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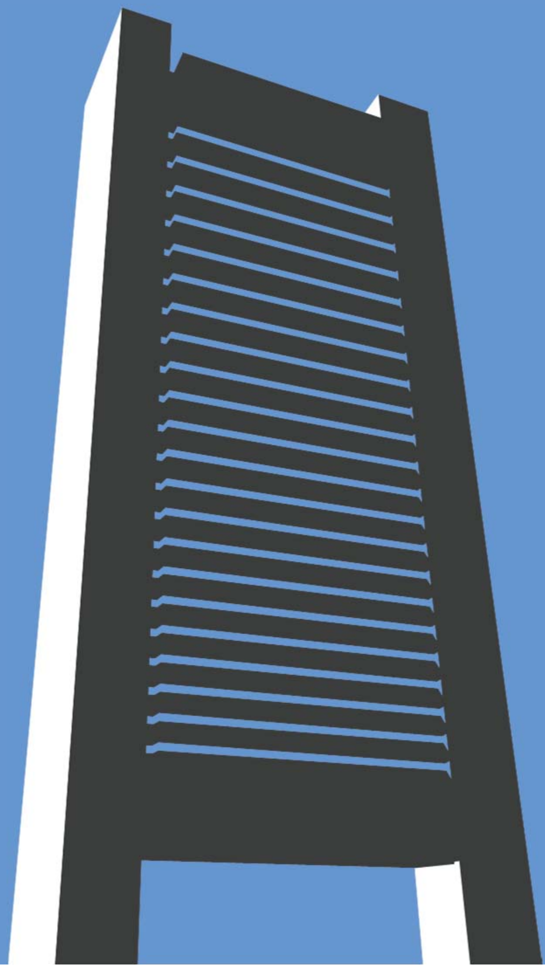

New Monetary Policy Tools: What Have We Learned?

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XXIII Cycle of Economic Lectures
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Guatemala City, Guatemala

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New Monetary Policy Tools

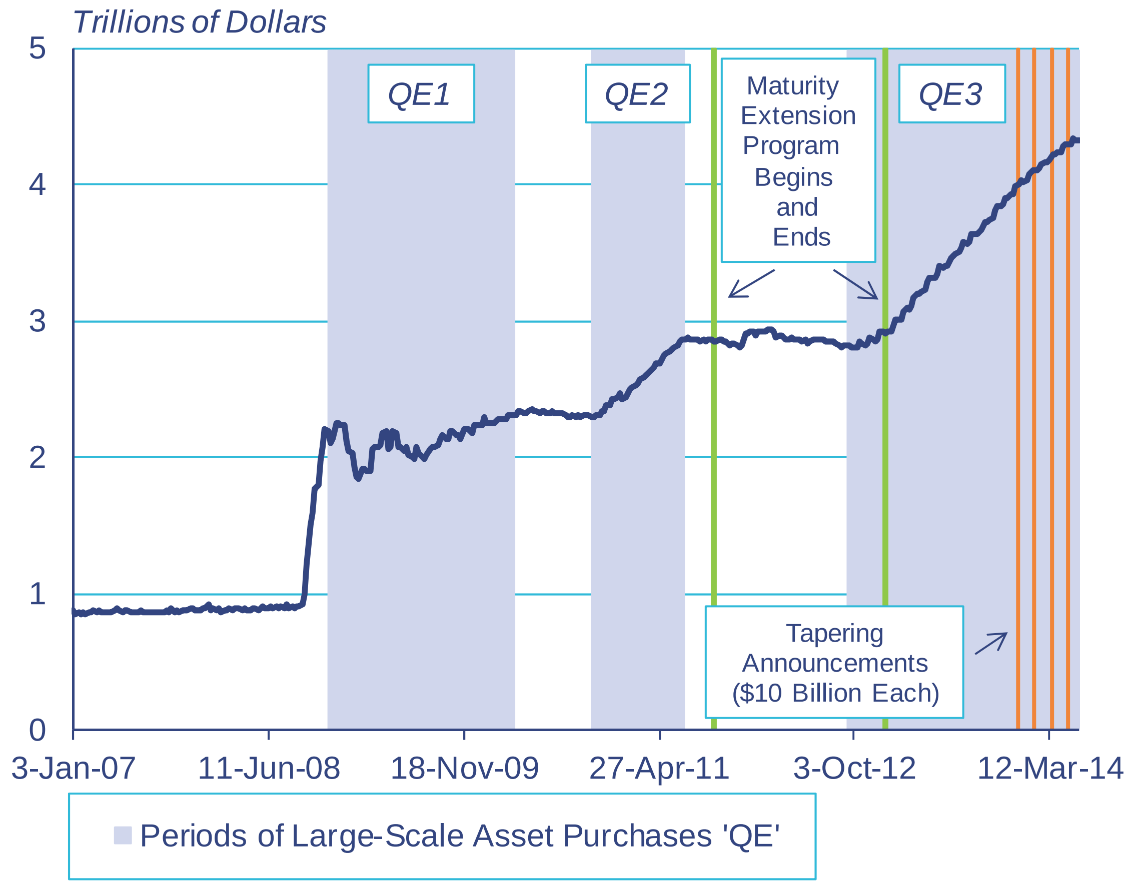
- Large-Scale Asset Purchases (LSAPs)
  - Purchases of mortgage-backed securities and long-term U.S. Treasury securities
  - Lower long-term interest rates
- Forward guidance
  - Provide guidance on maintaining low short-term rates
  - Lower long-term interest rates
- Today: Discuss context, impacts, possible evolution
- Full assessment of costs and benefits somewhat premature – still adding to accommodation, albeit in smaller increments

