EXCHANGE RATES IN MULTICOUNTRY ECONOMETRIC MODELS

The shift towards floating exchange rates during the seventies has made adequate modelling of the exchange rate of paramount importance. Yet the way multicountry econometric model builders deal with the problems of exchange-rate determination is still highly experimental. This fact is documented by the papers presented at a conference in Leuven brought together in this book. They address three major questions.

First, they show how practitioners of major multicountry econometric models introduce the exchange rate into their models and what role it plays.

Second, the papers reflect to what extent econometric model-builders have been affected in the construction of their models by recent developments in the theory of exchange-rate behaviour. It appears that we have not yet a generally accepted and unified theory of exchange-rate determination.

Third, they ask how important is the interaction between countries in the process of exchange-rate determination, and how exchange-rate changes affect the interdependencies in the world.

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Exchange Rates in Multicountry Econometric Models

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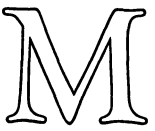

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Preface

This book brings together papers presented at the Leuven Conference on 'Exchange Rates in Multicountry Econometric Models' (November 1981). When initiating this conference we set ourselves several objectives. A first objective was to bring together the research that has been done on the role of exchange rates in multicountry econometric models. In other words we wanted to know how practitioners of these models introduce the exchange rate into their models and what role it plays.

A second question we had in mind when organizing this conference was how recent theories of exchange-rate behaviour have affected the way econometric model-builders construct their models. It will be clear for the reader of this book that the new theories have affected these models in profound ways. At the same time, however, it is striking that many of these models have incorporated existing economic theory by bits and pieces. For example, some models have chosen a monetary approach, others impose a purchasing power parity relation, still others use a balance of payments approach. One paper (Helliwell and Boothe) confronts these different approaches as competing hypotheses. One obvious reason for this state of affairs is that there is not yet a generally accepted and unified theory of exchange-rate determination. This allows model-builders to select their preferred theory, without always being explicit about the process through which this selection was made.

This book is about *multicountry* econometric models. A third objective, therefore, was to know how important the interaction between countries is in the process of exchange-rate determination, and how exchange-rate changes affect the interdependencies in the world. We know from the existing theories and econometric models of the fixed exchange-rate period that interactions of economic policies are important and that a failure to take these interactions into account can seriously bias our conclusion about the effects of different policies. It is clear that these interactions are important in the present world of quasi-floating. However, the nature of this interdependence is much less clear now than during the fixed exchange-rate period. The major reason why today the interdependencies between countries are more difficult to model is that the move from a

fixed to a flexible exchange rate was also a move away from a fixed and pre-announced policy rule to a system full of policy surprises and unpredictable policy rules. In other words in the fixed exchange-rate period the commitment to a fixed exchange rate system was an announced and known policy rule. As a result, national policies tended to be more predictable. In the present quasi-floating system with its absence of an announced policy rule the probability of policy surprises has increased dramatically.

The reader should keep in mind this aspect of the problem when he wanders through this book and finds that we are still far away from a satisfactory modelling of interactions between countries.

The book is divided as follows. The first three chapters are concerned mainly with methodological problems in modelling exchange rates. The first chapter by Melitz sets the stage by stressing that econometric models, despite their size, are too simple, that is, they tend to test special, limiting cases that the theory gives us little reason to expect to hold. Helliwell and Boothe in the second chapter go a step further and actually test alternative hypotheses of exchange-rate determination and introduce these into an econometric model of Canada. Their conclusion is that dynamic responses of a macromodel are very sensitive to the selection of the model of exchange-rate determination. This leads to the important observation that model-builders would be well advised to regularly test the sensitivity of their results to the selection of a particular model for the determination of exchange rates. Conversely, macroeconomic analysis should probably be an integral part of the selection process for exchange-rate models to be used in national or multilateral modelling.

In Chapter 3 Richard Blackhurst surveys the extensive literature on the relation between the current account and the exchange rate. After reviewing the literature he concludes that there is little evidence that exchange-rate changes have a predictable and significant independent impact on a country's current account balance. He then goes on to identify the reasons why existing studies have failed to find such empirical evidence. Finally he discusses the reverse relation between exchange rates and current account and finds that the recent empirical studies confirm the hypothesis that unanticipated developments in the current account balance ('surprises') play an important role in explaining unanticipated movements in exchange rates.

The second part of the book brings together the major multicountry models. After comparing the structure of these different models the reader will be struck by the wide differences in approaches and in the way exchange rates are introduced. The *Central Link* model (Hickman, Chapter

4) uses single equations relating the exchange rates to purchasing power parities and current accounts. The *EPA World Economic* model (Amano, Chapter 5) uses a balance of payments approach, that is starting from the balance of payments identity a structural model of the balance of payments is developed. A search method is then used determining the exchange rate which equilibrates the foreign exchange market. In the *Eurolink* model (Ranuzzi, Chapter 6) exchange rates are introduced through capital flow equations and intervention functions of the central bank. This financial submodel of Eurolink, however, is not yet integrated into the rest of the model as there are no feedback effects from the real side of the model.

The *MCM* model (Hooper, Haas, and Symansky, Chapter 7) has gone furthest in integrating recent developments in exchange-rate theory. Whereas earlier versions of the MCM model directly estimated the asset demand equations underlying the private capital account the present version replaces these equations in each country with a single exchange-rate equation. The latter is derived directly from the portfolio balance structure of the MCM model, that is by combining private foreign asset demand equations and solving for the exchange rate. In addition, this allows the authors to test for the existence of significant portfolio balance effects. These turn out to be statistically insignificant in most cases. This may give some comfort to those researchers who have employed models in which exchange rates are determined only by expectations and (real) interest rate differentials.

A most provocative model is certainly the *Liverpool* model (Minford, Ioannidis, and Marwaha, Chapter 8). It is rather different from the previous models in its general structure through the use of Lucas-supply equations and the introduction of a rational expectations routine in the solution of the model. The exchange rates are modelled using the assumption that expected returns are equated across countries and risk premia are absent. In addition the current account depends on the real exchange rate and domestic and foreign absorption.

Finally, Basevi and Calzolari (Chapter 9) deal with problems relating to the specification and estimation of intervention policies. They extend the Dornbusch-Frankel sticky-price exchange-rate model in a multi-country framework (EMS countries). They then specify and estimate reaction functions of the monetary authorities that take into account the constraints imposed by institutional regimes such as the EMS.

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