# International Monetary Economics

Jürg Niehans

JÜRG NIEHANS

# International Monetary Economics

The Johns Hopkins
University Press

Baltimore, Maryland

Printed in the United States of America

Originally published, 1984
Second printing, 1985
Johns Hopkins Paperbacks edition, 1986

The Johns Hopkins University Press
701 West 40th Street
Baltimore, Maryland 21211

Library of Congress Cataloging in Publication Data

Niehans, Jürg.
International monetary economics.

Bibliography: p. 319
Includes index.
1. Foreign exchange. 2. International finance.
3. Monetary policy. I. Title.
HG3821.N595 1984 332'.042 83-14960
ISBN 0-8018-3021-4
ISBN 0-8018-3408-2 (pbk.)

# Preface

Since the final collapse of the Bretton Woods system, experience and research about floating exchange rates have rapidly accumulated. Though much is still unclear, and in some cases more unclear than ever, it is evident that the working of floating rates is different from what both their protagonists and their opponents imagined it to be in the 1960s. This book tries to provide a comprehensive, balanced, and integrated survey of international monetary economics as it emerges from this decade of rapid learning. Its main topic is floating rates, but pegged exchange rates are considered wherever they shed light on fundamental problems.

In a sense, this volume may be regarded as an open-economy sequel to my *Theory of Money*. Like the latter, it provides a closely reasoned synthesis of received doctrine, recent contributions, and original developments. The international perspective adds a new analytical dimension to the theory of money inasmuch as relative prices appear in a decisive role. This combination of money and relative prices gives international monetary economics its specific fascination. At the same time, the microeconomics of the demand for money and of financial intermediation drop into the background.

The emphasis is on economic theory. Except for illustrative references to recent events, the reader will find no historical, empirical, or institutional material. In particular, there are no chapters on the working of the gold standard, the institutions of Bretton Woods, or the European Monetary System. (For the theory of the gold-exchange standard the reader is referred to my earlier volume.) There is also no discussion of exchange controls. The theory, however, is strongly policy-oriented. More specifically, it is focused on monetary policy in open economies under floating rates. The international aspects of fiscal policy, which attracted so much attention in the 1960s, are hardly touched upon.

This book does not subscribe to one or the other of the "approaches" between which economists supposedly have to choose. It is based on the conviction that different approaches help to illuminate different aspects of our complex world, each finding its appropriate place in an integrated analysis. Whether a particular adjustment process is described in terms of cash accumulation or of elasticities is not a matter of principle but of analytical convenience. The same is true with respect to the choice between a monetary approach and an asset approach to exchange dynamics. It is consistent with this philosophy that the exposition is not based on a single core model, gradually taken through its paces, as, for example, in Allen and Kenen (1980). The book is problem-oriented rather than model-oriented, each problem being discussed in terms of a model that expresses the essential points in a particularly simple way. A strong effort is made, however, to relate and integrate the various analytical tools. I hope the reader will not leave this volume with the frustrating impression of a bewildering variety of competing models.

The exposition is aimed at advanced undergraduates with a theoretical bent and first-year graduate students. It makes extensive use of mathematics, but the techniques do not go beyond elementary calculus and simple differential equations. Wherever possible, the argument is supported by graphs. Technical details are sacrificed where the marginal return in economic insight does not seem to warrant the marginal cost.

The first part of the book discusses the interaction of money, prices, and exchange rates in the absence of capital flows. In chapter 1, a summary review of the pure theory of international trade provides the "real" framework for monetary analysis. The second chapter introduces money, prices, and exchange rates, mostly in comparative-static terms, but including an analysis of price dynamics. The case of flexible exchange rates leads to purchasing-power parity; the case of fixed rates leads to the specie-flow mechanism. In full equilibrium, devaluation (under fixed rates) and money-supply changes (under floating rates) are neutral. During the adjustment process, both have powerful real effects. These are analyzed in chapters 3, 4, and 5. Each of these chapters focuses on one particular aspect. It is shown that the monetary approach, the elasticity approach, and the expenditure approach, often regarded as rivals, differ more in the choice of concepts than in economic substance. It turns out, in particular, that, under suitable assumptions, there is a precise correspondence between the Bickerdike/Robinson/Metzler condition familiar from the elasticity approach and an analogous condition in terms of hoarding coefficients under the monetary approach.

