11

Interest rates and exchange rates

11.1 INTRODUCTION

It is conventional in macroeconomics textbooks to see the interest rate as the price of money and to consider it in the context of the supply of and demand for money. Here, however, we consider the interest rate alongside the exchange rate. The reason for this is that because capital can move freely into and out of the country, UK interest rates are closely linked to interest rates in international markets, particularly those in the USA, Europe and Japan. Because investors, in deciding where to place their funds, are choosing between assets denominated in different currencies, this leads to a close connection (explored in detail later in this chapter) between interest rates and exchange rates. In an open economy such as the UK, the link between interest rates and exchange rates is stronger and more direct than the link between interest rates and the money supply. We start with interest rates, and then consider exchange rates.

11.2 INTEREST RATES

The term structure of interest rates

When we consider interest rates it is important to note that there is not just one interest rate, but many. A selection of such interest rates is given in figure 11.1. This shows that whilst there is obviously a

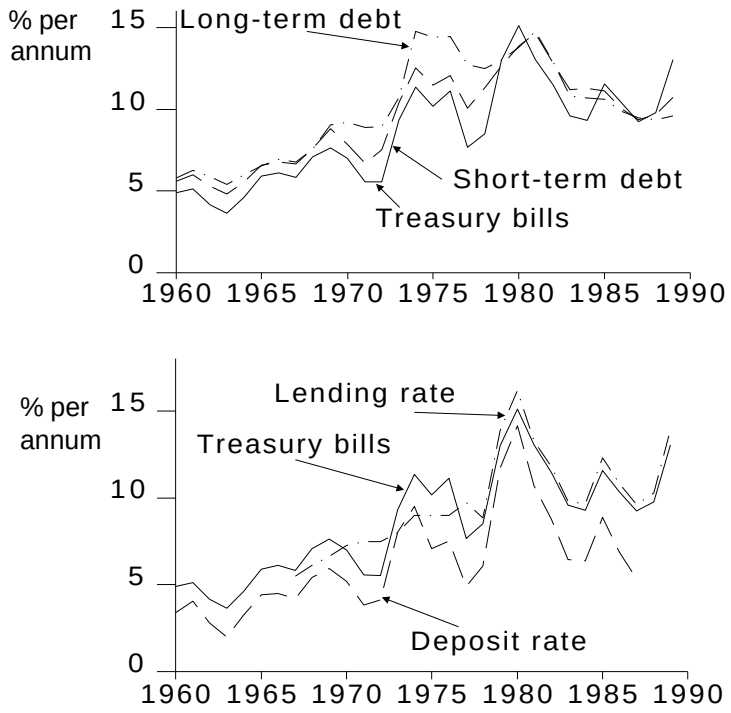

Figure 11.1 Nominal interest rates, 1960-89

Source: International Financial Statistics Yearbook. Figures are averages over the year.

tendency for interest rates to move together, there are considerable differences between different interest rates. Note that the deposit rate will normally be lower than the lending rate charged by financial institutions, for institutions have costs to cover and they need to make a profit.

Further detail on different interest rates is provided in figure 11.2 which illustrates the *term structure* of interest rates: this is the way that interest rates change as the term of the debt changes. It shows what is usually termed the *yield curve*, relating the yields on government securities to their term — to the time before the security matures. Figure 11.2 shows yields on government securities of different maturities at each of the three dates shown. These curves are calculated using the limited range of stocks for which yields are published in *Financial Statistics*, and so should be treated as approximations to the

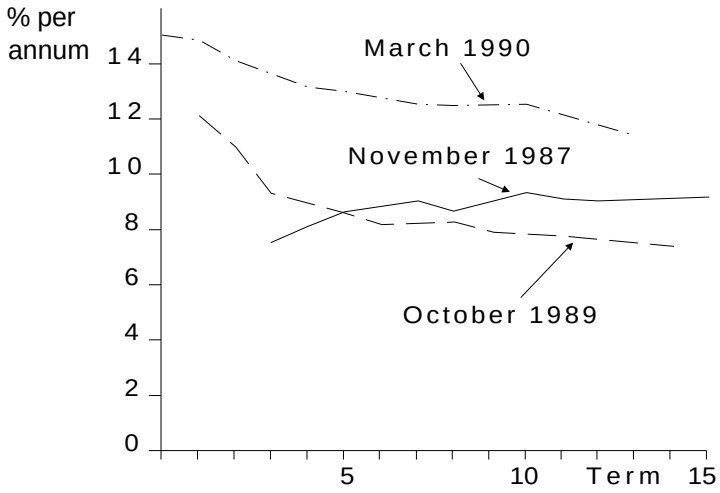

Figure 11.2 The yield curve

Source: Financial Statistics.

true curves. As we move from left to right we move from short-term debt to long-term debt.

There is no particular significance attached to the choice of these particular dates as the ones for which to plot yield curves. November 1987 is interesting, however, in that it illustrates the form we would normally expect the yield curve to take if the overall level of interest rates were expected to remain constant. We would expect the interest rate over a long period to be related to the average short-term interest rate over the period covered, but as uncertainty is greater the further ahead we look, long-term rates should be higher than short-term rates to compensate for the additional risk involved. In recent years, however, the yield curve has frequently had a negative slope, as in October 1989 and March 1990, something which has been true of many countries, not simply the UK. There are a number of reasons for this.

The main reason put forward for downward-sloping yield curves is concerned with expected inflation. Interest rates are, as is explained below, linked to inflation, so if inflation rates are expected to fall this means that short-term interest rates will be expected to fall, thus lowering the long-term interest rate. If the long-term inflation rate were expected to rise, this would raise long-term interest rates, giving the

yield curve a positive slope. The difference between the yield curves for November 1987 and October 1989 could be explained in the following way. Short-term interest rates have been raised and because the markets expect this to lower inflation in the longer term, long rates have fallen.

