

Guidance Counselors

*The Taylor Rule
and the Fed's
forward guidance.*

BY RICHARD CLARIDA AND SAUMIL PARIKH

A decade ago, discussions and debates over “forward guidance” were confined to academic seminars and the peer-reviewed pages of the *American Economic Review*. Fast forward to today and forward guidance is promoted by central bankers in Washington, London, Frankfurt, and Tokyo as a powerful new instrument in the toolbox of post-crisis monetary policy, policy that for several years has been constrained at the zero lower bound on nominal interest rates.

Forward guidance is designed to work a certain way in theory; however, in practice it might fall short of delivering on its bountiful theoretical promise.

What is forward guidance and how is it supposed to work?

Forward guidance is an explicit communication by a central bank that provides information today about the time path for specific policy tools in the future. Forward guidance that is successful works via familiar expectations channels, including that of the term structure that links long-maturity bond yields today to the expected path of short-term interest rates in the future. In addition, forward guidance may work by lowering the term premium on long-maturity bonds.

However, to the extent that forward guidance is not fully credible, it will not be sufficiently effective. Moreover, to the extent forward guidance raises doubts about the central bank's commitment to its inflation target, it could even increase the term premium on long-maturity bonds, negating much or potentially all of the decline in bond yields it is supposed to deliver.

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Fed Chair Yellen has discussed the forward guidance that would be forthcoming were a central bank to set policy according to a version of a Taylor rule.

Forward guidance builds on the modern theory of macroeconomic dynamics as developed by Michael Woodford and Nobel laureates Finn E. Kydland and Edward C. Prescott. In a recent survey¹ of this theoretical literature, Andrew Levin and his co-authors write, “Forward guidance regarding the future path of interest rates can be very effective in preserving macroeconomic stability ... even when the near-term path of the policy rate is constrained by the zero lower bound.”

THREE KINDS OF FORWARD GUIDANCE

There are actually at least three different types of forward guidance. Guidance can be “calendar-based,” “outcome-based,” or guidance can convey a commitment today by the central bank to a future policy rate path that mimics or approximates the “optimal control” solution to a dynamic economic model.

Forward guidance of any type is most potent if it can credibly convey a commitment today to bind the choices of future policymakers who, when the future arrives, may well have an incentive to renege on the promises made years before by their predecessors (or even by themselves!).

Here are examples of the three modes of forward guidance as actually implemented or seriously considered by the Federal Reserve:

- Calendar-based guidance: Federal Open Market Committee statements, August 2011 to December 2012;
- Outcome-based guidance: FOMC statements, December 2012 to present; and
- Optimal control guidance: Fed Vice Chair Janet Yellen speeches in April and November 2012.

Since 2011, the Fed has deployed both calendar-based and outcome-based guidance. This guidance has been

explicitly conditioned on the evolution of the macroeconomic data and has not specifically conveyed an attempt to bind the Fed if the future data deviates from the forecast.

For example, here is the Fed’s calendar-based guidance from the August 2011 FOMC statement:

“The Committee currently anticipates that economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant exceptionally low levels for the federal funds rate at least through mid-2013.”

Here is an example of outcome-based guidance (the so-called Evans Rule) from the December 2012 FOMC statement:

“[The] exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6.5 percent, inflation ... is projected to be no more than a half percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.”

In two significant speeches in 2012, Fed Vice Chair (now Chair) Yellen discussed how the “optimal control” approach pioneered by Woodford might be implemented by a central bank, like the Fed, operating at the zero lower bound with high unemployment and inflation running below target. According to an optimal control approach, if the Fed could commit today to the optimal policy rate path, it could reduce unemployment faster than if it followed other policies. But there is a tradeoff: To reap the full benefits of optimal control guidance, the Fed would need to be willing to tolerate three or four years of inflation above the 2 percent target to compensate for recent years in which inflation has fallen below 2 percent.

Note that according to economic theory, this would be the fully optimal path for monetary policy only assuming that inflation expectations remain anchored at the 2 percent target during the several years when the Fed is tolerating inflation above target. Crucially, if real world inflation expectations rise in line with actual inflation, textbook optimal control theory would be of little use to the central bank, because the theory simply assumes away the problem that inflation expectations might rise in tandem with actual inflation.

GUIDANCE BY TAYLOR RULE

Perhaps for this reason, Fed Chair Yellen also has discussed (in an April 2012 speech) the forward guidance that would be forthcoming were a central bank to set policy according to a version of a Taylor rule. (This rule is an