The subject of part II is international assets and capital flows, considered from a macroeconomic point of view. Chapter 6 discusses the determinants of net international indebtedness, the welfare implications of international lending, and the capital flows resulting from capital market integration. This results in a "$q$- theory" of capital flows as determined mainly by investment opportunities, whereas the role of interest rates is

shown to be secondary and ambiguous. This "new view" of capital flows, while rooted in the classical tradition, represents perhaps the book's most pronounced departure from prevalent notions. Chapter 7 introduces heterogeneous assets and asset diversification. It develops a theory of asset arbitrage based on the comparative advantages and preferences of each country for different types of assets in close analogy to international trade theory.

The following two chapters are about particular markets in financial assets. Chapter 8 argues that forward exchange markets owe their economic significance to transaction costs; with costless transactions they would be redundant. Though forward markets are important for microeconomic efficiency, their macroeconomic significance, therefore, is easily overestimated. Chapter 9 discusses the structure, economic function, and policy implications of Eurocurrency markets. It is based on an interpretation that explains the location of financial intermediaries in terms of transaction costs and regulatory constraints. Chapter 10 returns to the topic of chapter 6 by providing a detailed analysis of the influence of income, capital goods prices, interest rates, and exchange rates on capital movements. One of the recurring themes is the fundamental difference between asset arbitrage and net capital flows and the illegitimacy of equating the rapidity of arbitrage with the mobility of capital flows.

Part III considers monetary policy in open economies under floating rates with interacting trade and capital flows. Chapter 11 analyzes the dynamic adjustment of the economy to a change in monetary policy, focusing particularly on the "overshooting" of exchange rates. From a general model, three submodels are derived by alternative simplifications, shedding light on different aspects of the dynamic process. The remaining chapters gradually lead from pure theory to policy implications. Chapter 12 examines the differential effects of open-market operations and foreign-exchange operations on exchange rates, output, and interest rates over different time spans. This is followed in chapter 13 by a discussion of alternative strategies for central-bank intervention into the foreign-exchange market. It is argued that "leaning against the wind" and purchasing-power parity rules are not promising, whereas temporary exchange-rate ceilings may be useful as emergency measures against "imported" overshooting. Chapter 14 surveys the debate about pegged and floating rates, the literature about optimum currency areas, and the various proposals for introducing some flexibility into pegged exchange rates. For a noninflationary world, fixed rates emerge as the best solution, but floating rates appear second-best under inflationary conditions.

The book concludes with a largely nontechnical discussion of possible guidelines for monetary policy in open economies under floating rates. These guidelines, though largely derived from the preceding analysis, clearly involve elements of personal judgment. Pure theorists may perhaps deplore this. I believe, however, that judgment still is, and will probably remain, an essential part of economics. I also believe that, once doctrinal and political antago-

nisms are put on one side, there is more consensus about such guidelines than is commonly supposed.

In writing this book, I received help, support, and stimulation from many people and institutions. My greatest debt is to my wife, who not only accompanied me to faraway places wherever I was doing my work but also was a most dedicated editorial assistant, sometimes under difficult conditions. Mrs. Margrit Shannon, Mrs. Jeannette Regan, and Mrs. Carola Duff typed various parts of the manuscript and helped me to improve its style. Critical comments and questions from students and colleagues at Bern, Johns Hopkins, Kobe, and other universities left their traces in many chapters. Substantive contributions were made, in particular, by Ailsa Roëll. The graphs were expertly drawn by Jürg Grünig. As part of a larger project, the Swiss National Science Foundation enabled me to obtain the successive help of Carlo Graziani, Beat Moser, and Tobias Rötheli as research assistants. For five months, the Federal Reserve Bank of San Francisco provided me with an office, a library, and a stimulating environment. The Japan Society for the Promotion of Science, on the initiative of Kazuhiro Igawa, gave me the opportunity to work for another two months at Kobe University. For all these contributions I express my sincere thanks.

