[Estimating the effects of forward guidance in rational expectations models](#)

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Richard Harrison[1,2]

[1]Centre for Macroeconomics; and [2]Bank of England

Over the past decade, central banks have explored a variety of ways to provide information about how their assessments of the economy and of the appropriate way to achieve their policy objectives are likely to affect the future path of their policy instruments. Such 'forward guidance' comes in many forms, ranging from qualitative descriptions of the key judgments underpinning policy discussions, to explicit projections of the policy instrument under alternative assumptions about the nature of the shocks hitting the economy.

As noted by Woodford (2012), interest in the use of explicit forward guidance has increased in recent years. In part this is because many central banks reduced their policy rates to their effective lower bounds in response to the financial crisis. However, the objectives of recent forward guidance policies are varied. In some cases, the guidance has been intended to signal the stance of monetary policy that policymakers think is appropriate. In other cases, the stated intention of the guidance has been to clarify the nature of the monetary policy reaction function.

Alongside the continual development of forward guidance strategies by central banks, economists have studied the effects of forward guidance in a variety of rational expectations models. Recent papers have assessed the effects of forward guidance using linearized New Keynesian dynamic stochastic general equilibrium (DSGE) models. These papers have studied experiments in which the policymaker announces that the policy instrument will follow a particular path for a finite number of periods, thereafter being set in accordance with a monetary policy reaction function. The results of these experiments have been striking, typically generating effects on macroeconomic variables that most economists and would regard as implausibly large (see, for example, Weale (2013)). This result is dubbed the "forward guidance puzzle" by del Negro et. al., (2012).

In this paper I argue that the implementation of the policy experiment in recent papers may fall foul of a particular critique of policy analysis in rational expectations models. The adherence to a specific path for the policy rate in the short term represents a fully anticipated deviation from the monetary policy rule, which can be interpreted as a temporary regime change. In rational expectations models with a single monetary policy rule, the ex ante probability of such a regime change is zero. Implementing this type of experiment therefore generates an inconsistency since "Treating regime changes as surprises that will never occur again ascribes to the public beliefs about policy that are inconsistent with actual behavior – the government takes actions that the public thought were impossible" (Leeper and Zha, 2003, p1676).

One way to correctly estimate the effects of a temporary regime change in a DSGE model is to incorporate explicit beliefs about the set of feasible regimes and the conditions under which shifts between regimes occur. But even in models without such a rich description of beliefs about policy behavior, it may be possible to simulate the effects of some policy experiments as long as they represent within-regime changes in policy that are unlikely to prompt agents to believe that there has been a shift in policy regime. Leeper and Zha (2003) define such an experiment as a "modest policy intervention" and demonstrate how to test whether a policy experiment is likely to be modest in the context of a VAR model. I use a variant of Leeper and Zha's method, as extended to DSGE models by Adolfson et. al. (2003).

I show how to simulate the effects of an announced path for the policy rate under the assumption that the experiment represents a modest policy intervention. In some cases, it may be impossible to implement a modest policy intervention that delivers precisely the desired path for the policy rate. In those cases, I show how to construct a modest policy intervention that produces a path for the policy instrument that is as close as possible to the desired path.

I illustrate my technique using a variant of the Smets and Wouters (2007) medium-scale DSGE model, extended to include 'policy news shocks' that capture anticipated future changes in the Fed funds rate. The addition of policy news shocks provides the mechanism through which plans for future policy can be simulated and, importantly, compared with the effects of typical within-regime policy changes.

I estimate the model on US data and use it to conduct policy experiments in which the Fed funds rate is held lower than the model-based forecast. In line with recent findings, when these experiments are implemented naively they generate very large macroeconomic effects. However, those experiments do not represent modest policy interventions and so their predictions of extremely large effects of forward guidance may be unreliable. When I constrain the policy experiments to be modest policy interventions, the macroeconomic effects are greatly reduced. In many cases, the path for the Fed funds rate consistent with a modest policy intervention looks very similar to the planned path for the policy rate.

One interpretation of my approach is that it constrains the effects of policy experiments to be consistent with agents' beliefs about the conduct of monetary policy in the recent past. This interpretation chimes with statements by some central bankers that their forward guidance policies are not intended to signal a deviation from their past behavior, but rather to 'clarify their reaction function'.