Why currencies overshoot

This brief in our series on the modern classics of economics looks at exchange rates. The fourth of our chosen studies, published in 1976, started by assuming that foreign-exchange markets are "efficient" and "rational"—and then explained why currencies are nonetheless unstable.


The exchange rates of the main industrial economies have been free to float only since 1973, when the Bretton Woods system of fixed exchange rates collapsed. The large swings in currencies during the past 17 years have stimulated new interest among economists in theories to explain the forces that drive exchange rates. These new theories have focused on the role of internationally traded capital and investors' expectations.

Under the Bretton Woods arrangements, countries had to maintain their currencies (by official buying and selling) within 1% of their fixed rates against the dollar. The rules said that a country could change its fixed rate only if its balance of payments was in "fundamental disequilibrium". Long before the system broke down, most economists had advocated floating exchange rates. If rates were free to move, they said, governments would regain the use of monetary policy for domestic economic goals. Also exchange rates would move automatically to reflect changes in relative prices; real exchange rates (nominal exchange rates adjusted for differences in inflation) would therefore be steadier, and trade imbalances smaller.

Floating proved a disappointment. Currencies fluctuated by far more than was necessary to offset relative-price movements. So real exchange rates have actually been far more volatile in the 1970s and 1980s than in the three previous decades of fixed currencies.

Exchange rates have also moved perversely. Currencies appreciated in countries with big trade deficits and high inflation. The dollar, for example, rose by 30% against the yen and by 16% against the DM from 1980 to early 1985 even though its inflation rate was far higher than Japan's and West Germany's. The loss of competitiveness helped to transform America's current-account balance into a large and growing deficit, yet, for a while, the dollar carried on climbing.

It would be easy to blame exchange-rate volatility on inefficiencies in the foreign-exchange market or on the irrational behaviour of speculators. But the most widely accepted theory of exchange rates, developed by Rudiger Dornbusch, now of the Massachusetts Institute of Technology, shows otherwise. In 'Expectations and Exchange-Rate Dynamics' Mr Dornbusch argued that big swings in exchange rates are exactly what you should expect if the foreign-exchange market is efficient.

Introducing PPP

Before coming to Mr Dornbusch, consider some of the earlier theories that he was building upon. The simplest model is based on the idea of purchasing-power parity (PPP). This theory says that exchange rates gradually move to equate the prices of internationally traded goods—i.e., to ensure that $100 buys as much in America as $100-worth of yen buys in Japan. The "relative" version of the PPP theory argues that exchange rates should move in line with relative inflation rates. So, for example, if America's inflation rate is 6% and Germany's 3%, then the dollar should fall by 3% a year against the D-mark to maintain PPP.

Some economists then mated PPP with the quantity theory of money, which says that changes in the level of prices are caused by changes in the money supply. The offspring was an exchange-rate theory known as the monetary approach. This said that exchange rates were determined by differences in the rates at which countries' money supplies grow.

Suppose that exchange rates start in equilibrium at PPP, with $1 equalling DM2, say. Then if America doubles its money supply, prices will eventually double, leaving each dollar worth (in terms of purchasing power) half as many D-marks as before. The exchange rate falls to $1 equals DM2.

While PPPs are backed by a powerful economic logic, they have proved useless in forecasting exchange-rate movements. If the relative PPP theory held, real exchange rates would be fairly constant over time. As chart 1 shows, they are anything but.

Where did the theory go wrong? It ignored capital flows. That was all right, perhaps, when the theory was developed, because government controls on capital movements were widespread in the 1960s and 1970s. In more recent years money has been free to move between most countries; cross-border trade in financial assets swamps foreign-exchange transactions in goods and services (exports and imports). On one estimate, almost $110 trillion is traded every year on foreign-exchange markets; that is more than 20 times the volume of world trade in goods and services.

The asset-market approach therefore assumes that capital flows are more important than trade flows in determining exchange rates. It argues that if capital is fully mobile, investors will shift their funds, and hence exchange rates will move, until the total expected returns from each currency (i.e., interest plus the expected depreciation or appreciation of the currency) are equal.

Suppose, for example, that D-mark deposits offer 5% interest while dollar deposits pay 10%. If the dollar is not expected to change from its current rate, investors will favour the dollar, pushing it higher. The foreign exchange market will only move back to equilibrium when the dollar reaches a level from which investors expect it to depreciate by 5% over a year against the D-mark.

It follows that exchange rates will change when interest-rate differentials change or when expectations about future exchange rates change.

And rational too

If capital is perfectly mobile, currencies will shift until domestic interest rates are equal to foreign interest rates plus the expected rate of change in the currency. But now comes a question familiar to readers of previous briefs in this series: how is that expectation arrived at? Mr Dornbusch assumed that expectations are "rational"—i.e., that investors take account of all available information about current and future events, including a view on the fundamental forces that drive exchange rates. In other words, he assumed that in the long run people expect the exchange rate to return to PPP. He also assumed that investors expect currencies to move at a rate that is proportional to the discrepancy between the current exchange rate and PPP: the bigger the gap, the faster the expected change.

So far, this echoes the simple monetary model. But that model

Defining equilibrium

The overshooting theory explains divergences in exchange rates from their long-run equilibrium. Unfortunately, the idea of equilibrium is itself unclear. The most common definition is crazy—the rate which equates the prices of a basket of similar tradable goods and services across countries. Estimates of real PPPs vary, but Goldman Sachs, an American investment bank, reckons the dollar’s PPP at DM2.27—about 50% above the current DM1.48.

Others claim that the equilibrium exchange rate is that needed to achieve a “sustainable” current-account balance. America has become the world’s biggest debtor, with a mounting burden of interest to pay. To regain current-account balance it would therefore have to run a trade surplus. Some economists conclude from this that the dollar needs to be kept below its PPP for a while. Mr John Williamson, of the Institute of International Economists, has calculated what he calls fundamental equilibrium exchange rates (FEERS) for the dollar. He defines this as the rate which will produce a current-account deficit small enough to be financed comfortably and indefinitely. He estimates the dollar’s FEER at about DM1.41.

Exchange rates against 

<table>
<thead>
<tr>
<th>Currency</th>
<th>Actual</th>
<th>PPP</th>
<th>FEER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yen</td>
<td>128.3</td>
<td>206.0</td>
<td>114.0</td>
</tr>
<tr>
<td>DM</td>
<td>1.46</td>
<td>2.27</td>
<td>1.41</td>
</tr>
<tr>
<td>£</td>
<td>0.51</td>
<td>0.71</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Sources: Goldman Sachs; Test for International Economics

Bounce

Money supply

Nominal exchange rate

Interest rate

Prices

Time

Time

Time