

# Lecture Notes 1

## Introduction

International Economics: Finance

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Modern economies are interdependent. Macroeconomic policy decisions involve international considerations. Countries struggle to align their fiscal policies, defend their currencies, cope with international financial shocks, dodge excess international indebtedness and currency crisis, avoid high inflation and undesirable exchange rate fluctuations, and maintain international competitiveness and low unemployment even during global recessions. Making good macroeconomic policy requires an understanding of the international dimension, including the role of international financial markets and exchange rates.

## 1.1 The Open Economy

When we say that a country has an *open economy*, we mean that it has important economic interactions with other economies. Sometimes economists find it useful to ignore these interactions and study a hypothetical *closed economy*. However the focus of this book is the macroeconomics of the open economy.

Macroeconomic models of the open economy give an important role to money. As we will see, monetary policy is a key determinant of the nominal exchange rate. It may also have important effects on the real exchange rate. Inflation and potentially business cycles depend on monetary policy behavior. Fiscal policy may also influence the real exchange rate or business cycles. Real and financial adjustments may result from trade imbalances, and policy makers attempt monetary and fiscal responses to macroeconomic shocks. Macroeconomic models provide the reasoning behind policy responses. The success of our policy choices hinges on the adequacy of our models.

Modeling open economies is inherently complex. A central goal of this book is to reduce this complexity to manageable proportions. To that end, we will not survey the innumerable models that economists have developed. Instead we will try to develop unifying themes that render understandable the most important results.

Models of the open economy tend to proliferate. First, all of the questions that arise

in modeling a closed economy also arise in an open economy. In addition, a number of new questions arise. Is the exchange-rate regime a peg, a float, or something in between? Is financial capital internationally mobile, immobile, or something in between? Should we distinguish between goods that are traded internationally and those that are not? How much of an effect does domestic economic activity have on the world economy, and vice versa? Each of these questions multiplies the number of different configurations we can consider theoretically, and the diversity of actual economies and policy concerns lends relevance to many of these different configurations.

The response of the profession to the bewildering array of possible economies has been to build a bewildering array of theoretical models. However, these models are constructed from a few essential components, which function as theoretical building blocks. This book seeks an underlying unity of structure in a variety of specific models. We concentrate on simple, stylized models that highlight particular points under discussion. The nature of our questions will determine the nature of our models, which will be constructed from relatively simple theoretical building blocks. We use economic theory to understand the interaction of simple model components that can shed light on the behavior of actual economies.

### 1.1.1 Economic Models

The more accurate the map, the more it resembles the territory. The most accurate map possible would be the territory, and thus would be perfectly accurate and perfectly useless.

— from the Notebooks of Mr. Ibis in *American Gods* by Neil Gaiman, p.546

At some stage in their studies, many students of economics become puzzled by the role of modeling in economic reasoning. Economic phenomena are inherently complex and interrelated, while economic models are relatively simple and unrealistic. It is important to realize that from the perspective of economic modeling, lack of realism is *good*. We judge a model by its usefulness for a certain purpose, not by its overall realism. Realism is essential to the model only where it is needed for the model to serve our purposes, whether these be

a matter of understanding, forecasting, or policy guidance. Just as you would not choose a scale model of a city to serve the purposes of a street map, you would not choose a scale model of an economy to guide your understanding of exchange rate determination. Good economic theory strives to isolate the considerations that are most important for our goals. A street map serves better than a topographic map for finding one's way in a city, but both are simplifications that have their uses. As in the production of a useful map, we produce a useful economic model by selecting components based on its intended use.

In keeping with this philosophy, we spend time on two quite different approaches to modeling the macroeconomy. The first approach has a long-run focus. We capture this in a very simple “Classical” model, wherein the domestic economy's output is held fixed at a level corresponding to the full and efficient employment of the economy's existing resources. (Economists often call this *potential output* or *natural output*.) The second approach has a short-run focus. We capture this in a very simple “Keynesian” model, wherein the price level of the domestic economy is predetermined. (This is a stylized way of representing “sticky” prices in the domestic economy.) At times, as in our discussion of exchange rate overshooting, we will also discuss the transition between the short run and the long run.