Interest rates and inflation

Figure 11.1 shows that there was a significant and sustained rise in interest rates around 1973. It is natural to explain this as the result of rising inflation. The standard theory is that the real interest rate (the nominal interest rate minus the inflation rate) will be determined by savings and investment, and that this will be fairly stable over time. The relation between two interest rates (the treasury bill rate and the rate on long-term government debt) and the inflation rate is shown in figure 11.3. There are three main points to note about this graph.

- ❑ The rise in interest rates above their 1960s levels came around 1973, at the same time as inflation increased dramatically.
- ❑ The decline in interest rates after 1980 was associated with declining inflation.
- ❑ The real interest rate, defined simply as the difference between either of these interest rates and the inflation rate, has not been constant. It was positive during both the 1960s and the 1980s, and negative during the 1970s. These two real interest rates are shown in figure 11.4.
- ❑ Real interest rates were higher during the 1980s than during the 1960s.

So far, we have talked of the real interest rate as being the difference between the relevant nominal interest rate and the current inflation rate. The problem with this is that it does not take account of inflationary expectations. This is important because the real interest rate relevant to spending decisions should be the difference between the interest rate and the expected inflation rate. One way to measure this is to measure the real rate of interest on index-linked debt. Unfortunately such debt was introduced only in 1981, which means that we have no figures for the 1970s, the period for which we would most like to have them. Figures for a selection of such real interest rates are shown in figure 11.5. The two longer-term interest rates, those for debt maturing

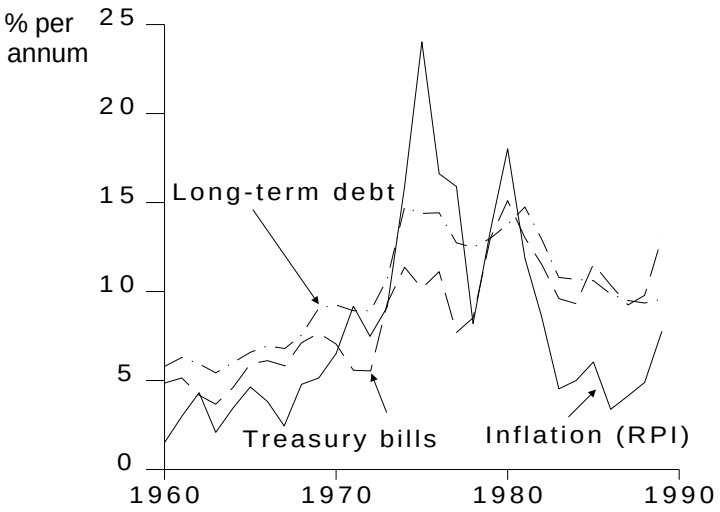

Figure 11.3 Interest rates and inflation, 1960-89

Source: figure 11.1 and *Economic Trends*.

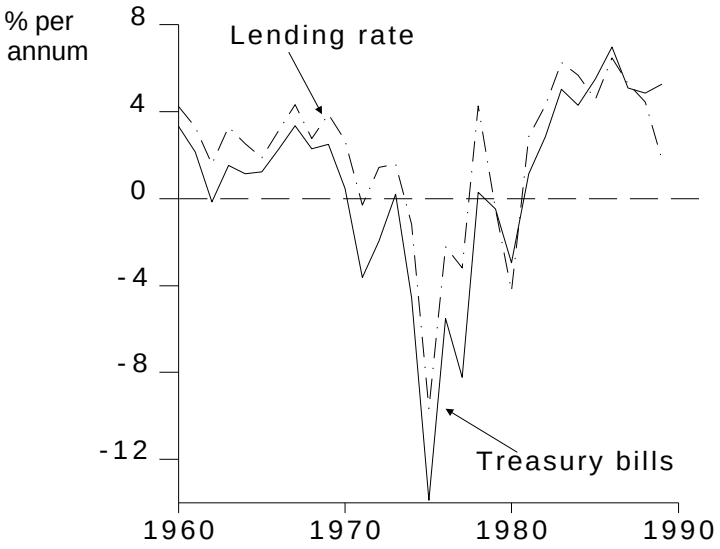

Figure 11.4 Real interest rates I, 1960-89

Source: as figure 11.3.

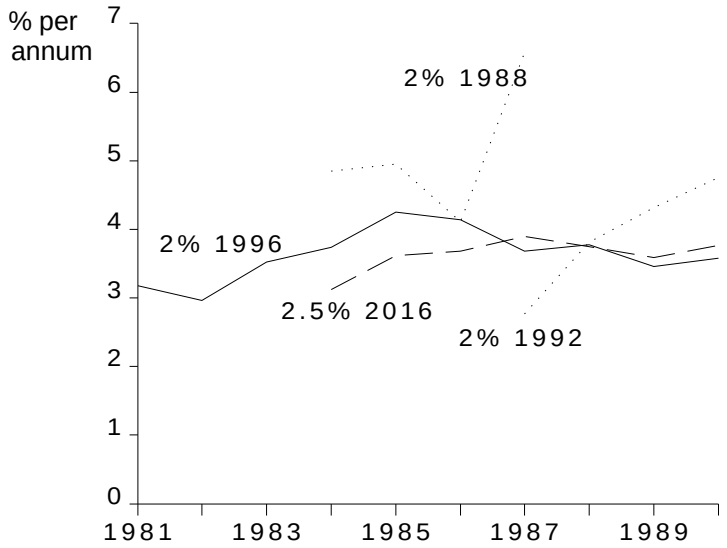

Figure 11.5: Real interest rates II, 1981-90

Source: Financial Statistics.

in 1996 and 2016, fluctuate only slightly compared with the real interest rates shown in figure 11.4.

