

# FRBSF ECONOMIC LETTER

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## Inferring Policy Objectives from Policy Actions

There is little doubt that when central banks, including the Federal Reserve, set interest rates, they do so purposefully, with particular goals and objectives in mind. But what are these goals and objectives? And if the Federal Reserve behaves systematically, what is it systematically responding to? These questions are important. Knowing what the goals of monetary policy are—and how policymakers trade off different goals when shocks hit the economy—presumably enables consumers and businesses to make better economic decisions themselves. This *Economic Letter* explores these questions by trying to infer Federal Reserve goals and objectives from Federal Reserve policy actions.

There are several ways to infer what the goals of monetary policy are. One approach is to examine Federal Reserve statements and what policymakers say they are trying to accomplish. A second approach is to use statistical methods to detect systematic relationships between the federal funds rate and other macroeconomic variables. If policymakers behave purposefully, with well-defined preferences for achieving different goals, then it may be possible to recover these preferences and goals from the empirical response of the federal funds rate to other macroeconomic variables.

### Federal Reserve statements

One way to learn about the Federal Reserve's policy objectives is to look at the Federal Reserve Act and at the policy statements the Federal Reserve releases at the time policy decisions are implemented. The Federal Reserve Act is examined in Judd and Rudebusch (1999); this *Economic Letter* will focus on statements issued by the Federal Open Market Committee (FOMC). Policy statements issued by the FOMC between January 1996 and January 2002 are available and can be downloaded from the Federal Reserve web site. Between 1996 and 2000, the FOMC released statements only when the federal funds rate target actually was changed or when the Committee's view on economic developments underwent a significant change. Since January 2000, it has released statements announcing its stance on policy after every meeting.

Every post-meeting statement since January 2000 contains the following phrase, or an almost identical equivalent: "...against the background of its long-run goals of price stability and sustainable economic growth."

From the standpoint of trying to model policy behavior, these press releases indicate that the Federal Reserve has two goals—price stability and sustainable economic growth—both of which are long-run goals. But are these really two distinct goals? And what is price stability anyway? Before January 2000, the equivalent passage might have read: "...a slightly lower federal funds rate should now be consistent with keeping inflation low and sustaining economic growth going forward" (September 29, 1998). Alan Greenspan, Federal Reserve Chairman, propounded this view in a recent speech (2001): "price stability is best thought of as an environment in which inflation is so low and stable over time that it does not materially enter into the decisions of households and firms." Thus "price stability" represents something closer to an inflation target than to a price level target.

As to whether price stability and sustainable economic growth are distinct goals, we have the following from the press releases: "The experience of the last several years has reinforced the conviction that low inflation is essential to realizing the economy's fullest growth potential" (March 25, 1997). And this: "The Committee, nonetheless, recognizes that in the current dynamic environment it must be especially alert to the emergence, or potential emergence, of inflationary forces that could undermine economic growth" (June 30, 1999). This language suggests that the two long-run goals are largely one and the same, and that the key contribution monetary policy can make to achieving sustainable economic growth is to bring about price stability, or low inflation. Reinforcing this view, Laurence Meyer, now a former Federal Reserve Governor, notes (1996): "If it were easy to produce more long-run growth simply by printing money we would have monetized our way to dramatically higher

living standards a long time ago.... Price stability is therefore the singular and unique long-run objective for monetary policy.”

While these press releases contain useful information, they fall short from the perspective of trying to model the policy formulation process formally. One issue floating in the background is whether there are also shorter-run goals, such as a short-run tradeoff between inflation and output.

### Estimated policy rules

An alternative way to describe U.S. monetary policy is through an estimated policy reaction function, or policy rule. The idea behind modeling policy this way is simple. If the Federal Reserve has in mind a long-run goal, or target, for inflation, then, when inflation departs from that target, the level at which interest rates are set should reflect this discrepancy. Of course, the degree to which interest rates respond to the deviation between inflation and its target value will depend on what other goals and concerns policymakers have, but the basic idea is insightful.

One of the most popular policy rules in the economics literature is the Taylor rule. Taylor (1993) showed that the following rule tracks the federal funds rate between 1987 and 1992 reasonably well: For each percentage point that inflation is above 2%, the federal funds rate is raised 150 basis points; for each percentage point output is above trend, the federal funds rate is raised 50 basis points. Building on Taylor's analysis, economists have used econometric techniques to estimate policy rules for a range of developed countries. For example, in Clarida, Galí, and Gertler (1998), their descriptive rule for the U.S., which is estimated over October 1979 and December 1994, has the federal funds rate responding to expected future inflation, the deviation between output and its trend (the output gap), and past federal fund rate settings.

