Ramsey monetary policy with labor market frictions ☆

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A R T I C L E   I N F O

A B S T R A C T

Traditional New Keynesian models prescribe that optimal monetary policy should aim at price stability. In the absence of a labor market frictions, the monetary authority faces no unemployment/inflation trade-off. The design of optimal monetary policy is analyzed here for a framework with sticky prices and matching frictions in the labor market. Optimal policy features deviations from price stability in response to both productivity and government expenditure shocks. When the Hosios [1990. On the efficiency of matching and related models of search and unemployment. Review of Economic Studies 57 (2), 279–298] condition is not met, search externalities make the flexible price allocation unfeasible. Optimal deviations from price stability increase with workers' bargaining power, as firms incentives to post vacancies fall and unemployment fluctuates above the Pareto efficient one.

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1. Introduction

Most of the recent literature on optimal monetary policy design using New Keynesian models neglects labor market frictions, which are the main cause of the existence of a short-run unemployment/inflation trade-off. Absent this, optimal monetary policy invariably consists in implementing the flexible price allocation through a zero inflation policy.

This paper instead analyzes optimal monetary policy in a model economy characterized by price adjustment costs a' la Rotemberg (1982) and matching frictions in the labor market a' la Mortensen and Pissarides (1999). Several recent papers have studied the quantitative implications of introducing matching frictions in a standard New Keynesian framework,[1] but very little has been done on the normative side. Our economy has three sources of inefficiency, both in the long and in the short run. The first is monopolistic competition, which induces an inefficiently low level of output thereby calling for mild deviations from strict price stability. The second type of distortion stems from the cost of adjusting prices, which reduces output below the efficient level thereby calling for closing the "inflation gap". The third stems from a congestion externality

[1] Several other authors, ranging from Walsh (2003) to Blanchard and Gali' (2008), have recently introduced matching frictions and real wage rigidity into New Keynesian models.

that tightens the labor market and induces inefficient unemployment fluctuations. In this context the policy maker faces a trade-off between stabilizing inflation and reducing inefficient unemployment fluctuations and an incentive to deviate from full price stabilization.

The design of optimal monetary policy in this paper follows the Ramsey approach (Atkinson and Stiglitz, 1976; Lucas and Stockey, 1983; Chari et al., 1991) in which the optimal path of all variables is obtained by maximizing agents' welfare subject to the relations describing the competitive economy and via an explicit consideration of all wedges that characterize both the long run and the cyclical dynamics. Recent studies apply this approach to the analysis of optimal policy in the context of New Keynesian models (Adao et al., 2003; Khan et al., 2003; Schmitt-Grohe and Uribe, 2004b; Siu, 2004).

Results are as follows. Optimal monetary policy deviates from price stability in response to both productivity and government expenditure shocks, in contrast with previous results from New Keynesian models.[2] Optimal deviations from price stability arise since search externalities generate an unemployment/inflation trade-off which requires the monetary authority striking a balance between reducing price adjustment costs and increasing an inefficiently low employment. More specifically, in response to productivity increases optimality requires a pro-cyclical policy, as the monetary authority should decrease inflation to allow an increase in demand. By raising firms' discounted marginal profits, the increase in demand raises the incentive to post vacancies, thereby reduces unemployment. Deviations from price stability increase with workers' bargaining power. This result hinges on role of the Hosios (1990) condition, which defines the socially efficient unemployment rate as the one prevailing when workers' bargaining power equalizes the share of unemployed workers in the matching technology. When workers' bargaining power is above this value, firms have little incentive to post vacancies. In this case equilibrium unemployment is above the social optimum. The opposite is true in the alternative case. Hosios (1990) has shown, in a static context, that an optimal hiring subsidy is needed to offset the search externality, stemming from the cost of posting vacancies, and the congestion externality, caused by deviations from the efficiency condition. The optimal subsidy must be higher when the unemployment rate is above the socially efficient level and smaller otherwise. In our context the monetary authority uses a single instrument, inflation, to foster incentives toward vacancy posting. If the unemployment rate is above the social optimum, the monetary authority reduces inflation to boost firms' profits and to increase vacancy posting. In the opposite case optimal volatitlity of inflation becomes almost zero as the monetary authority is concerned solely with reducing the cost of adjusting prices.

To provide a full assessment of the Ramsey policy the model dynamic under this plan is compared with the one arising under strict inflation targeting. The comparison shows that the Ramsey plan is welfare-improving because it allows to strike a balance between stabilizing inflation and unemployment.

The analysis in this paper is related to some other recent studies. Cooley and Quadrini (2004) introduce matching frictions into a model economy featuring the cost channel. The authors find that optimal policy should be pro-cyclical in response to productivity shocks. Blanchard and Gali' (2008) and Thomas (2008) augment a New Keynesian model with matching frictions and wage rigidity and analyze optimal monetary policy. Their analyses employ a linear quadratic approach based on first order approximation of the competitive equilibrium conditions and on second order approximation of the agents' utility. For the approximation to provide correct welfare rankings both papers assume a non-distorted steady state obtained by imposing the Hosios (1990) condition at all states and times. In this context, and in absence of wage rigidity, price stability remains optimal, as congestion externalities are eliminated through steady-state subsidies. When wages are rigid, deviations from price stability arise as wage rigidity translates into inefficient job creation and inefficient unemployment fluctuations. Arseneau and Chugh (2008) analyze optimal fiscal and monetary policy in a model with matching frictions, costly nominal wage adjustment and monetary frictions. They also restrict the analysis to the case in which the Hosios (1990) condition holds, nonetheless they find deviations from price stability and from constant labor tax rates. Finally, Faia (2008b) shows that an optimal monetary policy rule should target the unemployment gap alongside with the inflation gap in presence of matching frictions and wage rigidity.

The paper proceeds as follow. Section 2 presents the model. Section 3 analyzes the optimal policy plan. Section 4 shows results for the long-run optimal policy. Section 5 analyses the optimal short-run response to shocks. Section 6 concludes.

2. Model economy

There is a continuum of agents whose total measure is normalized to one. The economy is populated by households who consume different varieties of goods, save and work. Households save in both non-state contingent securities and in an insurance fund that allows them to smooth income fluctuations associated with periods of unemployment. Each agent can indeed be either employed or unemployed. In the first case he receives a wage that is determined according to a Nash bargaining, in the second case he receives an unemployment benefit. The labor market is characterized by matching frictions and exogenous job separation. Firms in the production sector are monopolistic competitive, produce a differentiated good using labor as input and face adjustment costs a' la Rotemberg (1982).

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[2] Zero inflation is the core result in the analysis of Woodford (2003), Clarida et al. (2000), and Adao et al. (2003), all of which feature price rigidity. Khan et al. (2003) and Schmitt-Grohe and Uribe (2004b) have shown that price stability remains robust even in presence of monetary frictions. See Benigno and Benigno (2003) and Faia and Monacelli (2008b) in the open economy context.