# Ben S Bernanke: Monetary policy since the onset of the crisis

Speech by Mr Ben S Bernanke, Chairman of the Board of Governors of the Federal Reserve System, at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, Wyoming, 31 August 2012.

* * *

When we convened in Jackson Hole in August 2007, the Federal Open Market Committee's (FOMC) target for the federal funds rate was 5-1/4 percent. Sixteen months later, with the financial crisis in full swing, the FOMC had lowered the target for the federal funds rate to nearly zero, thereby entering the unfamiliar territory of having to conduct monetary policy with the policy interest rate at its effective lower bound. The unusual severity of the recession and ongoing strains in financial markets made the challenges facing monetary policymakers all the greater.

Today I will review the evolution of U.S. monetary policy since late 2007. My focus will be the Federal Reserve's experience with nontraditional policy tools, notably those based on the management of the Federal Reserve's balance sheet and on its public communications. I'll discuss what we have learned about the efficacy and drawbacks of these less familiar forms of monetary policy, and I'll talk about the implications for the Federal Reserve's ongoing efforts to promote a return to maximum employment in a context of price stability.

## Monetary policy in 2007 and 2008

When significant financial stresses first emerged, in August 2007, the FOMC responded quickly, first through liquidity actions – cutting the discount rate and extending term loans to banks – and then, in September, by lowering the target for the federal funds rate by 50 basis points.[1] As further indications of economic weakness appeared over subsequent months, the Committee reduced its target for the federal funds rate by a cumulative 325 basis points, leaving the target at 2 percent by the spring of 2008.

The Committee held rates constant over the summer as it monitored economic and financial conditions. When the crisis intensified markedly in the fall, the Committee responded by cutting the target for the federal funds rate by 100 basis points in October, with half of this easing coming as part of an unprecedented coordinated interest rate cut by six major central banks. Then, in December 2008, as evidence of a dramatic slowdown mounted, the Committee reduced its target to a range of 0 to 25 basis points, effectively its lower bound. That target range remains in place today.

Despite the easing of monetary policy, dysfunction in credit markets continued to worsen. As you know, in the latter part of 2008 and early 2009, the Federal Reserve took extraordinary steps to provide liquidity and support credit market functioning, including the establishment of a number of emergency lending facilities and the creation or extension of currency swap agreements with 14 central banks around the world.[2] In its role as banking regulator, the Federal Reserve also led stress tests of the largest U.S. bank holding companies, setting the stage for the companies to raise capital. These actions – along with a host of interventions by other policymakers in the United States and throughout the world – helped stabilize global financial markets, which in turn served to check the deterioration in the real economy and the emergence of deflationary pressures.

---

1 One basis point equals one-hundredth of 1 percentage point.

2 For more on these actions to stabilize markets and their effects, see Bernanke (2009).

Unfortunately, although it is likely that even worse outcomes had been averted, the damage to the economy was severe. The unemployment rate in the United States rose from about 6 percent in September 2008 to nearly 9 percent by April 2009 – it would peak at 10 percent in October – while inflation declined sharply. As the crisis crested, and with the federal funds rate at its effective lower bound, the FOMC turned to nontraditional policy approaches to support the recovery.

As the Committee embarked on this path, we were guided by some general principles and some insightful academic work but – with the important exception of the Japanese case – limited historical experience. As a result, central bankers in the United States, and those in other advanced economies facing similar problems, have been in the process of learning by doing. I will discuss some of what we have learned, beginning with our experience conducting policy using the Federal Reserve's balance sheet, then turn to our use of communications tools.

## Balance sheet tools

In using the Federal Reserve's balance sheet as a tool for achieving its mandated objectives of maximum employment and price stability, the FOMC has focused on the acquisition of longer-term securities – specifically, Treasury and agency securities, which are the principal types of securities that the Federal Reserve is permitted to buy under the Federal Reserve Act.[3] One mechanism through which such purchases are believed to affect the economy is the so-called portfolio balance channel, which is based on the ideas of a number of well-known monetary economists, including James Tobin, Milton Friedman, Franco Modigliani, Karl Brunner, and Allan Meltzer. The key premise underlying this channel is that, for a variety of reasons, different classes of financial assets are not perfect substitutes in investors' portfolios.[4] For example, some institutional investors face regulatory restrictions on the types of securities they can hold, retail investors may be reluctant to hold certain types of assets because of high transactions or information costs, and some assets have risk characteristics that are difficult or costly to hedge.

