Lessons from the U.S. Experience with QE

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Too soon to make a full assessment in the U.S. – full evaluation will require a successful return to a normalized monetary policy

While the tapering process is complete, we still are a long way from normalizing either short-term interest rates or our balance sheet

However, it is still appropriate to evaluate which design features were effective, and which were less successful in achieving our monetary policy goals

An important lesson is that the communications strategy is equally important
Central Bank Differences

- Important caveat – institutional, structural and governance differences across central banks can make comparisons of policy actions difficult

- An important difference between the Fed in the U.S. and most central banks in developed countries is the Federal Reserve’s dual mandate (maximum sustainable employment as well as stable prices)

- Another important difference involves restrictions on securities the Fed can purchase – we are limited to securities that have the full backing of the U.S. government
Role of Energy Shocks

- Oil supply shocks have been associated with major monetary policy changes before
- Negative oil shock factored into failure to control inflation in the U.S. in the 1970s
  - Former Chairman Volcker is recognized for taking forceful action and ultimately taming inflation
- Positive oil shock now – mirror image of the problem in the 1970s
  - Failure to quickly address a significant undershooting of inflation targets could potentially leave economies stagnant at the zero lower bound
Lessons Learned

- Significant *undershooting* of the inflation target should be treated with the same policy urgency as a significant *overshooting*.

- *Open-ended* quantitative easing tied to policy goals is likely to be much more effective than limited quantitative easing programs.

- Clarity on monetary policy communications is difficult to achieve, but critically important for the success of the program.

- Communication is as critical to how we *normalize* policy as it is to how we *initiate* quantitative easing policies.
Figure 1: Monetary Policy: Large-Scale Asset Purchase Programs – QE1, QE2, QE3, and Operation Twist

<table>
<thead>
<tr>
<th>Program</th>
<th>Announcement Date</th>
<th>Targeted End Date</th>
<th>Targeted Total Purchase</th>
<th>Composition of Purchases</th>
<th>Program Details as Announced</th>
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</thead>
<tbody>
<tr>
<td>Quantitative Easing 1</td>
<td>November 25, 2008</td>
<td>Over Several Quarters</td>
<td>Agency Debt: Up to $100 bil Agency MBS: Up to $500 bil</td>
<td>Agency Debt and Agency MBS</td>
<td>Purchase up to $100 bil of agency debt and up to $500 bil of agency MBS. Purchases expected to take place over several quarters.</td>
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<tr>
<td>(QE1)</td>
<td>March 18, 2009</td>
<td>Treasury Securities:</td>
<td>Agency Debt: Additional $100 bil Agency MBS: Additional $750 bil Longer-Term Treasuries: $300 bil</td>
<td>Agency Debt, Agency MBS, and Longer-Term Treasury Securities</td>
<td>Total purchases of agency MBS will now be to up to $1.25 trillion, and agency debt up to $200 bil. Purchase up to $300 bil of longer-term Treasury securities over next 6 months.</td>
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<td></td>
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<td>September 30, 2009</td>
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<td></td>
<td></td>
<td>Agency Debt and MBS:</td>
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<td></td>
<td></td>
<td>December 31, 2009</td>
<td></td>
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<tr>
<td>Quantitative Easing 2</td>
<td>November 3, 2010</td>
<td>June 30, 2011</td>
<td>$600 bil</td>
<td>Longer-Term Treasury Securities</td>
<td>Purchase $600 bil of longer-term Treasury securities by the end of the second quarter of 2011, a pace of about $75 bil per month.</td>
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<td>(QE2)</td>
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<td>Maturity Extension</td>
<td>September 21, 2011</td>
<td>June 30, 2012</td>
<td>$400 bil</td>
<td>Longer-Term Treasury Securities¹</td>
<td>Purchase, by the end of June 2012, $400 bil of Treasury securities with remaining maturities of 6-30 years and sell an equal amount of Treasury securities with remaining maturities of 3 years or less.</td>
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<tr>
<td>Program (Operation Twist)</td>
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<td></td>
<td>June 20, 2012</td>
<td>December 31, 2012</td>
<td>Amount Limited by Remaining Shorter-Term Treasury Securities¹</td>
<td>Longer-Term Treasury Securities¹</td>
<td>Purchase Treasury securities with remaining maturities of 6-30 years at the current pace and sell or redeem an equal amount of Treasury securities with remaining maturities of approximately 3 years or less.</td>
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<td>Quantitative Easing 3</td>
<td>September 13, 2012</td>
<td>None Given</td>
<td>None Given</td>
<td>Agency MBS and Longer-Term Treasury Securities</td>
<td>Purchase agency MBS at a pace of $40 bil per month and continue Twist through yearend, increasing holdings of longer-term securities in aggregate by $85 bil.</td>
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<tr>
<td>(QE3)</td>
<td>December 12, 2012</td>
<td>None Given</td>
<td>None Given</td>
<td></td>
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</tbody>
</table>