Previewing My Conclusions

- New tools were essential to address a continued weak economy (despite low short-term rates)
- Particularly important: Emphasis on “doing what it would take,” and following through with actions
  - Interest rates did fall and asset prices rebounded
  - Interest sensitive sectors improved and the U.S. and global economies are better off now than in the fall of 2012
- New tools are not without challenges
  - Premium on communication
  - Market participants can react strongly to exit strategies, as witnessed one year ago
- An opportunity to carefully consider broad set of monetary tools, and their impact on financial stability along with inflation and unemployment

Figure 1: Federal Reserve System Assets

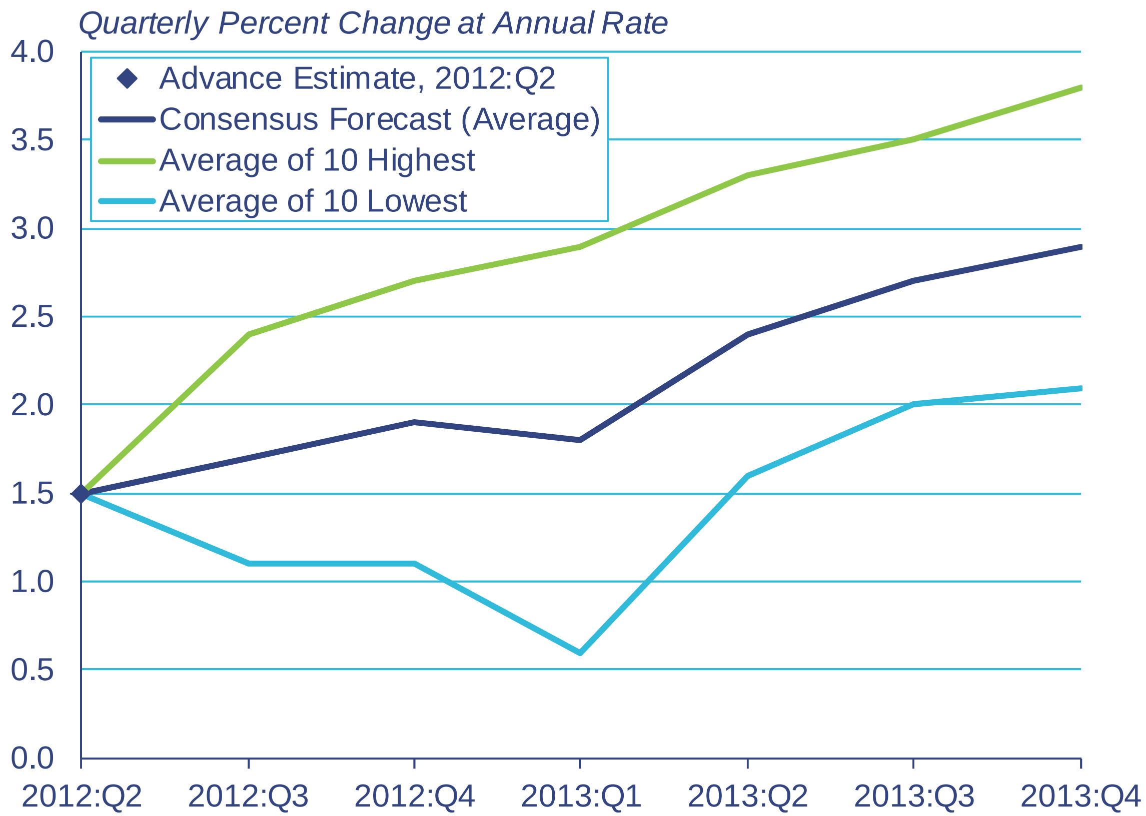
Weekly, January 3, 2007 - May 28, 2014



Source: Federal Reserve Board, Haver Analytics