Imperfect substitutability of assets implies that changes in the supplies of various assets available to private investors may affect the prices and yields of those assets. Thus, Federal Reserve purchases of mortgage-backed securities (MBS), for example, should raise the prices and lower the yields of those securities; moreover, as investors rebalance their portfolios by replacing the MBS sold to the Federal Reserve with other assets, the prices of the assets they buy should rise and their yields decline as well. Declining yields and rising asset prices ease overall financial conditions and stimulate economic activity through channels similar to those for conventional monetary policy. Following this logic, Tobin suggested that purchases of longer-term securities by the Federal Reserve during the Great Depression could have helped the U.S. economy recover despite the fact that short-term

---

[3] Agency securities are securities issued by the government-sponsored enterprises (GSEs) and include both mortgage-backed securities guaranteed by GSEs and GSE debt. Since August 2008, Fannie Mae and Freddie Mac have been in government conservatorship with capital support provided by the U.S. Treasury. The Federal Reserve's net acquisitions of securities are financed by the creation of commercial bank reserves, which in turn are held in accounts at the Federal Reserve. (*The text of this footnote has been revised since its original release.)

[4] See Tobin (1965, 1969), Modigliani and Sutch (1966), Brunner and Meltzer (1973), and Friedman and Schwartz (1982). Nelson (2011) discusses the relevance of Friedman's views for recent Federal Reserve policy. For modern treatments of the portfolio balance channel in a macroeconomic context, see Andrés, López-Salido, and Nelson (2004). The portfolio balance channel would be inoperative under various strong assumptions that I view as empirically implausible, such as complete and frictionless financial markets and full internalization by private investors of the government's balance sheet (Ricardian equivalence).

rates were close to zero, and Friedman argued for large-scale purchases of long-term bonds by the Bank of Japan to help overcome Japan's deflationary trap.[5]

Large-scale asset purchases can influence financial conditions and the broader economy through other channels as well. For instance, they can signal that the central bank intends to pursue a persistently more accommodative policy stance than previously thought, thereby lowering investors' expectations for the future path of the federal funds rate and putting additional downward pressure on long-term interest rates, particularly in real terms. Such signaling can also increase household and business confidence by helping to diminish concerns about "tail" risks such as deflation. During stressful periods, asset purchases may also improve the functioning of financial markets, thereby easing credit conditions in some sectors.

With the space for further cuts in the target for the federal funds rate increasingly limited, in late 2008 the Federal Reserve initiated a series of large-scale asset purchases (LSAPs). In November, the FOMC announced a program to purchase a total of $600 billion in agency MBS and agency debt.[6] In March 2009, the FOMC expanded this purchase program substantially, announcing that it would purchase up to $1.25 trillion of agency MBS, up to $200 billion of agency debt, and up to $300 billion of longer-term Treasury debt.[7] These purchases were completed, with minor adjustments, in early 2010.[8] In November 2010, the FOMC announced that it would further expand the Federal Reserve's security holdings by purchasing an additional $600 billion of longer-term Treasury securities over a period ending in mid-2011.[9]

About a year ago, the FOMC introduced a variation on its earlier purchase programs, known as the maturity extension program (MEP), under which the Federal Reserve would purchase $400 billion of long-term Treasury securities and sell an equivalent amount of shorter-term Treasury securities over the period ending in June 2012.[10] The FOMC subsequently extended the MEP through the end of this year.[11] By reducing the average maturity of the securities held by the public, the MEP puts additional downward pressure on longer-term interest rates and further eases overall financial conditions.

How effective are balance sheet policies? After nearly four years of experience with large-scale asset purchases, a substantial body of empirical work on their effects has emerged. Generally, this research finds that the Federal Reserve's large-scale purchases have significantly lowered long-term Treasury yields. For example, studies have found that the $1.7 trillion in purchases of Treasury and agency securities under the first LSAP program reduced the yield on 10-year Treasury securities by between 40 and 110 basis points. The $600 billion in Treasury purchases under the second LSAP program has been credited with lowering 10-year yields by an additional 15 to 45 basis points.[12] Three studies considering

---

5 See Tobin (1965) and Friedman (2000).

6 See Board of Governors (2008).

7 See Board of Governors (2009).

8 Several months later, to avoid an implicit tightening in policy associated with the runoff of maturing securities, the Federal Reserve also began reinvesting the principal payments received on agency MBS and debt into Treasury securities and continued to roll over maturing longer-term Treasury debt. See Board of Governors (2010a).

9 See Board of Governors (2010b).

10 At the same time, the Committee announced that it would reinvest principal payments from agency debt and agency MBS into agency MBS. See Board of Governors (2011a).

11 See Board of Governors (2012a).

12 Studies of the effects of securities purchases include, among others, D'Amico and King (forthcoming), Gagnon and others (2011), Hamilton and Wu (2012), Krishnamurthy and Vissing-Jørgensen (2011), Meaning and Zhu (2011), Swanson (2011), D'Amico and others (forthcoming), and Wright (2012).

the cumulative influence of all the Federal Reserve's asset purchases, including those made under the MEP, found total effects between 80 and 120 basis points on the 10-year Treasury yield.[13] These effects are economically meaningful.