In interpreting the data in figure 11.5 it is important to note that as we move from left to right along any of these curves, there are two factors to take into account. There are the normal changes in the economic environment (changing expectations and so on) which cause interest rates to change. In addition, the maturity of the relevant security shown is falling. In 1981 debt due to mature in 1996 had a term of 15 years, whereas by 1990 this had declined to 6 years. When first quoted, in 1987, 1992 stock had a term of 5 years, but by 1990 this had declined to 2 years. It is the latter factor which explains the sharp rise in 1988 stock in 1987: by the end of 1987, 1988 stock had only a month or so before it matured, which meant that it will have had a price (and yield) appropriate to a very liquid asset.

Although we do not do this here, it is possible to use the yields on index-linked and non-index-linked stock to calculate the implicit inflation rate expected by the market (such an inflation rate was used in estimating the inflation tax in chapter 4).

Interest rate parity

Capital can nowadays move freely between the world's main financial centres, which means that we would expect rates of return on similar assets to be the same in different countries: if they were not, then investors would move funds from the low-yielding asset to the high-yielding one. Because assets are denominated in different currencies, however, it is not enough to compare interest rates. We have to take account of exchange rate changes as well. The reason is that if an investor from Britain invests in the USA, and the dollar depreciates 5 per cent relative to sterling, the investor will make a capital loss of 5 per cent which has to be subtracted from the US interest rate in order to find out the return which the investor obtained from holding his or her funds in the USA. Had the funds been held in sterling there would have been no exchange rate loss. Thus if there is to be equilibrium in capital markets, the interest rate obtained abroad must equal the corresponding UK interest rate, *plus* the expected appreciation or depreciation of sterling. This is known as *uncovered interest rate parity*.

What makes the notion of interest rate parity usable is the existence of *forward markets* for foreign exchange. The reason for considering forward markets here is that they provide us with a means of measuring the expected change in the exchange rate (see box 11.1). The forward premium on sterling measures the amount by which investors expect sterling to appreciate. We thus have what is known as *covered interest rate parity*, which means that the interest rate obtained abroad must equal the UK interest rate *plus* the forward premium on sterling. It is called 'covered' interest rate parity because exchange rate movements are covered by forward contracts.

Some statistics on covered interest parity are shown in figures 11.6 and 11.7. Figure 11.6 shows the interest rates on UK (sterling) and US (dollar) Treasury bills, together with the forward premium on sterling, expressed as a percentage per annum. The gap between the two interest rates is the *interest rate differential*. The extent to which the interest rate differential equals the forward premium, as would be the case if covered interest parity held exactly, is shown in figure 11.7. Part (a) shows the yield on US Treasury bills together with the UK Treasury bill rate adjusted for the forward premium on sterling. Part (b) shows essentially the same information, but this time it is the US Treasury bill rate that is adjusted for the forward premium. The top panel thus shows US interest rates, and the bottom panel UK rates.

There are five main conclusions to draw from figures 11.6 and 11.7.

Box 11.1 FORWARD MARKETS AND EXPECTED CHANGES IN THE EXCHANGE RATE

On forward markets investors make contracts to buy and sell foreign exchange at a specified price at a specified date in the future (usually 1 or 3 months in advance). For example, if an investor sells £100 forward on 1 March at a 3 months forward price of £1 = $1.53 he or she is undertaking a commitment to sell £100 on 1 June in exchange for $153. Forward markets are useful to firms as they enable them to avoid the risks associated with fluctuations in exchange markets. If a firm knows that it is going to require foreign exchange in 3 months' time to pay for an import order, if can buy foreign exchange on the forward market: this way the firm can know the price it is going to have to pay for foreign exchange in 3 months' time.

To see the relation between forward and spot markets, consider an example. The *spot price* of sterling is $1.5270 and the 3 months *forward premium* on sterling is 0.87 cents. What does this mean?

- If you want to buy or sell sterling *now* you can do so at the spot price, of £1 = $1.5270.

- If you want to buy or sell sterling in 3 months' time you can do so at a price of £1 = $1.5357: this is the *forward price*, obtained by adding the forward premium ($0.0087) to the spot price. The forward premium is the difference between the forward price and the spot price.

If the forward premium is negative, on the other hand, we refer to sterling being at a *discount*, with the forward price being less than the spot price.

The forward premium is often expressed as a percentage per annum. For example, 0.87 cents divided by $1.527 gives 0.57 per cent. As this is over 3 months, it corresponds to a rate of 2.3 per cent *per annum*.

If the foreign exchange market works efficiently, and if investors are concerned simply with the expected value of their wealth, the forward exchange rate must equal whatever investors expect the spot rate to be in 3 months' time. To see this, consider another example. On 1 March the forward price of sterling is $1.54. Suppose an investor expects the price of sterling to be $1.50 on 1 June. This would mean that if he or she bought dollars (sold sterling) on the forward market, he or she would expect to make a profit: for each £100 sold forward, he or she would get $154 on 1 June; but the investor expects sterling's spot price to be $1.50 on 1 June, which means that he or she would expect to be able to sell these dollars for £102.67, a profit of £2.67. Thus if the forward price were not equal to the expected future spot price, speculators would immediately buy or sell foreign exchange in order to make a profit in this way, with the result that the forward price would change until it equalled the expected future spot price. If follows that the forward premium is, given certain assumptions, a measure of the expected change in the exchange rate.