Figure 2: Blue Chip Forecast for U.S. Real GDP Growth

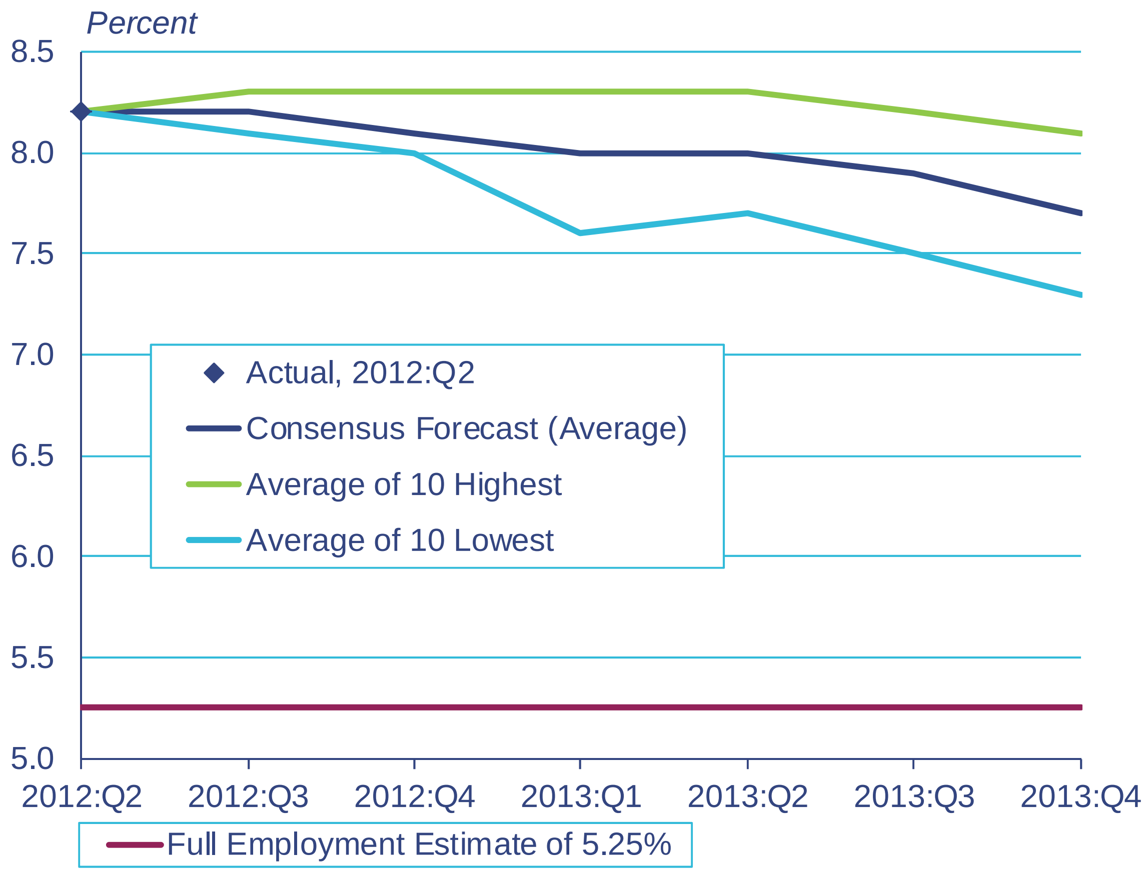
Forecast as of August 10, 2012



Source: Blue Chip Economic Indicators, August 10, 2012, BEA, Haver Analytics

Figure 3: Blue Chip Forecast for the U.S. Unemployment Rate

Forecast as of August 10, 2012



Source: Blue Chip Economic Indicators, August 10, 2012, BLS, Haver Analytics

Monetary Policy Statements

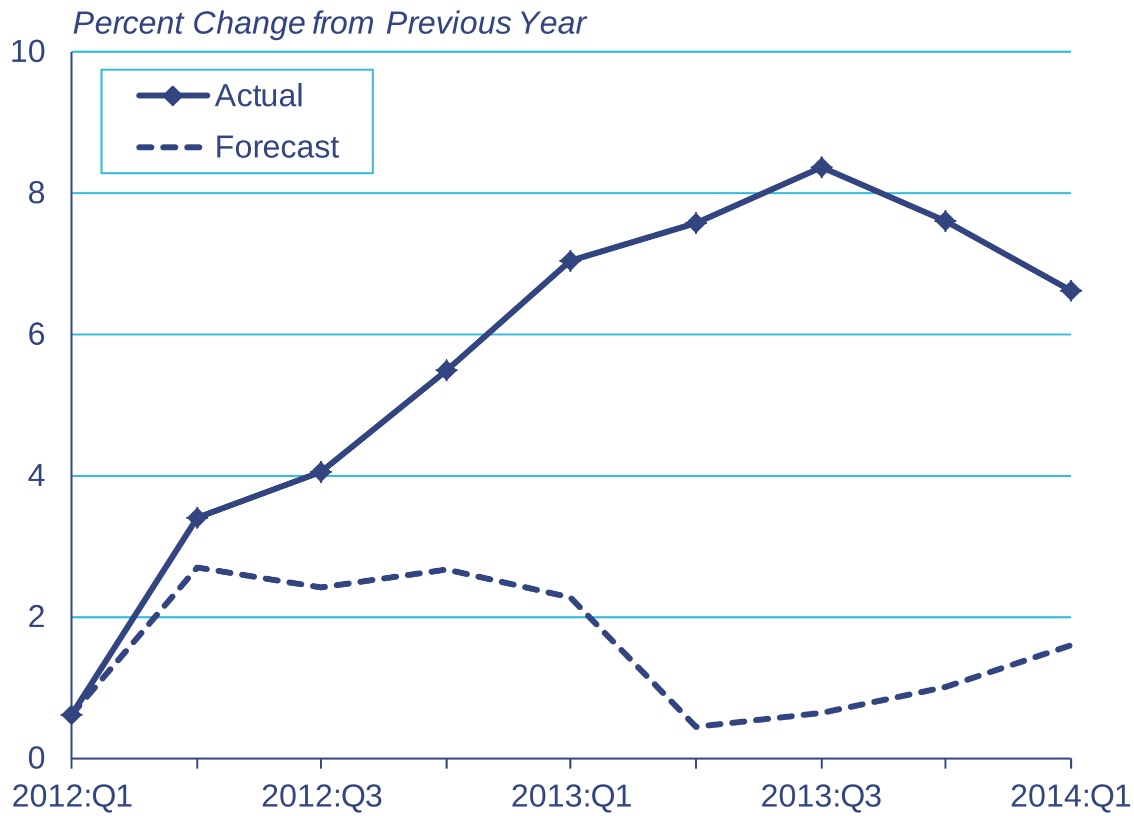
- September 2012
  - Purchase $40 billion a month of MBS securities in addition to $45 billion a month of long-term Treasury securities bought with funds from sales of short-term Treasury securities (Maturity Extension Program)
  - Asset purchases were to be open ended – no end date or total amount stated – focused instead on substantial improvement in labor markets
  - Suggested low rates were likely to be appropriate until at least mid-2015

