Journal of Economic Dynamics & Control 37 (2013) 345–364

Contents lists available at SciVerse ScienceDirect

Journal of Economic Dynamics & Control

journal homepage: www.elsevier.com/locate/jedc

Optimal monetary policy and downward nominal wage rigidity in frictional labor markets

Salem Abo-Zaid *

Texas Tech University, Department of Economics, Lubbock, TX 79409, USA

ARTICLE INFO

Article history:
Received 31 October 2010
Received in revised form
1 March 2012
Accepted 30 August 2012
Available online 20 September 2012

JEL classification:
E31
E32
E52
E58

Keywords:
Downward nominal wage rigidity
Optimal monetary policy
Long-run inflation rate
Labor market frictions
Intertemporal wedge smoothing

ABSTRACT

This paper studies the optimal long-run inflation rate in a labor search and matching framework in the presence of downward nominal wage rigidity. Optimal monetary policy features positive inflation in the long run; the optimal annual long-run inflation rate for the U.S. economy is slightly below 1 percent with a money demand motive and around 2 percent otherwise. Positive inflation facilitates real wage adjustments and hence it eases job creation and prevents excessive increase in unemployment following adverse productivity shocks. The findings of the paper can also be related to standard Ramsey theory of "wedge smoothing"; with positive inflation under sticky prices, the size and the volatility of the intertemporal wedge are significantly reduced.

1. Introduction

This paper studies optimal monetary policy in the presence of downward nominal wage rigidity (DNWR) within a labor search and matching model.[1] When nominal wages are downwardly rigid, the optimal long-run inflation rate is strictly positive. The optimal annual inflation rate is slightly below 2 percent with no money demand and slightly below 1 percent when a motive for money demand is introduced. A strictly positive long-run inflation rate is driven by precautionary considerations in the expectations of adverse shocks. Positive inflation allows for downward real wage adjustments (thus "greasing the wheels" of the labor market) that ease job creation and limit the increase in unemployment following adverse shocks. The optimal annual long-run inflation rate suggested by this paper is higher than in a model with neoclassical labor markets, suggesting that the nature of the labor market in which DNWR is introduced does matter for optimal monetary policy prescriptions.

* Tel.: +1 806 742 2466; fax: +1 806 742 1137.
E-mail address: salem.abozaid@ttu.edu

[1] DNWR means not only that wage increases are more likely than wage cuts, but also that the distribution of wage changes is not symmetric. Nominal wages tend to increase in good times but they do not tend to fall proportionally in bad times, thus generating an asymmetric distribution of wage changes. Note that the fact that wage increases are more common than wage cuts by itself is insufficient evidence for the presence of DNWR; a preponderance wage increases may reflect long-term productivity growth or steady state (positive) inflation.

0165-1889/$ - see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jedc.2012.09.003

The results of the paper are related to standard Ramsey theory of smoothing distortions (or "wedges") over time. A virtually constant distortion across periods is the main insight of Barro (1979), in a partial equilibrium framework, and Chari et al. (1991) in a quantitative general equilibrium model, among others. Recently, Arseneau and Chugh (2010) have developed intertemporal and static notions of efficiency in general equilibrium models with labor search and matching frictions. They show that the intertemporal wedge should indeed be smoothed, but, contrarily to the cornerstone result of tax smoothing in the Ramsey literature, that occurs through volatility in the labor-income tax rate. In this paper, optimal monetary policy, which calls for a positive inflation rate due to DNWR, reduces the size and the volatility of the intertemporal wedge when prices are sticky. This suggests that with both intertemporal and nominal distortions in place, the monetary authority cannot completely and simultaneously smooth both distortions. When prices are fully flexible, however, monetary policy keeps the intertemporal wedge virtually constant over the business cycle.

The results under zero-inflation policy at all dates and states are significantly different. In this case, the volatility of the intertemporal wedge is substantially higher; the wedge absorbs the shock. Similar results are obtained for labor market variables; the combination of DNWR and fully stable prices limit the decline in real wages considerably, thus generating unemployment increases and job creation declines far beyond their responses under a positive inflation rate.