## 1.2 Policy Goals

Most students of the international economy are interested either in prediction or policy. Good prediction may be seen as a prerequisite for good discretionary policy: one must predict the effects of proposed policies before choosing among them. For economists, prediction remains elusive. We will see that despite the best efforts of exchange rate economists, our ability to predict foreign exchange rates remains extremely limited. This can be viewed as a disappointment or as a challenge, and we emphasize the challenge.

Consider the following policy goals:

- high real income growth

- low variance of real income around its trend
- low unemployment
- low inflation
- low variance of inflation
- fair income distribution
- current account “balance”

Which of these are most important to you? Why? We will be interested in discovering the trade-offs between various policy goals.

## 1.3 Floating Rates

An *exchange rate* is the rate at which two currencies trade for each other. When we speak of “the” exchange rate, we will mean the domestic currency price of foreign currency. For example, if the domestic currency is the U.S. dollar and the foreign currency is the British pound, the exchange rate is the number of dollars it takes to buy a pound.

With this convention, the exchange rate looks like any other price. Someone pondering whether exchange rates should float or be fixed may therefore be tempted to draw an analogy between the market for foreign exchange and the market for commodities. Strong arguments have been offered against price fixing in commodity markets; can these arguments be marshalled against fixed exchange rates? In short, no.

Currencies fundamentally differ from commodities. Consider two neighboring cities currently using a single currency. Would you propose that the cities adopt two separate monies with a floating parity? Dealing in two separate monies will involve new costs, and in this case there is no obvious offsetting gain.<sup>1</sup>

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<sup>1</sup>The theory of optimum currency areas considers the various costs and benefits that arise when different geographic regions adopt a common currency.

The views of policy makers with respect to floating exchange rates have been extremely volatile. Milton Friedman reports how in 1969 top IMF officials “dismissed my proposal for floating exchange rates as utterly impractical,” but only two years later (facing the collapse of the Bretton Woods system) described “floating rates as the only practicable system” (Friedman and Friedman, 1998, p.220). The choice of exchange-rate regime is an important area of study in international finance, and we will take it up in chapter 13. Currently the countries of the world use a variety of exchange rate regimes, but most major currencies float against each other. A half a century ago the situation was quite different: most major currencies were part of a fixed exchange rate system.

Economists at that time had a number of expectations for a regime of floating exchange rates—expectations that tended to be rather sanguine. As it turns out, many of these expectations have not been met.<sup>2</sup>

**Floating exchange rates would be fairly stable.** Theoretical models of exchange rates suggested that money, interest rates, and real income were fundamental determinants of the exchange rate. Economists expected exchange rates to be largely determined by this small number of exchange-rate *fundamentals*. Correspondingly, they expected exchange rates to be about as stable as those fundamentals. They expected fluctuations in exchange rates to be fairly predictable, since the fundamentals (particularly monetary policy) were expected to be fairly predictable. Divergent macroeconomic policies—especially divergent monetary policies—would cause exchange rate movements, of course, but economists perceived the ability of exchange-rate movements to automatically offset divergent policies as a virtue of the system. The following argument is representative of this view:

...instability of exchange rates is a symptom of instability in the underlying economic structure ... a flexible exchange rate need not be an unstable exchange rate. If it is, it is primarily because there is underlying instability in the economic

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<sup>2</sup>The following discussion draws on Dornbusch and Frankel (1988). See also Friedman (1953a), Sohmen (1961), and Johnson (1969).

conditions . . .

—Friedman (1953b)

The reality has been substantial, unexplained fluctuations in exchange rates. Exchange rates are volatile relative both to their past history and to the known fundamentals. This is known as the *volatility puzzle*. Related to this, since most exchange rate variability is not explained by the usual lists of exchange rate fundamentals, empirical exchange rate models have performed poorly both in-sample and in out-of-sample forecasting.

