

# *Nominal Rigidities, Monetary Policy and Exchange Rates in a Small Open Economy\**

In this paper I set up a sticky price small open economy model with transaction costs and discuss the behavior of exchange rates as well as price. This paper shows that the sticky price model partly succeeds in generating the hump-shaped response of a real exchange rate to a positive monetary shock. It also shows that the volatility of exchange rates increases as the degree of nominal rigidities increase.

## **1. Introduction**

In international finance, many empirical studies on the effects of monetary policy have been performed with U.S. data and found that the estimated impulse responses of variables to innovations in monetary aggregates are consistent with traditional monetary analyses (Sims 1992; Clarida and Gali 1994; Eichenbaum and Evans 1995). But some empirical studies employing Vector Autoregressions (VARs) have documented puzzles such as the exchange rate puzzle and the price puzzle for small open economies. For example, Sims (1992) found these puzzles by analyzing five major industrial countries with six variable VARs. Also, Grilli and Roubini (1995) who analyzed the G-7 countries, found that a contractionary home monetary policy shock generates home currency depreciations for every country except the U.S.

Cushman and Zha (1997), however, argue that these puzzles derive from the recursive approach to monetary policy identification, which does not make sense for the small open economies. As monetary authorities in such economies are likely to respond quickly to foreign variables, the assumption that the interest rate or monetary aggregate innovations are independent is inappropriate in small open economies. Cushman and Zha (1997) address these empirical puzzles for small economies following Gordon and Leeper (1994) and Sims and Zha (1995) who used a structural VAR

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approach with an explicit monetary function to eliminate the interest rate puzzle and price puzzle found for the closed economies such as the U.S. They used this structural VAR approach for the Canadian case and found that these puzzles disappear; that is, the nominal and real exchange rates appreciate to a contractionary domestic monetary policy.

Though there have been some attempts to explain the excessive variation of exchange rates by setting up a two-country monetary general equilibrium model, only a few attempts have been made to explore them in a small open economy context.<sup>1</sup> Notwithstanding the empirical success in remedying these puzzles, only a few attempts have been made to explain them with the setup of an explicit theoretical model. This is because it is not easy to construct a model that fits the empirical facts, that is, a model that produces sufficient variation in exchange rates without excessive variation in expected consumption.

For a two-country economy, the international stochastic dynamic general equilibrium models, such as that of Schlagenhauf and Wrase (1995), in which money is introduced simply by adding cash-in-advance constraints or a transaction role for money with flexible prices, fail to explain the exchange rate movements. For a small open economy, Cardia (1991), who tried to evaluate the flexible price international finance model with various shocks, could not address the exchange rate variability and the exchange rate puzzles because she assumed that there was only one traded good and thus PPP always holds. In this one-good model, there is no nominal exchange rate puzzle because the nominal exchange rate equals the domestic price by assumption.

The recent international finance models, such as Rebelo (1997) and Uribe (1997), with flexible prices and continuously clearing market, explore the stabilization program observed in Latin America. Though these models are somewhat useful in discussing the inflationary economy, they fail to address the sluggish price and relatively large output adjustments observed in Europe and East Asia by exaggerating price level variability.

Recent attempts to reconcile RBC(Real Business Cycle) models with New Keynesian Macroeconomics are attractive, because the “sticky-price” dynamic general equilibrium model can be quantitatively evaluated. For example, Obstfeld and Rogoff (1996) suggested a sticky price model as a possible way to explain the monetary effects on exchange rates. This paper follows Obstfeld and Rogoff (1996) by utilizing the tradables and nontradables sector in a small open economy.

<sup>1</sup>Cardia (1991) discusses the business cycles properties in a small open economy with money. Obstfeld and Rogoff (1995) deal with a small open economy nominal with wage rigidities in brief.

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