Monetary Policy Statements (Continued)

- December 2012
  - Continued open-ended purchases of $85 billion a month in long-term securities
  - Introduced 6.5 percent unemployment rate threshold (low rates anticipated at least as long as the unemployment rate remained above that threshold and inflation and inflation expectations remained anchored)

Figure 4: U.S. FHFA House Price Purchase-Only Index: IHS Global Insight Forecast and Actual

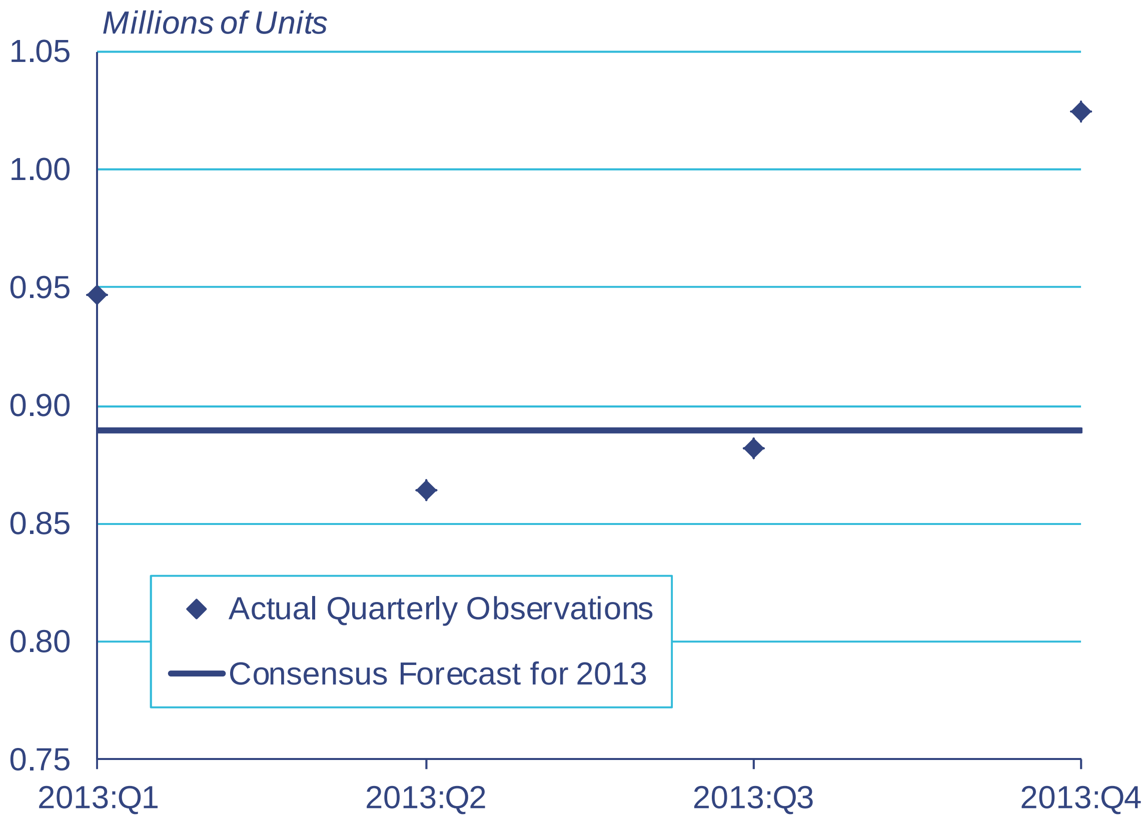
Forecast as of August 2012



Source: IHS Global Insight, U.S. Economic Outlook, August 2012, FHFA, Haver Analytics