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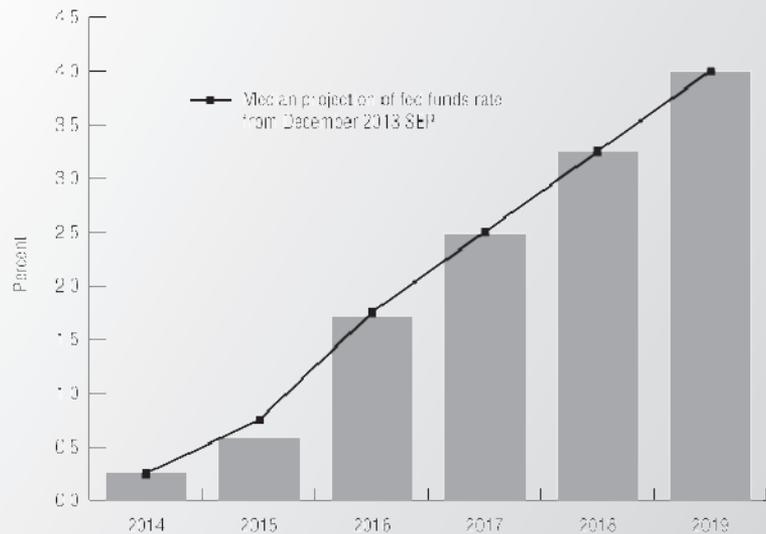
an interest rate forecasting model that guides how a central bank policy rate should respond to actual versus targeted levels of inflation and unemployment.)

One advantage of guidance by a Taylor rule (as shown for example by Clarida, Gali, and Gertler²) is that, in contrast to guidance by optimal control, it does not require the central bank to make promises today it will be tempted in the future to break. Indeed, under certain conditions, guidance by Taylor rule is the optimal policy for a central bank that is unable to commit credibly to a path for the policy rate five or six years into the future. Yellen has discussed the policy path implied by a Taylor rule of the form:

$$R = \text{neutral real rate} + 2 + 1.5(\text{inflation} - 2) + (\text{output gap})$$

To reap the full benefits of optimal control guidance, the Fed would need to be willing to tolerate three or four years of inflation above the 2 percent target to compensate for recent years in which inflation has fallen below 2 percent.

Figure 1 Implied Path for Federal Funds Rate From a Taylor Rule With SEP Inputs



Sources: Federal Open Market Committee Summary of Economic Projections, September 2013, and PIMCO calculations.

Note that guidance by Taylor rule is a version of outcome-based guidance. However, it is more informative than the current Fed approach because it indicates what the path for the policy rate will look like after unemployment falls below the Fed's target of 6.5 percent.

Note also that guidance by Taylor rule requires the Fed to provide guidance on the inputs to the Taylor rule. In the December 2013 Summary of Economic Projections, the FOMC reported projections that imply that the median Fed view is that the neutral real policy rate will be, at most, 0 percent as late as year-end 2016. In the "longer run," the Fed expects the policy rate will eventually rise to 4 percent, reflecting the 2 percent inflation target and an eventual return to an "old normal" real policy rate of 2 percent. Figure 1 shows the path for the policy rate implied by a Taylor rule using the projections from the September 2013 SEP as inputs.

OPTIMAL CONTROL OR BUST?

Although it has not to date been tried in the real world, there is broad agreement that credible guidance by optimal control could well have a potent influence on long-maturity bond yields.

However, there is less consensus on the efficacy of the calendar- and outcome-based guidance that the Fed has applied to date. In our view, the calendar-based guidance that was in effect from August 2011 to December 2012 did have material influence on the level as well as

the volatility of U.S. bond yields, especially in the front end and in the “belly” of the curve.

By contrast, it has been more difficult for the Fed to communicate with a consistent message the outcome-based guidance in effect since December 2012. This is due in no small part to the difficulty in relying on the unemployment rate, or really any single indicator, to measure accurately the state of the labor market. It is also due to the fact that the current guidance provides no information on the factors that govern the pace at which the policy rate will be normalized once the Fed does begin to hike. Either guidance by Taylor rule or by optimal control would provide that information. But realistically, as Yellen herself has stated in the April 2012 speech, “Such rules can serve as useful benchmarks ... but a dose of good judgment will always be essential as well.”

We expect the Yellen Fed to enhance the outcome-based guidance in place today to convey more information about the timing and pace of policy normalization after unemployment reaches 6.5 percent. We think it likely that the Taylor rule discussed

above as well as the optimal control analysis presented in her 2012 speeches will provide the guardrails for the policy rate path that the Fed communicates in future years. ♦

NOTES

1. Levin, A., D. López-Salido, E. Nelson, and T. Yun. 2010. Limitations on the effectiveness of forward guidance at the zero lower bound. *International Journal of Central Banking* 1:143–189.
2. We distinguish, as does Yellen, between “a” Taylor rule as shown in the text of this article and the “original” Taylor rule proposed by John Taylor. In the original Taylor rule, the neutral real interest rate is assumed constant and equal to 2 percent and the coefficient on the output gap is equal to 0.5, not 1.0 as in the text. As shown in the October 2010 *Global Central Bank Focus*, a Taylor rule of the form discussed in the text above actually describes the policy of the Fed (before hitting the zero bound in 2008) better than the original Taylor rule. See also R. Clarida, M. Gertler, and J. Gali (1999), “The science of monetary policy: a new Keynesian perspective,” *Journal of Economic Literature*, 37(4), December.