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Monetary Policy and the Taylor Rule

Overview

Some Members of Congress, dissatisfied with the Federal Reserve's (Fed's) conduct of monetary policy, have looked for alternatives to the current regime. H.R. 5018 would trigger congressional and GAO oversight when interest rates deviated from a Taylor rule. This *In Focus* provides a brief description of the Taylor rule and its potential uses.

What Is a Taylor Rule?

Normally, the Fed carries out monetary policy primarily by setting a target for the federal funds rate, the overnight inter-bank lending rate. The Taylor rule was developed by economist John Taylor to describe and evaluate the Fed's interest rate decisions. It is a simple mathematical formula that, in the best known version, relates interest rate changes to changes in the inflation rate and the output gap. These two factors directly relate to the Fed's statutory mandate to achieve "maximum employment and stable prices." The best known version of this rule is:

$$FFR = (R + I) + 0.5 \ x \ (output \ gap) + 0.5 \ x \ (I - IT)$$

where:

> FFR = federal funds rate
> R = equilibrium real interest rate (assumed here to equal 2)
> *output gap* = percent difference between actual GDP and potential GDP
> I = inflation rate
> IT = inflation target (assumed here to equal 2)

If actual GDP is equal to potential GDP and inflation is equal to its target, this rule calls for the federal funds rate to be 2% above the current inflation rate (because R = 2%). This is called the "neutral" interest rate, at which monetary policy is neither stimulative nor contractionary.

The goal of achieving maximum employment is represented by the factor *0.5 x (output gap)*. The output gap is the difference between actual and potential GDP. Potential GDP is the level of output that would be produced if all of the economy's labor and capital resources were being used. In economic downturns, actual GDP falls below potential because some resources are idle; likewise, the economy can temporarily be pushed above a level of output that is sustainable. In this rule, when the economy is below full employment, the output gap is expressed as a negative number, calling for lower interest rates. This Taylor rule states that when actual GDP is, say, 1% below potential GDP, the federal funds rate should be 0.5 percentage points below the neutral rate.

Changes in inflation enter the Taylor rule in two places. First, the nominal neutral rate rises with inflation (in order to keep the inflation-adjusted neutral rate constant). Second, the goal of maintaining price stability is represented by the factor *0.5 x (I-IT)*, which states that the FFR should be 0.5 percentage points above the inflation-adjusted neutral rate for every percentage point that inflation (I) is above its target (IT), and lowered by the same proportion when inflation is below its target. Unlike the output gap, the inflation target can be set at any rate desired. For illustration, it is set at 2% inflation here, which is the Fed's longer-term goal for inflation.

While a specific example has been provided here for illustrative purposes, a Taylor rule could include other variables, and any of the parameters (R, IT, and the weights on the output gap and inflation) could be set at any level.

How Are Taylor Rules Currently Used?

Taylor rules are currently used in economic analysis to explain the Fed's past actions or to offer a baseline in an evaluation of what the Fed has done or should do in the future. A Taylor rule (although with different parameters from this example) has been demonstrated to track actual policy relatively well for the period lasting from after inflation declined in the 1980s to the beginning of the financial crisis in 2007. Thus, it can be used in an economic model (which offers a simplified version of the actual economy) to represent the Fed's decisions under normal economic conditions.

A limitation of the Taylor rule is that it was designed only to be used with the FFR, which was the Fed's primary monetary policy instrument from roughly the early 1990s to late 2008. Since December 2008, the Fed has not used the FFR as its primary policy tool because the FFR has been at the "zero lower bound"—it has been set near zero, and thus cannot be lowered further. Instead, the Fed has created new policy tools to stimulate the economy. The Taylor rule cannot make policy prescriptions at the zero lower bound—different combinations of deflation (falling prices) and output gaps would prescribe a negative federal funds rate under the Taylor rule, but that prescription would not be actionable. The Taylor rule was devised at a time when interest rates had never fallen to the zero bound before, and it arguably seemed reasonable at the time to assume that the rule would not need to cover this contingency.

Could the Fed Use a Taylor Rule to Conduct Monetary Policy?

