Exchange Rate Volatility, Trade, and Capital Flows under Alternative Exchange Rate Regimes

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CAMBRIDGE
UNIVERSITY PRESS

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, UK http://www.cup.cam.ac.uk
40 West 20th Street, New York, NY 10011-4211, USA http://www.cup.org
10 Stamford Road, Oakleigh, Melbourne 3166, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain

First published 2000

Printed in the United States of America

Typeface Times Roman 10/12 pt. *System* LaTeX 2_ε [TB]

A catalog record for this book is available from the British Library.

Library of Congress Cataloging in Publication data

Sercu, Piet.

Exchange rate volatility, trade, and capital flows under alternative exchange rate regimes / Piet Sercu, Raman Uppal.

p. cm. – (Japan-U.S. Center Sanwa monographs on international finance markets)

Includes bibliographical references.

ISBN 0-521-56294-5 (hb)

1. Foreign exchange rates – Mathematical models. I. Title. II. Series. III. Uppal, Raman.

HG3823 .S465 2000
332.4′5 21 – dc21 99-040246

ISBN 0 521 56294 5 hardback

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1 Introduction and Overview

1.1 Our Objective and the Contribution of Our Work

As summarized by Krugman (1989), there are two prominent puzzling facts since the collapse of the Bretton Woods system. First, why has the floating-rate regime led to an increase in the volatility of real exchange rates? The consensus expectation in the late 1960s and the early 1970s was that real rates would be more stable, but the experience has been quite to the contrary (see Frankel, 1993, chap. 10). Second, why has the impact of these enormous swings in the real exchange rate on national outputs and inflation rates been so limited? Baxter and Stockman (1989) and also Frankel and Rose (1995) provide empirical evidence that, except for an increase in real exchange rate volatility, other macroeconomic aggregates have not been affected by the change in the exchange rate system in the 1970s. Perhaps more controversially, Krugman also holds that the large fluctuations in the value of, in particular, the U.S. dollar relative to the deutsche mark and the Japanese yen, are irrational bubbles. Furthermore, international capital flows have not smoothed out fluctuations in outputs and investments as expected. Many academics and politicians also think that the volatility of the exchange rate hinders international trade and international investments and conclude that a return to a system of fixed exchange rates, if feasible, would be desirable. One illustration of such a system is the European Union's single-currency plan.

In light of these considerations, and given the widespread perception that an increase in exchange rate volatility leads to a reduction in the level of international trade, various questions arise. Is the observed behavior of the exchange rate consistent with a rational model? Does exchange rate volatility hinder trade? What type of capital flows are consistent with a rational model? What are the channels and dynamics of the international transmission of shocks and what is the role of financial markets in dealing with these shocks? What is the effect of financial markets on a country's investment decisions and, through such decisions, on its growth and welfare? What is the effect of capital markets on a nation's optimal tariff policy? How would a return to fixed foreign-exchange rates affect macroeconomic aggregates and welfare, and

what are the requirements to make this feasible? Finally, how are the answers to these questions affected by the segmentation of the real sectors of international economies?

While addressing these issues, our focus is on a world consisting of large developed economies. Thus, the model that we consider is a general-equilibrium one, rather than that of a small open economy. Moreover, consistent with the current state of the financial system, our analysis considers explicitly the role of financial markets in the determination of spot and forward exchange rates, trade flows, capital flows, and the setting of tariff and monetary policy.[1] At the same time, our model allows for commodity markets to be segmented across countries so that nations are distinct.

1.2 Outline of the Monograph and Summary of Major Results

The remaining chapters in this monograph can be divided into three parts. The first part, consisting of Chapters 2 and 3, provides background information. In Chapter 2, we survey existing models of international economies, and in Chapter 3 we describe a simplified version our general model – one that is limited to a single consumption good and only two countries that are symmetric in their initial endowments and preferences – and also elucidate on the motivation for the assumptions that we make. The model is described in two versions: in the first, output is given exogenously and in the second the production decision is modeled explicitly. Our main objective in Chapter 3 is to contrast the general-equilibrium modeling approach with previous models of international economies, and to build some intuition in the context of these simple models that will be useful when analyzing variants of these models in later chapters. The principal contribution of this chapter is to show how one can develop a fairly simple framework to analyze macroeconomic quantities and policies.

