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Optimal monetary policy with the cost channel ☆

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Abstract

In the standard new Keynesian framework, an optimizing policy maker does not face a trade-off between stabilizing the inflation rate and stabilizing the gap between actual output and output under flexible prices. An ad hoc, exogenous cost-push shock is typically added to the inflation equation to generate a meaningful policy problem. In this paper, we show that a cost-push shock arises endogenously when a cost channel for monetary policy is introduced into the new Keynesian model. A cost channel is present when firms' marginal cost depends directly on the nominal rate of interest. Besides providing empirical evidence for a cost channel, we explore its implications for optimal monetary policy. We show that its presence alters the optimal policy problem in important ways. For example, both the output gap and inflation are allowed to fluctuate in response to productivity and demand shocks under optimal monetary policy.

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1. Introduction

In the standard new Keynesian framework, an optimizing policy maker does not face a trade-off between stabilizing the inflation rate and stabilizing the gap between actual output and output under flexible prices. The result that the optimal policy problem has a trivial solution is widely recognized as a shortcoming of this framework. Clarida et al. (1999) show that the introduction of an ad hoc, exogenous cost-push shock allows the new Keynesian model to generate a meaningful policy problem. In this paper, we show that a cost-push shock arises endogenously in the presence of a cost channel for monetary policy. A cost channel is present when firms' marginal cost depends directly on the nominal rate of interest. Barth and Ramey (2001) provide evidence based on industry level data for the cost channel, and Christiano et al. (2005) have incorporated a cost channel into an aggregate model estimated using U.S. aggregate data. Besides providing additional empirical evidence for a cost channel of monetary policy, we explore its implications for monetary policy trade-offs, the objectives of monetary policy, and the effects of shocks on the economy under optimal discretionary and commitment policies.

We derive the appropriate welfare-based loss function that should be the policy-maker's objective in a cost-channel economy and show it is possible to express the loss function in terms of the gap between output and a measure of potential output that is invariant to assumptions on monetary policy in the flexible-price equilibrium. As a consequence, the optimal policy implications can be directly compared with standard new Keynesian results. As we show, the presence of a cost channel alters these standard policy conclusions in important ways.

If a cost channel exists, *any* shock to the economy—whether a productivity, government spending, or preference shock—generates a trade-off between stabilizing inflation and stabilizing the output gap. In the standard new Keynesian model of Clarida et al. (1999), the optimal response to such shocks guarantees that neither inflation nor the output gap deviate from their flexible-price equilibrium values. In contrast, these shocks lead to inflation and output gap fluctuations under optimal policy (either commitment or discretion) when a cost channel is present. An adverse productivity shock, for example, leads to a fall in the output gap and a rise in inflation under optimal policy. Hence, if we assume the central bank behaves optimally, observing a rise in the inflation rate does not imply that a cost push-shock has hit the economy; an adverse productivity shock would generate the same inflation behavior. Conversely, observing a positive productivity shock coupled with constant inflation would imply that the central bank is *not* following the optimal policy.

We also show that the optimal policy does not fully insulate the output gap and inflation from fiscal shocks. This finding is independent of the presence of the cost channel, and it parallels the results of Khan et al. (2003) and Benigno and Woodford (2004). A common conclusion from many recent analyses of monetary policy is that shocks to the expectational *IS* curve should be neutralized so that they do not affect the output gap. We show that when the objective function is derived as a second order approximation to the representative agent's utility function, neutralizing *IS* shocks arising from fiscal policy is not optimal, because such shocks affect welfare even when the output gap and inflation remain equal to zero.

The rest of the paper is organized as follows. In Section 2, the model is set out and the equilibrium under flexible prices and under sticky prices is derived. Section 3 estimates a