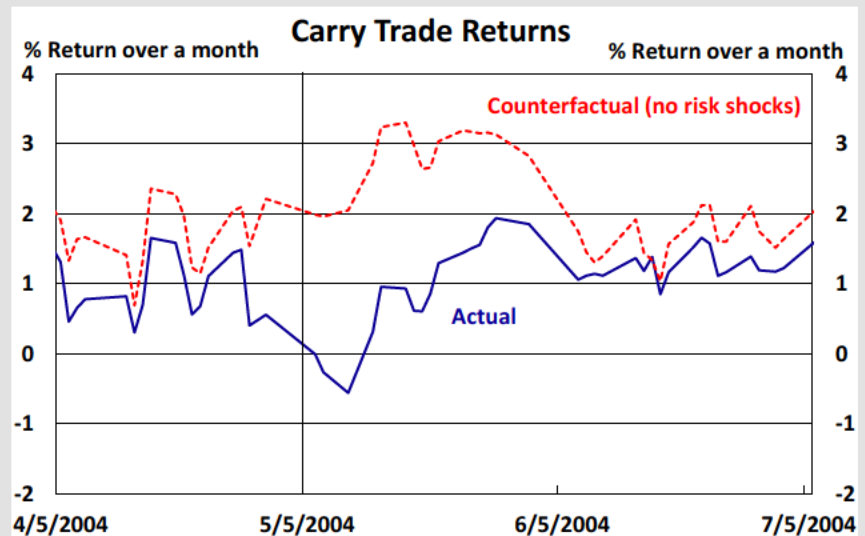
- On February 4, 1994, the FOMC surprised markets with a rate increase after having kept the fed funds rate at 3 percent throughout 1993.

What follows is a repeat of the calculation of the likely impact of changes in risk aversion immediately after these two FOMC announcements.

Like the most recent period, model estimates show that risk aversion affected carry trade currencies and EM equities in 2004 (the charts on the right) and 1994 (the charts on the next page). The carry trade and EM equities returns start to substantially undershoot their

counterfactual values around the dates of the FOMC announcements. The emergence of a gap between the blue and red lines, which reflects how the model's measure of changes in global risk aversion affected prices, coincided with FOMC announcements. The

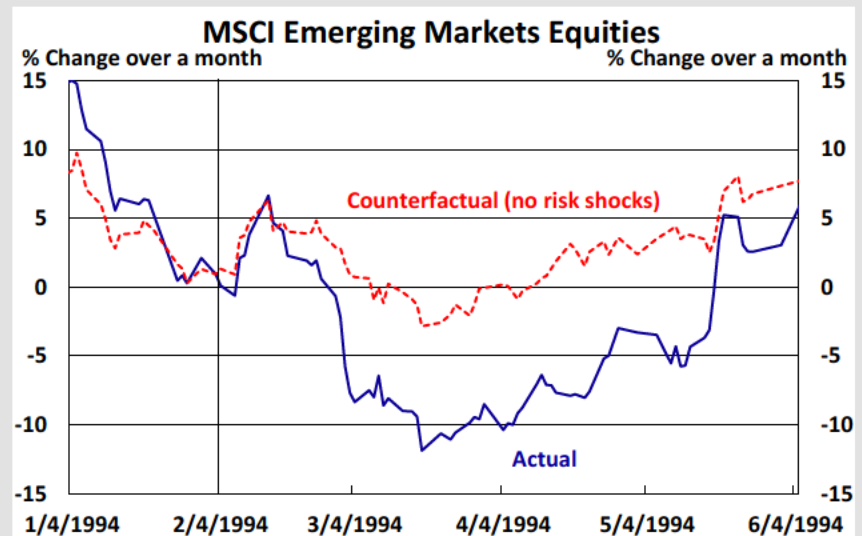
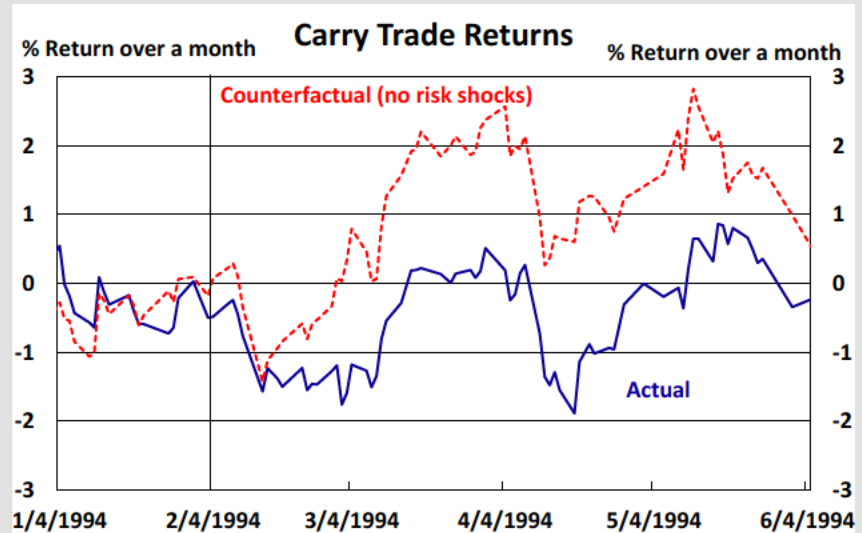
increase in risk aversion caused high interest rate currencies to depreciate more than low interest rate currencies, as well as for EM equities to perform poorly.



In 2004, the actual and counterfactual for carry trade returns and EM equities converged after a month. It took three months in 1994 for the actual and counterfactual change in EM equity prices to converge, while carry returns continued to be affected even after three months.

Overall, these historical episodes suggest that the initial signal of U.S. monetary policy tightening tends to increase global risk aversion, which puts downward pressure on global asset prices in the subsequent months after the signal. In

addition, the global asset price developments since May have not been out of the ordinary and the impact of the initial signaling of tighter policy has run its course.



5.3 Global Economic Policy

Euro Area: Unsurprisingly, the ECB left its main refinancing rate unchanged at its September policy meeting, and where it has remained unchanged since the rate cut in May. In the statement after the September meeting, the ECB repeated its forward guidance language, first invoked in July, stating that rates will remain at present or lower levels for an extended period. The guidance does not depend on economic performance. A likely reason why the ECB reiterated its forward guidance language is that it fears euro area interest rates will rise when the Federal Reserve slows the pace of its asset purchases and it is using the forward guidance to weaken the link with U.S. policy. At the accompanying press conference, President Draghi tried to put downward pressure on yields by making a point of underlining the fragility of the recovery and revealing that a rate cut was discussed at the September meeting.

Japan: At its April policy meeting, the Bank of Japan announced easing measures that will drastically ramp up asset purchases and increase the duration of assets held on its balance sheet, with the aim of achieving its 2 percent inflation target within the next two years. Subsequent meetings, the last one on September 5, have kept its policy stance unchanged. The monetary base is now the Bank's target and it was up 42 percent over the year in August. Loan growth, however, remains subdued. At its September meeting, the Bank upgraded its assessment of the economy, stating that inflation expectations appear to be rising and the economy was recovering moderately.

Canada and the U.K.: The Bank of Canada left its policy rate unchanged at 1.0 percent in September. The Bank projects that the economy will not reach full capacity until mid-2015. At its September meeting, the Bank of England maintained its policy rate at 0.5 percent and its asset purchase program size at £375 billion. In its quarterly *Inflation Report*, the Bank announced it would keep rates low until unemployment falls below 7 percent. The announcement has been interpreted by market participants as clarifying rate policy rather than offering additional stimulus.

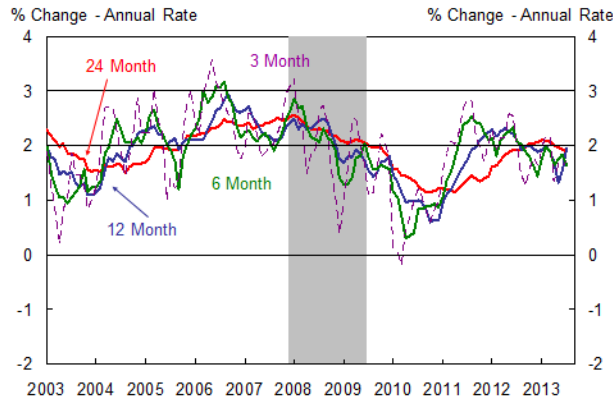
EM Asia: Capital outflows across EM Asia since May have led to foreign currency reserve sales by central banks aimed at containing the weakening pressures on their currencies. India and Indonesia have tightened monetary policy to support their currencies in the face of strong depreciation pressures. EM central banks are generally expected to remain on hold through year-end. Indonesia is the exception and is likely to hike its policy rate by year-end. India is providing liquidity to state-owned oil importers and increased its swap line with Japan.

Latin America: The central bank of Brazil increased its policy rate by 50 basis points on August 28, bringing the cumulative rate hikes since April to 175 basis points. An additional 50 basis points of hikes are expected by year-end. The Brazilian central bank announced that it would hold daily dollar liquidity auctions through end-2013, and this replaces ad hoc currency intervention activity by the Bank that has been underway since late May. The new program provides forward dollar liquidity to facilitate hedging (\$2 billion per week) and offers spot dollars through repurchase operations (\$1 billion per week). Mexico's central bank unexpectedly reduced its policy rate by 25 basis points to 3.75 percent at its September policy meeting. The Bank cited the absence of demand-side pressures given substantial economic slack, as well as upcoming fiscal reforms aimed at reinforcing Mexican public finances that likely will lead to fiscal tightening.

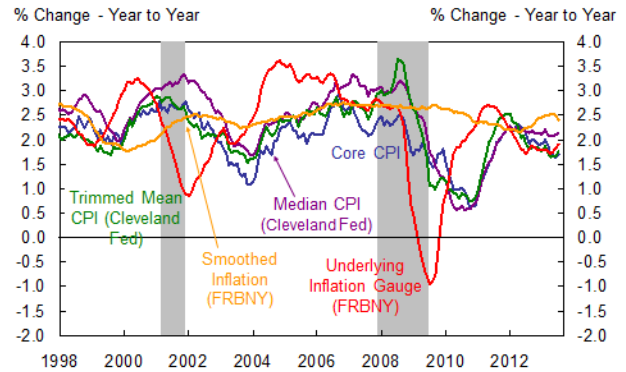
A. Significant Developments

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

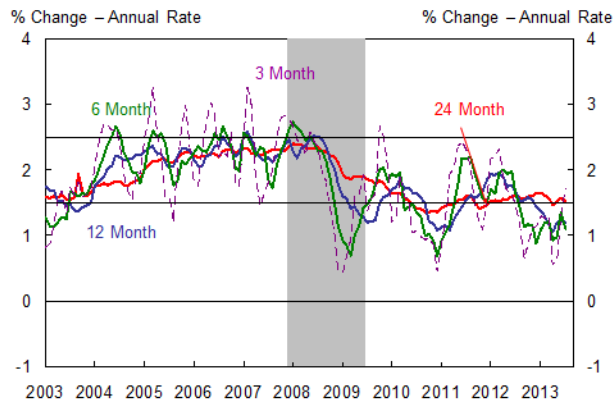
Core CPI Inflation over Various Horizons



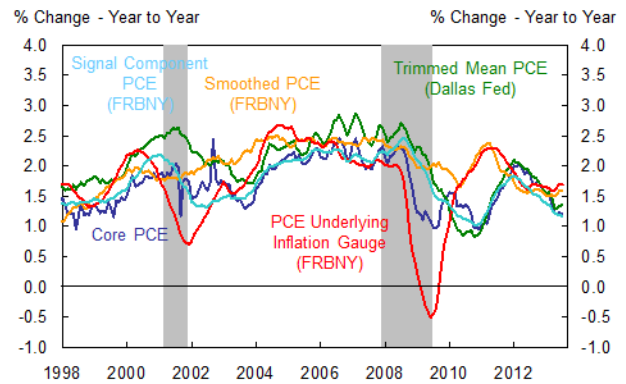
Alternative Measures of CPI Inflation



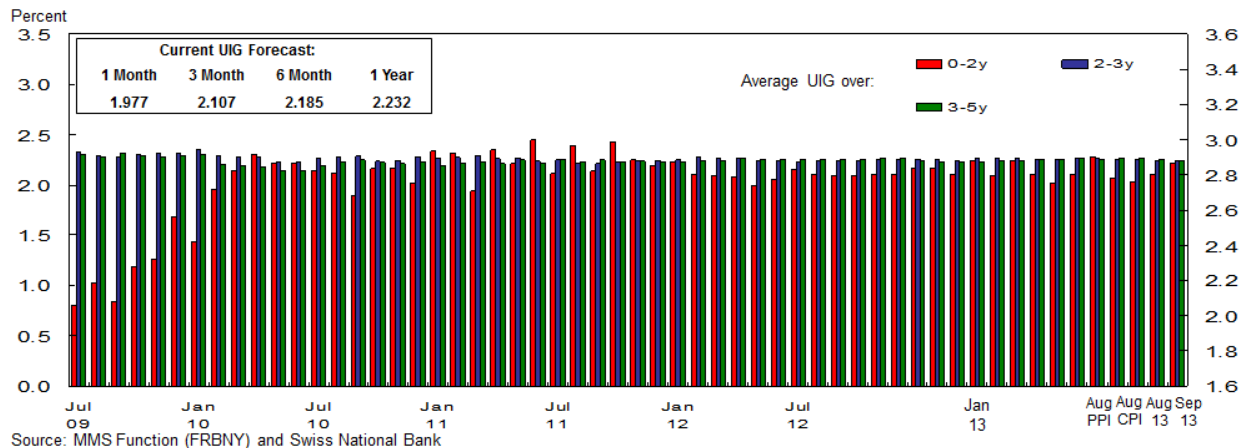
Core PCE over Various Horizons



Alternative Measures of PCE Inflation



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



A. Significant Developments

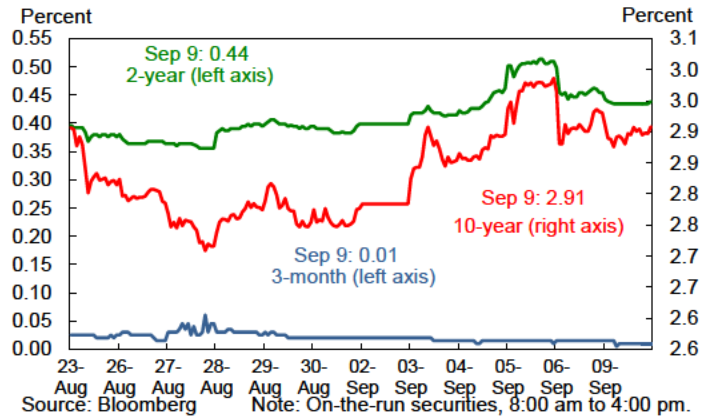
Exhibit A-3:
Treasury Yields

Short- and Long-Term Rates

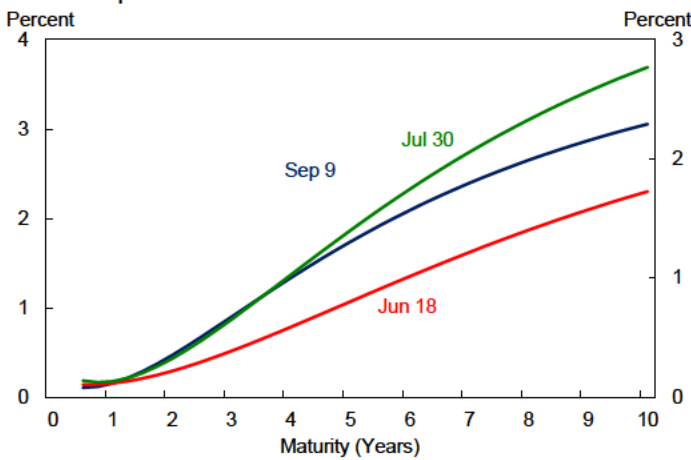


Source: Bloomberg Note: Yields of on-the-run securities.