The optimality of a positive inflation rate with DNWR and money demand is particularly interesting. In this case, there are three competing forces on inflation: DNWR calls for positive inflation, money demand calls for negative inflation and price stickiness pushes towards zero inflation. This paper suggests that, with plausible calibration of the model parameters, DNWR is the most dominant force of the three in the determination of the optimal long-run inflation rate. Money demand, however, remains very significant as it leads to a considerably lower optimal inflation rate compared to the optimal inflation rate with no money demand motive.

The paper is motivated by the evidence on DNWR that has been suggested by several empirical studies. One of the most notable recent evidence on DNWR is the comprehensive work of the International Wage Flexibility Project (IWFP), reviewed in Dickens et al. (2007a,2007b). Their findings indicate asymmetry in the distribution of nominal wage changes in 16 OECD countries, with the U.S. being among the countries with very high degrees of DNWR. Gottschalk (2005) shows that, after correcting for measurement errors that typically appear in wages reported in surveys, only about 5 percent of workers experienced wage cuts during a course of a year while working for the same employer. Card and Hyslop (1997) show a spike at the zero in the distribution of nominal wage changes, indicating DNWR. Altonji and Devereux (2000) find that only 2.5 percent of hourly workers had wage reductions.

The idea that positive inflation is needed to "grease the wheels" of the labor market dates back at least to Tobin (1972). Following negative shocks that call for real wage drops, Tobin (1972) suggests setting a positive inflation rate, on one hand, and stabilizing nominal wages, on the other, to facilitate real wage adjustment in the presence of DNWR. Tobin's idea has gained more attention in recent years for two reasons. First, inflation rates have become very low in the last two decades. Clearly, DNWR is more relevant in low inflation environments and during recessions. Second, central banks around the world target positive inflation rates, either explicitly or implicitly. DNWR creates a precautionary motive for positive inflation: since the timing of (negative) shocks is not fully predicted, the monetary authority keeps the inflation rate positive on average in order to "ensure" against those shocks once they materialize.

I allow for price rigidity, DNWR, money demand and labor market frictions, with the latter being consistent with positive unemployment in equilibrium. To model DNWR, I follow Kim and Ruge-Murcia (2009,2011) by using the *Linex* function as the nominal wage adjustment cost function. This function delivers higher costs in case of wage cuts compared to wage increases of the same magnitude. To see the significance of this setup, consider the response of an economy to an adverse productivity shock. If inflation is high, then DNWR is less likely to prevent real wage drops, and hence inflation mitigates the potential increase in unemployment. If inflation is low, however, DNWR will likely translate into Downward Real Wage Rigidity (DRWR). In this case, if the monetary authority seeks to keeps prices stable, downward rigidity in real wages implies higher unemployment than in the absence of DNWR. If the monetary authority instead chooses to stabilize employment, it inflates in order to achieve the desired cut in real wages. That is, the inflation rate needed "to grease the wheels" of the economy is higher than it would be if nominal wages were not downwardly rigid. In short, the presence of labor market frictions may magnify the need for grease inflation if policy makers are trying to keep unemployment low, or it may create excessive unemployment when attempting to keep prices close to full stability.

The current study contributes to the recent literature that studies the optimal inflation rate in the presence of DNWR. Assuming frictionless labor markets, Kim and Ruge-Murcia (2009,2011) show that the optimal annual grease inflation in the U.S. is positive (around 0.4 percent), regardless of whether a motive for money demand is introduced or not. Fagan and Messina (2009) introduce asymmetric menu costs for wage setting and show that the optimal inflation rate for the U.S. ranges between 2 percent and 5 percent. The optimal inflation rate in their model depends on the dataset used to measure the degree of DNWR. The optimal long run inflation rate found in this paper is thus more in line with the results of Fagan and Messina (2009). My paper differs from the work of Kim and Ruge-Murcia (2009,2011) mainly in the nature of the labor markets. In the current paper, unemployment-inflation tradeoff is a concern for monetary policy makers, which is resolved by setting a strictly positive inflation rate.

The fact that the inflation rate in this study is significantly higher than in Kim and Ruge-Murcia (2009,2011), despite the use of a similar proxy for DNWR, suggests that the structure of the labor market in which DNWR is studied matters for