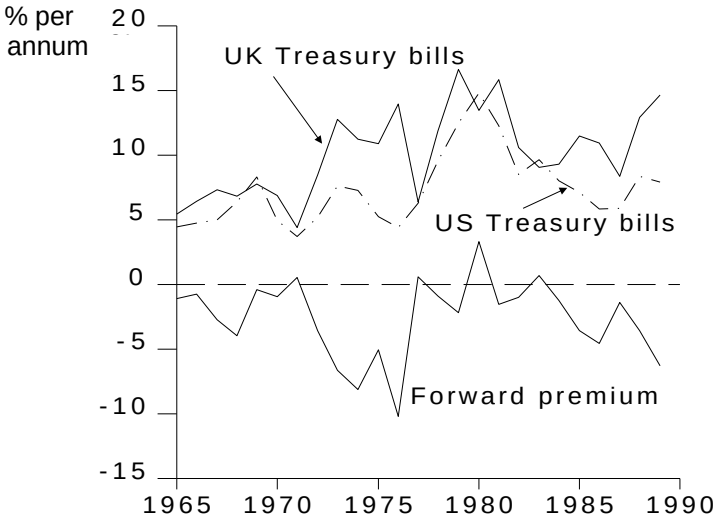

Figure 11.6 Interest rates and the forward premium, 1965-89

Source: Financial Statistics. Figures are for the last working day of the year shown.

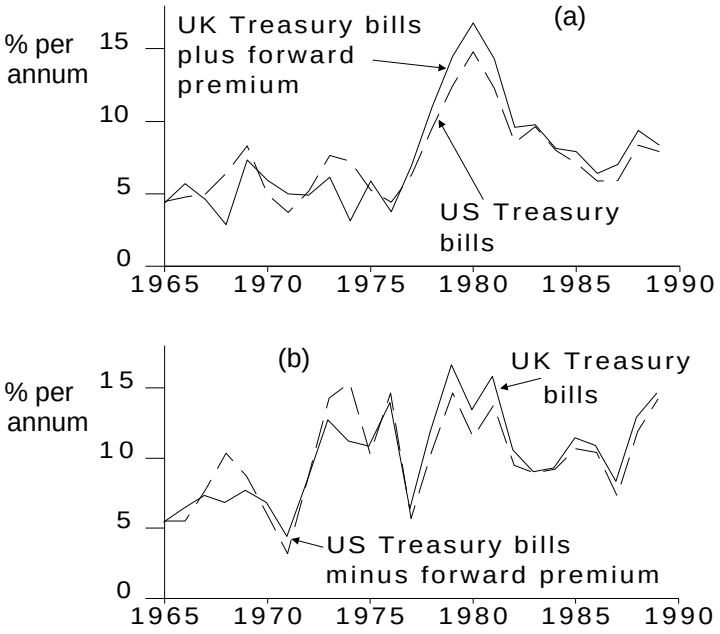

Figure 11.7 Covered interest rate parity, 1965-89

Source: as figure 11.6.

- ❑ UK and US interest rates move together fairly closely. Covered interest rate parity seems to hold in general, though there are marked differences in individual years.

- ❑ For most of the period sterling has been at a discount relative to the dollar. Because UK inflation has persistently been higher than US inflation, sterling has, on average, been depreciating against the dollar, and this is reflected in the forward discount.

- ❑ During the mid-1970s UK interest rates rose very sharply, without any corresponding rise in US interest rates, the difference being accounted for by the enormous forward discount on sterling. Sterling was, from around 1973 to 1976, expected to depreciate substantially, and hence UK interest rates had to exceed US rates by an equivalent margin.

- ❑ At the end of the 1970s there was a sharp rise in interest rates in both the USA and the UK, this being followed by a decline during the first half of the 1980s.

- ❑ At the end of the 1980s interest rates rose much more in the UK than in the USA, this being reflected in sterling being at a discount relative to the dollar.

For this illustration we have taken treasury bill rates. A similar exercise could have been undertaken using other interest rates. Had we taken other short-term money market rates (such as the inter-bank rate) interest rate differentials would have been low, reflecting the high degree of international capital mobility between the UK and the USA.

Entry into the exchange rate mechanism of the EMS (see section 11.5) will not mean the disappearance of risk premia, though they should be reduced. This is for two reasons. The EMS rules allow currencies to fluctuate within a limited range. In addition, there is still the risk that a currency may be devalued within the EMS.

11.3 EXCHANGE RATES

Real and nominal exchange rates

Some of the main exchange rates against sterling are shown in figure 11.8. The problem with using any individual exchange rate to talk about what has happened to the value of sterling is that an exchange

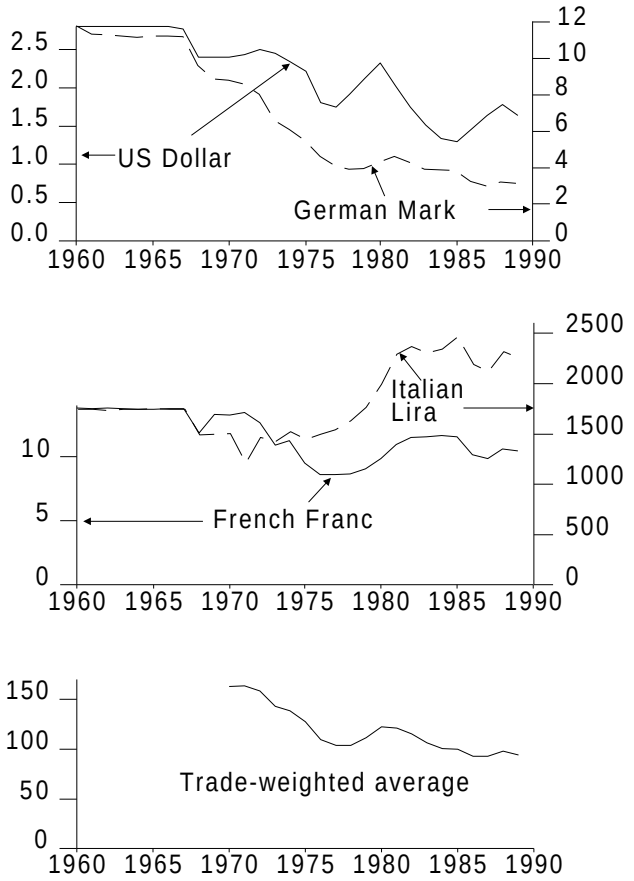

Figure 11.8 Exchange rates, 1960-89

Source: Financial Statistics. Bilateral rates are units of foreign currency per £. Average is an index number, 1985=100.