Importantly, the effects of LSAPs do not appear to be confined to longer-term Treasury yields. Notably, LSAPs have been found to be associated with significant declines in the yields on both corporate bonds and MBS.[14] The first purchase program, in particular, has been linked to substantial reductions in MBS yields and retail mortgage rates. LSAPs also appear to have boosted stock prices, presumably both by lowering discount rates and by improving the economic outlook; it is probably not a coincidence that the sustained recovery in U.S. equity prices began in March 2009, shortly after the FOMC's decision to greatly expand securities purchases. This effect is potentially important because stock values affect both consumption and investment decisions.

While there is substantial evidence that the Federal Reserve's asset purchases have lowered longer-term yields and eased broader financial conditions, obtaining precise estimates of the effects of these operations on the broader economy is inherently difficult, as the counterfactual – how the economy would have performed in the absence of the Federal Reserve's actions – cannot be directly observed. If we are willing to take as a working assumption that the effects of easier financial conditions on the economy are similar to those observed historically, then econometric models can be used to estimate the effects of LSAPs on the economy. Model simulations conducted at the Federal Reserve generally find that the securities purchase programs have provided significant help for the economy. For example, a study using the Board's FRB/US model of the economy found that, as of 2012, the first two rounds of LSAPs may have raised the level of output by almost 3 percent and increased private payroll employment by more than 2 million jobs, relative to what otherwise would have occurred.[15] The Bank of England has used LSAPs in a manner similar to that of the Federal Reserve, so it is of interest that researchers have found the financial and macroeconomic effects of the British programs to be qualitatively similar to those in the United States.[16]

---

[13] See Pandl (2012), Meyer and Bomfim (2012), and Li and Wei (2012). One important feature of these analyses is that they are not just based on event studies. For example, the Li and Wei study employs a no-arbitrage model of the term structure of interest rates and time-series data from 1994 to 2007 to estimate the effects on term premiums of changes in the amount of longer-term Treasury debt and agency MBS held by the public. Using this model, Li and Wei are able to infer the effects of the two LSAP programs and the MEP, controlling for changes in the expected path of the federal funds rate and its implications for long-term interest rates. Their analysis suggests that the Federal Reserve's asset purchases are an important factor underlying the current very low level of the term premium in longer-term rates.

[14] On corporate bonds, see Krishnamurthy and Vissing-Jørgensen (2011) and Wright (2012); Fuster and Willen (2010), Hancock and Passmore (2011), and Wright (2012) report results on mortgage yields. Early skeptics of balance sheet policies worried that any effects on Treasury yields would not be transmitted to other interest rates and asset prices. The evidence reported in these papers refutes this concern, as does the fact that spreads of investment-grade corporate bond yields and mortgage rates over comparable-maturity Treasury yields were not elevated from late 2009 through mid-2011; those spreads have since risen somewhat, reflecting in part concerns about the European situation and the pace of the U.S. economic recovery.

[15] See Chung and others (2012) for details of assumptions and simulation results. Focusing only on the second LSAP program, Fuhrer and Olivei (2011) find comparable effects, attributing to that program a bit less than a 1 percent increase in output and 700,000 new jobs. Using different methodologies, Kiley (2012) finds significantly smaller effects and Baumeister and Benati (2010) find larger effects.

[16] Joyce, Tong, and Woods (2011) summarize a range of estimates of the macroeconomic effects of the Bank of England's quantitative easing program, which, relative to size of the U.K. economy, is roughly equivalent in scale to the Federal Reserve's two LSAP programs. Those estimates suggest a peak effect of 1-1/2 to 2 percent for real output and between 3/4 and 1-1/2 percent for inflation in the United Kingdom. See also Baumeister and Benati (2010) and Christensen and Rudebusch (2012).

To be sure, these estimates of the macroeconomic effects of LSAPs should be treated with caution. It is likely that the crisis and the recession have attenuated some of the normal transmission channels of monetary policy relative to what is assumed in the models; for example, restrictive mortgage underwriting standards have reduced the effects of lower mortgage rates. Further, the estimated macroeconomic effects depend on uncertain estimates of the persistence of the effects of LSAPs on financial conditions.[17] Overall, however, a balanced reading of the evidence supports the conclusion that central bank securities purchases have provided meaningful support to the economic recovery while mitigating deflationary risks.

Now I will turn to our use of communications tools.

## Communication tools

Clear communication is always important in central banking, but it can be especially important when economic conditions call for further policy stimulus but the policy rate is already at its effective lower bound. In particular, forward guidance that lowers private-sector expectations regarding future short-term rates should cause longer-term interest rates to decline, leading to more accommodative financial conditions.[18]

The Federal Reserve has made considerable use of forward guidance as a policy tool.[19] From March 2009 through June 2011, the FOMC's postmeeting statement noted that economic conditions "are likely to warrant exceptionally low levels of the federal funds rate for an extended period."[20] At the August 2011 meeting, the Committee made its guidance more precise by stating that economic conditions would likely warrant that the federal funds rate remain exceptionally low "at least through mid-2013."[21] At the beginning of this year, the FOMC extended the anticipated period of exceptionally low rates further, to "at least through late 2014," guidance that has been reaffirmed at subsequent meetings.[22] As the language indicates, this guidance is not an unconditional promise; rather, it is a statement about the FOMC's collective judgment regarding the path of policy that is likely to prove appropriate, given the Committee's objectives and its outlook for the economy.

