Determinants of exchange rate movements: a review

A discussion of the factors influencing goods and asset markets that help to explain exchange rate fluctuations in a world of floating currencies.

Andrew Crockett

One of the central obligations of member countries of the International Monetary Fund is “to collaborate with the Fund and other members to assure orderly exchange arrangements and to promote a stable system of exchange rates” (Article IV, Section 1). The Fund itself is charged with the responsibility of overseeing the functioning of the international monetary system, and the compliance of member countries with their obligations relating to exchange rate policies.

The function of surveillance is a continuous one, and is applied to each one of the Fund’s 141 member countries. It is the policies of the largest member countries, however, that have the greatest impact on the functioning of the system as a whole. Not only do these countries account for the bulk of world trade, but also their currencies dominate international financial markets and currency flows. For the most part, these currencies are free to fluctuate against each other. This raises questions about what the causes and consequences of such fluctuations are and the policies, if any, that should be undertaken to limit their extent.

To facilitate the analysis of these questions, the Fund’s Research Department periodically assembles charts and tables containing data that bear on the evolution of exchange rates. (See “Exchange rate indicators,” Finance & Development, June 1980.) This article will discuss the implications of some of these for the analysis of exchange rate movements. The indicator used to measure the external value of currencies, and shown here in Chart 1, is the “effective” exchange rate. This rate shows the evolution of a given currency’s value in terms of a weighted average of other currencies. The weights, generated by the Fund’s Multilateral Exchange Rate Model, attempt to capture the relative importance for a country’s balance of trade of exchange rate changes taking place among the currencies of trading partners and competitors.

Charts 2–6 relate to various factors which affect international exchanges of goods and financial assets, and which therefore influence developments in exchange markets. For many years, the analysis of payments and exchange rate developments concentrated mainly on the influences of supply and demand in goods markets—that is, on developments in the current account. More recently, there has been increased recognition that the demand and supply for financial assets can also be a potent influence on exchange rate developments. In what follows, therefore, developments affecting goods market equilibrium and asset market equilibrium are discussed in turn. It should be emphasized, however, that the determination of exchange rates is a complex interactive process, which cannot be fully explained by any one factor or any limited set of explanatory variables. More often than not, adequate explanation requires attention to several major economic factors whose respective influences sometimes reinforce and sometimes partially offset each other. In addition, changes in expectations, sometimes induced by political developments, can exert a strong influence on exchange markets.

The current account

An exchange rate is a price, and like any other price is ultimately determined by supply and demand. Much early analysis of payments flows saw demand for foreign exchange as a derived demand, representing simply the other side of the coin of the demand and supply for goods and services entering international trade. If the demand for goods produced in country X were to rise relative to the demand for goods coming from country Y, the demand for currency X would rise relative to that for currency Y. Currency X would appreciate to the point where demand for X-goods was discouraged and that for Y-goods was promoted, so that once again the balance of trade would be restored to equilibrium.

Such a view of the foreign exchange market suggests that the balance of payments (BOP) on current account is likely to be a major determinant of exchange rate movements, as indeed it is. A comparison of Chart 2 with Chart 1 reveals a number of occasions where such an association can be observed. The growth, and later decline, of the Japanese payments surplus over the period 1976–79 is matched by an appreciation and subsequent depreciation in the effective exchange rate of the Japanese yen. A similar though less striking relationship can be detected for the United States; and the appreciation of the pound sterling in 1979 and 1980 can be explained in terms of the (relative) strength of the U.K. current account.

By and large, however, attempts to explain exchange rate developments exclusively or even predominantly in terms of the BOP on current account do not yield very satisfactory results. Most of the short-term fluctuations in exchange rates among the five currencies covered in the charts have little to do with payments performance; and even over longer periods the relationship is quite loose. The reasons are perhaps not surprising. If exchange rates
did, as the hypothesis maintains, move to equilibrate the current account, then there would be no observable and systematic relationship between the two phenomena, since the payments position would always tend to equilibrium. Only if there were a systematic lag in the response of the exchange rate to payments developments could an empirical relationship be established. However, the existence of such a systematic lag would tend to set up incentives for private market participants to anticipate the subsequent exchange rate movement and to eliminate the observed relationship. Thus, to the extent that current account developments bring about exchange rate changes, their impact is obscured by the two-way nature of the relationship, as well as by the presence of other important factors.