Short- and Long-Term Rates (Intraday)

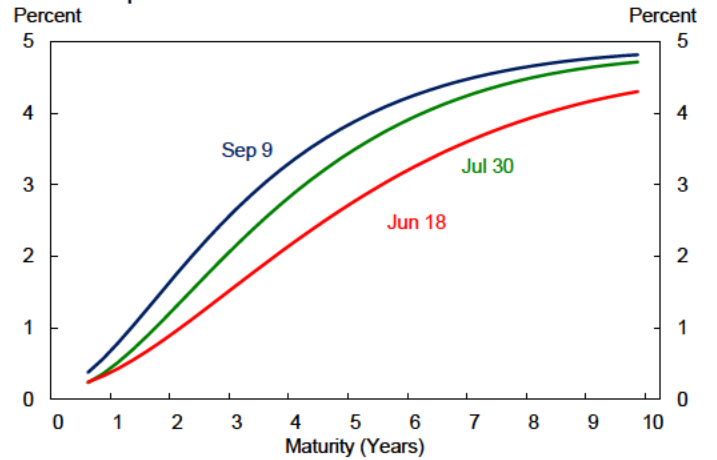


Zero Coupon Yield Curves



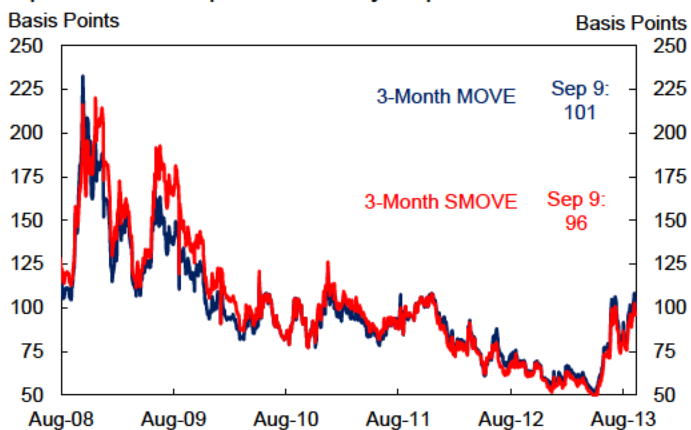
Source: Federal Reserve Board

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

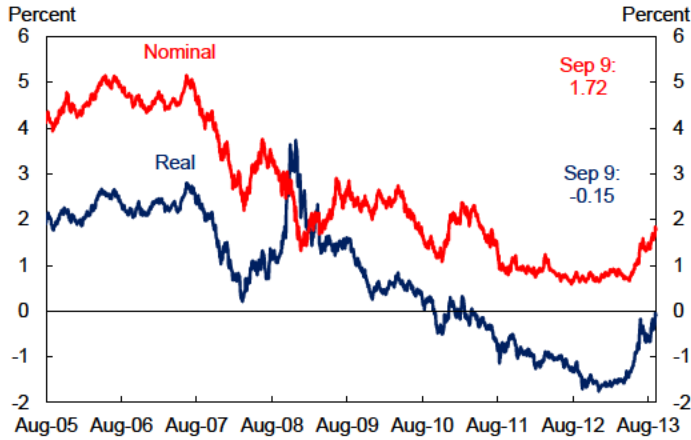


Source: FRBNY calculations, Federal Reserve Board

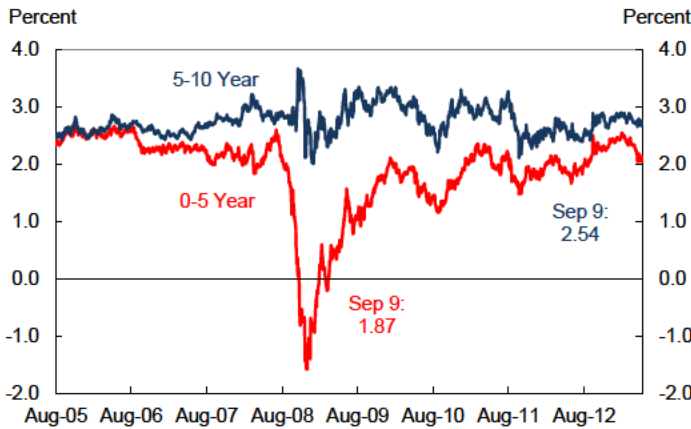
A. Significant Developments

Exhibit A-4:
Real Yields and Implied Inflation

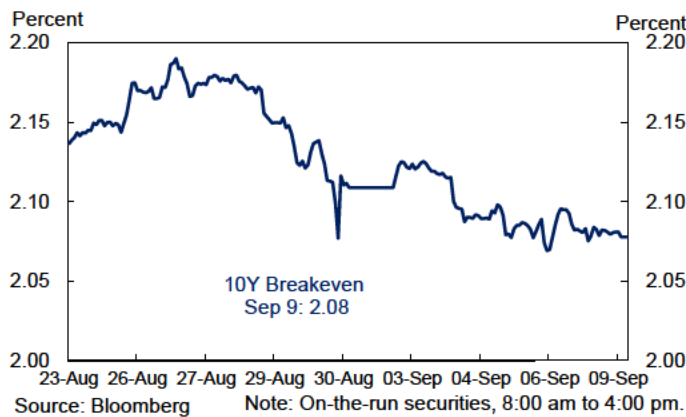
5 Year Spot Rate



Source: Federal Reserve Board
TIPS Implied Inflation Compensation: 0-5, 5-10 Year Horizons

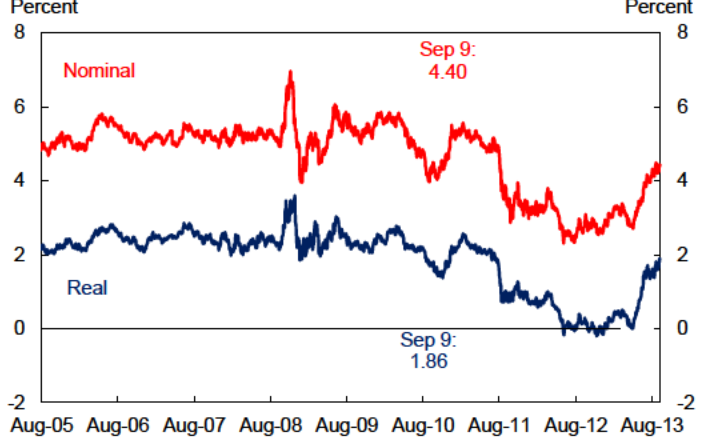


Source: Federal Reserve Board Note: Carry-adjusted.
10-Year Breakeven Inflation Compensation (Intraday)

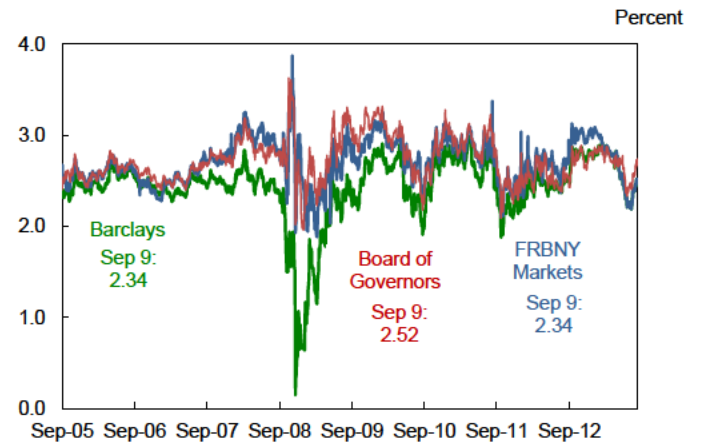


Source: Bloomberg Note: On-the-run securities, 8:00 am to 4:00 pm.

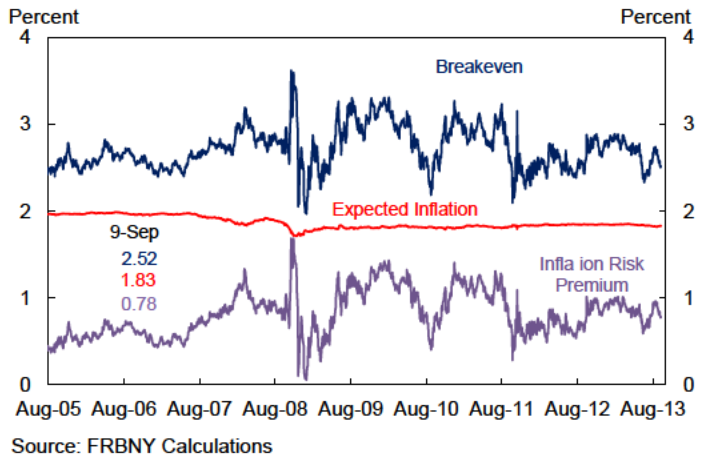
5-10 Year Forward Rates



Source: Federal Reserve Board
Alternative Measures of 5-10 Year Implied Inflation Compensation



Source: Federal Reserve Board, Barclays, and FRBNY calculations
5-10 Year Forward Decomposition (2005-present)

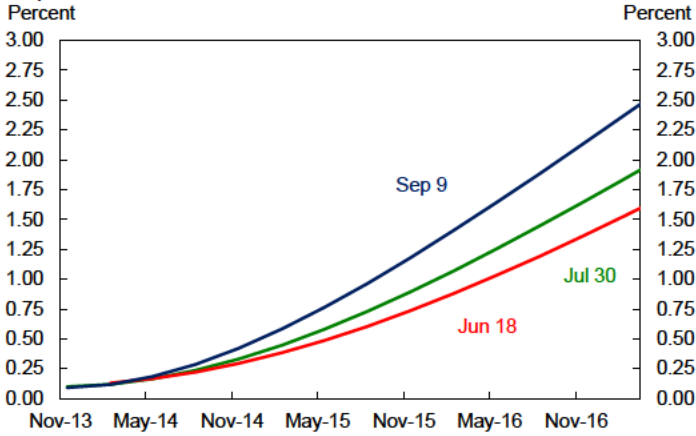


Source: FRBNY Calculations

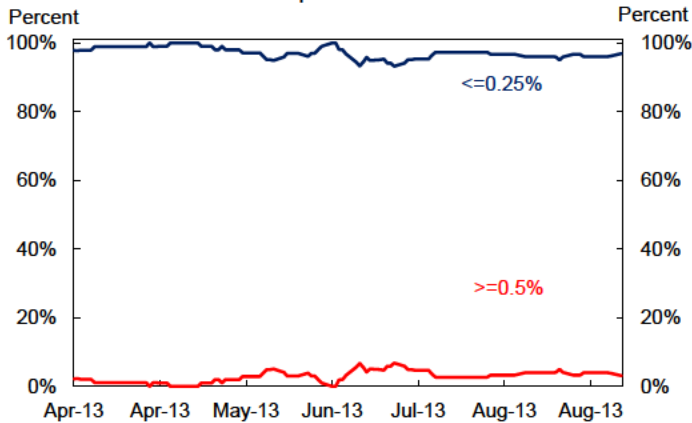
A. Significant Developments

**Exhibit A-5:
Policy Expectations**

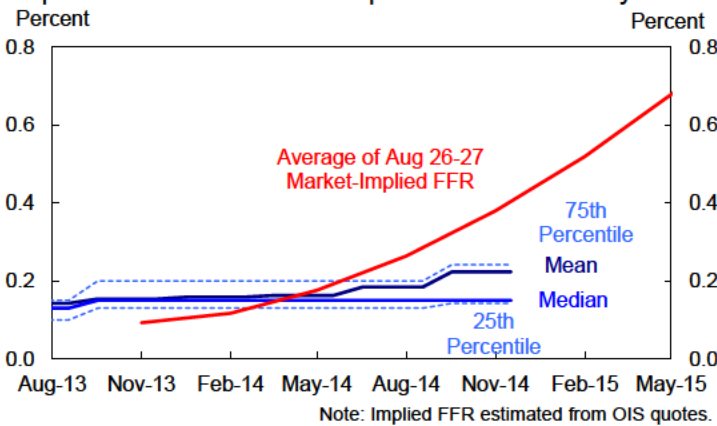
Expected Fed Funds Rate



Source: Federal Reserve Board Note: Estimated using OIS quotes.
Fed Funds Probabilities Sept 2013

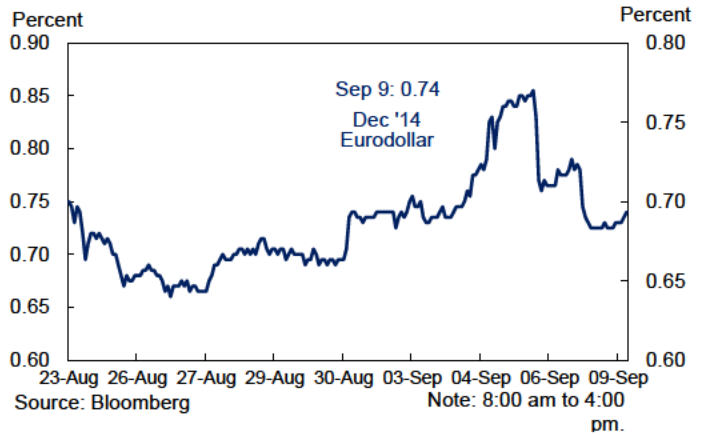


Source: Bloomberg Note: Estimated from Fed Funds Futures
Expected Fed Funds from September 2013 Survey

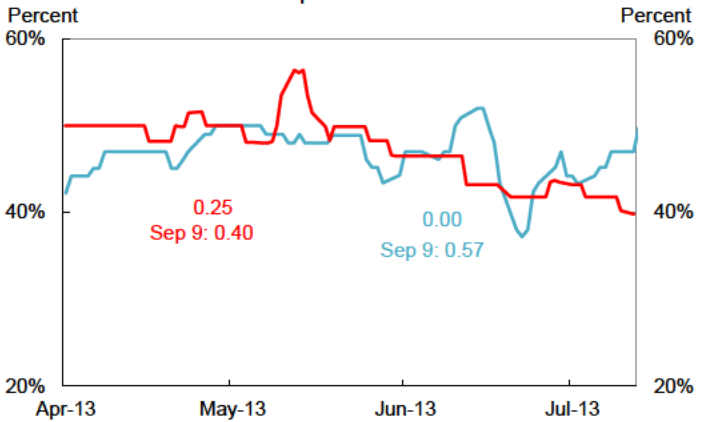


Source: The Blue Chip Financial Forecast conducted on August 26-27.