The views of Committee members regarding the likely timing of policy firming represent a balance of many factors, but the current forward guidance is broadly consistent with prescriptions coming from a range of standard benchmarks, including simple policy rules and optimal control methods.[23] Some of the policy rules informing the forward guidance relate

---

[17] For example, while the macroeconomic effects reported by Chung and others (2012) are consistent with the persistence of financial effects as estimated by Li and Wei (2012), Wright (2012) finds much less persistence using a different methodology. Kiley (2012) also provides arguments and evidence for why LSAPs may have been less stimulative than found in Chung and others (2012) and Fuhrer and Olivei (2011).

[18] See Eggertsson and Woodford (2003) and Levin and others (2010) for discussions of the role of communication at the zero lower bound.

[19] As with asset purchases, the Federal Reserve has not been alone in using forward policy guidance. The Bank of Canada, for example, announced in April 2009 its intention to hold the overnight policy at 25 basis points through the second quarter of 2010; this conditional guidance was subject to the bank's assessment of future inflation trends. The Bank of Japan has long provided forward guidance linking policy to economic developments. In March 2001, for example, the Bank of Japan committed to maintain its policy rate at zero until Japanese consumer prices stabilized or exhibited a year-on-year increase. The Riksbank and the Reserve Bank of New Zealand in recent years have made statements about the future course of the policy rate similar to those provided by the Federal Reserve and the Bank of Canada.

[20] See Board of Governors (2009).

[21] See Board of Governors (2011b).

[22] See Board of Governors (2012b).

[23] Yellen (2012a, 2012b) provides details on the current forward guidance.

policy interest rates to familiar determinants, such as inflation and the output gap. But a number of considerations also argue for planning to keep rates low for a longer time than implied by policy rules developed during more normal periods. These considerations include the need to take out insurance against the realization of downside risks, which are particularly difficult to manage when rates are close to their effective lower bound; the possibility that, because of various unusual headwinds slowing the recovery, the economy needs more policy support than usual at this stage of the cycle; and the need to compensate for limits to policy accommodation resulting from the lower bound on rates.[24]

Has the forward guidance been effective? It is certainly true that, over time, both investors and private forecasters have pushed out considerably the date at which they expect the federal funds rate to begin to rise; moreover, current policy expectations appear to align well with the FOMC's forward guidance. To be sure, the changes over time in when the private sector expects the federal funds rate to begin firming resulted in part from the same deterioration of the economic outlook that led the FOMC to introduce and then extend its forward guidance. But the private sector's revised outlook for the policy rate also appears to reflect a growing appreciation of how forceful the FOMC intends to be in supporting a sustainable recovery. For example, since 2009, forecasters participating in the Blue Chip survey have repeatedly marked down their projections of the unemployment rate they expect to prevail at the time that the FOMC begins to lift the target for the federal funds rate away from zero. Thus, the Committee's forward guidance may have conveyed a greater willingness to maintain accommodation than private forecasters had previously believed.[25] The behavior of financial market prices in periods around changes in the forward guidance is also consistent with the view that the guidance has affected policy expectations.[26]

**Making policy with nontraditional tools: a cost-benefit framework**

Making monetary policy with nontraditional tools is challenging. In particular, our experience with these tools remains limited. In this context, the FOMC carefully compares the expected benefits and costs of proposed policy actions.

The potential benefit of policy action, of course, is the possibility of better economic outcomes – outcomes more consistent with the FOMC's dual mandate. In light of the evidence I discussed, it appears reasonable to conclude that nontraditional policy tools have been and can continue to be effective in providing financial accommodation, though we are less certain about the magnitude and persistence of these effects than we are about those of more-traditional policies.

---

[24] On responding to unusual headwinds (technically, a situation in which a lower real interest rate is required to achieve full employment), see Williams (2009). On risk management near the zero lower bound, see Orphanides and Wieland (2000). On compensating for limits to policy accommodation attributable to the lower bound on rates, see Reifschneider and Williams (2000). Another argument for sustaining low rates follows because optimal policies may involve a slow, or "inertial," adjustment of rates; see, for example, Woodford (2003).

[25] In October 2009, private forecasters in the Blue Chip survey projected that the unemployment rate would be near 10 percent and overall inflation as measured by the consumer price index (CPI) would be 2 percent at the time that short-term interest rates (three-month Treasury bill rates) rose above 50 basis points. By March 2011, forecasters had lowered the projected unemployment rate at the policy liftoff date to about 8-1/2 percent, again accompanied by inflation near 2 percent. And by March 2012, forecasters projected that the unemployment rate would have fallen below 7-1/2 percent, and that CPI inflation would be moving up to close to 2-1/2 percent, before short-term interest rates would rise appreciably above the current target range.

