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Review of Economic Dynamics 9 (2006) 683–714
Review of Economic Dynamics
www.elsevier.com/locate/red

Optimal fiscal and monetary policy with sticky wages and sticky prices

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Received 6 December 2005; revised 10 July 2006
Available online 7 September 2006

Abstract

We determine the optimal degree of price inflation volatility when nominal wages are sticky and the government uses state-contingent inflation to finance government spending. We address this question in a well-understood Ramsey model of fiscal and monetary policy, in which the benevolent planner has access to labor income taxes, nominally risk-free debt, and money creation. Our main result is that sticky wages alone make price stability optimal in the face of shocks to the government budget, to a degree quantitatively similar as sticky prices alone. Key for our results is an equilibrium restriction between nominal price inflation and nominal wage inflation that holds trivially in a Ramsey model featuring only sticky prices. Our results thus show that when nominal wages are sticky, setting real wages as close as possible to their efficient path is a more important goal of optimal monetary policy than is financing innovations in the government budget via state-contingent inflation. A second important result is that the nominal interest rate can be used to indirectly tax the rents of monopolistic labor suppliers. Taken together, our results uncover features of Ramsey fiscal and monetary policy in the presence of a type of labor market imperfection that is widely-believed to be important.

JEL classification: E50; E61; E63

Keywords: Optimal fiscal and monetary policy; Sticky wages; Sticky prices; Friedman Rule; Ramsey problem

1. Introduction

In a recent strand of the Ramsey literature on optimal fiscal and monetary policy, Schmitt-Grohe and Uribe (2004b) and Siu (2004) have found that sticky product prices makes the

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1094-2025/$ – see front matter
doi:10.1016/j.red.2006.07.001

volatility of Ramsey inflation quite small. This result contrasts with the strikingly high inflation volatility discovered by Chari et al. (1991) in an environment with flexible prices. Given recent renewed attention to the importance of stickiness in nominal wages, a natural question is to what degree does low volatility of Ramsey inflation arise in a model featuring sticky wages, either instead of or in addition to sticky prices. In this paper, we address this question in a well-understood Ramsey environment featuring only a few key distortions. Our main result is that sticky wages alone dampen inflation volatility to a similar quantitative degree as sticky prices alone in the face of shocks to the government budget. That is, consumer price stability characterizes optimal policy if wages are sticky even if product prices are fully flexible.

Inflation volatility is high in the baseline model of Chari et al. (1991) because surprise movements in the price level allow the government to synthesize real state-contingent debt payments from nominally risk-free government bonds. Surprise inflation thus serves as a non-distortionary instrument to finance innovations in the government budget, and so is preferred by the Ramsey planner to changes in distorting proportional taxes. As a prescriptive matter for central bankers, however, the optimality of highly volatile inflation seems peculiar. This prediction turns out to depend crucially on the absence of allocative effects of surprise inflation in the Chari et al. (1991) environment, due to the assumption of fully-flexible nominal prices and nominal wages. In contrast, central bankers typically think of the economy as featuring nominal rigidities, which entail costs of surprise movements in the price level.

Recent work by Christiano et al. (2005), Smets and Wouters (2005), Levin et al. (2005), and others shows that sticky nominal wages may be more important than sticky nominal prices in explaining macroeconomic dynamics. These results suggest more generally that labor market frictions are of first-order concern in the formulation of policy advice and have sparked a resurgence in studying the implications of sticky wages and other labor market imperfections for the design of optimal policy. Because the Ramsey approach to designing macroeconomic policy is an attractive one that has received increasing attention, it is of interest to investigate the impact of sticky wages on Ramsey fiscal and monetary policy. This investigation is the purpose of this paper.

Our central finding is that even when it is only nominal wages that are sticky, the Ramsey planner does not engineer volatile nominal prices in order to finance innovations to the government budget. Thus, sticky nominal wages, similar to sticky nominal prices, impose an efficiency cost an order of magnitude larger than the insurance benefit for the government of surprise inflation. The basic reason for this result is that when nominal wages are sticky, setting real wages as close as possible to their efficient path is a much more important goal of policy than financing innovations to the government budget via state-contingent inflation.

Key for our result is a law of motion for real wages, which amounts to a restriction relating real wage growth, nominal wage inflation, and nominal price inflation. The condition itself is an identity, but is one that is a non-trivial part of the definition of equilibrium in a model featuring sticky nominal wages. Thus, this law of motion must be imposed as a constraint on the Ramsey problem. The main idea behind this restriction is that wage-setting behavior on the part of sellers of labor constrains the path of nominal wages in such a way as to make the law of motion non-trivial. This restriction drives price inflation dynamics to try to mimic the efficient path of *real* wages when nominal wages are sticky. Quantitatively, this motive dominates the motive to use inflation to finance shocks to the government budget. In contrast, with flexible nominal wages, as in Chari et al. (1991), Schmitt-Grohe and Uribe (2004b), and Siu (2004), the nominal wage adjusts residually to ensure consistency between the time paths of nominal prices and real wages. We develop further economic intuition for this condition when we discuss the equilibrium of our model.