New directions for stochastic open economy models

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Abstract

The paper develops a simple stochastic new open economy macroeconomic model based on sticky nominal wages. Explicit solution of the wage-setting problem under uncertainty allows one to analyze the effects of the monetary regime on welfare, expected output, and the expected terms of trade. Despite the potential interplay between imperfections due to sticky wages and monopoly, the optimal monetary policy rule has a closed-form solution. To motivate our model, we show that observed correlations between terms of trade and exchange rates are more consistent with our traditional assumptions about nominal rigidities than with a popular alternative based on local-currency pricing. © 2000 Elsevier Science B.V. All rights reserved.

1. Introduction

There has been an explosion of academic literature on the ''new open economy macroeconomics'' in the last several years (see Lane, 1999 for an excellent

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survey).[1] Very recent contributions have sought to understand more deeply the positive macroeconomic effects of uncertainty as well as the normative implications for alternative international monetary regimes. As we showed in Obstfeld and Rogoff (1998), important effects of uncertainty – including effects on economic activity levels – can compound or offset the more obvious welfare effects of variability. These effects are central to accurate regime evaluation, yet they are masked by the linearization techniques commonly used to solve dynamic stochastic models. In this paper we present a simplified sticky-price model with an exact closed-form solution. The model illustrates simply and clearly both the positive effects of uncertainty and the implications for welfare.[2]

The possibilities for modeling nominal rigidities are inherently more numerous in a multicurrency international economy than in the single-money closed economy setting. For example, if output prices are pre-set in nominal terms, in what currencies are they denominated? In an international setting, moreover, it is natural to consider the possibility of segmentation between national markets, with prices for the same product being set in different currencies in different markets. Indeed, much interesting recent work in the new open economy macroeconomics is built on a pricing-to-market paradigm in which prices of imported goods are temporarily rigid in the importing country's currency. In the new models, nominal exchange rate changes tend to have small or negligible short-run effects on international trade flows. This new view contrasts sharply with the traditional Keynesian approach, which assumes that prices are rigid only in exporters' currencies, but not in importers' currencies, so that the exchange rate plays a central role in the international transmission of monetary disturbances.

Before presenting our formal model, we therefore address the empirical issue of which approach is closer to reality. We show that a framework in which imports are invoiced in the importing country's currency implies that unexpected currency depreciations are associated with *improvements* rather than deteriorations of the

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[1] For more updated references, see Brian Doyle's new open economy macroeconomics homepage at http://www.princeton.edu/~bmdoyle/open.html.

[2] In important independent work, Bacchetta and van Wincoop (1998) show how a framework related to the one in Obstfeld and Rogoff (1998) can elucidate the effects of exchange rate uncertainty on international trade. Using the mode of analysis suggested by Obstfeld and Rogoff (1998), Devereux and Engel (1998, 1999) analyze the welfare implications of alternative exchange rate regimes under uncertainty. We mention briefly some relevant precursor literature. Rankin (1998) develops a very interesting analysis of a small open economy with complete asset markets and competitive production, in which monopolistic labor suppliers preset money wages. While (like us) he examines the positive effects of monetary uncertainty, he does not systematically explore the welfare effects of policies. An earlier complete-markets model with nominal rigidities is that of Svensson and van Wijnbergen (1989). Svensson and van Wijnbergen (1989), building on Svensson's (1986) closed-economy model, provide an early discussion of price-setting in advance by maximizing firms facing uncertainty. The appendix to Svensson (1986) briefly discusses the welfare impact of an infinitesimal degree of money-supply variability, but such higher-moment effects are not the main focus of his paper.