[26] For example, Board staff members have performed event studies of the movement in Eurodollar futures prices and other financial variables immediately following the release of the August 2011 and January 2012 FOMC statements. In both cases, the provision of specific guidance about the likely date of liftoff was associated with a noticeable flattening of the expected path of the federal funds rate. For a formal analysis of the effectiveness of the FOMC's forward guidance, see Swanson and Williams (2012).

The possible benefits of an action, however, must be considered alongside its potential costs. I will focus now on the potential costs of LSAPs.

One possible cost of conducting additional LSAPs is that these operations could impair the functioning of securities markets. As I noted, the Federal Reserve is limited by law mainly to the purchase of Treasury and agency securities; the supply of those securities is large but finite, and not all of the supply is actively traded. Conceivably, if the Federal Reserve became too dominant a buyer in certain segments of these markets, trading among private agents could dry up, degrading liquidity and price discovery. As the global financial system depends on deep and liquid markets for U.S. Treasury securities, significant impairment of those markets would be costly, and, in particular, could impede the transmission of monetary policy. For example, market disruptions could lead to higher liquidity premiums on Treasury securities, which would run counter to the policy goal of reducing Treasury yields. However, although market capacity could ultimately become an issue, to this point we have seen few if any problems in the markets for Treasury or agency securities, private-sector holdings of securities remain large, and trading among private market participants remains robust.

A second potential cost of additional securities purchases is that substantial further expansions of the balance sheet could reduce public confidence in the Fed's ability to exit smoothly from its accommodative policies at the appropriate time. Even if unjustified, such a reduction in confidence might increase the risk of a costly unanchoring of inflation expectations, leading in turn to financial and economic instability. It is noteworthy, however, that the expansion of the balance sheet to date has not materially affected inflation expectations, likely in part because of the great emphasis the Federal Reserve has placed on developing tools to ensure that we can normalize monetary policy when appropriate, even if our securities holdings remain large. In particular, the FOMC will be able to put upward pressure on short-term interest rates by raising the interest rate it pays banks for reserves they hold at the Fed. Upward pressure on rates can also be achieved by using reserve-draining tools or by selling securities from the Federal Reserve's portfolio, thus reversing the effects achieved by LSAPs. The FOMC has spent considerable effort planning and testing our exit strategy and will act decisively to execute it at the appropriate time.

A third cost to be weighed is that of risks to financial stability. For example, some observers have raised concerns that, by driving longer-term yields lower, nontraditional policies could induce an imprudent reach for yield by some investors and thereby threaten financial stability. Of course, one objective of both traditional and nontraditional policy during recoveries is to promote a return to productive risk-taking; as always, the goal is to strike the appropriate balance. Moreover, a stronger recovery is itself clearly helpful for financial stability. In assessing this risk, it is important to note that the Federal Reserve, both on its own and in collaboration with other members of the Financial Stability Oversight Council, has substantially expanded its monitoring of the financial system and modified its supervisory approach to take a more systemic perspective. We have seen little evidence thus far of unsafe buildups of risk or leverage, but we will continue both our careful oversight and the implementation of financial regulatory reforms aimed at reducing systemic risk.

A fourth potential cost of balance sheet policies is the possibility that the Federal Reserve could incur financial losses should interest rates rise to an unexpected extent. Extensive analyses suggest that, from a purely fiscal perspective, the odds are strong that the Fed's asset purchases will make money for the taxpayers, reducing the federal deficit and debt.[27] And, of course, to the extent that monetary policy helps strengthen the economy and raise incomes, the benefits for the U.S. fiscal position would be substantial. In any case, this purely fiscal perspective is too narrow: Because Americans are workers and consumers as well as

[27] Remittances to the Treasury from the Federal Reserve have totaled about $200 billion over the past three years, well above historical averages.

taxpayers, monetary policy can achieve the most for the country by focusing generally on improving economic performance rather than narrowly on possible gains or losses on the Federal Reserve's balance sheet.

In sum, both the benefits and costs of nontraditional monetary policies are uncertain; in all likelihood, they will also vary over time, depending on factors such as the state of the economy and financial markets and the extent of prior Federal Reserve asset purchases. Moreover, nontraditional policies have potential costs that may be less relevant for traditional policies. For these reasons, the hurdle for using nontraditional policies should be higher than for traditional policies. At the same time, the costs of nontraditional policies, when considered carefully, appear manageable, implying that we should not rule out the further use of such policies if economic conditions warrant.