Not only have nominal exchange rates been volatile, but so have real exchange rates. Economists draw a distinction between the nominal exchange rate, which is the domestic currency cost of foreign currency, and the real exchange rate, which is the cost in domestic goods of foreign goods. We define the *real exchange rate* ( $Q$ ) as follows:

$$Q = \frac{SP^*}{P} \quad (1.1)$$

Here  $P$  is the domestic price level and  $P^*$  is the foreign price level. Taking the U.S. dollar (USD) as the domestic currency, can discover the units of the real exchange rate as follows:

$$\begin{aligned} \frac{SP^*}{P} &= \frac{(\#USD/FCU)(\#FCU/basket^*)}{\#USD/basket} \\ &= \frac{\#basket}{basket^*} \end{aligned} \quad (1.2)$$

Here a \* indicates the foreign country, and FCU is the foreign currency unit. So the real exchange rate is the number of baskets of the domestic good it takes to buy a basket of the foreign good. It is the cost of their good in terms of our goods. Volatility in the real exchange rate may cause volatility in the international demand for our goods, which can increase the volatility of our trade balance and even our unemployment rate.

Nowadays many economists believe that existing models cannot easily accommodate the short-run behavior of exchange rates. The list of fundamentals implied by accepted theory does not seem closely related to exchange rate movements. And there are other problems

as well, which we will take up in future chapters. As one example, the appreciation of the early 1980s was large but gradual, while popular models predict that it should have taken place in a series of large jumps (in response to policy changes).<sup>3</sup>

**Real exchange rates were expected to be very stable in the long run, but sticky prices would slow the adjustment toward long run equilibrium.** While divergent macroeconomic policies might lead to volatility in the nominal exchange rate, as we have just discussed, economists expected these nominal exchange rate movements to stabilize the real exchange rate—if not immediately, then after a short adjustment period.

The prediction of stability in the real exchange rate is called the doctrine of ***purchasing power parity***. The purchasing-power-parity doctrine holds that, at least in the long run, the real exchange rate approximates a constant value that is determined by real economic activity. As we will see in chapter 5, the reality has been that purchasing power parity fails badly in the short-run, and evidence that it prevails in the long-run remains problematic. Most movement in real exchange rates is unexpected and very persistent. Some economists even consider these persistent shocks to be “permanent”, in the sense that they have no tendency to be automatically reversed. Long-run exchange rates have proved much harder to predict than the purchasing power parity doctrine seems to suggest.

**Countries would be free to pursue divergent macroeconomic policies with less concern about international linkages.** In particular, it was expected that flexible exchange rates would free countries to pursue independent monetary policies. And indeed, countries have seized this freedom in picking macroeconomic policy mixes. The generalized float has been associated with divergent monetary policies and divergent inflation rates. For example, the tight monetary policies initiated by the U.S. and U.K. in 1979 were independent of German or Japanese policy actions. Related to this policy independence, real interest rate differentials across countries have also increased. However, as continual G-7 meetings

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<sup>3</sup>However if the credibility of policy news accumulates slowly, then slower movements are predicted.



make clear, countries continue to be very interested in international policy coordination.<sup>4</sup> Further, monetary policy changes abroad can lead to large capital flows and large exchange rate movements, which may influence domestic monetary policy.

**Countries would be insulated from external “shocks”.** Changes in foreign income, interest rates, or import demand were expected to have less influence on the domestic economy under flexible exchange rates. However it is certainly not obvious that international macroeconomic linkages have been reduced during by flexible exchange rates. In fact, the correlations between real GDP among countries appears to have increased during the floating rate period (Lumsdaine and Prasad, 2003). Possibly this correlation traces to large global shocks, such as the large oil price movements of the 1970s and 1980s. Another contributor may be real interest rate linkages across economies, which may in turn be responses to sticky prices and high capital mobility. And in fact some evidence suggests that floating exchange rates reduce the variability of inflation and GDP (Taylor, 1995).

**Large trade imbalances would be rare, reducing protectionist pressures.** A key concern in discussions of international monetary reform is now that large exchange rate fluctuations are an important source of protectionist pressure. In addition, the U.S. has run very large current account deficits since the early 1980s. Protectionism probably has nevertheless declined in the last two decades, it is difficult to assess the extent to which increases in non-tariff protectionism has offset declines in tariff barriers (such as those negotiated under the GATT).