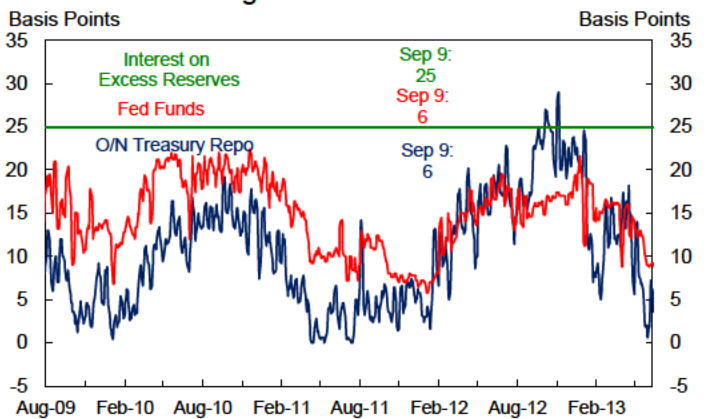
Implied Eurodollar Rates (Intraday)



Fed Funds Probabilities September 2013



Source: Bloomberg Note: Estimated from Fed Funds Futures
Short Term Funding Rates

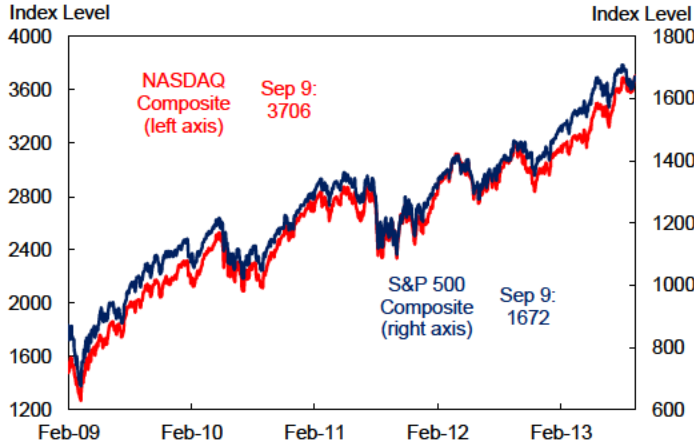


Source: Bloomberg, FRBNY calculations Note: 1-week moving averages.

A. Significant Developments

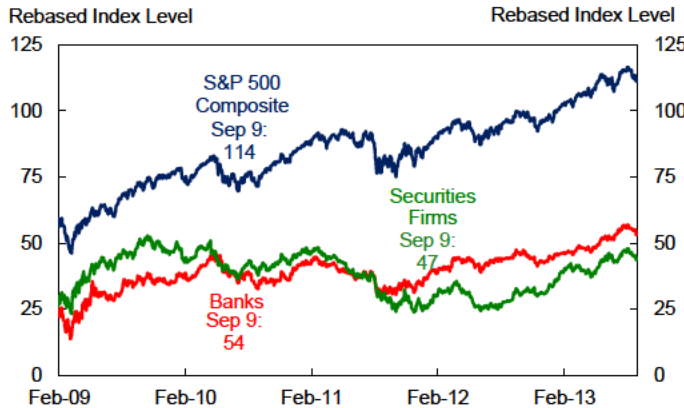
Exhibit A-6:
Equity

Equity Index Levels



Source: Bloomberg

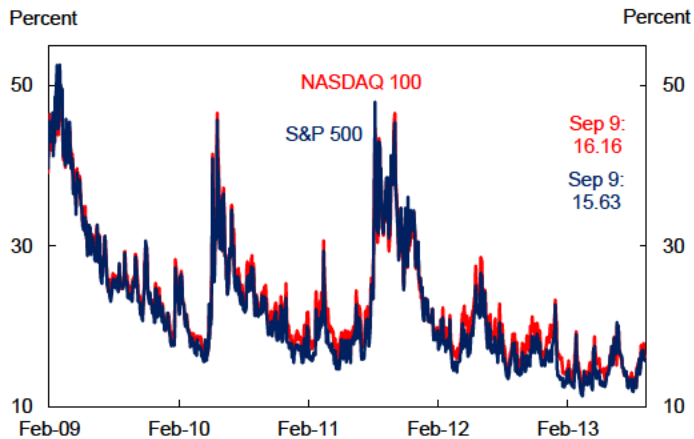
Equity Performance



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.

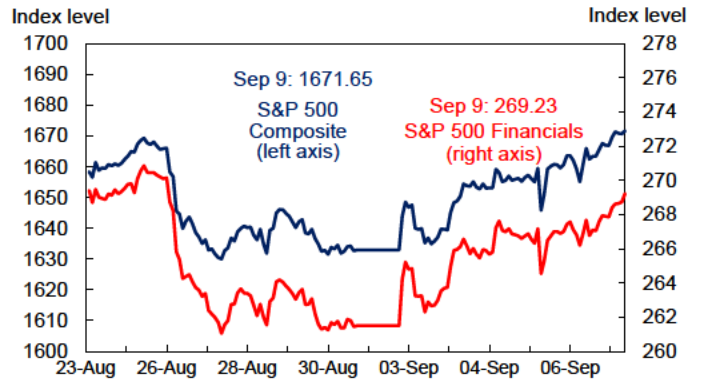
Source: Bloomberg

Equity Index Implied Volatility: 1-Month



Source: Bloomberg

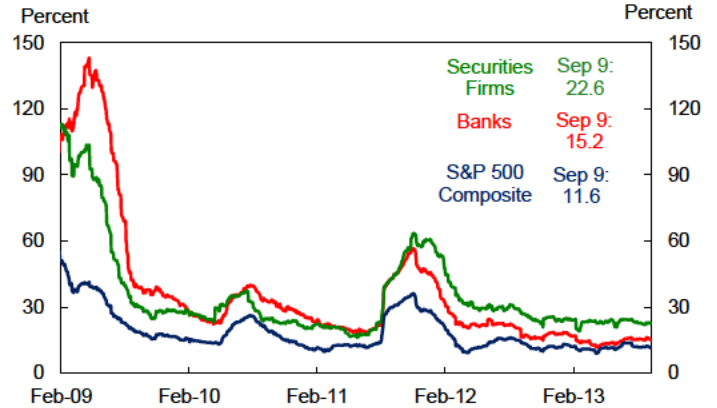
S&P 500 Indices (Intraday)



Source: Bloomberg

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

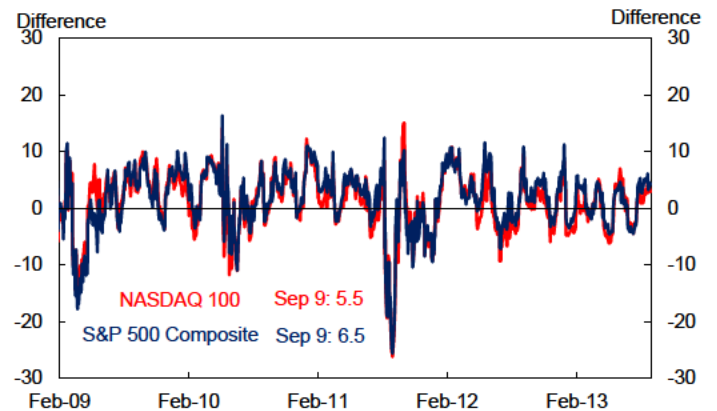
Historical Equity Volatility



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.

Source: Bloomberg

Difference of Implied and Realized Volatility



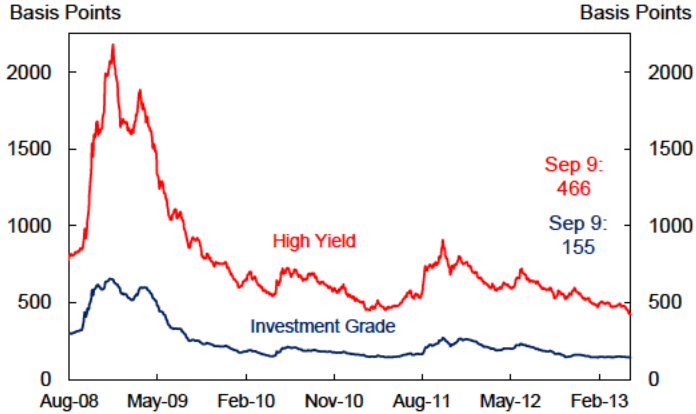
Source: Bloomberg

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

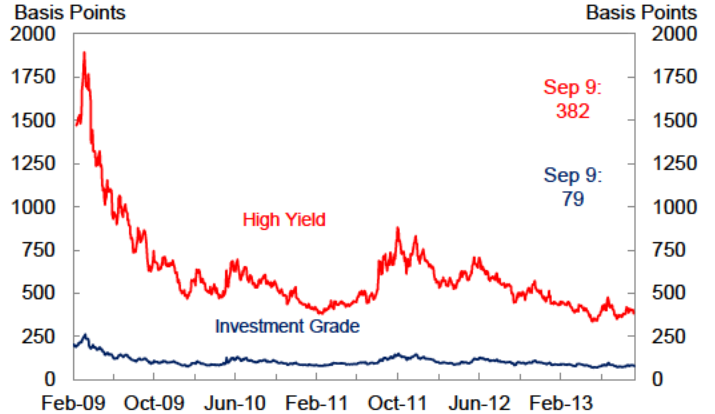
Corporate Credit Spreads



Source: Merrill Lynch

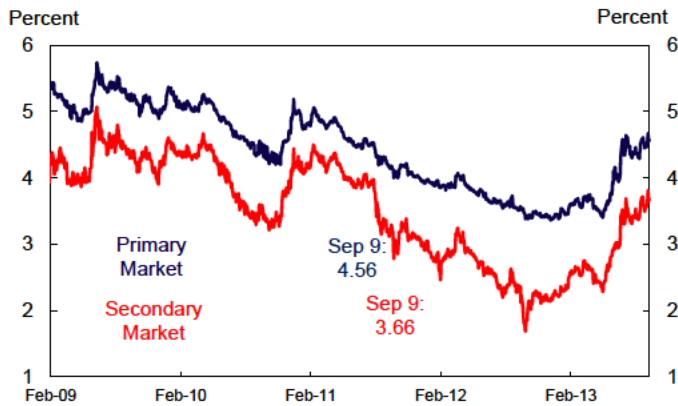
Note: Option-adjusted spreads.

CDS Spreads



Source: Bloomberg

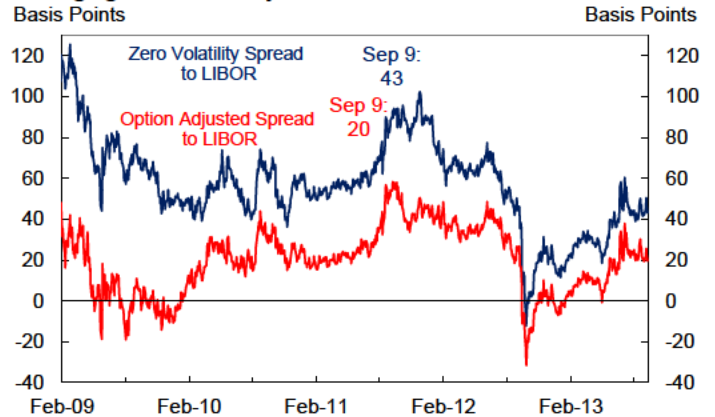
Mortgage Market Rates



Source: Bloomberg

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

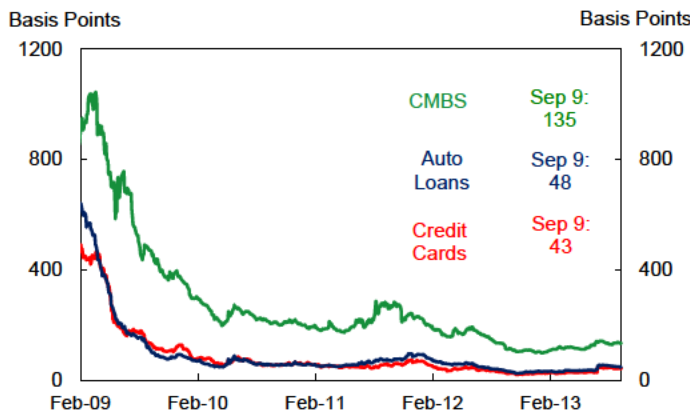
Mortgage Secondary Market



Source: J.P. Morgan

Note: 30 year current coupon Fannie Mae MBS.

