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Economic Outlook

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Investor Implementation of Fed Policy

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In introductory remarks to a conference on monetary policy this past weekend, Federal Reserve Chairman Ben Bernanke candidly acknowledged that central bankers' understanding of the monetary policy tools deployed since 2008 is incomplete. Since World War II, the Fed has relied primarily on the federal funds rate as its policy tool. With this rate near zero since late-2008, policy implementation has shifted to changes in the size and composition of the Fed's balance sheet and greater specificity in communication with financial market participants (so-called "open mouth operations"). Although empirical evidence suggests that these new policy tools have reduced yields and risk premia, the precise channels through which they operate is not entirely clear. There is some risk that the effectiveness of these programs has depended, in part, on a degree of investor participation and enthusiasm that may not exist in the future.

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The Evolution of the Fed's Monetary Policy Toolkit

At the height of the financial crisis, the Fed created a large number of emergency credit and liquidity programs to diminish the risk of a total collapse of the financial system. These included the Money Market Investor Funding Facility (MMIFF), the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), the Commercial Paper Funding Facility (CPFF), the Primary Dealer Credit Facility (PDCF), the Term Securities Lending Facility (TSLF), and the Term Auction Facility (TAF), and temporary liquidity swap arrangements between the Federal Reserve and other foreign central banks. Although these programs made use of the Fed balance sheet, the Fed initiated these facilities in its capacity as the lender of last resort for the financial system. It was not until the Fed launched the first Large Scale Asset Purchase (LSAP) program in November 2008 that the balance sheet began to be used for monetary policy purposes.

The first LSAP, or quantitative easing (QE), program involved the purchase of $600 billion in the debt and mortgage-backed securities (MBS) of Fannie Mae, Freddie Mac, and Ginnie Mae. In March 2009, the Fed expanded the program to include longer-term Treasury securities and increased the size of the purchases to $1.75 trillion, which was more than twice the size of the Fed's pre-crisis balance sheet.[1] These purchases were financed through the creation of new reserve balances at the selling bank's account with the Fed. Although this has been described as "printing money," the new balances generally remain on loan with the Fed where they earn interest. Most analysts credit the first LSAP, or "QE1" as it's commonly known, for aiding the stabilization of the financial system and reducing the substantial risk premium that existed in MBS

[1] Gagnon, et al., "Large Scale Asset Purchases by the Federal Reserve: Did They Work?" *FRBNY Economic Policy Review* May 2011.

markets. Estimates suggest QE1 reduced yields on the 10 year Treasury note and current coupon MBS by over 110 basis points (1.1%).[2]

After QE1 ended March 31, 2010, the Fed briefly began contemplating a gradual withdrawal of monetary accommodation. The Federal Open Market Committee (FOMC) minutes from April 2010, for example, detail debates among Committee members about how quickly to normalize the size and composition of the Fed balance sheet. However, as the recovery weakened, the Fed decided instead to institute another LSAP, which consisted of an additional $600 billion of longer-term Treasury securities. Formally announced in November 2010, this program, more commonly known as "QE2" was effectively unveiled by Chairman Bernanke on August 27, 2010 at Jackson Hole. Most studies find these purchases reduced Treasury yields by between 15 and 30 basis points.[3]

When the recovery again appeared to be losing steam in mid-2011, the Fed launched two additional unconventional policy measures. First, on August 9, 2011 the Fed announced that the Fed funds rate would *likely* remain at "exceptionally low levels" through "mid-2013." This was the first time the Fed had committed to keeping its policy rate at a certain level for a specific period of time. By changing the expected path for short-term rates, the policy resulted in a collapse in the two-year and three-year swap rates from 0.7% and 1.18%, respectively, on July 1 to 0.42% and 0.58% after the August announcement. Secondly, on September 21, 2011 the Fed launched the Maturity Extension Program (MEP), or "Operation Twist," where the Fed intends to purchase $400 billion of longer-term Treasury securities through proceeds generated by the sale of an equal amount of shorter-term Treasury holdings. Unlike QE1 and QE2, Operation Twist was not financed by the creation of new reserve balances and will leave the size of the Fed's balance sheet unchanged. A March 2012 paper from the Bank for International Settlements (BIS) finds that Operation Twist would reduce longer-term Treasury yields by 85 basis points, holding other factors constant.[4]