rate may change either because of what is happening to sterling or because of what is happening to the other currency. To get round this problem we use the *effective exchange rate*, shown in the bottom panel of figure 11.8. This is a weighted average of different exchange rates, the weights corresponding to the importance of the currencies concerned in the UK's international trade. It is, for obvious reasons, calculated only for the years of floating exchange rates. Movements in these exchange rates are discussed in the next section.

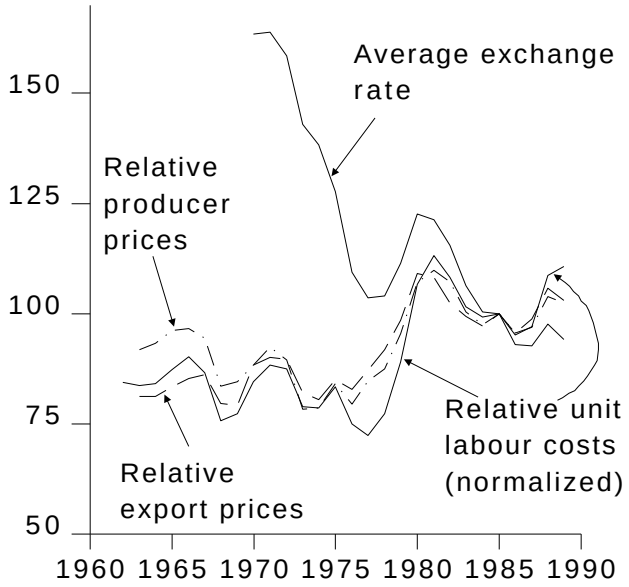

Figure 11.9 Measures of the real exchange rate, 1962-89

Source: Economic Trends.

Movements in an exchange rate, even the effective exchange rate, do not tell the full story of what is happening to the value of a currency. When considering trade between two countries, the important thing is not the rate at which two currencies exchange for each other, but the rate at which the two countries' goods and services are exchanged. This is the *real exchange rate*. There is, of course, no unique way to measure this. Some of the most common measures of the real exchange rate were discussed in chapter 5 under the heading 'measures of competitiveness', and are shown in figure 11.9, together with the effective exchange rate from figure 11.8. The indices are all constructed so as to be 100 in 1985, so the levels of the different indices relative to each other are of no significance, just the changes.

Figure 11.9 immediately shows that the dramatic fall in the value of sterling from 1970 to the late 1980s is mainly the result ofrelative price changes: the exchange rate has fallen, but this is compensated for by higher sterling prices. There has been no similar decline in the ratio at which UK goods are exchanged with other countries' goods. Indeed,

the most noticeable feature of figure 11.9 is the fact that all measures of the real exchange rate were *higher* for most of the 1980s than in the 1960s and 1970s.

Purchasing power parity

Purchasing power parity, a concept introduced briefly in chapter 1, is defined as the exchange rate at which a given commodity, or bundle of commodities, costs the same in two countries. For example, suppose we wish to calculate the purchasing power parity for hamburgers, and a hamburger costs £1 in Britain and $1.50 in the US, whilst the market exchange rate is £1=$2. The dollar price of hamburgers is $1.50 in the US and $2 in the UK. The PPP for hamburgers is $1.50, the exchange rate at which a hamburger costs the same in both countries.

This definition of PPP means that different goods, or different bundles of goods, will in general have different PPPs. A selection of PPPs is shown in table 11.1, together with the comparative dollar price levels they imply. The two parts of table 11.1 provide the same information in two different ways. Take private consumption, for example. In part (b) of table 11.1 we see that goods which cost $100 in the US will cost $76 (at the 1985 exchange rate) in the UK. The 1985 exchange rate was $1 = £0.779 (£1 = $1.28) which means the goods cost £76 × 0.779 = £59. In other words, PPP is £59 = $100, or £0.59 = $1, the figure given in part (a).

It is worth noting that the greatest price differentials arise in non-traded goods. The balance of trade by definition covers only traded goods, and dollar price levels are virtually the same in all four countries. Other goods listed, apart from transport, are cheaper in Europe than in the USA, the cheapest being medical care and government consumption. For GDP as a whole dollar prices in Britain were only 73 per cent of US prices. (Note that many categories of expenditure are not listed here.)