AAA-Rated ABS/CMBS Spreads

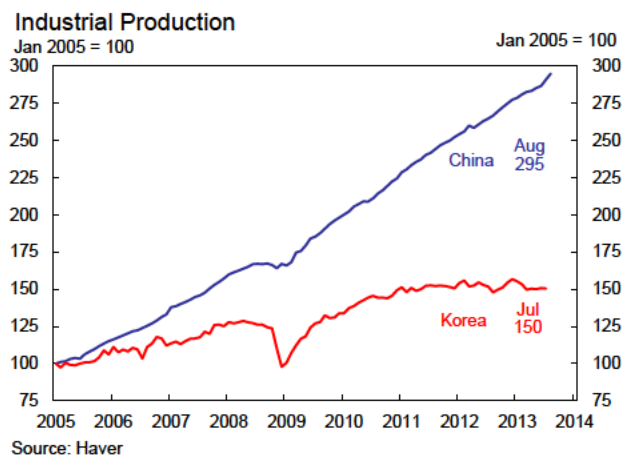
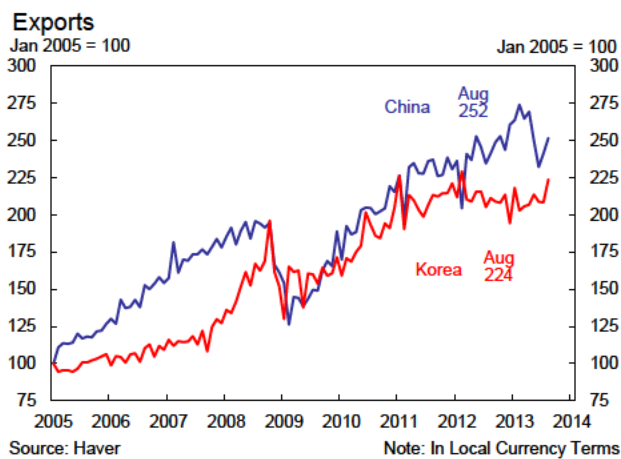
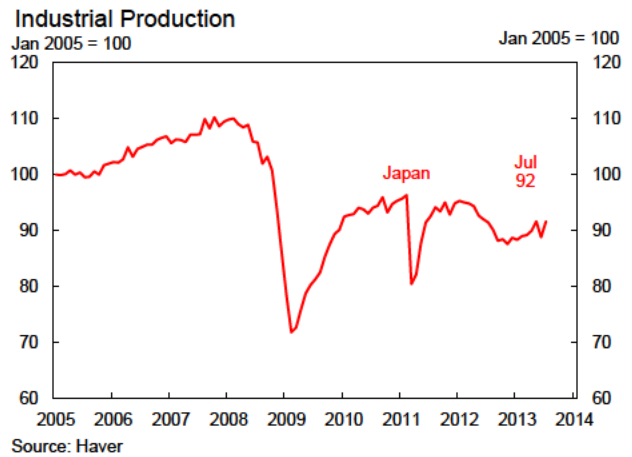
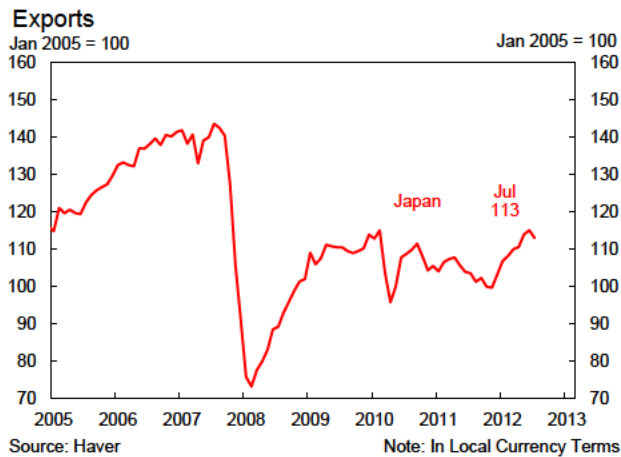
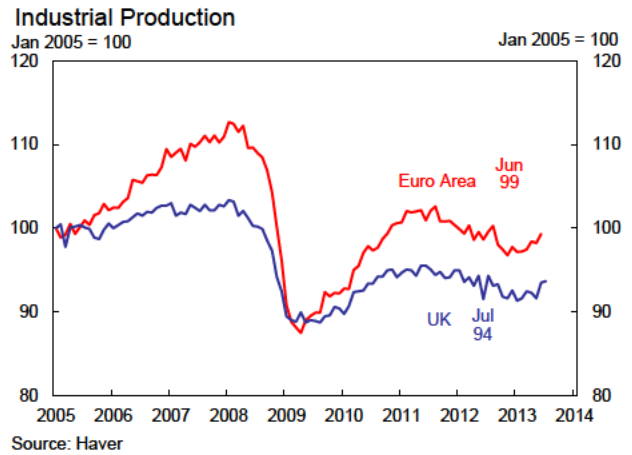
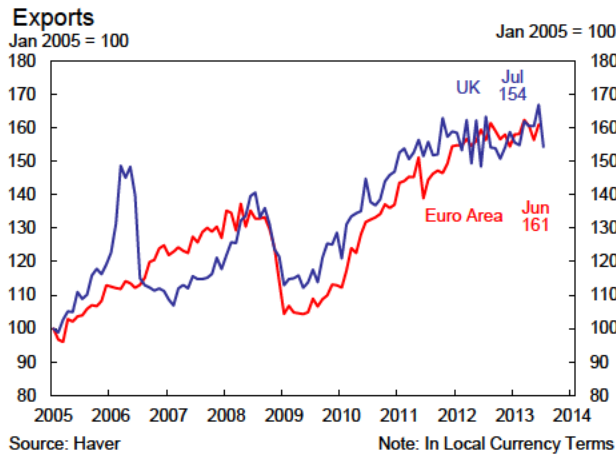


Source: Merrill Lynch

Note: Option-adjusted spreads.

A. Significant Developments

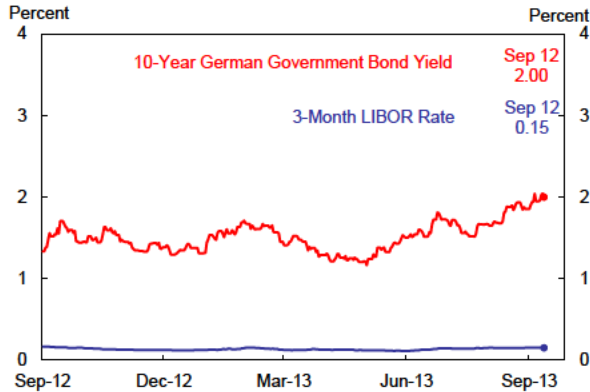
Exhibit A-8: Exports and Industrial Production



A. Significant Developments

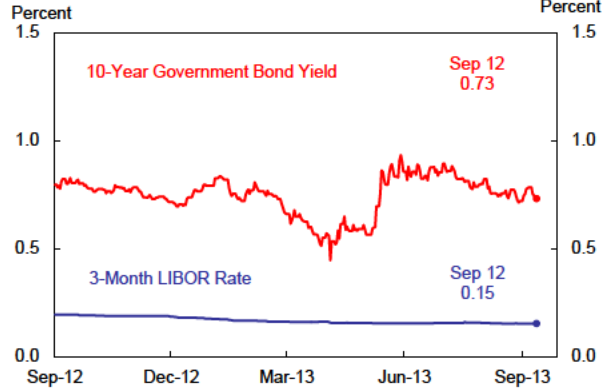
Exhibit A-9: Global Interest Rates and Equity Markets

Euro Area Short- and Long-Term Interest Rates



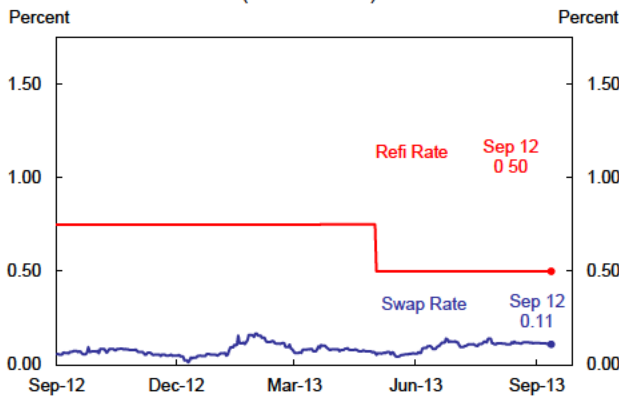
Source: Bloomberg

Japan Short- and Long-Term Interest Rates



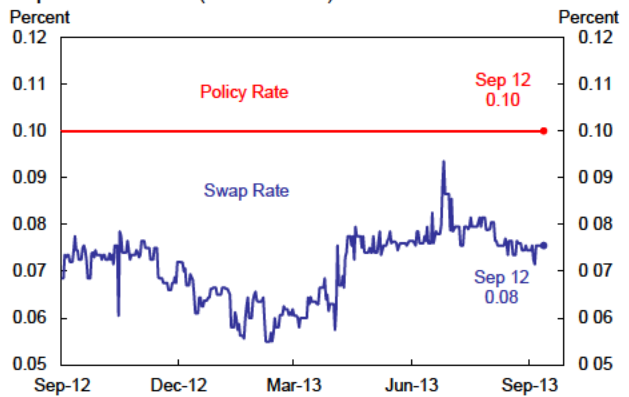
Source: Bloomberg

Euro Area: OIS Rate (Six Months)



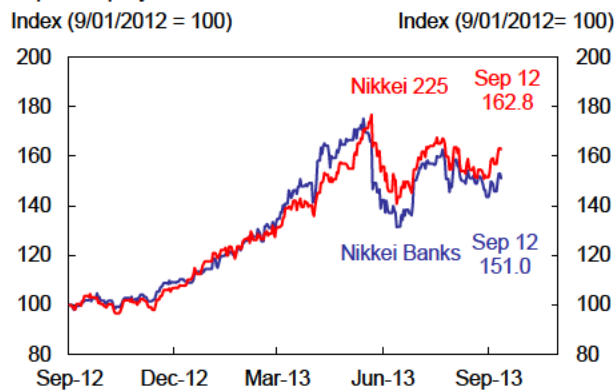
Source: Bloomberg

Japan: OIS Rate (Six Months)



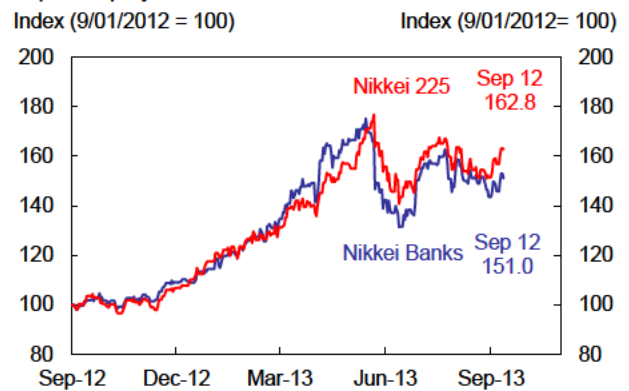
Source: Bloomberg

Japan Equity Price Indices



Source: Bloomberg

Japan Equity Price Indices

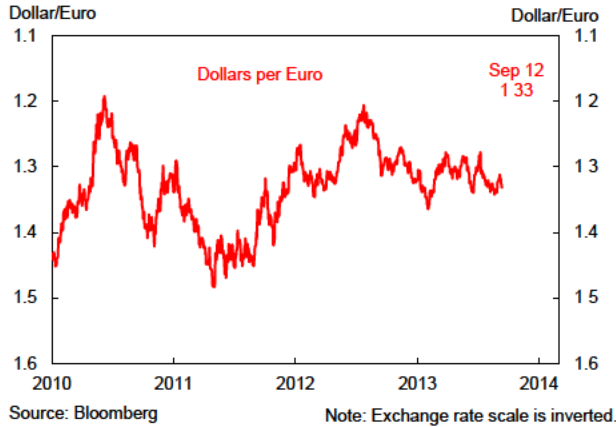


Source: Bloomberg

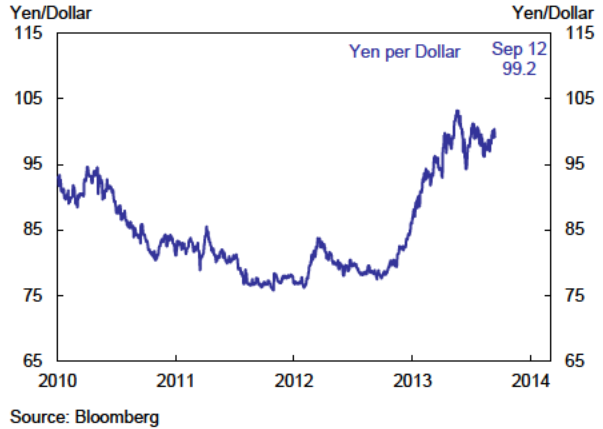
A. Significant Developments

Exhibit A-10:
Exchange Rates

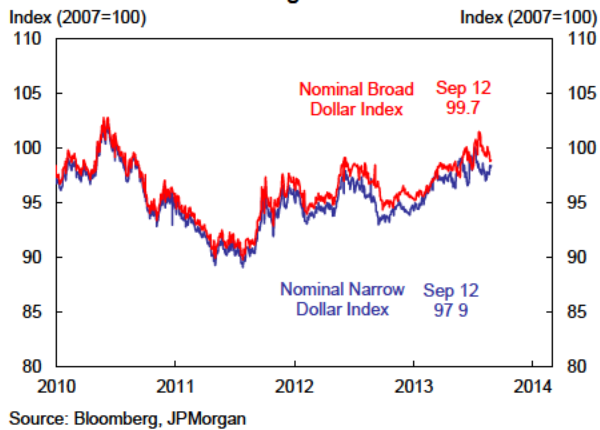
Dollar-Euro Exchange Rate



Yen-Dollar Exchange Rate



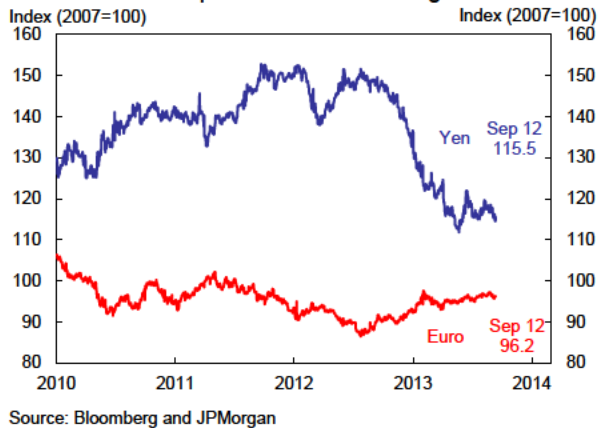
Nominal Effective Exchange Rates



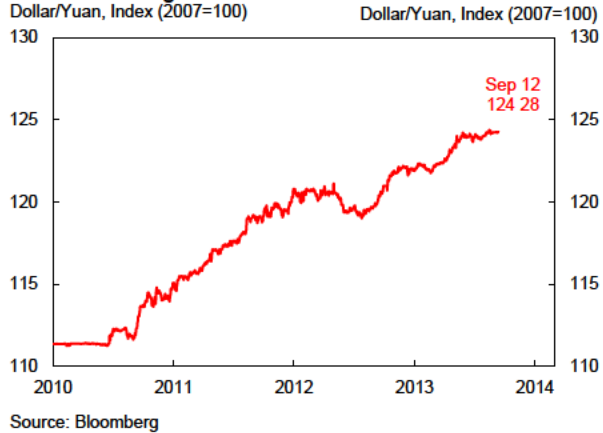
Euro and Yen One-Month Implied FX Option Volatility