Finally, on January 25, 2012 the Fed formally set an inflation target of 2%, as measured by the annual change in the price index for personal consumption expenditures. Although widely anticipated since Bernanke became Fed Chairman in 2006, the stipulation of a formal inflation target was a huge institutional change that again emphasizes the importance of communication as a policy tool. The announcement of the inflation target was also accompanied by summaries of the economic projections and the target fed funds rate projections made by Federal Reserve Board members and Federal Reserve Bank presidents.

Investors as the Key Monetary Policy Transmission Channel

Studies of the effectiveness of the new policy tools generally focus on the changes in financial market conditions from the date of the policy's announcement rather than the policy's effective date.[5] And, in many cases, the policy's announcement date is considered to have occurred well in advance of the official policy statement due to the response of investors to the news content of speeches or well-sourced news articles. **The focus on announcement dates is significant because it implies that the effectiveness of the asset purchases stems from investors' willingness to implement fed policy themselves.** Investors in sovereign debt have effectively "front run" the Fed by bidding up the prices of securities the Fed intends to buy weeks or months in advance of the first bid order from the Fed's System Open Market Account (SOMA).

[2] Gagnon, et al., 2011..
[3] See, for example, Krishnamurthy1 and Vissing-Jorgensen, "The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy," October 13, 2011.
[4] Meaning and Zhu, "The impact of Federal Reserve asset purchase programmes: another twist," Bank for International Settlements Quarterly Review, March 2012.
[5] The alternative to these "event studies" is a counterfactual experiment where rates in the presence of QE are compared to those that would hypothetically exist in it absence. For an example of the later, see Jarrow and Lee, "The Impact of Quantitative Easing on the U.S. Term Structure of Interest Rates," March 2012.

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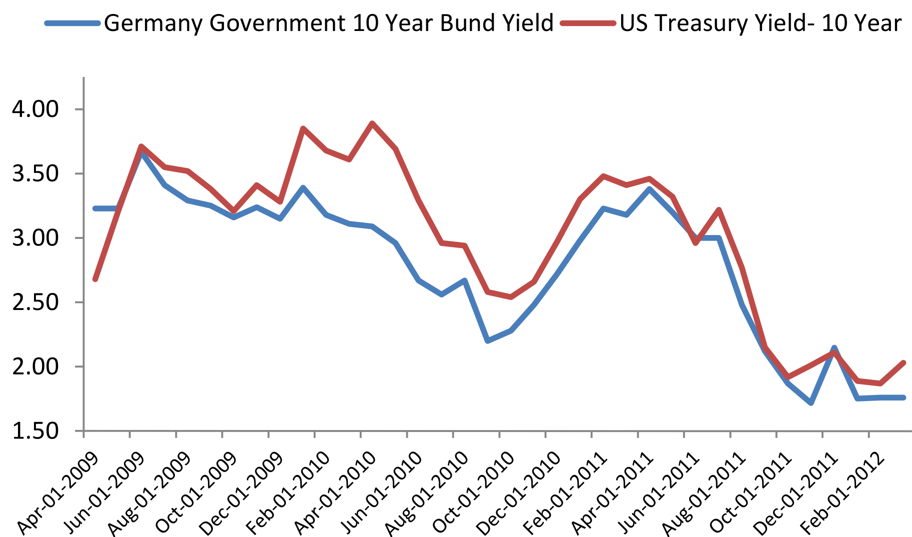
Fed research suggests that asset purchases directly reduce yields by about 3.5 basis points, on average, in the days immediately following the transaction.[6] This effect increases to 50 basis points, on a cumulative basis, when including the market reaction to expectations of a decline in the supply of available Treasury securities. The evidence suggests that if the Fed commitment to purchase additional securities were not credible, or if market participants perceived additional purchases as inflationary, the purchases themselves would not have had the intended impact.[7] Moreover, the evidence on the impact of the purchase announcements may be contaminated by other policy announcements made by the Fed at the same time. Even if no other policy is announced, if the Fed suggests that the economy is doing poorly, longer-dated yields may fall simply because investors expect the fed funds rate to be lower for a longer period of time.