**Central banks would hold fewer foreign exchange reserves.** Central banks continue to accumulate foreign exchange reserves. Of course, it is also true that central banks have continued to actively intervene in foreign exchange markets. Some of these interventions have been huge, their size possibly mandated by high levels of international capital mobility.

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<sup>4</sup>The G-7 meetings bring together the finance ministers from seven nations: Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

For example, in 1998 the United States intervened to bolster the Japanese yen, which was tumbling in response to a financial panic that had spread around Asia. The yen subsequently rose about 30 percent, suprising giant investment funds and banks that had been betting on a further deterioration of the yen and were forced to abandon their positions with heavy losses. As another example, in late 2000 the European, American and Japanese central banks staged a coordinated currency intervention to prop up the declining euro. The European Central Bank had raised interest rates six times in a year without much affect on the the euro's decline. Concerns had arisen that the decline in the euro would hurt the global economy by causing recessionary pressures in Europe: the relatively high oil prices in late 2000 hit Europe particularly hard due to the euro depreciation. (Oil is priced in dollars.) After a single-day intervention of perhaps USD 10B, the euro rose briefly from USD .85 to USD .9, but almost immediately lost about half that gain. By 26 Oct it hit a new low of 82.3 cents. In early November, the ECB tried intervening again, this time on its own. The market response was limited. In subsequent year, despite the absence of targeted interventions, the euro appreciated strongly against the dollar.

**Speculation would be stabilizing rather than destabilizing.** Foreign exchange speculators buy foreign exchange (or claims on foreign exchange) when they expect it to rise in value and sell foreign exchange when they expect it to fall in value. Economists imagined speculators would smooth price fluctuations over time the way arbitragers smooth price fluctuations over space: increasing demand where price is relatively low, and increasing supply where price is relatively high. That is the basis of profitable speculation. Friedman (1953a) offered an extremely influential argument that since profitable speculation must be stabilizing, speculation must ultimately prove stabilizing: loss-making speculators eventually will be driven from the market.

As we have seen, exchange rates have been quite volatile, and the volatility puzzle continues to pose an empirical challenge. It may be true, as McKinnon (1976) argues, that this

represents *insufficient* speculation (due, e.g., to capital constraints and institutional rules that stop traders from maintaining large open positions in foreign exchange). However modern theory, such as the theory of speculative bubbles, now tells us that even under rational expectations speculation can be destabilizing. In addition, evidence has accumulated that many market participants rely on technical analysis, which is essentially fancy extrapolation. De Long et al. (1987) incorporate this observation into a “noise trader” model that shows how destabilizing, profitable speculators may remain in the market. (They are rewarded for unintentionally bearing more risk.) This radically weakens the theoretical claim that speculation must be stabilizing.

**The new exchange rate risk would have little effect on international trade since instruments for hedging this risk would become widely available.** The volume of international trade has grown, and with it the demand for foreign exchange hedging has grown. *Hedging* is a method of reducing the risk of loss due to foreign exchange fluctuations, which we will discuss in chapter 2. Most currencies are convertible—they can be freely traded for other currencies—and low cost hedging through forward markets is widely available. In this sense the prediction has been born out. Yet Dornbusch and Frankel (1988) observe that most international trade is not hedged in the forward market.

# Terms and Concepts

closed economy, 2

exchange rate, 5

fundamentals, 6

hedging, 11

natural rate, 4

open economy, 2

purchasing power parity

    doctrine, 7

real exchange rate, 7

speculator, 10

volatility puzzle, 7

## Problems for Review

1. What is a foreign exchange rate? (Be precise.)
2. Suppose upon learning of your studies in economics a friend comments that economic models cannot be useful because they are unrealistic. How would you respond?
3. How prescient were postwar economists about the behavior of flexible exchange rates?
4. Why did economists believe that profitable speculation should be stabilizing?
5. Why is prediction a prerequisite to policy making?
6. In microeconomics you learn that it is inefficient for policy makers to fix the price of a commodity that is sold in competitive markets. Why does this argument not apply to foreign exchange markets, which are very competitive?



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