Figure 5: U.S. Housing Starts: Blue Chip Annual Forecast for 2013 and Quarterly Actual

Forecast as of August 10, 2012

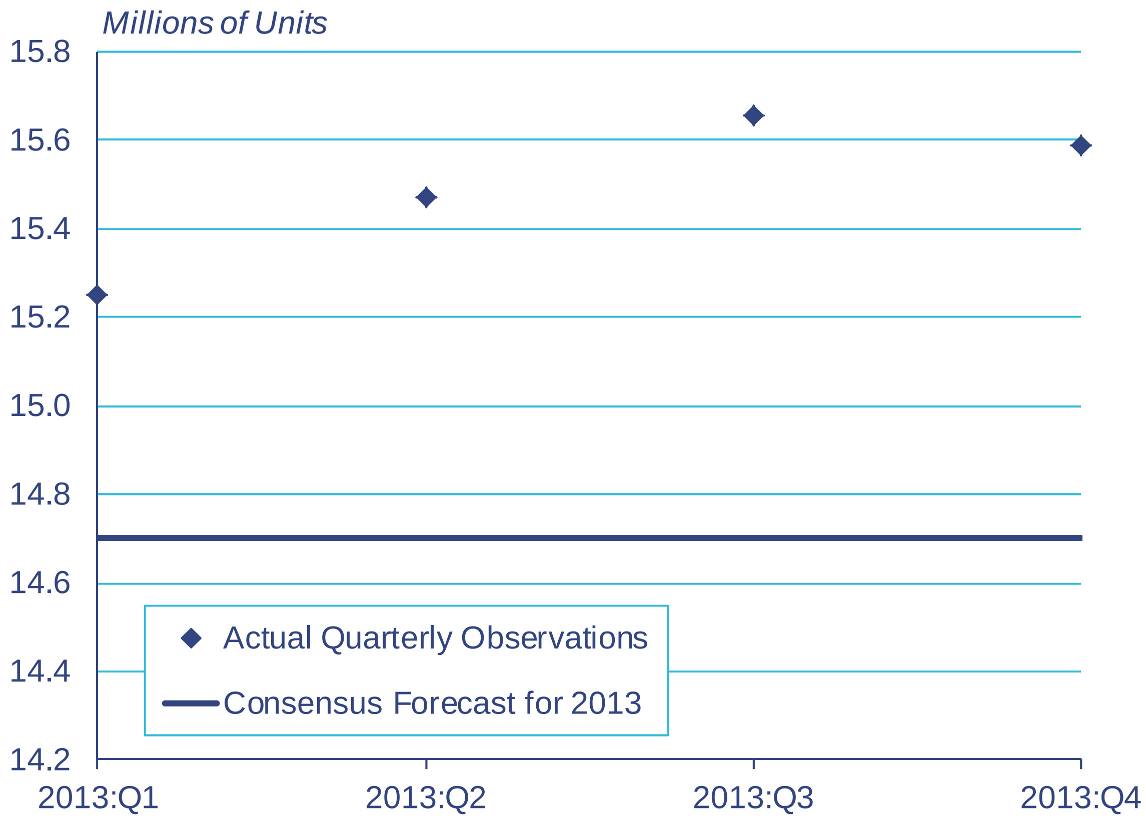


Note: Actual quarterly observations are seasonally adjusted annual rates.

Source: Blue Chip Economic Indicators, August 10, 2012, Bureau of the Census, Haver Analytics

Figure 6: U.S. Auto Sales: Blue Chip Annual Forecast for 2013 and Quarterly Actual