In the second part of the monograph, comprising Chapters 4, 5, and 6, our focus is on macroeconomic variables. The variables that we study are the spot exchange rate, the forward exchange rate, short-term interest rates, and trade flows.

In Chapter 4 we extend our basic model to a multicountry, multigood setting that allows for international differences in preferences and endowments. We then derive the exchange rate in this setting. The contribution of this chapter is both on the modeling front, and in the empirical testing of the model. On the theoretical side, we show that the implications of the general-equilibrium model

[1] Andersen and Moene (1995) present work on the effect of the opening of financial markets on macroeconomic variables.

of the exchange rate are quite different than those implied by the monetary theory of exchange rates and purchasing-power parity (PPP). On the empirical front, we show that our model nests several specifications tested in the literature and that the general model provides a better explanation of exchange rate behavior than the standard models.

In Chapter 5 our attention shifts from the spot exchange rate to the forward exchange rate and interest rates. Using a model with endogenous production, we study the implications of segmented commodity markets for the behavior of the forward exchange risk premium. We describe how a model with proportional shipping costs, and therefore deviations from PPP, can generate exchange rate behavior that is closer to the data than predicted by earlier models.

In Chapter 6 we examine trade flows and the relation between exchange rate volatility, trade, and welfare. Existing models analyze exchange rate volatility in a partial-equilibrium setting (see, e.g., De Grauwe, 1988; Franke, 1991; and Viaene and de Vries, 1992), whereas the model that we construct is a general-equilibrium one, which implies that it is internally consistent and permits welfare analysis. We find that while an increase in exchange rate volatility always lowers welfare, the increase in exchange rate volatility could be associated with either an increase or a decrease in trade. That is, the model offers one explanation for the empirical observation that there is little evidence of a negative relation between exchange rate volatility and the volume of international trade.

Finally, in the third part of the monograph, we look at policy issues. In Chapter 7 we investigate the policy of opening financial markets. We start by discussing the effect of opening financial markets on welfare. One implication of our model is that integration of financial markets can have a substantial effect on welfare. The welfare gains can be direct ones, arising from improved risk sharing, or indirect ones, arising from the ability to invest in high-return, high-risk production technologies because of the improved opportunities to share risk across countries. A second finding is that the gains from opening financial markets are significant even when commodity markets are not perfectly integrated. The policy implication is that it is important to encourage the flow of financial capital even in the absence of perfect commodity market integration. In the models that we develop, we also find that the volume of capital flows exceeds the volume of trade flows; this is consistent with the data, which show that less than 20% of transactions in capital markets are related to trade flows.

In Chapter 8 we examine the interaction between financial markets and the choice of tariff rates. We describe how the structure of financial markets influences directly the choice of optimal tariff rates: whereas in the absence of capital markets the optimal tariff is strictly positive, with perfectly integrated

financial markets the welfare-maximizing tariff rate is zero. Thus, there is an additional source of welfare gains from the integration of financial markets: besides the gains from risk sharing and improved production decisions, welfare improves also because the optimal tariff rate is driven down to zero. It turns out that the welfare gain from the reduction in tariffs is substantially larger than the gain from risk sharing. The analysis described in this chapter also suggests that financial markets can play an important role in coordinating international trade policy.

Although money has been introduced in the basic models described in Chapter 3, and the models with money have been used in our analysis of spot and forward exchange rates in Chapters 4 and 5, the process driving money supply has been taken to be exogenous in these chapters. In Chapter 9 we examine monetary policies and the choice of an exchange rate regime in an economy where money supply is determined endogenously. In the context of a specific model, we identify the particular conditions under which a regime of fixed exchange rates is welfare maximizing.

Chapter 10 contains our conclusions and some thoughts for future research. In this chapter, we also discuss the issues that we have not touched upon in our analysis.