¹Shorter-term Treasury securities are sold or redeemed while an equal amount of longer-term Treasury securities are purchased, resulting in no net increase in balance-sheet size.

Source: Federal Open Market Committee (FOMC)
Figure 2: Federal Reserve System Assets
January 2007 - December 2014

Source: Federal Reserve Board, Haver Analytics
Figure 3: Federal Reserve System Assets
January 2007 - December 2014

Source: Federal Reserve Board, Haver Analytics
Impact of Programs


- Imprecisely estimated, but roughly a 20-25 basis point reduction in long-term rates associated with a purchase of $500 billion in long-term assets
  - Numerous Federal Reserve officials were publicly discussing possible policy options
  - Timing of *exactly when the market came to expect* a new program is hard to pinpoint
Broader Impact

- Statements at various times emphasized that program would:
  - “Put downward pressure on longer-term interest rates”
  - “Support mortgage markets”
- Examine broad differences in QE2 and QE3 impact
Figure 4: Quantitative Easing Announcements and Ten-Year Treasury Yields

Source: Federal Reserve Board, Haver Analytics
Figure 5: Housing Starts

April 2010 - December 2014

Source: Census Bureau, Haver Analytics
Figure 6: U.S. House Price Index

April 2010 - November 2014

Index, January 2000 = 100

Periods of Large-Scale Asset Purchases 'QE'

Source: FHFA, Haver Analytics
Figure 7: Auto and Light-Weight Truck Sales
April 2010 - December 2014

*Millions of Units, Seasonally Adjusted Annual Rate*

- **QE2**
- **QE3**
- **Twist Begins**
- **Tapering Begins**
- **Tapering Discussed**
- **Tapering Ends**

*Source: BEA, Haver Analytics*
Figure 8: S&P 500 Composite Stock Price Index
April 2010 - December 2014

Source: S&P, Haver Analytics
Figure 9: Civilian Unemployment Rate
April 2010 - December 2014

Source: BLS, Haver Analytics
Figure 10: Inflation Rate: Change in Core Personal Consumption Expenditures Price Index
April 2010 - December 2014

Source: BEA, Haver Analytics
Observations

- The presence of full employment in the Fed’s dual mandate, and the pain felt in U.S. labor markets, coupled with core inflation below 2 percent, provided plenty of support for aggressive policy actions

- QE2
  - Limited in scope – fixed purchase amount
  - Not communicated in a manner tied to goals
  - Focused on Treasury securities rather than areas with larger spreads, such as mortgages
  - As a result – limited impact
QE3 was limited only by the progress made against goals

- Purchases were open-ended
- Communication was firmly tied to goals
- It included areas with larger spreads, such as mortgages

- Both financial variables and real variables showed improvement with this program
Exit Strategy

- Policy should not be focused on progress from where we have been
- Policy should instead be focused on meeting the ultimate goals in a timely fashion
- At this time, there is insufficient evidence that U.S. inflation is clearly trending toward the 2 percent goal
- A policy of patience in the U.S. continues to be appropriate
- There are asymmetric costs and challenges, given that the U.S. remains at the zero lower bound
Figure 11: Employment Cost Index for Total Compensation for Private Industry Workers by Occupational Group
2001:Q1 - 2014:Q4

Source: BLS, Haver Analytics
Concluding Observations

- Focus has been on the U.S. experience
  - Japanese experience of raising the rate of inflation with a broad open-ended program tied to its policy goal is encouraging
  - We will also learn from recently announced programs being initiated in Europe
- The focus among central banks around the world on persistently low inflation rates is encouraging
- Problems generated by low inflation and interest rates settling at the zero lower bound were underestimated by professional economists and central bankers alike
- Actions being taken to achieve inflation targets should result in a more robust global economy