Forecast as of August 10, 2012

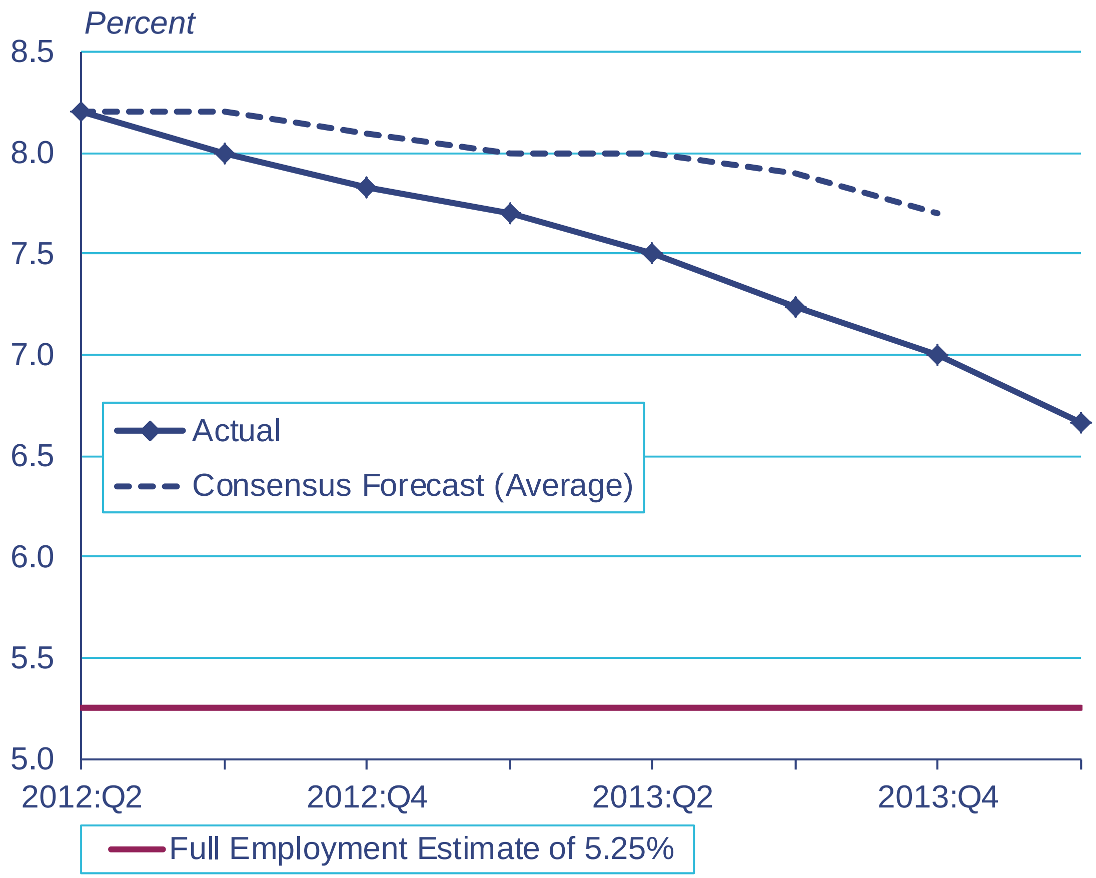


Note: Actual quarterly observations are seasonally adjusted annual rates.

Source: Blue Chip Economic Indicators, August 10, 2012, BEA, Haver Analytics.

Figure 7: U.S. Unemployment Rate: Blue Chip Forecast and Actual

Forecast as of August 10, 2012



Source: Blue Chip Economic Indicators, August 10, 2012, BLS, Haver Analytics

New Monetary Policy Tools a Factor in Better Economic Outcomes

- Rebounding asset prices and falling interest rates resulted in better than forecast economic outcomes
- Not only helped U.S. economy, but also helped other advanced and developing economies whose economies were underperforming (given the improving state of the U.S. as an export market)
- Rates fell as private investors invested “alongside” the Federal Reserve
- Models must account for potential investor reaction: e.g., the risk that private investors would “switch sides” quickly when policies changed

Figure 8: 10-Year U.S. Treasury Note Yield at Constant Maturity

January 2, 2013 - June 2, 2014

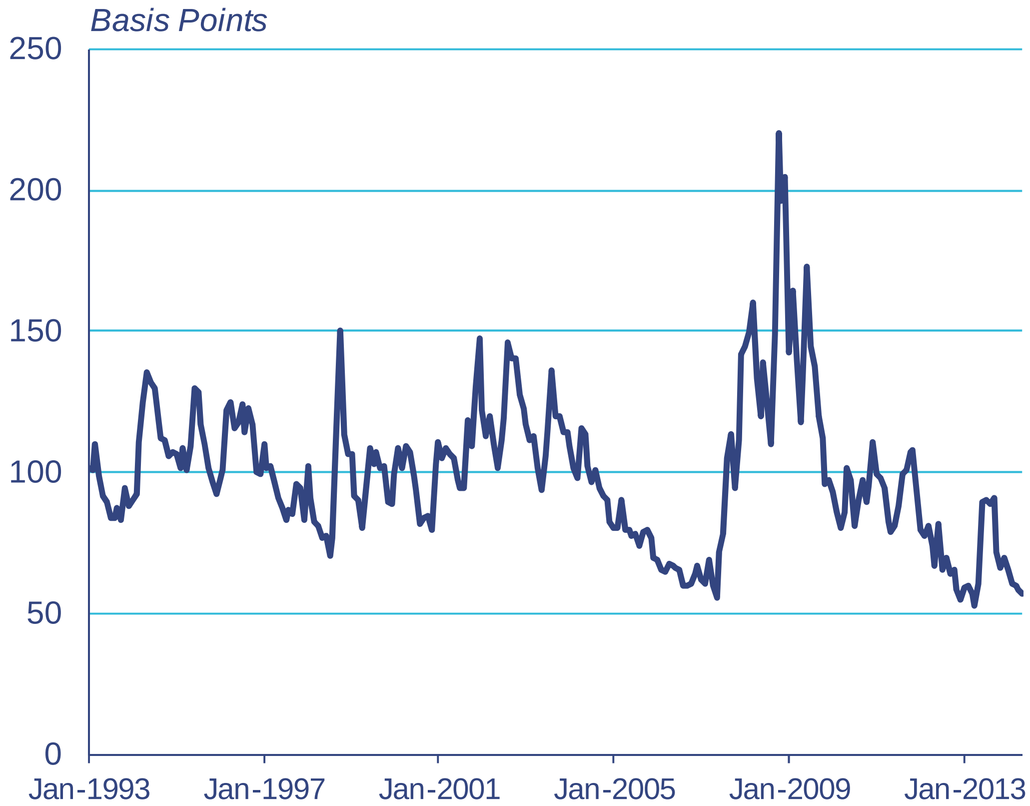
Source: Federal Reserve Board, Haver Analytics

