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Optimal monetary policy in a small open economy with staggered wage and price contracts

Hyuk-jae Rhee*, Nurlan Turdaliev[1]

University of Windsor, Department of Economics, 401 Sunset Avenue, Windsor, Ontario N9B 3P4, Canada

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A B S T R A C T

We study optimal monetary policy for a small open economy in a model where both domestic prices and wages are sticky due to staggered contracts. The simultaneous presence of the two forms of nominal rigidities introduces an additional trade-off between domestic inflation and the output gap. We derive a second-order approximation to the average welfare losses that can be expressed in terms of the unconditional variances of the output gap, domestic price inflation, and wage inflation. As a consequence, the optimal policy seeks to minimize a weighted average of these variances. We analyze welfare implications of several alternative simple policy rules, and find that domestic price inflation targeting generates relatively large welfare losses, whereas CPI inflation targeting performs nearly as well as the optimal rule.

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1. Introduction

The new Keynesian model has become a new theoretical consensus for studying various issues in monetary policy (Goodfriend, 2007). However, some features of the new Keynesian model are deemed to be unsatisfactory. For example, the monetary policy rule that stabilizes price inflation also stabilizes output gap variability. Therefore, a simple price inflation targeting monetary policy can achieve the (Pareto) optimal welfare level that would occur in the absence of nominal frictions. This property of the

* Corresponding author. Tel.: +1 519 253 3000x2385; fax: +1 519 973 7096.
E-mail addresses: jayrhee@uwindsor.ca (H.-j. Rhee), nurlan@uwindsor.ca (N. Turdaliev).
[1] Tel.: +1 519 253 3000x2391; fax: +1 519 973 7096.

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new Keynesian framework is called the 'divine coincidence' (Blanchrad and Galí, 2007). In addition, recent empirical studies (e.g., Galí, 1992; Christiano et al., 1999; Neely and Rapach, 2008) reveal that a staggered price mechanism by itself is incapable of generating persistent real effects of monetary shocks. Instead, it has been argued that wage stickiness may be a more important force than price stickiness for generating output persistence (e.g., Ambler et al., 2012; Chari et al., 2000; Huang and Liu, 2002).

The small open economy version of the new Keynesian model with staggered price-setting (Galí and Monacelli, 2005: Clarida et al., 2002) also lead to a striking, but controversial result. In the model, domestic goods prices are sticky but foreign goods prices are flexible. This specification of pricing behavior leads to disappearance of CPI inflation from any of the structural equations needed to compute welfare of the households. Since the model's Phillips curve contains only domestic inflation, it is then not surprising that it is optimal for the central bank to target domestic rather than CPI inflation. According to the standard new Keynesian small open economy model, therefore, CPI inflation targeting in a small open economy is misguided. But all real world inflation targeting countries are open economies, and all of them target CPI inflation, not domestic inflation (Svensson, 2000). The description of the inflation dynamics and policy implications of the standard new Keynesian small open economy model, therefore, should be modified.

A number of studies have incorporated both wage and price stickiness into the new Keynesian model in a closed economy framework to help solve the issues mentioned above (Christiano et al., 2005; Erceg et al., 2000; Gali, 2011; Sbordone, 2002). In particular, Erceg et al. formulate a model in which both the labor and product markets exhibit monopolistic competition and staggered contracts. They find that the model (with both sticky prices and sticky wages) exhibits a tradeoff between stabilizing the output gap, price inflation, and wage inflation. They also find that price inflation targeting generates a relatively large welfare loss. Most of the studies involving both nominal wage and price rigidities, however, focus on the closed-economy framework. The recent papers by Adolfson et al. (2007, 2008) are among rare notable exceptions.[2]

In this paper, we employ the Calvo specification to incorporate both nominal wage and price rigidities into a small open economy new Keynesian framework. The goods market side of the model is similar in structure to the one developed in Galí and Monacelli (2005). Monopolistically competitive domestic producers set prices in staggered contracts as in Calvo (1983). Following Erceg et al. (2000), however, we modify the labor market where individual households supply differentiated labor services to domestic firms, and domestic firms combine this labor services to produce domestic goods. Monopolistically competitive households also set nominal wages in staggered fashion. These modifications lead to several distinctive features of our model. First, they necessitate the presence of the terms of trade, and thus CPI inflation, in the equation for wage inflation. Therefore, the behavior of wage inflation in this model is different from that in Erceg et al. (2000), which is a natural consequence of the small open economy framework. Second, there is a direct effect of CPI inflation on domestic price inflation, the dynamics of which, therefore, differs from that in the standard new Keynesian open economy Phillips curve of Galí and Monacelli (2005). This also has a very important policy implication (discussed below). Lastly, foreign output affects the dynamics of the real wage gap. It is through the real wage gap that shocks to foreign output affect both domestic price and wage inflation.

Within this model, we discuss how the economy responds to a contractionary monetary policy shock when both domestic prices and wages are sticky. In order to disentangle the role played by nominal wage rigidity, we examine four different assumptions on domestic price and wage stickiness. We consider an economy in which (i) both domestic prices and wages are flexible, (ii) only domestic prices are flexible, (iii) only wages are flexible, and (iv) both domestic prices and wages are sticky. We find that the existence of staggered wage setting influences the economy's equilibrium response to a monetary policy shock regardless of the presence of sticky domestic prices. This exercise also implies that wage stickiness is more important than price stickiness for generating persistent real effects of monetary shocks in a small open economy.

[2] Their work focuses mostly on estimating their model, whereas we derive some theoretical implications for several monetary policy rules for a small open economy that exhibits the simultaneous presence of the two forms of nominal rigidities.

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