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
2012												
Q1	2.2	2.2	2.2	2.0	2.0	3.7	8.3	8.3	8.3	0-0.25	0-0.25	0-0.25
Q2	1.7	1.8	1.8	1.3	1.3	1.2	8.2	8.2	8.2	0-0.25	0-0.25	0-0.25
Q3	1.1	1.4	1.4	3.1	3.1	2.8	8.0	8.0	8.0	0-0.25	0-0.25	0-0.25
Q4	1.0	1.3	1.3	0.4	0.4	0.1	7.8	7.8	7.8	0-0.25	0-0.25	0-0.25
2013												
Q1	1.3	1.3	1.3	1.8	1.8	1.1	7.7	7.7	7.7	0-0.25	0-0.25	0-0.25
Q2	0.8	0.8	0.8	1.3	1.1	2.5	7.6	7.6	7.6	0-0.25	0-0.25	0-0.25
Q3	1.2	1.2	1.6	2.0	2.0	1.8	7.5	7.5	7.3	0-0.25	0-0.25	0-0.25
Q4	1.3	1.3	1.7	2.7	2.6	2.6	7.4	7.3	7.2	0-0.25	0-0.25	0-0.25
2014												
Q1	1.5	1.5	1.6	2.8	2.7	2.7	7.2	7.1	7.1	0-0.25	0-0.25	0-0.25
Q2	1.7	1.7	1.7	2.8	2.8	3.0	7.0	7.0	6.9	0-0.25	0-0.25	0-0.25
Q3	1.9	1.9	1.9	3.1	3.3	3.3	6.8	6.8	6.6	0-0.25	0-0.25	0-0.25
Q4	2.1	2.1	2.1	3.4	3.3	3.5	6.5	6.4	6.3	0-0.25	0-0.25	0-0.25
Q4/Q4												
2011	1.7	1.8	1.8	2.0	2.0	2.0	-1.3	-1.3	-1.3	0.0	0.0	0.0
2012	1.5	1.7	1.7	1.7	1.7	2.0	-0.8	-0.8	-0.8	0.0	0.0	0.0
2013	1.1	1.4	1.4	1.9	1.9	2.0	-0.7	-0.7	-0.7	0.0	0.0	0.0
2014	1.8	1.9	1.8	3.0	3.0	3.1	-0.7	-0.7	-0.8	0.0	0.0	0.0

Note: Forecast made prior to August are Pre-NIPA Revision

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

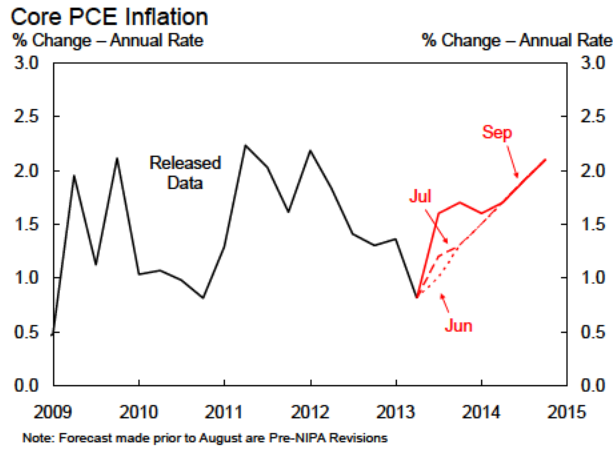
*Quarterly values are the average rate for the quarter. Yearly values are the difference between Q4 of the previous year and Q4 of the listed year.

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

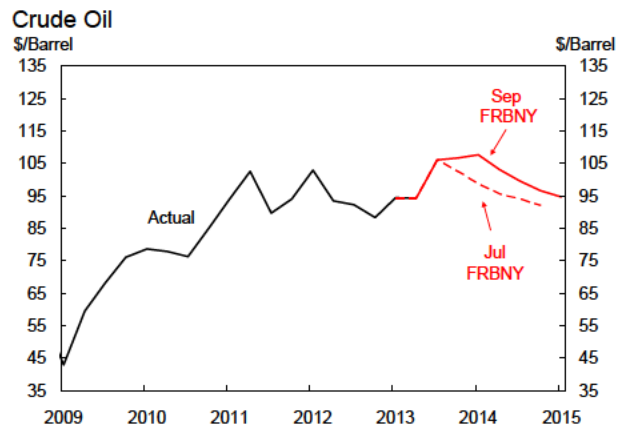
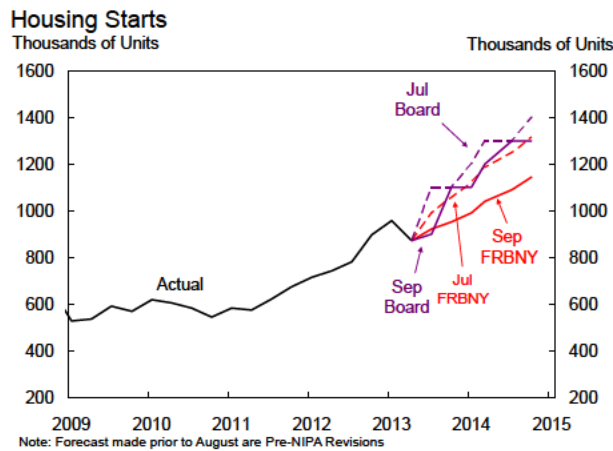
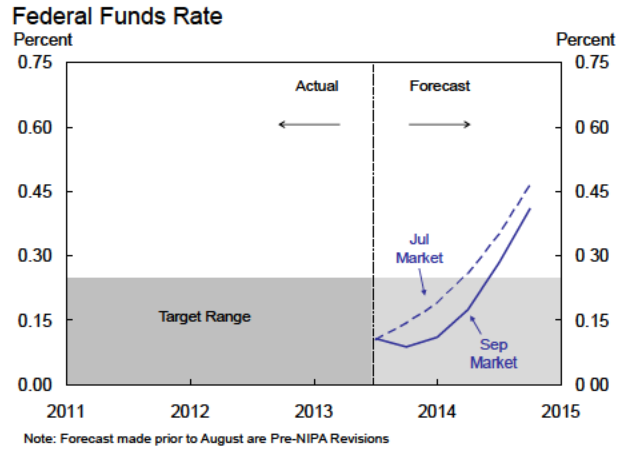
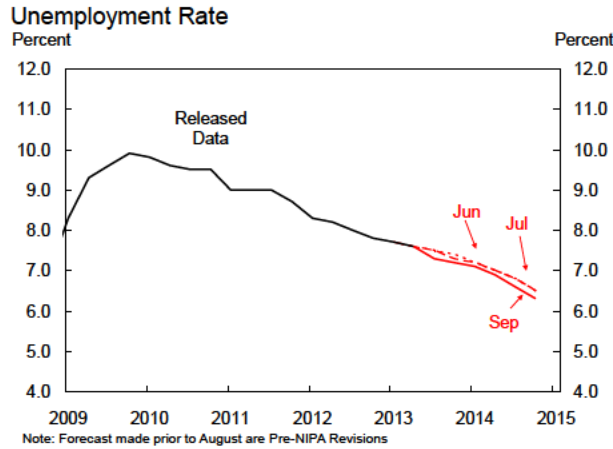
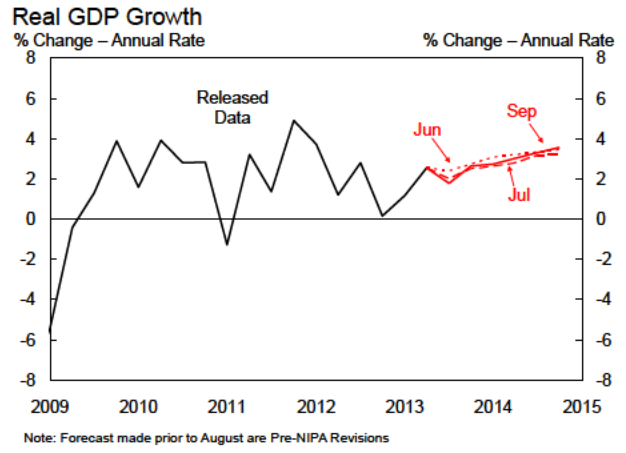
B. FRBNY Forecast Details

Exhibit B-2: Evolution of Projected Quarterly Paths

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)		
	2013Q3	2013Q4	2014Q1	2013Q3	2013Q4	2014Q1
OUTPUT						
Real GDP	1.8 (2.0)	2.6 (2.6)	2.7 (2.7)	1.8 (2.0)	2.6 (2.5)	2.7 (2.7)
Final Sales to Domestic Purchasers	1.7 (1.8)	2.2 (2.2)	2.7 (2.7)	2.0 (1.8)	2.1 (2.3)	2.5 (2.7)
Consumption	1.8 (2.1)	2.3 (2.5)	2.6 (2.6)	1.2 (1.5)	1.6 (1.8)	1.8 (1.8)
BFI: Equipment	2.0 (4.0)	6.0 (6.0)	8.0 (8.0)	0.1 (0.3)	0.3 (0.4)	0.4 (0.6)
BFI: Nonresidential Structures	7.0 (2.0)	5.0 (4.0)	6.0 (6.0)	0.2 (0.1)	0.1 (0.1)	0.2 (0.2)
BFI: Intellectual Property Products	4.0 N/A	4.0 N/A	4.0 N/A	0.2 N/A	0.2 N/A	0.2 N/A
Residential Investment	20.0 (18.0)	12.0 (16.0)	12.0 (14.0)	0.6 (0.5)	0.4 (0.5)	0.4 (0.4)
Government: Federal	-4.0 (-6.2)	-6.2 (-6.2)	-6.2 (-6.3)	-0.3 (-0.5)	-0.5 (-0.5)	-0.5 (-0.4)
Government: State and Local	0.3 (-0.5)	0.3 (-0.2)	0.5 (1.5)	0.0 (-0.1)	0.0 (-0.1)	0.1 (0.2)
Inventory Investment	-- --	-- --	-- --	-0.4 (-0.1)	0.0 (0.2)	0.1 (0.3)
Net Exports	-- --	-- --	-- --	0.4 (0.3)	0.3 (0.3)	-0.1 (-0.3)
INFLATION						
Total PCE Deflator	2.2 (1.8)	1.8 (1.5)	1.7 (1.6)			
Core PCE Deflator	1.6 (1.2)	1.7 (1.3)	1.6 (1.3)			
PRODUCTIVITY AND LABOR COSTS*						
Output per Hour	1.4 (0.8)	1.5 (1.0)	1.5 (1.0)			
Compensation per Hour	2.3 (1.7)	2.2 (1.7)	2.4 (1.7)			
Unit Labor Costs	0.9 (0.9)	0.7 (0.7)	0.9 (0.7)			

Note: Numbers in parentheses are from the previous FOMC meeting and were made pre-NIPA revisions.

*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
OUTPUT						
Real GDP	2.0 (1.7)	2.0 (1.8)	3.1 (2.9)	2.0 (1.7)	2.0 (1.8)	3.1 (2.9)
Final Sales to Domestic Purchasers	2.1 (1.8)	1.6 (1.6)	3.2 (3.1)	2.2 (1.8)	1.6 (1.6)	3.0 (3.2)
Consumption	2.0 (1.8)	2.0 (2.2)	2.7 (2.7)	1.4 (1.3)	1.4 (1.6)	1.9 (2.0)
BFI: Equipment	4.5 (4.7)	3.1 (3.5)	11.0 (11.0)	0.2 (0.3)	0.2 (0.3)	0.6 (0.8)
BFI: Nonresidential Structures	9.2 (7.3)	-0.8 (-0.2)	7.2 (8.5)	0.2 (0.2)	0.0 (0.0)	0.2 (0.3)
BFI: Intellectual Property Products	2.9 N/A	2.7 N/A	4.0 N/A	0.1 N/A	0.1 N/A	0.2 N/A
Residential Investment	15.5 (14.9)	14.3 (15.2)	12.0 (11.0)	0.4 (0.3)	0.4 (0.4)	0.4 (0.3)
Government: Federal	-2.3 (-2.8)	-5.1 (-6.3)	-6.0 (-6.1)	-0.2 (-0.2)	-0.4 (-0.5)	-0.4 (-0.4)
Government: State and Local	-0.3 (-1.1)	-0.3 (-1.0)	1.2 (2.2)	0.0 (-0.1)	0.0 (-0.1)	0.1 (0.3)
Inventory Investment	-- --	-- --	-- --	-0.5 (-0.5)	0.3 (0.2)	0.1 (0.2)
Net Exports	-- --	-- --	-- --	0.3 (0.3)	0.1 (0.0)	-0.3 (-0.4)
INCOME						
Personal Income	5.8 (5.7)	1.7 (1.6)	4.9 (5.1)			
Real Disposable Personal Income	3.6 (3.8)	-0.4 (-0.5)	2.8 (2.9)			
Personal Saving Rate	6.6 (5.3)	4.4 (2.8)	4.6 (3.0)			
Corporate Profits Before Taxes	2.7 (3.1)	5.1 (-5.1)	-0.3 (2.6)			

Note: Numbers in parentheses are from the previous FOMC meeting and were made pre-NIPA revisions.

B. FRBNY Forecast Details

Exhibit B-5: Medium-Term Projections, Continued

	Q4/Q4 Growth Rates		
	2012	2013	2014
INFLATION			
Total PCE Deflator	1.7 (1.6)	1.3 (1.0)	1.9 (1.9)
Core PCE Deflator	1.7 (1.5)	1.4 (1.1)	1.8 (1.8)
Total CPI Inflation	1.9 (1.9)	1.6 (1.3)	2.2 (2.7)
Core CPI Inflation	1.9 (1.9)	1.8 (1.7)	2.1 (2.4)
GDP Deflator	1.8 (1.8)	1.3 (1.1)	1.8 (2.3)
PRODUCTIVITY AND LABOR COSTS*			
Output	2.8 (2.5)	2.3 (2.2)	3.7 (3.7)
Hours	1.9 (1.9)	1.4 (1.8)	2.2 (2.4)
Output per Hour	0.9 (0.6)	0.9 (0.3)	1.5 (1.3)
Compensation per Hour	5.3 (4.4)	0.4 (0.4)	2.4 (1.9)
Unit Labor Costs	4.4 (3.8)	-0.5 (0.0)	0.9 (0.7)
LABOR MARKET			
Unemployment Rate (Avg. Q4 Level)	7.8 (7.8)	7.2 (7.3)	6.3 (6.4)
Participation Rate (Avg. Q4 Level)	63.7 (63.7)	63.3 (63.5)	63.4 (63.8)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	181 (181)	188 (202)	242 (263.0)

Note: Numbers in parentheses are from the previous FOMC meeting and were made pre-NIPA revisions.
*Nonfarm business sector.

