

# FRBSF ECONOMIC LETTER

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## The Fed's Monetary Policy Response to the Current Crisis

The global financial market turmoil that started in August 2007 has been followed by a severe economic downturn. Indeed, the U.S. economic recession is on track to be the longest and deepest of the postwar period. This *Economic Letter* describes the Federal Reserve's monetary policy response to this financial and economic crisis. A key element of this response has been a reduction of the federal funds rate—the Fed's usual monetary policy instrument—essentially to its lower bound of zero. Still, with the economy continuing to slump, additional stimulus appears warranted, and the Federal Open Market Committee (FOMC 2009) has promised to “employ all available tools to promote economic recovery and to preserve price stability.” Therefore, the Fed has eased financial conditions by employing a variety of unconventional monetary policy tools that alter the size and composition of its balance sheet. It has also communicated more explicitly its expectations for the course of monetary policy and the economy in order to help guide households and businesses during these uncertain times.

### Interest rate actions and enhanced communications

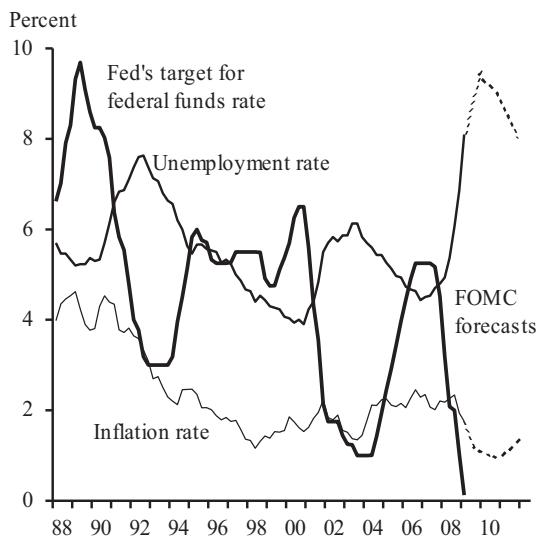
As shown in Figure 1, over the past two decades, the Fed has set the federal funds rate, a key gauge of the stance of monetary policy, in a fairly consistent fashion relative to various economic indicators such as unemployment and inflation. (Figure 1 shows the quarterly average funds rate and unemployment rate, and the four-quarter inflation rate for prices of core personal consumption expenditures. A data file is available via the online version of this *Letter*.) During the current and two previous recessions—around 1991, 2001, and 2008—the Fed responded to large jumps in unemployment with aggressive cuts in the funds rate. In addition, episodes of lower inflation also were generally associated with a lower funds rate.

A rough guideline for setting the federal funds rate that captures the Fed's behavior over the past two decades is provided by a simple equation that relates the funds rate to the inflation and unemployment rates. This equation is obtained by a statistical

regression of the funds rate on the inflation rate and on the gap between the unemployment rate and the Congressional Budget Office's estimate of the natural, or normal, rate of unemployment. The resulting empirical policy rule of thumb—a so-called Taylor rule—recommends lowering the funds rate by 1.3 percentage points if core inflation falls by one percentage point and by almost two percentage points if the unemployment rate rises by one percentage point. As shown in Figure 2, this simple rule of thumb captures the broad contours of policy over the past two decades. Differences between the recommended target rate from the estimated policy rule (the thin line) and the Fed's actual target funds rate (the thick line) are fairly small. Exceptions occurred during the mid-1990s and mid-2000s, when the funds rate was set somewhat higher or lower than the policy rule recommended. During 2007 and 2008, by this rudimentary empirical metric, the Fed's lowering of the funds rate by over five percentage points was roughly in line with its historical behavior.

The estimated Taylor rule can also be used in conjunction with economic forecasts to provide a rough

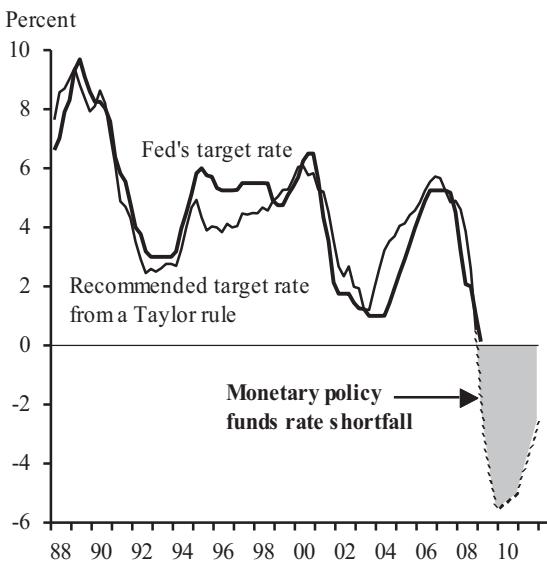
**Figure 1**  
Federal funds, unemployment, and inflation rates



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**Figure 2**  
**Federal funds rate**



benchmark for calibrating the appropriate stance of monetary policy going forward. The dashed lines in Figure 1 show the latest forecasts for unemployment and inflation provided by FOMC participants—the Federal Reserve presidents and governors. (The dashed lines are quarterly linear interpolations of the median forecasts in FOMC, 2009.) Like many private forecasters, FOMC participants foresee persistently high unemployment and low inflation as the most likely outcome over the next few years. The recommended future policy setting of the funds rate based on the estimated historical policy rule and these economic forecasts is given as the dashed line in Figure 2. This dashed line shows that, in order to deliver a degree of future monetary stimulus that is consistent with its past behavior, the FOMC would have to reduce the funds rate to  $-5\%$  by the end of this year—well below its lower bound of zero. Alternative specifications of empirical Taylor rules, described in Rudebusch (2006), also generally recommend a negative funds rate.