## Economic prospects

The accommodative monetary policies I have reviewed today, both traditional and nontraditional, have provided important support to the economic recovery while helping to maintain price stability. As of July, the unemployment rate had fallen to 8.3 percent from its cyclical peak of 10 percent and payrolls had risen by 4 million jobs from their low point. And despite periodic concerns about deflation risks, on the one hand, and repeated warnings that excessive policy accommodation would ignite inflation, on the other hand, inflation (except for temporary deviations caused primarily by swings in commodity prices) has remained near the Committee's 2 percent objective and inflation expectations have remained stable. Key sectors such as manufacturing, housing, and international trade have strengthened, firms' investment in equipment and software has rebounded, and conditions in financial and credit markets have improved.

Notwithstanding these positive signs, the economic situation is obviously far from satisfactory. The unemployment rate remains more than 2 percentage points above what most FOMC participants see as its longer-run normal value, and other indicators – such as the labor force participation rate and the number of people working part time for economic reasons – confirm that labor force utilization remains at very low levels. Further, the rate of improvement in the labor market has been painfully slow. I have noted on other occasions that the declines in unemployment we have seen would likely continue only if economic growth picked up to a rate above its longer-term trend.[28] In fact, growth in recent quarters has been tepid, and so, not surprisingly, we have seen no net improvement in the unemployment rate since January. Unless the economy begins to grow more quickly than it has recently, the unemployment rate is likely to remain far above levels consistent with maximum employment for some time.

In light of the policy actions the FOMC has taken to date, as well as the economy's natural recovery mechanisms, we might have hoped for greater progress by now in returning to maximum employment. Some have taken the lack of progress as evidence that the financial crisis caused structural damage to the economy, rendering the current levels of unemployment impervious to additional monetary accommodation. The literature on this issue is extensive, and I cannot fully review it today.[29] However, following every previous U.S. recession since World War II, the unemployment rate has returned close to its pre-recession level, and, although the recent recession was unusually deep, I see little evidence of substantial structural change in recent years.

Rather than attributing the slow recovery to longer-term structural factors, I see growth being held back currently by a number of headwinds. First, although the housing sector has shown

[28] See Bernanke (2012).

[29] See Daly and others (2011) for an overview.

signs of improvement, housing activity remains at low levels and is contributing much less to the recovery than would normally be expected at this stage of the cycle.

Second, fiscal policy, at both the federal and state and local levels, has become an important headwind for the pace of economic growth. Notwithstanding some recent improvement in tax revenues, state and local governments still face tight budget situations and continue to cut real spending and employment. Real purchases are also declining at the federal level. Uncertainties about fiscal policy, notably about the resolution of the so-called fiscal cliff and the lifting of the debt ceiling, are probably also restraining activity, although the magnitudes of these effects are hard to judge.[30] It is critical that fiscal policymakers put in place a credible plan that sets the federal budget on a sustainable trajectory in the medium and longer runs. However, policymakers should take care to avoid a sharp near-term fiscal contraction that could endanger the recovery.

Third, stresses in credit and financial markets continue to restrain the economy. Earlier in the recovery, limited credit availability was an important factor holding back growth, and tight borrowing conditions for some potential homebuyers and small businesses remain a problem today. More recently, however, a major source of financial strains has been uncertainty about developments in Europe. These strains are most problematic for the Europeans, of course, but through global trade and financial linkages, the effects of the European situation on the U.S. economy are significant as well. Some recent policy proposals in Europe have been quite constructive, in my view, and I urge our European colleagues to press ahead with policy initiatives to resolve the crisis.

## Conclusion

Early in my tenure as a member of the Board of Governors, I gave a speech that considered options for monetary policy when the short-term policy interest rate is close to its effective lower bound.[31] I was reacting to common assertions at the time that monetary policymakers would be "out of ammunition" as the federal funds rate came closer to zero. I argued that, to the contrary, policy could still be effective near the lower bound. Now, with several years of experience with nontraditional policies both in the United States and in other advanced economies, we know more about how such policies work. It seems clear, based on this experience, that such policies can be effective, and that, in their absence, the 2007–09 recession would have been deeper and the current recovery would have been slower than has actually occurred.

As I have discussed today, it is also true that nontraditional policies are relatively more difficult to apply, at least given the present state of our knowledge. Estimates of the effects of nontraditional policies on economic activity and inflation are uncertain, and the use of nontraditional policies involves costs beyond those generally associated with more-standard policies. Consequently, the bar for the use of nontraditional policies is higher than for traditional policies. In addition, in the present context, nontraditional policies share the limitations of monetary policy more generally: Monetary policy cannot achieve by itself what a broader and more balanced set of economic policies might achieve; in particular, it cannot neutralize the fiscal and financial risks that the country faces. It certainly cannot fine-tune economic outcomes.

As we assess the benefits and costs of alternative policy approaches, though, we must not lose sight of the daunting economic challenges that confront our nation. The stagnation of the labor market in particular is a grave concern not only because of the enormous suffering

---

[30] For more on fiscal policy and policy uncertainty, see Congressional Budget Office (2012) and Baker, Bloom, and Davis (2012).

[31] See Bernanke (2003).

and waste of human talent it entails, but also because persistently high levels of unemployment will wreak structural damage on our economy that could last for many years.