Significant Reaction to Discussion of Taper

- Investors pulled back (became active sellers) with discussion of taper
- “Carry trade” reversal – investors borrowing “short” and investing “long” were often highly levered
- Particularly a problem in emerging markets as investors borrowed in U.S. but sought higher yields in other securities including those in emerging markets
- Repercussions have been felt in U.S. housing, and emerging economies

Figure 9: U.S. Treasury Yield Volatility Index

January 1993 - May 2014



Note: Merrill Lynch's MOVE Index is a yield curve weighted index of the normalized implied volatility on 1-month Treasury options. It is the weighted average of volatilities on Treasuries maturing in 2, 5, 10, and 30 years with weights of 20%, 20%, 40% and 20%, respectively.

Source: Bank of America Merrill Lynch, Bloomberg, Haver Analytics

Recent Response to Tapering of Stimulus

- Since December, the FOMC has reduced purchases from $85 billion a month to $45 billion a month
- Gradual and predictable reduction in the purchase program
  - Market volatility has been relatively low
  - Economy improving, albeit gradually and with some setbacks along the way
- Benign reaction to tapering of stimulus may be instructive as we consider eventual winding down the Federal Reserve's balance sheet
  - One scenario for consideration: Gradual, transparent, and predictable policy – for example, slowly taper percentage of maturing assets that are reinvested, as long as economy continues improving

Short-Term Rates

- My personal view is that raising short-term rates should occur only when the U.S. economy is likely within one year of both achieving full employment and returning to within a narrow band around 2 percent inflation
- Raising rates, when appropriate, is complicated by the large quantity of excess reserves
- Raise rate of interest paid on excess reserves. Can choose to have more control of short-term rates by also engaging in overnight reverse repurchase agreements

Figure 10: Excess Reserves of Depository Institutions in the U.S.

January 2007 - April 2014

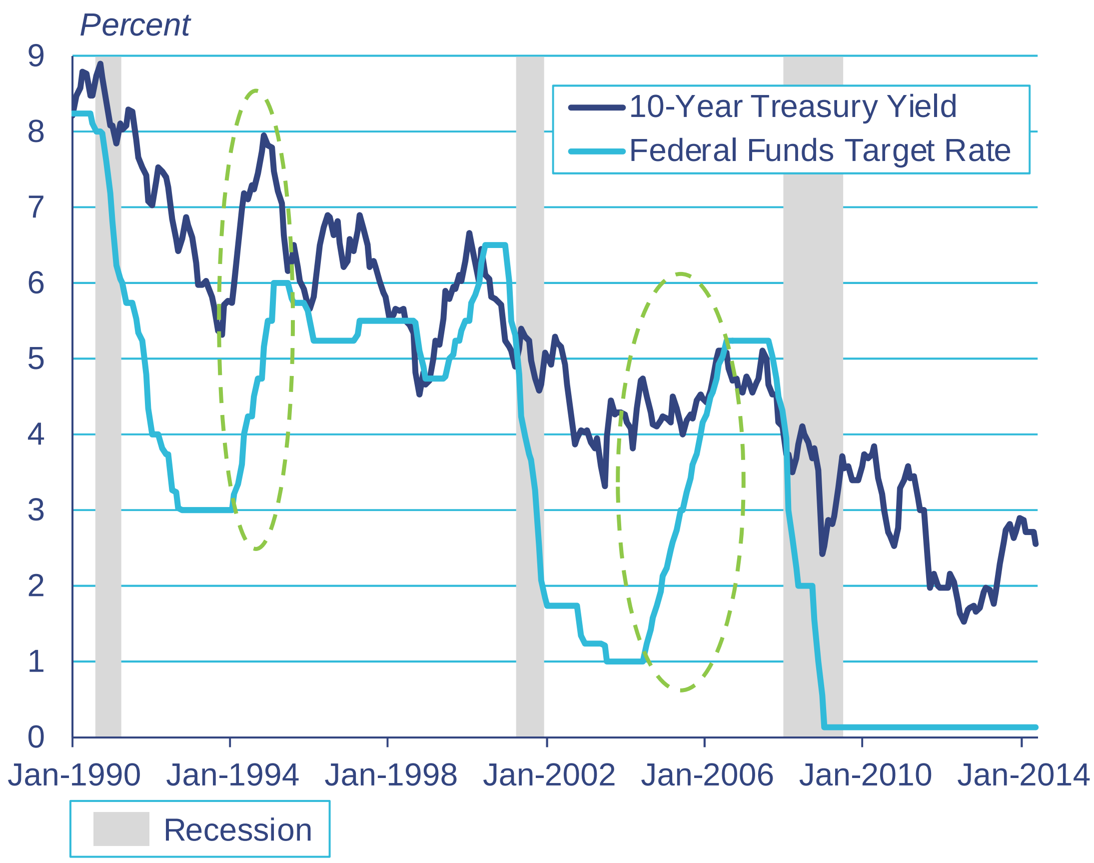
Source: Federal Reserve Board, Haver Analytics