But while estimated policy rules are useful for describing how the federal funds rate changes in relation to macroeconomic factors, they do not establish whether the variables that the federal funds rate responds to are the same as the variables that the Federal Reserve views as target variables. It may be that these variables appear in estimated policy rules not because they are targeted themselves but simply because they provide information that is useful for setting policy. Thus the output gap's presence in estimated rules does not necessarily translate into the Federal Reserve's having an output gap target. The Federal Reserve may respond to the output gap when setting interest rates because a positive output gap today can lead to higher inflation in the future.

### Estimating the Fed's goals and objectives

Implicit in the discussion so far is the idea that the Federal Reserve has a set of goals and objectives in mind that are not necessarily of equal priority, and that it sets monetary policy to meet these goals and objectives, given the economic environment it faces. The solution to this optimization problem—best meeting its goals subject to the economic environment—leads to a decision rule, which describes how the federal funds rate should be set given the economic environment. Viewed from this angle, estimated policy rules implicitly contain information about target values and the relative importance, or weights, placed on different goals. To extract information about these target values and relative weights from the data, it is necessary to formalize the setting of the federal funds rate and model the Federal Reserve's optimization problem.

The monetary policy literature usually thinks about policy goals and objectives through a quadratic objective function. In a quadratic objective function it is the squared deviation between a target variable and its target value that policymakers are concerned with, and different target variables are assigned weights reflecting that variable's relative importance. For example, if inflation and output are targeted in the objective function, and the relative weight on output is 2, then this means that policymakers are twice as concerned about deviations in output from target than about deviations in inflation from target, for a deviation of a given size. Once a policy objective function for the Federal Reserve is specified, it is possible (under certain conditions) to work backward from the way the economy evolves over time to recover the target values and relative weights that are most likely to have generated the economic outcomes actually observed.

We can apply this approach to U.S. data using the macroeconomic policy model presented in Rudebusch and Svensson (1999). This model contains equations that summarize the evolution of inflation (GDP chain-weighted price index) and real GDP (relative to trend) over time. The federal funds rate enters the model through its influence on real GDP. Next, we assume that the policy objective function is quadratic and that it contains targets for annual inflation, output, and the change in the federal funds rate. Including a target for the change in the federal funds rate accommodates the possibility that the Federal Reserve may smooth interest rates.

Following the approach described in Dennis (2001), the implicit inflation target over 1982:Q1–2000:Q2 is estimated to have been about 1.4%, and the relative weights on output and interest rate smoothing

in the objective function are estimated to be approximately 2.2 and 3.4, respectively. These estimates suggest that the economy's behavior through time is consistent with the Federal Reserve having a long-run inflation target, while also dampening the volatility of output relative to trend and the magnitude of interest rate changes.

Some caveats to these results are in order. To estimate the inflation target and the relative weights, a quadratic policy objective function has been assumed. It is sometimes thought, however, that policymakers are not symmetric in their behavior, and that they may respond to situations where output is below trend differently from those where output is above trend. If policymakers do behave asymmetrically, then a procedure that assumes they behave symmetrically is likely to miss some of the finer details in the policy formulation process. Similarly, the results above rely on the Rudebusch-Svensson model for its description of how output and inflation evolve over time. Using a different model for output and inflation would likely produce different results. In choosing the model to use, however, it is important that it fit the data well, for the model dictates what monetary policy can feasibly achieve.

### Conclusions

This *Economic Letter* has described three complementary approaches that can be used to uncover information about the Federal Reserve's policy goals and objectives. These three approaches differ in how much economic structure they bring to the problem. The first approach is to look at Federal Reserve policy statements. This approach is relatively straightforward, but it yields the least information. The second approach is to assume that the policy-setting process can be summarized in terms of a rule, and then estimate that rule. Estimated policy rules indicate how monetary policy responds to macroeconomic fluctuations, but they do not pin down what the underlying reasons for these policy responses are. The final approach requires modeling the way the economy evolves over time jointly with the monetary policy decisionmaking process. While requiring more economic structure than the two previous approaches,

this procedure provides information about the Federal Reserve's implicit targets and the relative importance it places on its different goals. Applying the latter approach to the U.S. over 1982:Q1–2000:Q2, we estimate the implicit inflation target to be 1.4%, along with substantial weight on output and interest rate smoothing relative to inflation stabilization.

**Richard Dennis**  
Economist

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