Over the past five years, the Federal Reserve has acted to support economic growth and foster job creation, and it is important to achieve further progress, particularly in the labor market. Taking due account of the uncertainties and limits of its policy tools, the Federal Reserve will provide additional policy accommodation as needed to promote a stronger economic recovery and sustained improvement in labor market conditions in a context of price stability.

## References


Andrés, Javier, J. David López-Salido, and Edward Nelson (2004). "Tobin's Imperfect Asset Substitution in Optimizing General Equilibrium," Journal of Money, Credit and Banking, vol. 36 (August), pp. 665–90.

Baker, Scott R., Nicholas Bloom, and Steven J. Davis (2012). "Measuring Economic Policy Uncertainty (PDF)," working paper, June. Economic Policy Uncertainty, website.

Baumeister, Christiane, and Luca Benati (2010). "Unconventional Monetary Policy and the Great Recession: Estimating the Impact of a Compression in the Yield Spread at the Zero Lower Bound (PDF)," European Central Bank Working Paper Series, 1258. Frankfurt: European Central Bank, October.

Bernanke, Ben S. (2003). "Some Thoughts on Monetary Policy in Japan," speech delivered at the Japan Society of Monetary Economics, Tokyo, May 31.

Bernanke, Ben S. (2009). "Reflections on a Year of Crisis," speech delivered at "Financial Stability and Macroeconomic Policy," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 20–22.

Bernanke, Ben S. (2012). "Recent Developments in the Labor Market," speech delivered at the National Association for Business Economics Annual Conference, Washington, March 26.

Board of Governors of the Federal Reserve System (2008). "Federal Reserve Announces It Will Initiate a Program to Purchase the Direct Obligations of Housing-Related Government-Sponsored Enterprises and Mortgage-Backed Securities Backed by Fannie Mae, Freddie Mac, and Ginnie Mae," press release, November 25.

-------- (2009). "FOMC Statement," press release, March 18.

-------- (2010a). "FOMC Statement," press release, August 10.

-------- (2010b). "FOMC Statement," press release, November 3.

-------- (2011a). "Federal Reserve Issues FOMC Statement," press release, November 21.

-------- (2011b). "FOMC Statement," press release, August 9.

-------- (2012a). "Federal Reserve Issues FOMC Statement," press release, June 20.

-------- (2012b). "FOMC Statement," press release, January 25.

Brunner, Karl, and Allan H. Meltzer (1973). "Mr. Hicks and the 'Monetarists,'" Economica, vol. 40 (February), pp. 44–59.

Christensen, Jens H.E., and Glenn D. Rudebusch (2012). "The Response of Interest Rates to U.S. and U.K. Quantitative Easing (PDF)," Working Papers Series 2012–06. San Francisco: Federal Reserve Bank of San Francisco, May.

Chung, Hess, Jean-Philippe Laforte, David Reifschneider, and John C. Williams (2012). "Have We Underestimated the Likelihood and Severity of Zero Lower Bound Events?" Journal of Money, Credit and Banking, vol. 44 supplement (February), pp. 47–82.

Congressional Budget Office (2012). *Economic Effects of Reducing the Fiscal Restraint That Is Scheduled to Occur in 2013*. Washington: CBO, May.

Daly, Mary, Vart Hobijn, Aysegul Sahin, and Robert Valleta (2011). "Search and Matching Approach to Labor Markets: Is the Natural Rate of Unemployment Rising?" *Journal of Economic Perspectives*, vol. 26 (Summer), pp. 3–26.

D'Amico, Stefania, and Thomas B. King (forthcoming). "Flow and Stock Effects of Large-Scale Treasury Purchases: Evidence on the Importance of Local Supply," *Journal of Financial Economics*.

D'Amico, Stefania, William English, David López-Salido, and Edward Nelson (forthcoming). "The Federal Reserve's Large-Scale Asset Purchase Programs: Rationale and Effects," *Economic Journal*.

Eggertsson, Gauti B., and Michael Woodford (2003). "The Zero Bound on Interest Rates and Optimal Monetary Policy," *Brookings Papers on Economic Activity*, Spring, pp. 139–211.

Friedman, Milton (2000). "Canada and Flexible Exchange Rates (PDF)," speech delivered at "Revisiting the Case for Flexible Exchange Rates," a conference sponsored by the Bank of Canada, Ottawa, Ontario, November.

Friedman, Milton, and Anna J. Schwartz (1982). *Monetary Trends in the United States and the United Kingdom: Their Relation to Income, Prices, and Interest Rates*, 1867–1975. Chicago: University of Chicago Press.

Fuhrer, Jeffrey C., and Giovanni P. Olivei (2011). "The Estimated Macroeconomic Effects of the Federal Reserve's Large-Scale Treasury Purchase Program," Public Policy Briefs 2011–02. Boston: Federal Reserve Bank of Boston, April.