The source of this information was a survey undertaken in 1985, which collected prices of a wide range of goods. These prices were used to calculate PPP figures for 1985. From this starting point PPPs for other years were calculated using relative inflation rates according to the following formula.

$$PPP_{k,t} = PPP_{k,1985}(1+\pi_{k,t})/(1+\pi_{US,t})$$

$PPP_{k,t}$ is the PPP for country k in year t and $\pi_{k,t}$ is the inflation rate in country k between year t and 1985. US inflation appears in all cases because the USA is taken as the benchmark. If we want the PPP

Table 11.1 PPPs and comparative dollar price levels in 1985

(a) Purchasing power parities (£/US$)

Private consumption		0.590
Food, beverages, tobacco	0.613	
Medical care	0.306	
Transport/communication	0.958	
Government consumption		0.428
Gross fixed capital formation		0.670
Construction	0.715	
Machinery/equipment	0.645	
Stocks		0.681
Balance of trade		0.772
GDP		0.567

(b) Comparative dollar price levels (US = 100)

	UK	Germany	France
Private final consumption	76	87	84
Food, beverages, tobacco	79	80	79
Medical care	39	62	49
Transport/communications	123	117	123
Government consumption	55	79	71
Gross fixed capital formation	86	84	83
Construction	92	85	82
Machinery/equipment	83	83	85
Stocks	87	93	91
Balance of trade	99	99	99
GDP	73	84	81

Note: the exchange rate in 1985 was £0.779=$1 (£1=$1.28).

Source: OECD *National Accounts*, supplement on purchasing power parities.

between two other currencies, say sterling and the German mark, we simply take the ratio of the relevant two dollar PPPs.

It is worth noting that these measures of the real exchange rate, or competitiveness, are similar to measures of purchasing power parity (see chapter 1). The notion that there is an equilibrium real exchange

rate is the same as claiming that there is an equilibrium relationship between the exchange rate and purchasing power parity. Define P as the domestic price level in sterling, P_W as the world price level (in foreign currency) and e as the exchange rate (value of sterling). Purchasing power parity is thus measured by P_W/P. Let α denote the ratio of the exchange rate to PPP, so that

$$\alpha = e/\text{PPP} = eP/P_W.$$

The right-hand expression here is simply the price of domestic goods divided by the price of foreign goods, both expressed in foreign currency. α is thus a measure of competitiveness, similar to relative producer prices. This means that we can interpret measures of competitiveness as measuring the gap between the exchange rate and PPP.

In a simple world, where both countries produced and consumed identical goods, and in which there were no transport costs or other barriers to trade, the equilibrium value of α would be 1. In practice, however, because of measurement problems and the fact that we are using price indices, there is no reason to expect the equilibrium value of α to be 1. This is equivalent to saying that we could not necessarily expect the equilibrium exchange rate to equal PPP.

PPP and measures of competitiveness have been introduced in this chapter because, though there are great practical problems in knowing what the equilibrium exchange rate might be, these concepts do provide a long run theory of the exchange rate. If the exchange rate rises a long way above PPP (for an appropriate bundle of goods) this means that competitiveness is falling, a situation which should not be sustainable indefinitely (though it may well persist for a long time). The same applies, of course, to downward movements away from PPP, for such movements imply that another country's exchange rate is rising above PPP.

The reason for economists' attachment to PPP as a theory of the exchange rate is not that it as been used successfully to explain exchange rate movements — attempts to test the PPP theory have usually failed. The reason is the theoretical argument that, even if currency speculation causes exchange rates to depart from PPP for long periods, there must be *some* limit to the extent to which a country can lose competitiveness and still enter into international trade. The fact that the link between PPP and exchange rates is in practice so weak, however, means that great care must be taken in interpreting statistics on PPP or competitiveness. PPP and measures of competitiveness must

be used alongside other evidence in order to assess whether a country's exchange rate is at, above or below its long run equilibrium level.

11.4 THE HISTORY OF THE EXCHANGE RATE

It is worth providing a brief history of the exchange rate, because in doing so we provide a summary of the main aspects of macroeconomic policy-making in the UK, so central have exchange rate problems been. In such a history we have to divide the post-war period into two main periods: the period up to 1971, when exchange rates were regulated by the Bretton Woods system, established after the war; and the period of floating exchange rates since 1971.

The Bretton Woods system

Under the Bretton Woods system governments were committed to maintaining their currencies close to a par value. From time to time, however, par values became unsustainable, and new parities were established, with currencies being devalued. In the UK the Bretton Woods period falls into two parts: before and after 1967.

From 1949 to 1967 the par value was £1 = $2.80, with the exchange rate being kept within the range $2.78-2.82. During the 1960s, however, sterling came under pressure for a number of reasons. The two main ones were that competitiveness was deteriorating and there was thought to be a large problem with the current account.

- ❑ Competitiveness was deteriorating because UK wages and prices were rising faster than US wages and prices. The rise in real exchange rates, shown in figure 11.9, from 1963 to 1966 may not look much by more recent standards, but it was nonetheless significant.

- ❑ There was perceived to be a large balance of payments problem, with the official figures showing a current account deficit from 1964 right through to 1967. Although there had been balance of payments deficits in every business cycle since the war, these had always been eliminated fairly quickly once the boom had finished. This time the deficit was thought to be persistent.

In this paragraph we have focused on contemporaries' perceptions of the balance of payments situation as the cause of problems with the exchange rate. This is very deliberate, the reason being that the current

account was, according to subsequent figures, in fact in *surplus* for much of the period from 1965 to 1967. The published balance of payments figures were, if subsequent estimates are to be believed, substantially in error, mainly because exports were systematically under-recorded. This shows the importance of confidence and expectations in exchange rate determination. What appears to have happened during this period was that people *believed* there was a current account problem, which caused problems with the capital account, putting pressure on sterling.

Believing the problem to be with the current account, the government imposed the appropriate policies. Prices and incomes policy, whereby firms had to get government approval before they could raise prices and wage rates, was used to reduce inflation and prevent competitiveness from deteriorating. Strict foreign exchange controls were imposed. Fiscal policy was restrictive. All these were aimed at increasing exports and reducing imports, with a view to strengthening the current account and enabling the government to maintain the value of sterling at £1 = $2.80.