# Contents

# I

# MONEY, TRADE, AND EXCHANGE RATES

# CHAPTER 1

# The International Division of Labor

## Introduction

The subject of this book is the influence of money on the international flows of goods, services, and assets. The primary determinants of these flows are nonmonetary, arising from "real" factors like resource endowments, tastes, and knowledge analyzed in the "pure theory" of international trade. The monetary aspects are best understood as a layer of secondary modifications superimposed on the real factors. While these modifications are sometimes so powerful, dramatic, and even catastrophic that the real factors are in danger of being lost from sight, they cannot be understood in isolation.

Consistent with this perspective, this introductory chapter offers a thumbnail summary of the real aspects of international economics. It is intended to provide the nonmonetary background for the monetary aspects of international economics discussed in the following chapters. Inevitably, the exposition must be reduced to a bare minimum of analytical building blocks. It is designed for a reader who has some familiarity with international trade theory without, however, being an accomplished expert in it. The competent international trade theorist will find that many important qualifications and extensions are disregarded; he will learn nothing from this chapter. The complete novice, on the other hand, may find the exposition excessively terse and undesirably abstract; he should consult the literature on international trade theory.[1]

The discussion is limited to two countries and two commodities. The first section concentrates on the demand side, exhibiting the prominent role of

1. In particular, the following expositions may be useful: Caves and Jones 1977, pts I and II; Heller 1973, ch. 6; Krauss 1979, chs. II and VI.

price elasticities. The second section concentrates on the supply side, emphasizing differences in factor endowments and technology. In the third section, demand and supply elements are combined into a concise restatement of the international division of labor with imperfect specialization. It is followed by a brief discussion of the terms of trade. The final section introduces rigid wages and thus unemployment.

## 1.1 Diversified Consumption with Specialization in Production

Suppose there are two countries, Portugal and England, and two goods, wine and cloth. Transportation costs are disregarded. Each country is endowed with certain factors of production. In reality these are of various kinds, including capital goods of different types, labor of different skills, and land of different quality and location. For the present purpose it will be assumed, however, that there are only two kinds of factors, called land and resources. Land may be visualized as actually found on the map. Resources, on the other hand, should be visualized rather abstractly as consisting of standardized "bundles" of labor inputs and capital goods. As a consequence, the quantity of resources can be measured in a single number. The question is what quantities of wine and/or cloth each country will consume, produce, export, and import. The complete answer is complex. It will be developed in stages by concentrating in each stage on one particular aspect. The present section focuses on the significance of demand, an aspect emphasized by John Stuart Mill and analytically elaborated by Alfred Marshall (1923, 1930). At the same time, the influence of cost factors is pushed into the background by the assumption that each country specializes in one product. With its land and resources, Portugal produces wine but is assumed to be unable to produce cloth. England, on the other hand, produces cloth but is unable to grow wine. It is clear that, with fully employed resources, Portugal produces a fixed quantity of wine, $\bar{W}_P$, while England produces a fixed quantity of cloth, $\bar{C}_E$. Production is thus predetermined.

Under these assumptions, Portugal's demand can be described as follows. Her income, measured in barrels of wine, is $\bar{W}_P$. Her consumption of cloth depends on this income and on the relative price of cloth in terms of wine, $\pi$, called the terms of trade:

$$C_P = C_P(\pi, \bar{W}_P). \tag{1.1.1}$$

The same can be said about the demand for wine,

$$W_P = W_P(\pi, \bar{W}_P),$$

but this function does not contain new information, because the consumption of wine is just what is left of income after the payment for cloth. This is expressed by the budget constraint

$$W_P = \bar{W}_P - \pi C_P. \tag{1.1.2}$$

What can be said about the demand functions? If Portuguese income increases, the demand for both commodities will normally rise. In this case the goods are called "normal" (or sometimes "superior"). It may happen, however, that demand declines as income rises; such goods are called "inferior." Clearly, not all goods can simultaneously be inferior, since additional income must be spent on something.

If the price of cloth rises, Portugal will probably demand less of it; the exceptional "Giffen case," while logically conceivable for strongly inferior goods with a high budget share, is extremely unlikely and, in the present context, can practically be disregarded. It may seem that the same argument can be applied to wine. A rising relative price of cloth is equivalent to a falling relative price of wine, which should induce an increase in the demand for wine. However, this argument is deficient. In fact, it is quite possible that the decline in the demand for cloth is accompanied by a decline in the demand for wine. At the higher price of cloth, even a reduced quantity may have to be bought with a higher quantity of wine, leaving less of the latter for Portuguese home consumption.