Relative prices

To gain a better understanding of the causal mechanisms at work, therefore, it is necessary to look behind the current account to the underlying determinants of trade flows, as well as beyond it to capital flows and reserve movements. One underlying determinant is relative price developments in different countries, the expectation being that exchange rate changes would tend to offset differential movements in national price levels. The “Purchasing Power Parity” (PPP) theory is one formal expression of this expectation. It was first popularized by Gustav Cassel in 1918 and has since enjoyed a somewhat checkered academic reputation. Under suitably rigorous assumptions, PPP becomes a tautology. If nothing changes in an economy except that all costs and prices double, the value of real assets and the quantity of financial assets doubles, the distribution of wealth is unchanged, and so on, then the equilibrium value of the currency used in that economy, in terms of other currencies, will be halved.

It is clear, however, that other factors are not likely to remain constant while these monetary changes are taking place. Production methods may adjust, the relative scarcity of different factors of production may change, new discoveries may be made, tastes may alter, cyclical developments can occur, and so on. These factors may be set off by events that are independent of monetary developments; they may also be influenced by them. But whatever the reason, one result is likely to be changes in the structure of international demand and supply in goods markets that will bring about the exchange rate changes needed to offset underlying inflation differentials.

Both BOP and exchange rate developments can be explained partly in terms of relative movements in aggregated price indices, and partly in terms of specific factors affecting the demand for and supply of particular traded goods. Which factor predominates depends both on how rapid general inflation is and how significantly individual countries’ terms of trade are shifting. If one major industrial country is experiencing 20–30 per cent inflation while another, producing broadly the same range of goods, has contained inflation to, say, 5 per cent, it is to be expected that the currency of the former is likely to depreciate...
in terms of the currency of the latter, and that over time the rate of depreciation will not be too different from the difference in the rates of inflation. This explains why the Federal Republic of Germany and Japan, whose inflation rates have generally been below those of the other major industrial countries, have each had a steadily appreciating currency (see Charts 1 and 3). If, however, there is a substantial change in a country’s trade structure, this may well be reflected in disparate movements in the exchange rate and domestic costs. Since 1976, for example, the pound sterling has steadily appreciated against the other four major currencies, despite an inflation rate in the United Kingdom that is well above average. The reason lies, at least to some extent, in the strength imparted to its BOP by the rising production of North Sea oil.

More generally, if differences in inflation are small, their effect on competitiveness is more likely to be swamped by the other “real” factors affecting BOP performance. Under such circumstances, a comparison of differences in inflation will make a much smaller contribution in explaining actual exchange rate movements—particularly since it will not be clear which particular measure of inflation is appropriate for cross-country comparisons. The prices of internationally traded goods might seem most relevant in explaining payments developments. However, such prices are prevented by the forces of competition from diverging very much from similar goods produced in other countries; so that the impact on trading performance is not directly through price changes, but through changes in the profitability of the firms that produce export products. What is needed, therefore, is a measure of costs or prices that better reflects national inflationary developments.

In general, consumer prices give a measure of inflationary pressures and are both comprehensive and broadly comparable among countries. For this reason, they are used in Chart 3. However, consumer prices also reflect local pressures that do not affect international trade—such as consumption taxes and differences in local prices of traded and nontraded goods. If a country has a very rapid increase in productivity in traded goods industries, this is likely to result in a shift in labor from nontraded to traded goods firms, and hence to rapidly increasing real wages in nontraded goods industries also. If productivity is rising only slowly in the nontraded goods industries, the prices of their products will rise rapidly, thus bringing about increases in the consumer price index as a whole. Japan is a striking example of this phenomenon. For much of the 1950s and 1960s, Japan had the most rapidly rising consumer price index of any industrial country, yet had stable export prices and a steadily improving trading position. The reason lay in the much stronger productivity gains which Japan was experiencing in traded, as compared with nontraded, goods industries.