In October 1967 it became clear that this policy could not be sustained, and sterling was devalued by 14 per cent, to £1 = $2.40. Competitiveness, as shown by figure 11.9, improved. This, however, did not lead to an end to restrictive policies, for two reasons. The first was that it was important that the competitive advantage given by devaluation was not eroded too quickly by high inflation. If the higher import prices brought about by devaluation were to lead to wage and price rises, competitiveness would deteriorate and the stimulus to increase exports and decrease imports would be reduced. The second was that it was necessary that resources be made available for export industries, which required that domestic demand had to be kept low.

The monetary and fiscal policies pursued after devaluation were thus as restrictive as before: the government budget was in surplus by 1970. The result was an improvement in the balance of payments, which moved into surplus.

Floating exchange rates, 1971-1976

In 1971 the exchange rate floated, at first upwards, and then downwards against all major currencies except the Lira, until 1976. There were three main reasons for this depreciation: a rapid demand expansion; high oil prices; and rapid inflation in the UK.

- In 1972 the government made a deliberate decision to expand the economy rapidly, so as to achieve a growth rate of 5 per cent per annum, a high rate by UK standards. By doing this the government expected to reduce unemployment from 1 million to 500,000 by the end of 1973 (a target they achieved). It was hoped that the announcement of such a large and sustained rise in demand would encourage investment and raise productivity, improving prospects for the longer term. Exchange rate policy was a key aspect of this policy. Previous booms had always ended in a balance of payments crisis, so the government announced that it would let the exchange rate float downwards if this were necessary to keep the expansion going.

- The oil price rise of 1973-4 led to massive balance of payments deficits for oil-importing countries. At the same time, a miners' strike had disastrous effects on production, with the imposition of a 3-day week to conserve fuel.

- In 1974-5 the UK inflation rate rose to around 25 per cent per annum, a rate much higher than in most other industrial countries.

This culminated in the sterling crisis of 1976. This was resolved with a package of restrictive monetary and fiscal policy measures and assistance from the International Monetary Fund.

Floating exchange rates, 1976-1990

1977 saw a dramatic turn-around in the UK's financial situation. A very severe incomes policy, combined with tight monetary and fiscal policies succeeded in bringing down inflation from 25 per cent to under 10 per cent. At the same time unemployment stopped rising and the balance of payments moved into surplus. This, together with the government's perceived determination to stick to its monetary targets, introduced in 1976 at the time of the sterling crisis, led to a slight rise in the exchange rate.

The next few years saw a dramatic rise in the value of sterling, the unprecedented nature of this rise being revealed by the behaviour of the real exchange rate. Relative unit labour costs, often considered the best measure of the real exchange rate, rose by over 55 per cent from 1977 to 1981, an unparalleled increase. This was due to two factors: North Sea oil, and very tight monetary policy.

BOX 11.2 EXCHANGE RATE OVERSHOOTING

To show how exchange rate overshooting can occur, we will consider a very simple example. Many of the assumptions will sound very artificial — they are introduced solely in order to keep everything as simple as possible. Our starting point is an economy which is in equilibrium with a constant inflation rate of 10 per cent per annum. The growth rate of the money supply and the world inflation rate are also equal to 10 per cent per annum. The exchange rate is constant and is not expected to change. At time t_0 the government suddenly announces a new policy: that for the next τ years it is going to reduce the growth rate of the money supply to 6 per cent per annum, after which it will return to 10 per cent. Assume that this will reduce the inflation rate by the same amount for this period.

In this artificially simple economy there is no reason for competitiveness to change at all. If competitiveness is to remain constant we must have

$$\Delta e/e = \Delta P_W/P_W = \Delta P/P$$

where e is the exchange rate (defined as units of foreign currency per unit of domestic currency — as in £1 = \$2), P_W is the world price level and P the domestic price level. For competitiveness to remain constant for the τ years after t_0, the exchange rate must appreciate at 4 per cent per annum.

At this stage we introduce two crucial assumptions: that capital markets are perfect, so that interest rate parity holds, and that investors in financial markets have rational expectations, which in this simple model means that their expectations must be correct. If competitiveness is to remain unchanged, the exchange rate must appreciate at 4 per cent per annum. The exchange rate would follow the path labelled (i) in figure 11.B2.1. If investors anticipate this correctly, interest rate parity requires that domestic interest rates fall by 4 per cent. There is no reason for this to happen: indeed, we would expect a monetary contraction to *raise*, not lower, interest rates.

If interest rates are to stay the same, interest rate parity will hold only if the exchange rate immediately rises to a level such that investors no longer expect it to appreciate: in other words, if the