Economists and policy analysts have debated whether basing monetary policy on a Taylor rule would lead to better economic outcomes than the status quo. Currently, Congress has granted the Fed broad

discretion **to conduct monetary policy as it sees fit as long as it strives to meet its statutory mandate. This discretion includes autonomy over what policy tools to use (e.g., whether policy should be carried out by targeting the federal funds rate) and what the stance of monetary policy should be (e.g., at what level should the federal funds rate be set?).**

The Fed already uses the Taylor rule as a reference tool to help inform its policy decisions. Proponents would like the Taylor rule to have a more formal role in policymaking, either requiring policy to be set by a Taylor rule or requiring the Fed to explain its decisions relative to a Taylor rule. If the Fed desired, it could arguably adopt these proposals voluntarily under current law (e.g., Fed officials who set monetary policy could agree to base their vote on a Taylor rule's prescription). Legislative changes would be needed to require the Fed to adopt these proposals, however. Legislation could provide the specific details on what should be incorporated in such a rule or leave it to the Fed to work out the details.

Rules Versus Discretion

The desirability of basing policy on a Taylor rule can be viewed through the prism of the economic debate about the superiority of rules versus discretion in policymaking. Economists who favor the use of rules argue that policy is more effective if it is predictable and transparent. They argue that unpredictable policy results in financial and economic instability. For example, there can be large movements in financial prices when the Fed makes a policy change that "surprises" financial markets. A formal role for a Taylor rule could also potentially help Congress in its oversight capacity by providing a clear benchmark against which the Fed's decisions could be evaluated.

Economists favoring discretion argue that policymakers need flexibility to manage an inherently complex economy that is regularly hit by unexpected shocks. For example, rules might have hindered the Fed's ability to respond to the housing bubble and the financial crisis. In principle, a Taylor rule need not be limited to inflation and the output gap, but making it more complex would reduce the perceived benefits of transparency and predictability. Likewise, periodically modifying the form that the Taylor rule takes in response to unforeseen events would reduce predictability and increases discretion. Further, how could a Taylor rule incorporate amorphous concerns about, say, financial stability or asset bubbles when there is no consensus on how to quantify them? A Taylor rule requires data points that are easy to measure and accurately embody a larger economic phenomenon of concern. Using forecasts would probably be preferable to using actual data in the

Taylor rule, but would potentially reintroduce policy discretion. Further, if perceived policy errors by the Fed were mainly caused by forecasting errors (e.g., the failure to identify the housing bubble), then using a Taylor rule based on forecasts would probably not have prevented them.

Other practical challenges with formalizing use of the traditional Taylor rule include (1) requisite data are released with lags and later revised; (2) the neutral rate of interest and potential output growth cannot be directly observed and may vary over time, making them difficult to estimate accurately in real time; (3) basing the FFR on only inflation and the output gap would make it more volatile; (4) public comprehension; and (5) addressing the zero bound issue. (The traditional Taylor rule was not designed to prescribe unconventional policies, but it does not follow that the adoption of a Taylor rule would prevent unconventional policy because, in principle, a new version of the rule could be designed to base unconventional policies on inflation and the output gap.) These issues could be addressed by modifying the Taylor rule, but this would arguably reduce the perceived benefits of a rules-based regime.

Rules were originally favored by economists who believed that Fed discretion was responsible for high inflation, but inflation has been low since the 1990s. Recently, Taylor rules have been used to support criticism that the Fed has engaged in too much stimulus. Taylor rules in general do not inherently have a pro- or anti-stimulus bias, however, as their parameters can be adjusted to meet policymakers' goals. Policymakers who emphasize price stability could put a relatively high weight on the inflation parameter. Alternatively, policymakers who want the Fed to be responsive to (high or low) growth could put a relatively high weight on the output gap parameter. Since the form that a Taylor rule takes involves, in part, value judgments about the goals of monetary policy and the best way to achieve those goals, choosing its form involves political tradeoffs as well as economic modeling.

CRS Resources

For an overview, see CRS Report RL30354, *Monetary Policy and the Federal Reserve: Current Policy and Conditions*, by Marc Labonte.

For more information, see CRS Report R42962, *Federal Reserve: Unconventional Monetary Policy Options*, by Marc Labonte.

Marc Labonte, Specialist in Macroeconomic Policy

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