The shaded area in Figure 2 is the difference between the current zero-constrained level of the funds rate and the level recommended by the policy rule. It represents a *monetary policy funds rate shortfall*, that is, the desired amount of monetary policy stimulus from a lower funds rate that is unavailable because nominal interest rates can't go below zero. This policy shortfall is sizable. Indeed, the Fed has been able to ease the funds rate only about half as much as the policy rule recommends. It is also persistent. According to the historical policy rule and FOMC economic forecasts, the funds rate should be near its zero lower bound not just for the next six or nine months, but for several years. The policy shortfall persists even

though the economy is expected to start to grow later this year. Given the severe depth of the current recession, it will require several years of strong economic growth before most of the slack in the economy is eliminated and the recommended funds rate turns positive.

Economic theory suggests that it is useful for the Fed to communicate the likely duration of any policy shortfall. Monetary policy is in large part a process of shaping private-sector expectations about the future path of short-term interest rates, which affect long-term interest rates and other asset prices, in order to achieve various macroeconomic objectives (McGough, Rudebusch, and Williams 2005). In the current situation, the FOMC (2009) has noted that it “anticipates that economic conditions are likely to warrant exceptionally low levels of the federal funds rate for an extended period.” Other central banks have been even more explicit about the duration of low rates. For example, the central bank of Sweden has recently stated explicitly that it expects to keep its policy rate at a low level until the beginning of 2011. Rudebusch and Williams (2008) describe how such revelation of central bank interest rate projections may help a central bank achieve its policy goals.

Last February, FOMC participants also started to publish their long-run projections for output growth, unemployment, and inflation—in keeping with a trend toward greater transparency (Rudebusch 2008). Such *long-run* projections can help illuminate the FOMC's policy strategies and goals, and these revealed that most FOMC participants would like to see an annual inflation rate of about  $2\%$  in the longer run. Such an expression of a positive inflation objective may help prevent inflationary expectations from falling too low and forestall any excessive decline in inflation.

#### **Fed's balance sheet actions**

The size of the monetary policy funds rate shortfall has also caused the Fed to expand its use of unconventional policy tools that change the size and composition of its balance sheet. The Fed started to employ these balance sheet tools in late 2007 as unusual strains and dislocations in financial markets clogged the flow of credit. Typically, changes in the funds rate affect other interest rates and asset prices quite quickly. However, the economic stimulus from the Fed's cuts in the funds rate was blunted by credit market dysfunction and illiquidity and higher risk spreads. Accordingly, the Fed started to lend directly to a broader range of counterparties and against a broader set of collateral in order to enhance liquidity in critical financial markets, improve the flow of credit to the

economy, and restore the full effect of the monetary policy interest rate easing.

Toward the end of 2008, the recession deepened with the prospect of a substantial monetary policy funds rate shortfall. In response, the Fed expanded its balance sheet policies in order to lower the cost and improve the availability of credit to households and businesses. One key element of this expansion involves buying long-term securities in the open market. The idea is that, even if the funds rate and other short-term interest rates fall to the zero lower bound, there may be considerable scope to lower long-term interest rates. The FOMC has approved the purchase of longer-term Treasury securities and the debt and mortgage-backed securities issued by government-sponsored enterprises. These initiatives have helped reduce the cost of long-term borrowing for households and businesses, especially by lowering mortgage rates for home purchases and refinancing.

In terms of overall size, the Fed's balance sheet has more than doubled to just over \$2 trillion. However, this increase has likely only partially offset the funds rate shortfall, and the FOMC has committed to further balance sheet expansion by the end of this year. Looking ahead even further over the next few years, the size and persistence of the monetary policy shortfall suggest that the Fed's balance sheet will only slowly return to its pre-crisis level. This gradual transition should be fairly straightforward, as most new assets acquired by the Fed are either marketable securities or loans with maturities of 90 days or less. Still, any economic forecast is subject to considerable uncertainty. Some outside forecasters have warned of a deeper and more protracted recession, in which case, the monetary policy funds rate shortfall and the balance sheet expansion would be even larger and more persistent. In contrast, other analysts have argued that the Fed's growing balance sheet will lead to a resurgence of inflation (despite Japan's recent historical experience to the contrary of an increasing central bank balance sheet and falling inflation). With much higher inflation, the policy shortfall would be reduced and the Fed would need to shrink the size of its balance sheet and raise the funds rate earlier than suggested by Figure 2. Still, the Fed's short-term loans can be unwound quickly, and its portfolio of securities can be readily sold into the open market, so there should be ample time to normalize monetary policy when needed. Finally, some economists have cautioned about reading too much into policy shortfall projections (and negative funds rate rec-

ommendations) that rely on uncertain estimates of the degree of economic slack. Such considerations are always important for real-time policymaking (Rudebusch 2001, 2006), but the degree of uncertainty regarding estimates of the natural, or normal, rate of unemployment over the past two decades pales in size relative to the depth of the ongoing recession.

### Summary

The Federal Reserve is employing all available tools to promote economic recovery and price stability by lowering borrowing costs and boosting credit availability. In particular, after lowering the federal funds rate to essentially zero, the Fed has turned to unconventional policy tools to help accomplish its goals. Eventually, as the economy recovers, it will be appropriate for the Fed to reduce the size of its balance sheet toward pre-crisis levels and to raise the funds rate, and the Fed has both the means and the determination to do so.

**Glenn D. Rudebusch**  
Senior Vice President and  
Associate Director of Research

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