B. FRBNY Forecast Details

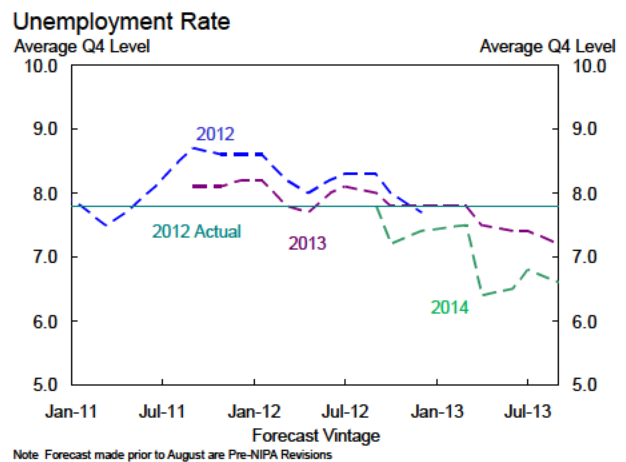
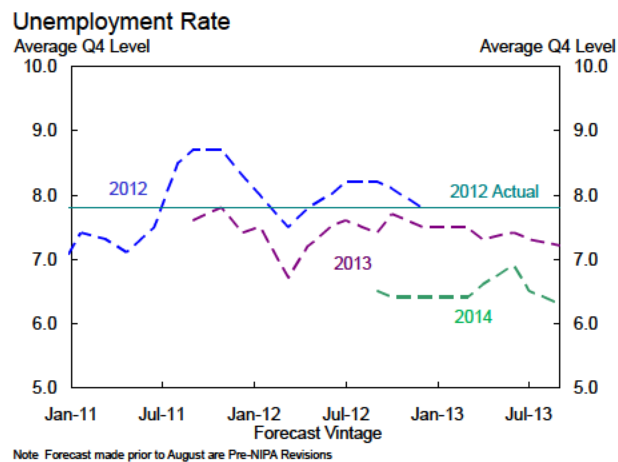
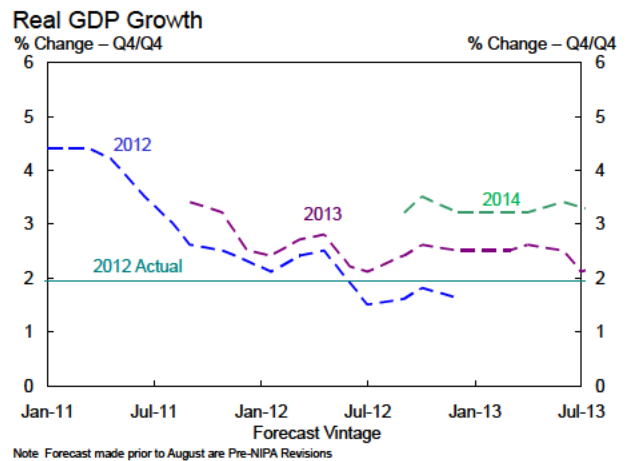
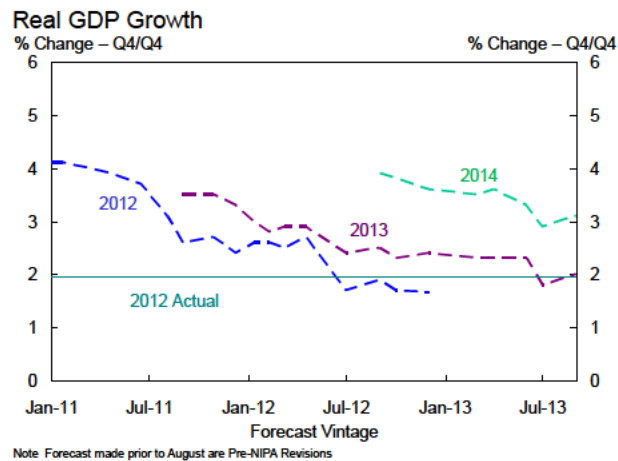
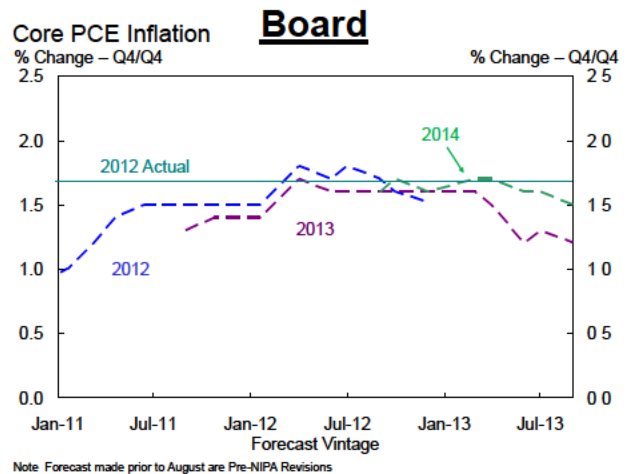
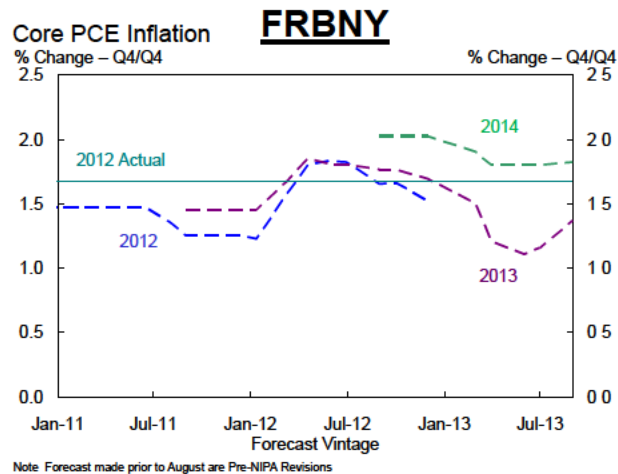
Exhibit B-6: FRBNY and Tealbook Forecast Comparison

	FRBNY (Q4/Q4)			Board (Q4/Q4)		
	2012	2013	2014	2012	2013	2014
OUTPUT						
Real GDP	2.0 (1.7)	2.0 (1.9)	3.1 (3.0)	2.0 (1.7)	2.3 (2.5)	3.1 (3.4)
GDP Growth Contributions						
Final Sales to Domestic Purchasers	2.2 (1.8)	1.6 (1.7)	3.0 (3.2)	1.8 (1.8)	1.7 (1.8)	3.2 (3.3)
Consumption	1.4 (1.3)	1.4 (1.6)	1.9 (2.0)	1.3 (1.3)	1.6 (1.8)	2.5 (2.6)
BFI	0.6 (0.6)	0.3 (0.3)	1.0 (1.1)	0.6 (0.6)	0.3 (0.4)	0.6 (0.5)
Residential Investment	0.4 (0.3)	0.4 (0.4)	0.4 (0.3)	0.3 (0.3)	0.3 (0.3)	0.5 (0.6)
Government	-0.2 (-0.4)	-0.4 (-0.6)	-0.3 (-0.2)	-0.4 (-0.4)	-0.5 (-0.7)	-0.4 (-0.4)
Inventory Investment	-0.5 (-0.5)	0.3 (0.2)	0.1 (0.2)	-0.4 (-0.4)	0.5 (0.3)	0.0 (0.1)
Net Exports	0.3 (0.3)	0.1 (0.0)	-0.3 (-0.4)	0.3 (0.3)	0.0 (0.0)	-0.1 (-0.1)
INFLATION						
Total PCE Deflator	1.7 (1.6)	1.3 (1.0)	1.9 (1.9)	1.6 (1.6)	1.1 (0.9)	1.2 (1.4)
Core PCE Deflator	1.7 (1.5)	1.4 (1.1)	1.8 (1.8)	1.5 (1.5)	1.2 (1.2)	1.5 (1.6)
INTEREST RATE ASSUMPTION						
Fed Funds Rate (End-of-Year)	0-0.25 0-0.25	0-0.25 0-0.25	0-0.25 0-0.25	0-0.25 0-0.25	0-0.25 0-0.25	0-0.25 0-0.25
PRODUCTIVITY AND LABOR COSTS*						
Output per Hour	0.9 (0.6)	0.9 (0.3)	1.5 (1.3)	0.6 (0.6)	1.1 (0.3)	1.4 (1.6)
Compensation per Hour	5.3 (4.4)	0.4 (0.4)	2.4 (1.9)	4.4 (4.4)	0.5 (0.8)	2.7 (2.8)
Unit Labor Costs	4.4 (3.8)	-0.5 (0.0)	0.9 (0.7)	3.8 (3.8)	-0.6 (0.4)	1.4 (1.1)
LABOR MARKET						
Unemployment Rate (Avg. Q4 Level)	7.8 (7.8)	7.2 (7.3)	6.3 (6.5)	7.8 (7.8)	7.2 (7.4)	6.6 (6.8)
Participation Rate (Avg. Q4 Level)	63.7 (63.7)	63.3 (63.5)	63.4 (63.8)	63.7 (63.7)	63.3 (63.4)	63.3 (63.3)
Avg. Monthly Nonfarm Payroll Growth (Thous.)	181 (181)	188 (202)	242 (263)	189 (189)	181 (198)	202 (209)
SAVING						
Personal Saving Rate (Avg. Q4 Level)	6.6 (5.3)	4.4 (2.4)	4.6 (2.8)	5.3 (5.3)	3.8 (2.8)	3.4 (2.6)
HOUSING						
Housing Starts (Avg. Q4 Level, Thous.)	896 (896)	950 (1055)	1145 (1315)	800 (800)	1000 (1000)	1200 (1300)

Note: Numbers in parentheses are from the previous Blackbook and were made pre-NIPA revisions.

B. FRBNY Forecast Details

Exhibit B-7: Evolution of FRBNY and Board Forecasts since the beginning of 2011



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

B. FRBNY Forecast Details

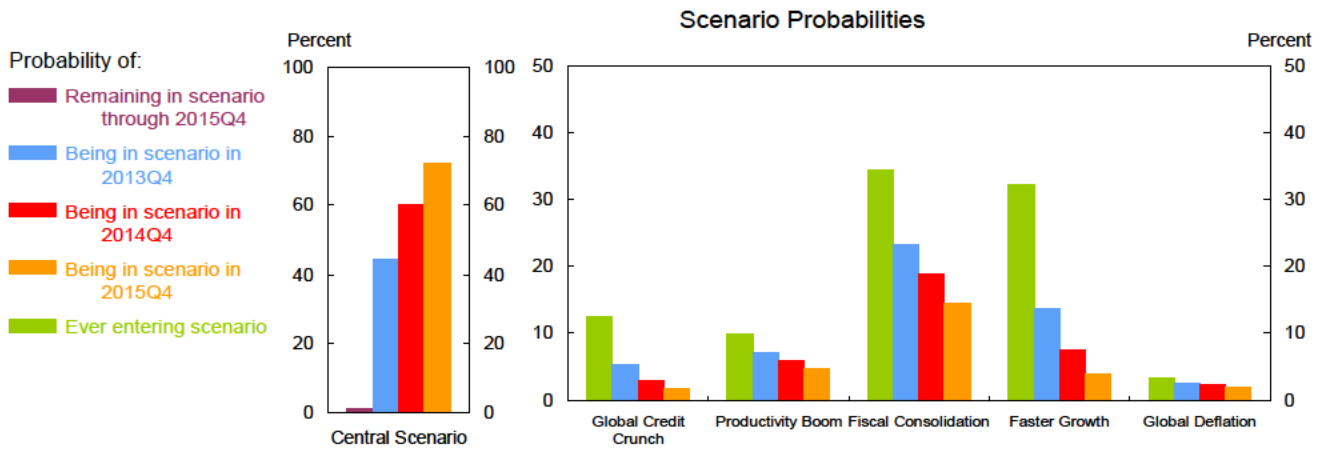
Exhibit B-8: Alternative GDP and Inflation Forecasts

		Real GDP Growth			
	Release Date	2013Q3	2013Q4	2013 Q4/Q4	2014 Q4/Q4
FRBNY	9/12/2013	1.8 (2.0)	2.6 (2.6)	2.0 (2.3)	3.1 (3.0)
Blue Chip	9/10/2013	2.1 (2.3)	2.6 (2.7)	2.1 (2.1)	2.8 (2.8)
Median SPF	8/16/2013	2.2 (2.3)	2.3 (2.7)	1.8 (2.3)	-- --
Macro Advisers	9/6/2013	1.8 (2.4)	2.6 (3.0)	2.0 (2.2)	2.7 (3.0)
FRBNY-DSGE	9/13/2013	1.8 (1.2)	2.0 (1.4)	1.9 (1.3)	1.9 (1.4)
		Core PCE Inflation			
	Release Date	2013Q3	2013Q4	2013 Q4/Q4	2014 Q4/Q4
FRBNY	9/12/2013	1.6 (1.2)	1.7 (1.7)	1.4 (1.1)	1.8 (1.8)
Median SPF	8/16/2013	1.4 (1.6)	1.5 (1.8)	1.3 (1.5)	1.8 (1.9)
Macro Advisers	9/6/2013	1.5 (1.2)	1.4 (1.6)	1.3 (1.1)	1.5 (1.5)
FRBNY-DSGE	9/13/2013	1.6 (0.9)	1.2 (1.0)	1.2 (1.0)	1.2 (1.3)
		CPI Inflation			
	Release Date	2013Q3	2013Q4	2013 Q4/Q4	2014 Q4/Q4
FRBNY	9/12/2013	2.9 (1.8)	2.1 (1.8)	1.6 (1.3)	2.2 (2.7)
Blue Chip	9/10/2013	2.6 (2.1)	1.9 (2.0)	1.5 (1.4)	2.0 (2.1)
Median SPF	8/16/2013	2.0 (2.0)	1.7 (2.0)	1.4 (1.7)	2.0 (2.2)
Macro Advisers	9/6/2013	3.0 (2.3)	2.4 (1.4)	1.7 (1.2)	1.4 (1.5)
		Core CPI Inflation			
	Release Date	2013Q3	2013Q4	2013 Q4/Q4	2014 Q4/Q4
FRBNY	9/12/2013	1.9 (1.6)	1.9 (1.6)	1.8 (1.7)	2.1 (2.4)
Median SPF	8/16/2013	1.9 (2.0)	1.9 (2.0)	1.8 (2.0)	2.0 (2.1)
Macro Advisers	9/6/2013	1.8 (1.6)	1.7 (1.6)	1.7 (1.5)	1.7 (1.7)

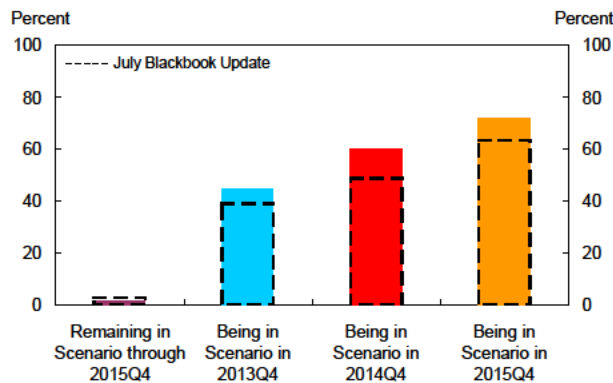
*Note: Numbers in gray are from the previous FOMC meeting, before the NIPA revisions.

