Optimal fiscal and monetary policy under sticky prices

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Abstract

This paper studies optimal fiscal and monetary policy under sticky product prices. The theoretical framework is a stochastic production economy. The government finances an exogenous stream of purchases by levying distortionary income taxes, printing money, and issuing nominal non-state-contingent bonds. The main findings of the paper are: First, for a miniscule degree of price stickiness (i.e., many times below available empirical estimates) the optimal volatility of inflation is near zero. Second, small deviations from full price flexibility induce near random walk behavior in government debt and tax rates. Finally, price stickiness induces deviation from the Friedman rule.
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1. Introduction

Two distinct branches of the existing literature on optimal monetary policy deliver diametrically opposed policy recommendations concerning the long-run and cyclical behavior of prices and interest rates. One branch follows the theoretical framework laid out in Lucas and Stokey [16]. It studies the joint determination of optimal fiscal and monetary policy in flexible-price environments with perfect competition in

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product and factor markets. In this group of papers, the government's problem consists in financing an exogenous stream of public spending by choosing the least disruptive combination of inflation and distortionary income taxes. The criterion under which policies are evaluated is the welfare of the representative private agent.

Calvo and Guidotti [4,5] and Chari et al. [6] characterize optimal monetary and fiscal policy in stochastic environments with nominal non-state-contingent government liabilities. A key result of these papers is that it is optimal for the government to make the inflation rate highly volatile and serially uncorrelated. Under the Ramsey policy, the government uses unanticipated inflation as a lump-sum tax on financial wealth. The government is able to do this to the extend that it has nominal, non-state-contingent liabilities outstanding. Thus, price changes play the role of a shock absorber of unexpected innovations in the fiscal deficit. This 'front-loading' of government revenues via inflationary shocks allows the fiscal authority to keep income tax rates remarkably stable over the business cycle.

On the other hand, a more recent literature focuses on characterizing optimal monetary policy in environments with nominal rigidities and imperfect competitions.[1] Besides its emphasis on the role of price rigidities and market power, this literature differs from the earlier one described above in two important ways. First, it assumes, either explicitly or implicitly, that the government has access to (endogenous) lump-sum taxes to finance its budget. An important implication of this assumption is that there is no need to use unanticipated inflation as a lump-sum tax; regular lump-sum taxes take up this role. Second, the government is assumed to be able to implement a production (or employment) subsidy so as to eliminate the distortion introduced by the presence of monopoly power in product and factor markets.

A key result of this literature is that the optimal monetary policy features an inflation rate that is zero or close to zero at all dates and all states.[2] The reason why price stability turns out to be optimal in environments of the type described here is straightforward: the government keeps the price level constant in order to minimize (or completely eliminate) the costs introduced by inflation under nominal rigidities.

Taken together, these two strands of research on optimal monetary policy leave the monetary authority without a clear policy recommendation. Should the central bank pursue policies that imply high or low inflation volatility? The goal of this paper is to contribute to the resolution of this policy dilemma. To this end, it incorporates in a unified framework the essential elements of the two approaches to optimal policy described above. Specifically, we build a model that shares three elements with the earlier literature: (a) The only source of regular taxation available

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[1] See, for example, [10,12,13,20,28,29].

[2] In models where money is used exclusively as a medium of account, the optimal inflation rate is typically strictly zero [30]. Khan et al. [13] show that when a transaction role for money is introduced, the optimal inflation rate lies between zero and the one called for by the Friedman rule. However, in calibrated model economies they find that the optimal rate of inflation is in fact very close to zero and smooth. Erceg et al. [10] show that in models with sluggish price adjustment in product as well as factor markets price stability is suboptimal. Yet, for realistic calibrations of their model, the optimal inflation volatility is close to zero.