In analyzing exchange rate trends, therefore, it may often be more appropriate to use measures which try to capture changes in costs in industries producing export goods. Chart 4 offers three possible measures: wholesale prices, the gross do-
mestic product deflator, and unit labor costs in the manufacturing industry (all expressed in terms of the national currency). But although these measures may provide a better analytical basis for determining the causes of exchange rate developments, they still fall short of a fully satisfactory framework. In the first place, changes in relative costs of production manifestly do not fully explain the exchange rate changes that have taken place among major currencies over the past few years. Second, to the extent that they do provide a partial explanation, the more fundamental question remains of what has caused the changes in relative production costs.

There are a number of basic shortcomings in any approach that attempts to explain why exchange rates shift in terms of cost and price developments. First, such an approach does not take account of the impact of cyclical fluctuations in output and incomes on the demand for imports and the supply of exports. Second, it ignores changes in the structure of output and demand that affect the equilibrium relationship of aggregate cost or price indices between countries. And, third, it does not explain short-term movements in exchange rates which may result from uncertainties and lags in the adjustment process. Lastly, it does not address the question of how capital flows are determined.

**Asset markets**

Partly in answer to these perceived shortcomings, in recent years a consensus has arisen among analysts of BOP and exchange rate developments that the foreign exchange market should be viewed, at least in the short term, as an asset market. That is to say, the price which emerges for a particular currency in the foreign exchange market must represent a balance between the desire to hold stocks of assets denominated in that currency and the quantity of such assets in existence.

Such a theory does not, of course, deny that there is a demand for currency as a vehicle for the acquisition of real goods. However, in the relatively short run, the stock of financial assets that is held for purposes of investment or liquidity is inevitably large relative to the volume of financial instruments that need to be acquired for the purpose of effecting current transactions. Since assets can be exchanged relatively easily (at least at the margin), while it takes time to exploit an emerging comparative advantage in goods production, it is likely that factors influencing the attractiveness of different assets to hold will, in the short run, play the greater role in determining exchange rate movements.

To help explain short-term currency movements, therefore, it is necessary to consider factors affecting the demand and supply of financial instruments denominated in the currency under study, as well as those affecting other currencies for which they might be exchanged. Since empirical work for a wide range of countries has suggested that the most stable demand function for a financial asset is that for money, one of the ways in which exchange rate developments may be assessed is through a comparison of the supply and demand for money in different countries.

Rates of growth of monetary aggregates provide information on the supply of various currencies (Chart 5). In the absence of other developments, it would be expected...
that a more moderate rate of monetary growth would be associated with a strengthening exchange rate, because monetary tightening would induce capital inflows, a reduction in domestic inflationary pressures, and improved competitive performance. Chart 5 shows some developments that are consistent with these a priori expectations. The declines in monetary growth in Japan in 1976/77 and in the United Kingdom in 1978/79 were both associated with a strengthening of their respective currencies. On the other hand, viewed as a whole, the charts do not reveal a very close correlation between exchange rates and monetary growth.

Part of the explanation is that supply is only one side of the equation. Exchange rate movements are likely to be induced by imbalances between demand and supply in different money markets. The analysis must therefore be extended to include comparisons of factors governing the demand for money. Such a comparison requires econometric rather than simply graphical techniques. However, a powerful factor affecting the relative attractiveness of currencies is interest rates. Because of the importance of this phenomenon in determining exchange rate movements, Chart 6 provides information on interest rate developments for short-term instruments. It may be seen that the rapid increase in interest rates on U.S. dollar assets that took place in late 1979 and early 1980 was accompanied by a marked strengthening of the dollar in exchange markets. Overall, however, the prima facie relationship is not good. This does not necessarily mean that the causal link is weak, since other major influences are likely to be operating. Indeed, it may be that monetary authorities have used interest rate policy to moderate movements in the external value of their currency. Thus the observed association between interest rates and exchange rates may be negative (a falling exchange rate induces the monetary authorities to adopt higher interest rates) while the causal link is positive.