C. FRBNY Forecast Distributions

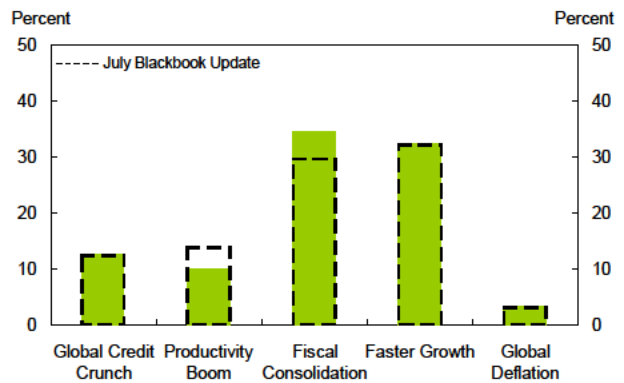
Exhibit C-1: Risks



Change in Central Scenario Probabilities



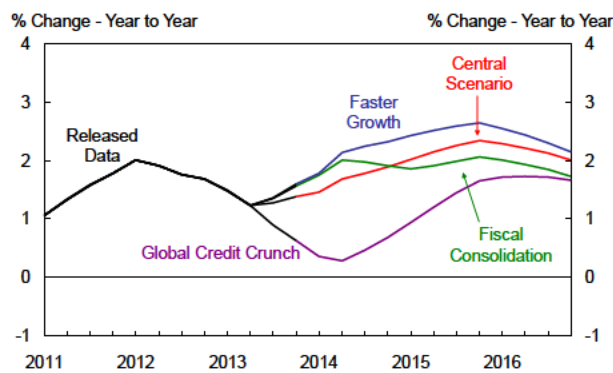
Change in Alternative Scenario Probabilities*



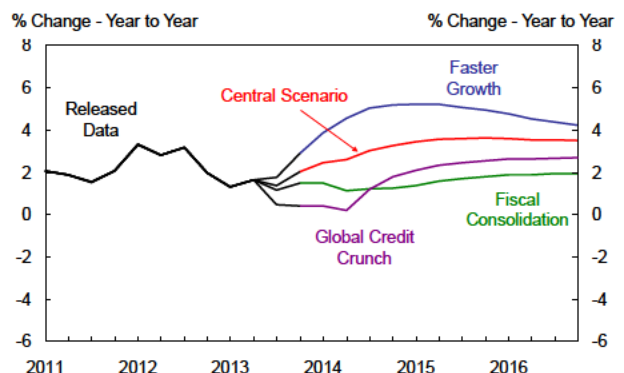
*Probability of ever reaching scenario

Exhibit C-2: Projections under Alternative Scenarios

Core PCE Inflation under Alternative Scenarios Selected



Real GDP Growth under Alternative Scenarios Selected

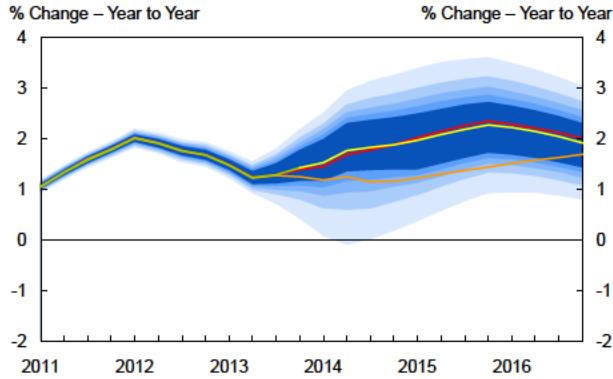


Source: MMS Function (FRBNY)

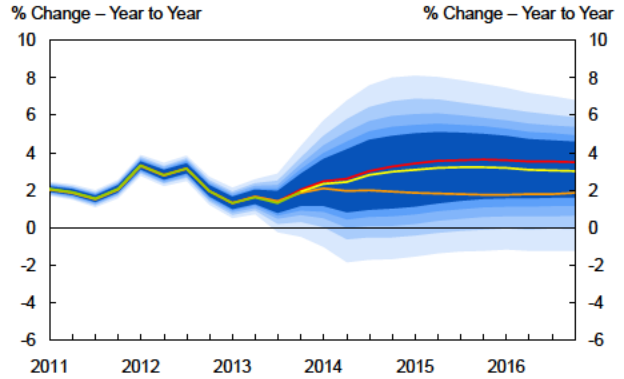
C. FRBNY Forecast Distributions

Exhibit C-3: Inflation and Output Forecast Distributions

Core PCE Inflation Forecast Distribution

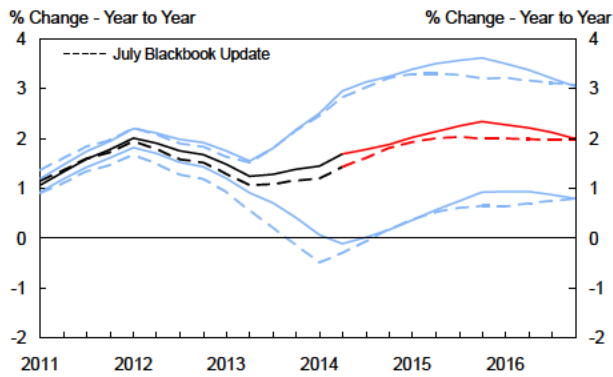


Real GDP Growth Forecast Distribution

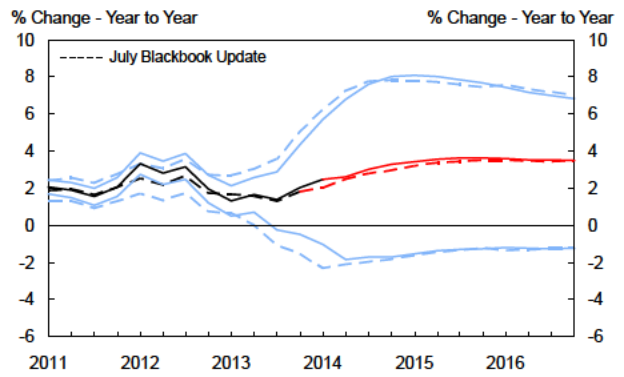


The yellow line is the expected value of the forecast distribution, the red line is the FRBNY central projection, the orange line is the DSGE forecast, and the green line is released data. The shading represents the 50, 60, 70, 80 and 90 percent probability that the four-quarter change will be within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

Change in Core PCE Inflation Forecast Distribution

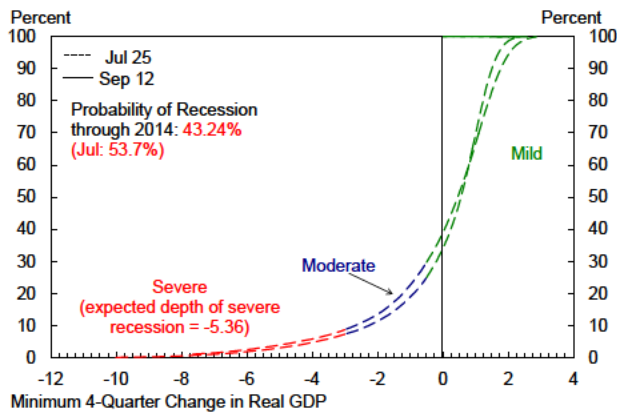


Change in Real GDP Growth Forecast Distribution

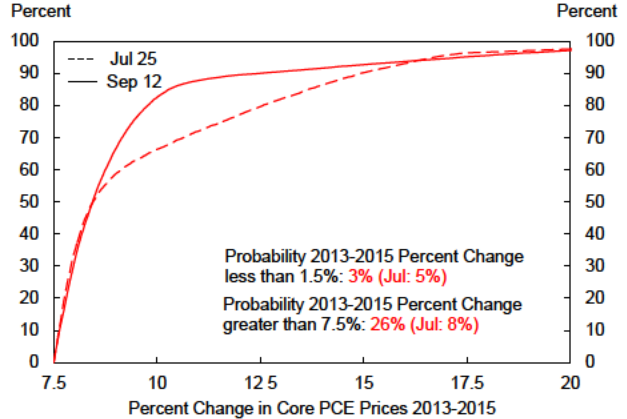


The blue lines are the 90% chance the four-quarter change will be within the lines, the red line is the central scenario projection, and the black line is released data. Dashed lines represent forecasts from the previous Blackbook.

Depth of Recession



High Inflation Probability and Distribution

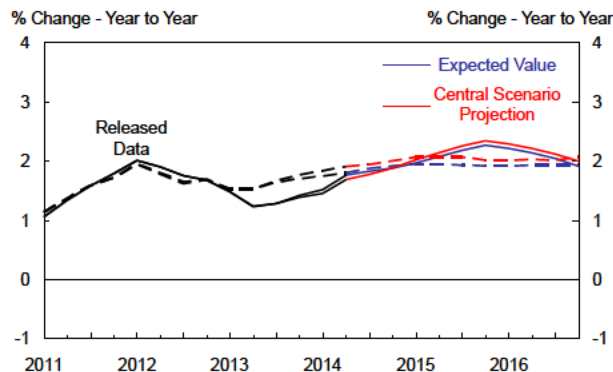


Source: MMS Function (FRBNY)

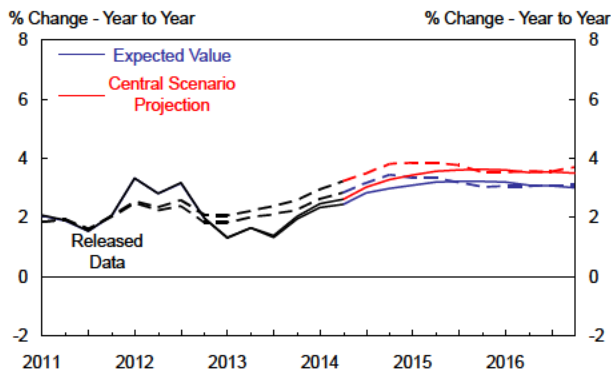
C. FRBNY Forecast Distributions

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

One-Year Comparison of Core PCE Inflation Forecast

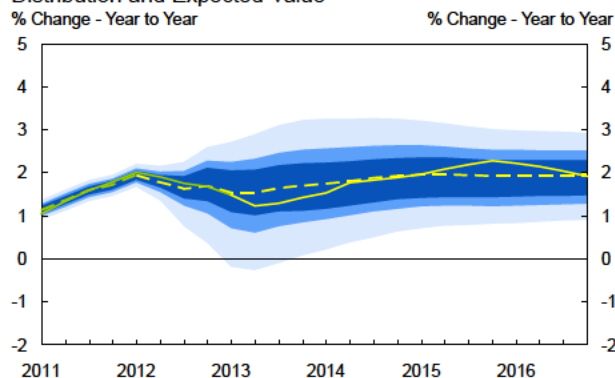


One-Year Comparison of Real GDP Growth Forecast

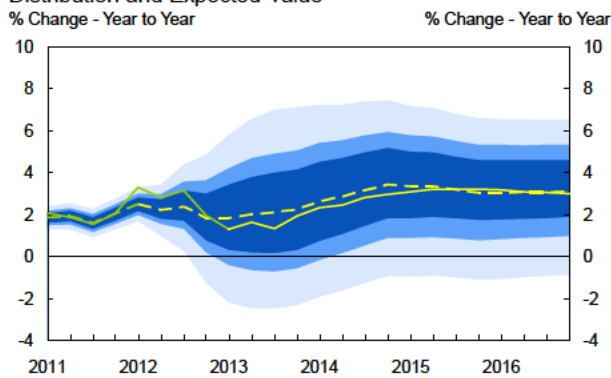


The solid lines represent the current central scenario projection and expected value, while the dashed lines represent those from the year-ago Blackbook.

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



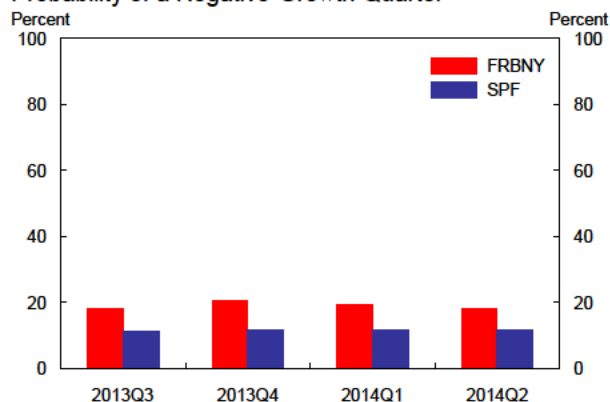
One-Year Comparison of Real GDP Growth Forecast Distribution and Expected Value



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

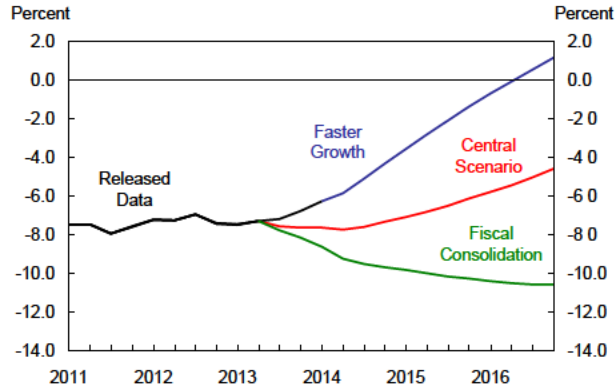


Source: MMS Function (FRBNY)