Financial Stability and Exit

- Other considerations
  - Reverse repo provides a safe asset for investors
  - During instability, however, a run from private sector assets to reverse repurchase agreements is possible
  - Federal Reserve may need to limit size of the reverse repo facility
- Potential benefits, in my view:
  - Size of balance sheet does not impact ability to influence rates
  - Fed could maintain a large balance sheet to have additional financial stability tools at its disposal – for example, MBS and Treasury securities that could be sold to raise long-term rates, to react to asset bubbles

Figure 11: Federal Funds Target Rate and 10-Year U.S. Treasury Yield

January 1990 - May 2014



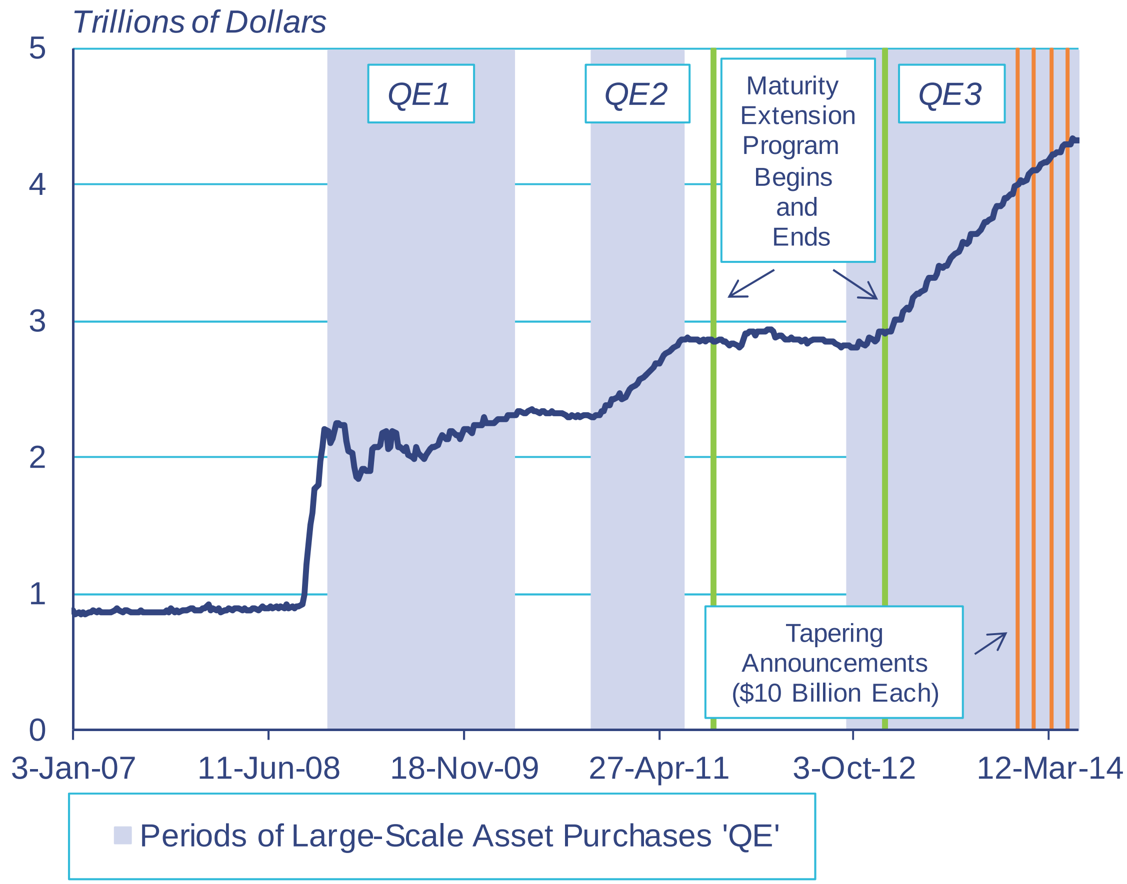
Source: Federal Reserve Board, Haver Analytics

Concluding Observations

- Even without these new policy tools, the "exits" from accommodative monetary policy can be unsettled
- The new tools were essential in recent years
- Need to react flexibly as we learn more about the use of tools as we exit
- New tools have been quite helpful, given that short-term rates were essentially at zero. It will be important to continue to work on communication and consider financial stability implications as we continue to gradually normalize policies

Figure 12: Federal Reserve System Assets

Weekly, January 3, 2007 - May 28, 2014



Source: Federal Reserve Board, Haver Analytics