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Monetary policy rules and exchange rate flexibility in a simple dynamic general equilibrium model

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Abstract

This paper provides a complete analytical characterization of the positive and normative effects of alternative exchange rate regimes in a simple two-country sticky-price dynamic general equilibrium model with multiple shocks. A central question addressed is whether fixing the exchange rate prevents macroeconomic adjustment in relative prices from occurring. We find that in general, allowing the exchange rate to float does not facilitate relative price adjustment, in face of country-specific shocks. In a comparison of monetary policy rules which allow for differential degrees of exchange rate targeting, it is found that a rule in which both countries engage in a cooperative exchange rate peg welfare-dominates a rule which allows the exchange rate to float endogenously (as well as a one-sided peg). When optimal monetary rules can target both employment and exchange rates however, a cooperative exchange rate peg leads to lower welfare. Therefore, whether fixing the exchange rate involves a welfare cost depends critically upon the way in which monetary rules are designed. Quantitatively, we find that the welfare differences across different monetary rules (exchange rate regimes) are very small.

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1. Introduction

This paper explores the effects of alternative monetary rules that allow for varying degrees of exchange rate flexibility in a stochastic general equilibrium model, where prices are sticky, and there are a variety of different macroeconomic shocks. There has been a lively recent debate on the macroeconomic implications of alternative exchange rate regimes. The traditional literature, based on Friedman (1953) and Mundell (1961), argues for the importance of exchange rate flexibility in dealing with country specific disturbances. The cost of sacrificing the exchange rate as a macroeconomic adjustment device was seen as one of the key drawbacks of the European single currency (e.g. Feldstein, 1997). On the other hand, De Grauwe (1994) has set out the benefits of exchange rate stability within a single market, and recent evidence by Rose (2000) provides empirical support for the trade benefits of a single currency.

The aim of this paper is to map out the trade-offs involved in stabilizing the nominal exchange rate, both from a positive and normative perspective, within a model that makes use of recent developments in open economy macroeconomics due to Obstfeld and Rogoff (1995, 2000), Bachetta and Van Wincoop (2000), Corsetti and Pesenti (2001), and others. Specifically, we construct a two-country dynamic general equilibrium model in which prices are set in advance, in a stochastic environment, by profit-maximizing firms. The economy is subject to shocks to money demand and aggregate productivity.¹ This framework can be used to address a variety of traditional questions in the comparison of exchange rate regimes. For instance, under what circumstances is exchange rate flexibility useful in offsetting country-specific macroeconomic disturbances? How does the manner in which the exchange rate is pegged matter—i.e. whether it is done cooperatively between monetary authorities or unilaterally by one country? Quantitatively, how important are the welfare differences between alternative exchange rate regimes? Finally, what are the characteristics of welfare maximizing monetary policies, and how much exchange rate flexibility is implied by these policies?

The model also allows us to focus on some non-traditional aspects of alternative exchange rate regimes. In particular, because the analysis allows for an exact analytical solution in a dynamic, stochastic environment, alternative monetary policies have implications for employment, the capital stock, and long run GDP.

An obvious but important point in the comparison of alternative exchange rate regimes is that the monetary policy rule through which exchange rates are targeted may be equally as important as the degree of exchange rate volatility itself. We focus on simple monetary rules where the policy variable can be targeted on some easily observable macroeconomic aggregate rather than directly on the underlying stochastic disturbances themselves. We first compare the implications of three different monetary rules that differ in the degree to which they target the exchange rate. The first rule simply involves a constant money growth rate, the second rule represents a unilateral exchange rate peg, while the third is a bilateral or cooperative peg. In each

¹ The addition of a government spending shock is straightforward—see the discussion below.

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