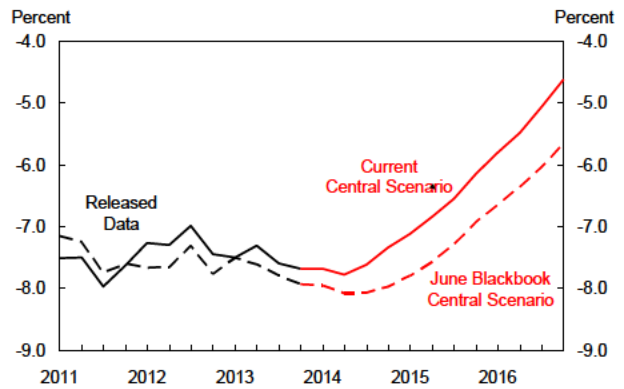
D. FRBNY Fed Funds Rate Projections

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

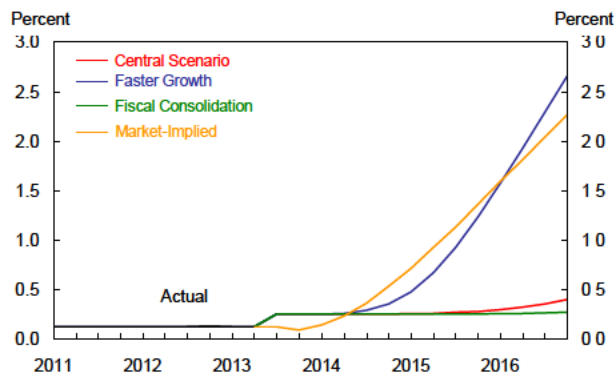
Real FFR under Alternative Scenarios



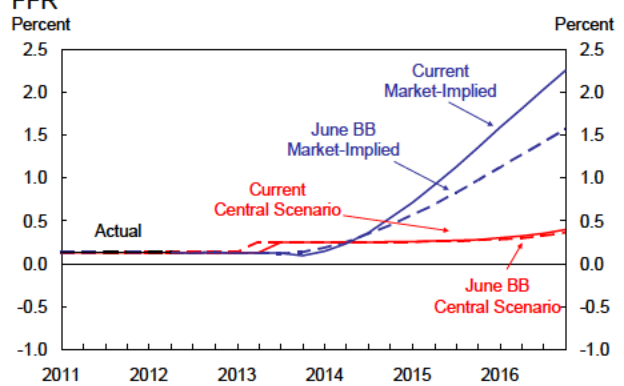
Change in Central Scenario Real FFR



Nominal FFR under Alternative Scenarios



Change in Central Scenario and Market-Implied Nominal FFR

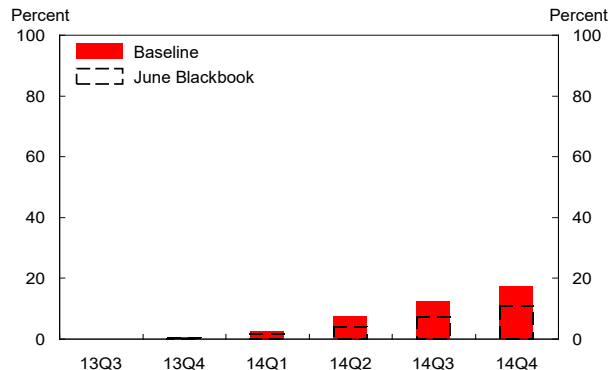


Source: MMS Function (FRBNY)

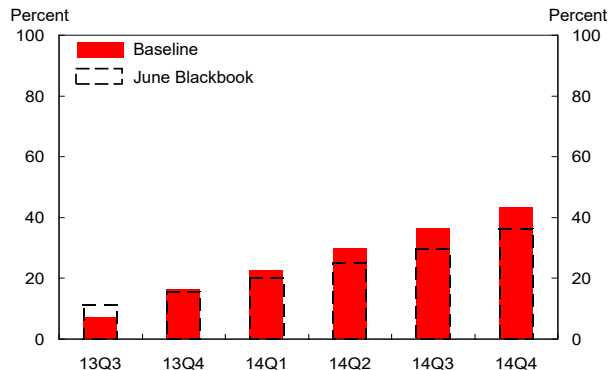
D. FRBNY Fed Funds Rate Projections

Exhibit D-2: FFR Probabilities Above 0.5%

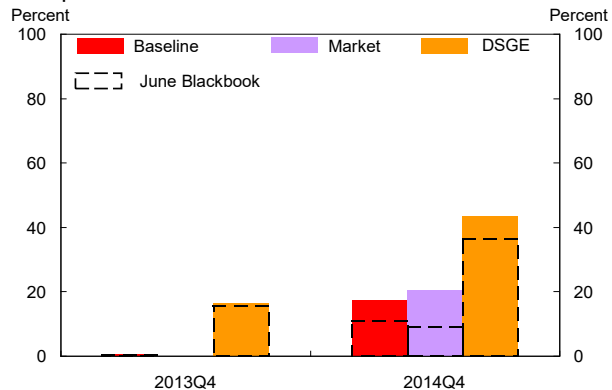
FRBNY Forecast Distributions Over Next 6 Quarters



FRBNY DSGE Model Over Next 6 Quarters



Comparison Over 2013 and 2014 Year End

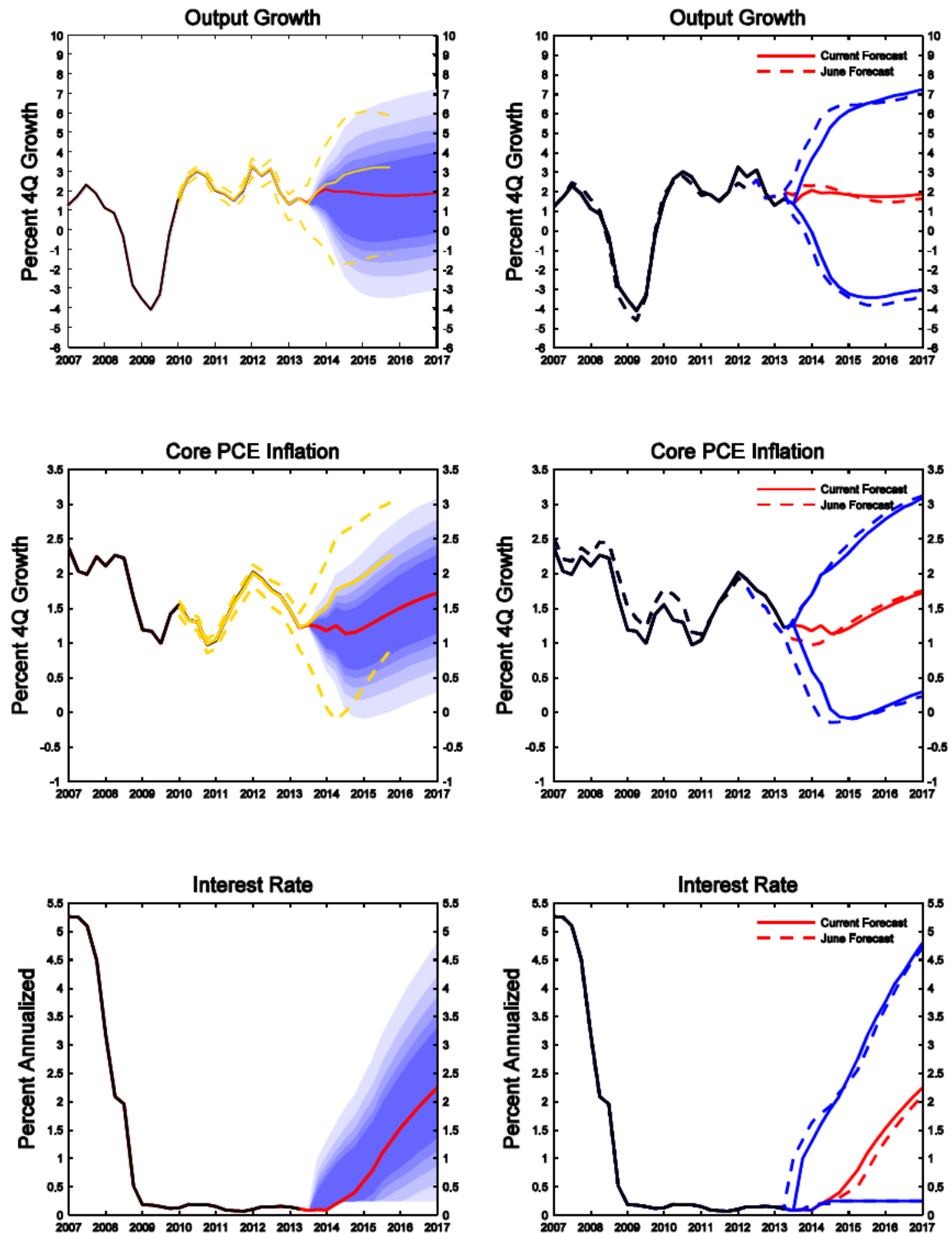


Note: Probability displayed is probability of FFR being above 0.5% in quarter noted and remaining above 0.5% in subsequent four quarters. DSGE results are shown for model including zero bound restriction.

Source: MMS Function (FRBNY)

E. FRBNY-DSGE Model

Exhibit E-1: FRBNY-DSGE Forecasts

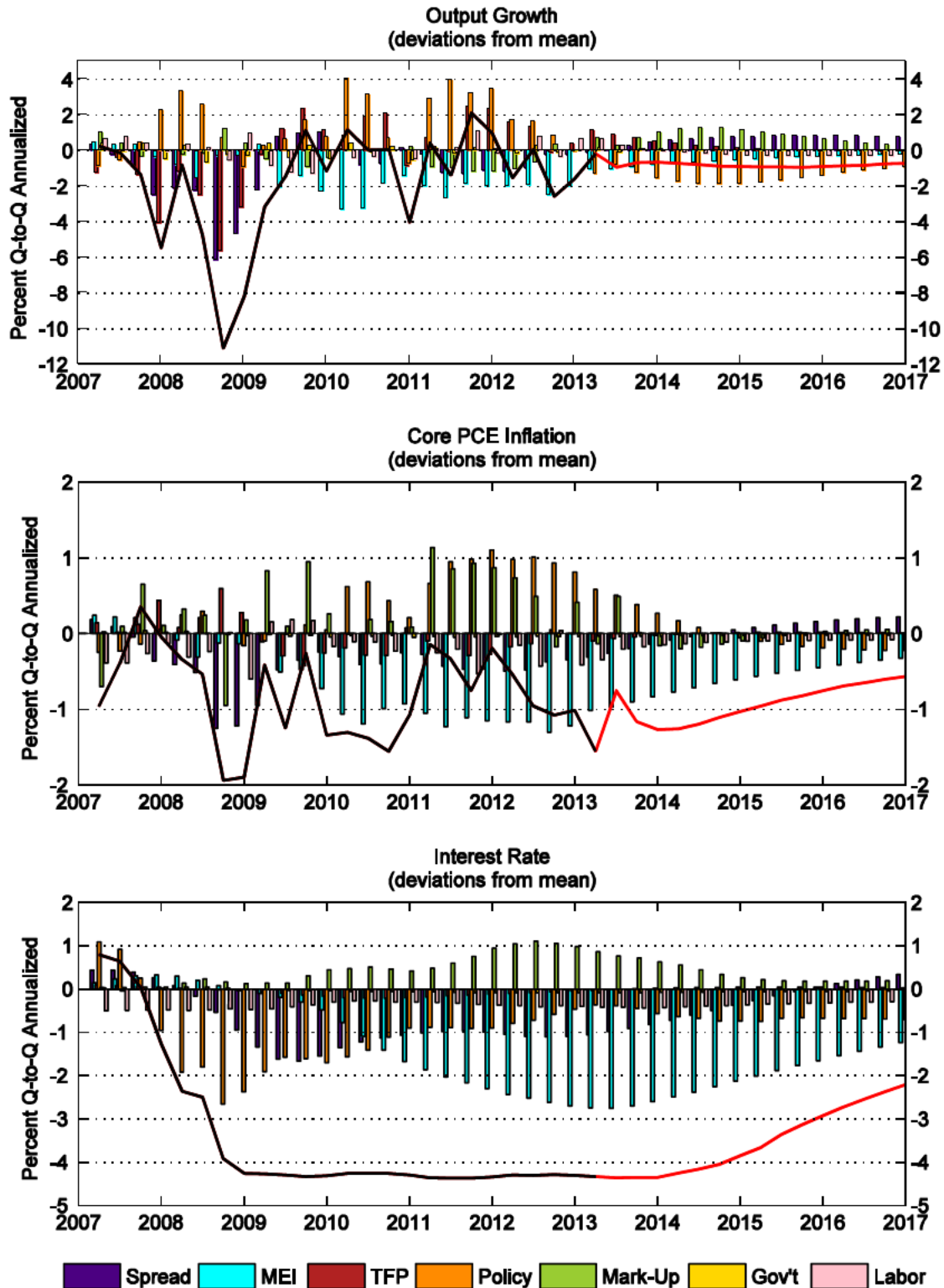


Note: Black lines indicate data, red lines indicate mean forecasts, and shaded areas mark the parameter and shock uncertainty associated with our forecast as 50, 60, 70, 80, and 90 percent probability intervals. For comparison, we report the FRBNY Central Projection for output growth and inflation (solid 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)

Appendix 1: Alternative Scenario Descriptions

In this Appendix, we provide brief descriptions of the alternative scenarios used in this Blackbook. A description of the methodology underlying our risk assessment and forecast distributions is included in the Blackbook Documentation.

Our first alternative scenario considers the impact of above-trend productivity growth. Our current assumption of trend productivity growth is around 1.5% 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 another scenario (*Faster Growth*). We also currently consider four additional scenarios. In one (*Faster Growth*), the “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*), renewed stresses in global financial and economic conditions 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

Productivity growth has been subdued and below our current estimate of trend productivity growth. Our central forecast sees the recent slow growth as cyclical, and anticipates that productivity growth will return to near trend. However, it is possible that resource reallocation associated with the recession and its aftermath and recent technological developments have set the stage for a prolonged period of higher productivity growth, closer to that of the 1947-72 and the mid-1990s through the mid-2000s periods. 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 keep inflation subdued.

Alternative 2: *Fiscal Consolidation*

Persistent high U.S. fiscal deficits and the European sovereign debt crisis have raised issues about the possible economic consequences if concerns were to develop about the sustainability of the U.S. government's fiscal position. Furthermore, a political stalemate like that of August 2011 could exacerbate these concerns. 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 keep output growth below that of the central forecast. As the U.S. government responds to those concerns by further 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 depreciation of the dollar and possible increases in inflation expectations². [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*

The current expansion has been quite weak, especially given the severe drop in real activity during the recession. Factors behind the slow growth 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 payroll growth in the

² 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.

face of fiscal headwinds raise the possibility that the process of mending may be near an end. The *Faster Growth* 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, 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 fairly elevated levels of some commodity prices are consistent with such commentary. Even though the FOMC has made its commitment to low rates in part contingent on medium-term inflation below 2½% and inflation expectations remaining well anchored, it is possible that market participants may begin to believe that the FOMC is not credibly committed to keeping inflation around the FOMC's longer-run goal, especially if the unemployment rate remains above the FOMC's 6½% threshold. 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 inflation and inflation expectations to rise above forecast.

Alternative 5: *Global Credit Crunch*

Although financial markets are generally notably healthier than they were during 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 sizable wealth losses during the crisis, which may be adversely affecting their desire to take on risk. 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 the longer-run neutral FFR to be around 3.50%). 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 continue to point to low inflation in many regions of the world. With inflation at such levels, sluggish global growth, continuing 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 be 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.

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*: 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.

Appendix 2: Policy Rule Description

In this Appendix, we describe our *Baseline* policy rule. Additional background is included in the Blackbook Documentation.

In our *Baseline* policy rule specification, the policy rate responds to deviations of inflation from target and of output from potential, while incorporating some inertia. For each of the FFR paths, we determine these deviations using the inflation and output paths generated in Exhibit C.

Baseline Policy Rule Specification:

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

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

$i^* = 3.50$ over the forecast horizon (neutral FFR)

$\pi^* = 2.00$ (PCE inflation longer - run objective)

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

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

π_t : core PCE, 4 - quarter average

x_t : output gap, using 2.3% potential growth rate

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