Effectiveness of history-dependent monetary policy

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In this paper, we evaluate the effectiveness of history-dependent monetary policy, focusing on the design of targeting regimes and simple policy rules. Our quantitative analysis is based on a small estimated forward-looking model of the Japanese economy with a hybrid Phillips curve. Our main findings are: (1) History-dependent targeting regimes, such as price level targeting and income growth targeting, outperform inflation targeting; (2) Committing to a simple history-dependent policy rule results in nearly the same social welfare as the optimal delegation of price level targeting and income growth targeting; (3) The central bank can achieve almost the same performance as the optimal commitment policy by adopting the first difference hybrid policy rule in which the change in interest rate responds to inflation, output gap, and real income growth rate. *J. Japanese Int. Economies* **18** (3) (2004) 330–361. Bank of Japan, 2-1-1, Hongokucho, Nihonbashi, Chuo-ku, Tokyo 103-8660, Japan; Board of Governors of the Federal Reserve System, Washington, DC 20551, USA; Carnegie Mellon University, Pittsburgh, PA 15213, USA.
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1. Introduction

Recent monetary policy studies have emphasized the importance of history dependence in the conduct of monetary policy. Giannoni (2000) and Woodford (2000) point out that when private agents are forward-looking, it is optimal for the central bank not only to respond to current shocks and the current state of the economy, but that it is also desirable to respond to lagged variables. Conducting monetary policy of this kind allows the central bank to appropriately affect private sector expectations. This, in turn, improves the performance of monetary policy, because the evolution of the central bank's target variables depends not only on its current actions, but also on how the private sector foresees future monetary policy.

Optimal commitment policy is history dependent and most efficient. However, it is generally time-inconsistent and therefore not particularly realistic. A lot of previous literature investigated other ways in which the monetary policy decision-making process might incorporate the sort of history dependence required for the optimal commitment policy. The design of optimal delegation is one way. On the assumption that the central bank will pursue its goal in a discretionary fashion, rather than committing itself to an optimal plan, the optimal goal with which to charge the central bank need not correspond to the true social welfare function. It is desirable that the loss function assigned to the central bank depend on lagged as well as current values of the target variables. In this case, discretionary policy is history dependent because the bank's loss function is history dependent even though the true social loss function is not.

Vestin (2000) shows that, within a purely forward-looking Phillips curve, discretionary optimization results in the same equilibrium as the optimal commitment policy, if the central bank is charged with stabilization of the price level rather than the inflation rate. Price level targeting is a history-dependent policy, in the sense that the central bank's loss function depends on the cumulative sum of inflation rates over past periods. Jensen (1999) and Walsh (2001) show that discretionary income growth targeting is also desirable, because the central bank's loss function depends on lagged output gap as well as current values of target variables.

However, there are several problems with the practical implementation of optimal delegation. Optimal delegation regimes require full information with respect to demand and price shocks for implementation by the central bank. When the central bank cannot accurately observe these shocks, which seems to be a realistic assumption, optimal delegation is not so effective as previous literature suggests. Even if the central bank can completely identify these shocks, the policy reaction function implied by optimal delegation is complicated and not transparent to the public.

Instead of implementing optimal delegation, adopting a simple policy rule is another way to incorporate history dependence into monetary policy. Woodford (1999, 2000) and Giannoni (2000) suggest that central banks can introduce desirable history dependence into monetary policy by adopting a policy rule in which the interest rate reacts to its own lagged value, price level, or income growth (i.e. change in output gap). Giannoni (2000) then shows that such a simple history-dependent policy rule performs better than the Taylor rule and results in lower welfare loss. Because simple policy rules involve no explicit dependence on demand and price shocks, and so do not even require that the central bank