The anticipation of Fed asset purchases and associated portfolio rebalancing is also thought to impact the prices of related assets. The "term premium" is the additional compensation an investor demands to bear the interest rate risk associated with longer-term obligations. Fed purchases of longer-term Treasury securities reduce the term premium and the amount of duration risk private sector balance sheets have to absorb. Investors displaced by Fed purchases are then thought to move into other assets with similar characteristics, such as high-quality corporate bonds. This portfolio rebalancing was sufficiently large to cause BBB bond yields to fall by almost 100 basis points in the two days following the announcement of QE1.[8]

Chart 1



Source: S&P Capital IQ

Portfolio rebalancing is not limited to domestic assets. The suppression of domestic risk premia and yields increases the attractiveness of foreign assets with similar characteristics. This leads investors to bid up the prices of these assets, depressing their yields and the foreign exchange value of the dollar. As shown in Chart 1, the search for substitutable assets caused the 10-year German Bund yields to closely track those of Treasury notes over the period despite no outright asset purchases by the European Central Bank. QE1 also led to a 7.7% fall in the U.S. dollar index in two days. The dollar depreciation introduced by QE is assumed to occur if the asset purchases are financed by "printing money" or selling short-term government debt. The

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[6] D'Amico and King, "Flow and stock effects of large scale asset purchases." Federal Reserve Board Finance and Economics Discussion paper 2010-52.
[7] Meaning and Zhu, "The impact of recent central bank asset purchase programmes," Bank for International Settlements Quarterly Review, December 2011.
[8] Meaning and Zhu, 2011.

impact comes from the suppression of longer-term, dollar-denominated yields, which causes investors to rationally increase the weight of foreign assets held in the portfolio.[9]

Will Investors Always Be So Pliant?

Fed asset purchase programs condition investors' expectations about the likely returns on longer-term Treasury securities. Investors respond to diminished return expectations by rebalancing portfolios, which causes the impact of the Fed asset purchases to extend beyond the actual securities acquired. But if the impact of Fed policy depends on the reaction of investors rather than the purchases themselves, it is worthwhile to wonder whether investors will always be so pliant. Bank for International Settlements research suggest that QE2 was less effective per billion dollars spent than QE1 and attributes the reduced efficiency to the decline in the "novelty element." As market participants become inured to Fed asset purchases and portfolio shifts, the scale of action necessary to generate a given amount of movement in asset prices or yields could rise exponentially. At the end of 2011, the total value of credit market debt outstanding in the U.S. stood at $54.1 trillion, while corporate equities added an additional $22 trillion to the stock of investible assets.[10]

At the same time, investors' willingness to implement Fed policy will likely depend critically on the internal consistency of Fed policy targets. At some point, the Fed's ability to reduce the yields on longer-term Treasury securities may come in conflict with its ability to hit its announced inflation target, in which case conditions are unlikely to warrant "exceptionally low" overnight rates through the end of 2014. By deliberately suppressing the premia that investors earn from bearing interest rate and credit risk and fostering expectations that monetary policy will remain accommodative for longer periods than investors anticipate, the Fed is actually making investors' portfolios more vulnerable to a shock that causes the Fed to reverse course. There is the potential for a dangerous circularity in the current arrangement in that monetary policy depends on investor portfolio rebalancing, which itself depends on sustained confidence in the integrity of Fed policy targets and the duration of policy accommodation.

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[9] Neely, "The Large-Scale Asset Purchases Had Large International Effects," Federal Reserve Bank of St. Louis Working Paper 2010-018C.
[10] Flow of Funds Accounts of the United States, L. 5.