Fuster, Andreas, and Paul S. Willen (2010). "$1.25 Trillion Is Still Real Money: Some Facts about the Effects of the Federal Reserve's Mortgage Market Investments," Public Policy Discussion Papers 2010–04. Boston: Federal Reserve Bank of Boston, November.

Gagnon, Joseph, Mathew Raskin, Julie Remache, and Brian Sack (2011). "The Financial Market Effects of the Federal Reserve's Large-Scale Asset Purchases," *International Journal of Central Banking*, vol. 7 (March), pp. 3–43.

Hamilton, James D., and Jing C. Wu (2012). "The Effectiveness of Alternative Monetary Policy Tools in a Zero Lower Bound Environment," *Journal of Money, Credit and Banking*, vol. 44 supplement (February), pp. 3–46.

Hancock, Diana, and Wayne Passmore (2011). "Did the Federal Reserve's MBS Purchase Program Lower Mortgage Rates?" *Journal of Monetary Economics*, vol. 58 (July), pp. 498–514.

Joyce, Michael, Mathew Tong, and Robert Woods (2011). "The United Kingdom's Quantitative Easing Policy: Design, Operation, and Impact (PDF)," *Bank of England Quarterly Bulletin*, September, pp. 200–12.

Kiley, Michael (2012). "The Aggregate Demand Effects of Short- and Long-Term Interest Rates," Finance and Economics Discussion Series 2012–54. Washington: Board of Governors of the Federal Reserve System, September.

Krishnamurthy, Arvind, and Annette Vissing-Jørgensen (2011). "The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy," *Brookings Papers on Economic Activity*, Fall, pp. 215–65.

Levin, Andrew, David López-Salido, Edward Nelson, and Tack Yun (2010). "Limitations on the Effectiveness of Forward Guidance at the Zero Lower Bound," *International Journal of Central Banking*, vol. 6 (March), pp. 143–89.

Li, Canlin, and Min Wei (2012). "Term Structure Modelling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs," Finance and Economics Discussion Series 2012–37. Washington: Board of Governors of the Federal Reserve System, May.

Meaning, Jack, and Feng Zhu (2011). "The Impact of Recent Central Bank Asset Purchase Programmes." *Bank of International Settlements Quarterly Review,* December, pp. 73–83.

Meyer, Laurence H., and Antulio N. Bomfim (2012). "Not Your Father's Yield Curve: Modeling the Impact of QE on Treasury Yields," Macroeconomic Advisers, *Monetary Policy Insights*, May 7.

Modigliani, Franco, and Richard Sutch (1966). "Innovations in Interest Rate Policy," *American Economic Review*, vol. 56 (March), pp. 178–97.

Nelson, Edward (2011). "Friedman's Monetary Economics in Practice," Finance and Economics Discussion Series 2011–26. Washington: Board of Governors of the Federal Reserve System, April.

Orphanides, Athanasios, and Volker Wieland (2000). "Efficient Monetary Policy Design near Price Stability," *Journal of the Japanese and International Economies*, vol. 14 (December), pp. 327–65.

Pandl, Zach (2012). "Talking Down the Term Premium," Goldman Sachs ECS Research, *US Economics Analyst*, no. 12/19.

Reifschneider, David, and John C. Williams (2000). "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking*, vol. 32 (November), pp. 936–66.

Swanson, Eric T. (2011). "Let's Twist Again: A High-Frequency Event-Study Analysis of Operation Twist and Its Implications for QE2," *Brookings Papers on Economic Activity*, Spring, pp. 151–88.

Swanson, Eric T., and John C. Williams (2012). "Measuring the Effect of the Zero Lower Bound on Medium- and Longer-Term Interest Rates (PDF)," Working Papers Series 2012–02. San Francisco: Federal Reserve Bank of San Francisco, May.

Tobin, James (1965). "The Monetary Interpretation of History," *American Economic Review*, vol. 55 (June), pp. 464–85.

-------- (1969). "A General Equilibrium Approach to Monetary Theory," *Journal of Money, Credit and Banking*, vol. 1 (February), pp. 15–29.

Williams, John C. (2009). "Heeding Daedalus: Optimal Inflation and the Zero Lower Bound," *Brookings Papers on Economic Activity*, Fall, pp. 1–37.

Woodford, Michael (2003). "Optimal Interest-Rate Smoothing," *Review of Economic Studies*, vol. 70 (October), pp. 861–86.

Wright, Jonathan H. (2012). "What Does Monetary Policy Do to Long-Term Interest Rates at the Zero Lower Bound? (PDF)" NBER Working Paper Series 17154. Cambridge, Mass.: National Bureau of Economic Research, June.

Yellen, Janet L. (2012a). "The Economic Outlook and Monetary Policy," speech delivered at the Money Marketeers of New York University, New York, April 11.

-------- (2012b). "Perspectives on Monetary Policy," speech delivered at the Boston Economic Club Dinner, Boston, June 6.