To illustrate with an extreme example, imagine a happy state in which Portugal can obtain cloth free, so that she can satiate herself with cloth without sacrificing any of her wine. If England now started to charge a price for her cloth, Portugal's consumption of wine, though it had become relatively cheaper, would certainly decline. Suppose, on the other hand, the price of cloth is initially so high that none is consumed in Portugal. If the price of cloth now declines to a level at which some is consumed, the consumption of wine will have to be reduced to pay for the cloth. In this case, the price of cloth and the consumption of wine necessarily move in the same direction. Between these extremes, we cannot be quite sure whether a rise in the relative price of cloth (and thus a fall in the relative price of wine) will raise or lower the Portuguese demand for wine. The microeconomic theorist would trace this ambiguity to the opposing signs of a substitution effect and an income effect in the case of a supplier of a normal good. While the lower relative price of wine, taken at the same real income level, would tend to raise Portugal's wine consumption, the lower purchasing power of her wine in terms of English cloth reduces her real income and would thus, taken by itself, tend to reduce her consumption of wine.

What do these demand reactions imply for Portugal's imports and exports? Since home production is fixed, a decline in cloth consumption is associated with an equal decline in import demand. For wine, exports increase as consumption decreases, and vice versa. The effect of a price change on cloth imports, $C_P$, and wine exports, $\bar{W}_P - W_P$, can be summarized in a familiar graph (fig. 1.1.1). With a falling relative price of cloth, cloth imports rise as expressed by the falling demand curve. Wine exports, $\bar{W}_P - W_P$, are measured by the area of the shaded rectangle (see 1.1.2). It is clear that with falling $\pi$ this area can increase, stay constant, or decrease depending on the price elasticity of the demand for cloth.

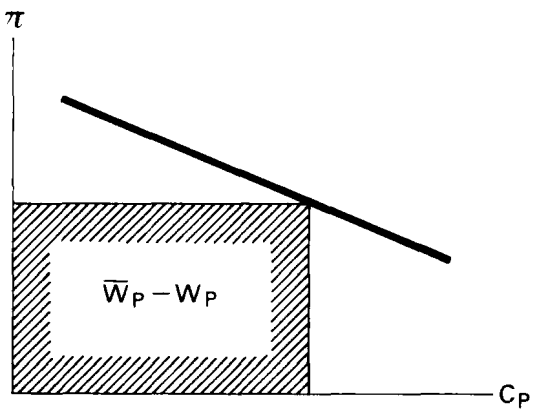


**FIGURE 1.1.1**
Portugal's Imports and Exports

The precise relationship between import demand and export supply of the same country can be expressed in terms of two elasticities. By taking the total differential of the budget constraint (1.1.2) one obtains

$$d(\bar{W}_P - W_P) = \pi dC_P + C_P d\pi.$$

Using the budget constraint (1.1.2), this can be written

$$\frac{d(\bar{W}_P - W_P)}{d\pi} \cdot \frac{\pi}{(\bar{W}_P - W_P)} = \frac{dC_P}{d\pi} \cdot \frac{\pi}{C_P} + 1.$$

Defining the elasticity of the Portuguese import demand for cloth with respect to its relative price as

$$\epsilon_{PC} = \frac{dC_P}{d\pi} \cdot \frac{\pi}{C_P}$$

and the elasticity of the Portuguese export supply of wine with respect to its relative price, $\pi^* = 1/\pi$, as

$$\eta_{PW} = \frac{d(\bar{W}_P - W_P)}{d\pi^*} \cdot \frac{\pi^*}{(\bar{W}_P - W_P)} = -\frac{d(\bar{W}_P - W_P)}{d\pi} \cdot \frac{\pi}{(\bar{W}_P - W_P)},$$

this can be written

$$\epsilon_{PC} + \eta_{PW} = -1. \tag{1.1.3}$$

In words, the elasticities of import demand and export supply, each in terms of its own relative price, sum to $-1$.

In the preceding argument, Portugal's demand function for cloth was regarded as one of the ultimate data. On the assumption that the behavior of the Portuguese economy can be analyzed in the same way as the behavior of a