A reconciliation

The fact that the exchange rate is a price that has to balance the desire to hold stocks of assets denominated in a particular currency with the available supply does not mean that it does not also have to equilibrate demand flows, arising from current transactions, over time. Indeed the longer the time horizon being considered, the more helpful it is to consider flow factors; and the shorter the horizon, the more helpful it is to consider changes in stocks. This is simply a question of relative magnitudes. Over a short period, the stock of assets that can be exchanged for assets denominated in other currencies is large relative to the purchases and sales of these assets out of current income. The longer the time horizon being considered, however, the greater the potential size and importance of cumulative flows of assets, and the stronger the influence of current account factors on the equilibrium value of the currency.

It should also be noted that asset markets (under normal conditions) can adapt to changed circumstances more rapidly than goods markets. If monetary conditions tighten in a given country, pushing up interest rates, funds can be attracted from abroad very quickly, and the consequent impact on the exchange rate almost immediate. On the other hand, it takes considerable time, possibly even several years, for improved competitiveness in goods markets (as a result, for example, of devaluation) to be fully reflected in trade flows. Time is required for producers to recognize new market opportunities, expand production capacity, build up marketing networks, acquire product reputation, and attract business away from competitors.

However, the fact that the current account responds sluggishly to changes in its underlying determinants does not mean that it has no influence on short-term exchange rate movements. International investors and speculators move funds bearing in mind expected exchange rate movements. Where future developments affecting a country’s payments position or international competitiveness can be foreseen, they will “cast their shadow forward” and cause an anticipatory adjustment in market rates. Perhaps the best example of this phenomenon is the strength of the British and Norwegian currencies even before oil production in the North Sea had been built up to significant levels. It has also probably been the cause of the wide swings that have taken place in exchange rates, in reflection, inter alia, of changing perceptions of countries’ relative prospects for success in combating inflation.

An interactive process

This article has reviewed a number of factors that affect, proximately or more fundamentally, fluctuations in exchange rates. These factors are not, however, alternative explanations. They are separate aspects of an interactive process that needs to be viewed as a whole. An increase in the quantity of currency X will tend, other things being equal, to depress its price in terms of other currencies. One of the ways in which this will come about is through a decline in interest rates for currency X, that provokes an outflow of funds across the exchanges. Another way this influence can be transmitted is through more expansionary policy. This will lead to an increase in the money supply, which will tend to cause an increase in the domestic absorption of goods of all kinds, and thus bring about a deterioration in the current account. Higher demand for domestic factors of production will make it easier for these factors to raise their prices. Higher factor costs in turn will lead to higher retail prices, to reduced competitiveness in foreign markets, and then to continued downward pressure on the exchange rate.

It is apparent from the above discussion that there is no single variable which can be used to explain exchange rate developments in a world of floating exchange rates. Different factors explain different aspects of current price movements; they represent separate links in the chain of causation and can occur in a wide variety of combinations. Thus, there can be no simple policy prescription that can be used to bring about greater exchange rate stability. Indeed, the fact that each of the policy instruments or indicators that is associated with exchange rate changes has links also with other domestic and international policy objectives should warn national authorities against establishing exchange rate stability as an overriding objective. Nevertheless, it is clear that domestic policies which help bring about a greater measure of stability in local prices and nominal interest rates will contribute to a more smoothly functioning international exchange rate system. In that situation, the underlying determinants of exchange rates are likely to shift more slowly, expectations will be equilibrating rather than disruptive, and the propensity of market transactors to “second-guess” official policy actions in ways which destabilize exchange markets will be minimized.