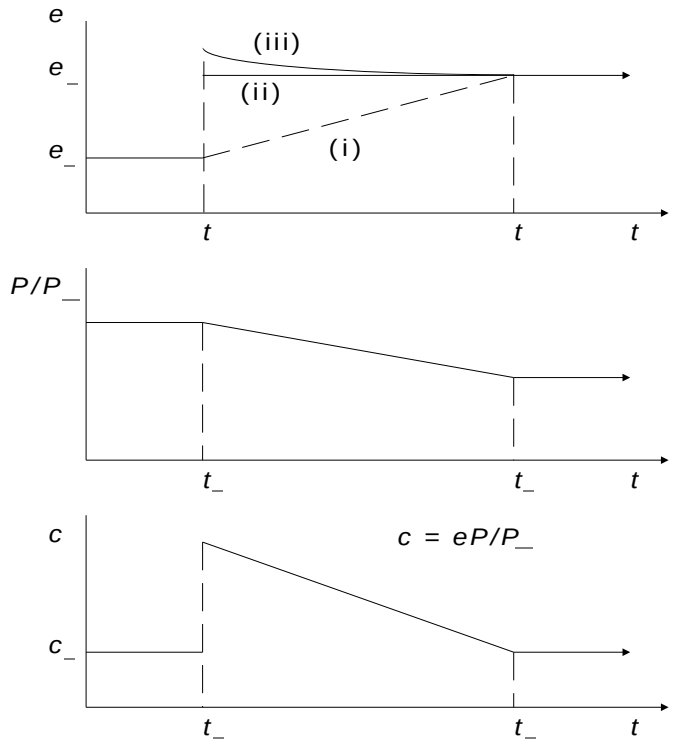

Figure 11.B2.1 Exchange rate overshooting

exchange rate follows the path labelled (ii) in figure 11.B2.1. Even if the exchange rate jumps in this way at time t_0, however, there is no reason to think that prices will do the same. Prices are likely to follow a path such as that shown in figure 11.B2.1. If so, we find that competitiveness jumps up at time t_0 and then falls steadily, returning to its original level after τ years.

If the reduction in the growth rate of the money supply were to raise interest rates, interest rate parity would require the exchange rate to rise to a level high enough for investors to expect it to depreciate: the expected capital loss caused by the depreciation would cancel out the rise in the rate of interest. In this case the exchange rate would follow a path such as (iii) in figure 11.B2.1. This is *exchange rate overshooting* — where the exchange rate overshoots its new equilibrium level.

- ❑ North Sea oil production was increasing from an insignificant amount in the mid-1970s to the point of self-sufficiency in oil by 1980 (see chapter 9). For reasons discussed elsewhere, increased oil production will have contributed to the appreciation of sterling. Such estimates as exist of this 'oil premium', however, suggest that it accounts for no more than half of the appreciation which occurred, and perhaps less.

- ❑ The other main factor was the very tight monetary policy which followed the Conservatives' election victory in 1979. The government committed itself to a 'medium term financial strategy', involving a gradual reduction of the growth rate of the money supply over several years. In practice, however, there was a remarkably severe monetary squeeze in 1979-80. This was for a number of reasons, one of the main ones being that the government focused on sterling M3 as its monetary target. Because sterling M3 grew much faster than other monetary aggregates (including M1 and M5) it under-estimated the tightness of monetary policy. Another reason was that the rapid rise in inflation in 1980 made the monetary squeeze even tighter: the *real* value of the money supply fell dramatically.

The commonly accepted argument is that the introduction of this tight monetary policy led to *exchange rate overshooting*, the theory of which is discussed in box 11.2. Such behaviour is needed to account for the exceptionally sharp rise in the real exchange rate which took place from 1979 to 1981. It was a problem made worse by the removal of exchange control regulations which had taken place in the second half of the 1970s. With strict foreign exchange controls, such as existed during the 1960s, the capital flows needed to produce such overshooting would have been less likely to occur.

Since 1981 there has been a decline in the exchange rate. There are three reasons why this may have taken place.

- ❑ A natural reaction to the overshooting of 1979-81.
- ❑ Declining North Sea oil revenues, due in part to falling production, but due mainly to the fall in the price of oil.
- ❑ The inflation rate, though it has fallen substantially, has remained high compared with that of many industrial countries, and has recently started to rise. Since the mid-1980s sterling has been at a substantial discount on the forward market, reflecting the fact that people expect it to depreciate due to rising inflation.

The EMS, since 1990

On 5 October 1990 the government announced its intention to join the exchange rate mechanism of the EMS (which is discussed in detail in the next section) with sterling pegged to a rate of 2.95 German marks to the pound, and a six per cent band on either side. This was accompanied by a cut in interest rates of one per cent. The reason for this interest rate cut was the belief that, once sterling joined the exchange rate mechanism, investors would no longer expect its value to fall relative to other EMS currencies, notably the German mark. If interest rates did not fall this would make the expected yield on investments in sterling (the sterling interest rate less any expected depreciation) very high compared with, say, interest rates in Germany. If this happened funds would flow into sterling, pushing sterling to the top of its allowed range. For the first few days this appeared to be happening, with sterling rising well above 2.95 German marks, but within a few weeks this upward pressure had stopped and sterling was close to its minimum value.

Under the EMS the ability of the government to keep sterling within its allowed range depends crucially on whether or not it can persuade investors that it is going to take whatever action is necessary to achieve this. This in turn will depend on two things: whether or not sterling is over-valued at 2.95 German marks; and how soon UK inflation comes into line with inflation in the other major European Community countries. This issue is discussed further at the end of this chapter and in chapter 13. Before then we need to discuss the EMS in more detail.

11.5 THE EUROPEAN MONETARY SYSTEM

The mechanics of the EMS

The European Monetary system was established in 1979, and has three main elements: the European Currency Unit; the exchange rate mechanism; and the European Monetary Cooperation Fund.

The European Currency Unit (ECU). This is a basket of the currencies of European Community member countries, with the quantity of each country reflecting the size of the corresponding economy. The composition of the ECU is shown in table 11.2 and figure 11.10. Notice that the weight of different currencies in the ECU depends on their values. Thus if, for example, the German Mark appreciates, this will raise its weight within the ECU. The quantity of each currency in the ECU has changed twice: in September 1984 and again in September

Table 11.2 The composition of the ECU

	Units of currency			Weights		
	1979	1984	1989	1979	1984	1989
German mark	0.828	0.719	0.6242	33.0	32.1	30.1
French Franc	1.15	1.31	1.332	19.8	19.1	19.0
Sterling	0.0885	0.0878	0.08784	13.3	14.9	13.0
Guilder	0.286	0.2560	0.2198	10.5	10.2	9.4
Lira	109.0	140.0	151.8	9.5	10.1	10.15
Belgian Franc	3.80	3.85	3.301	9.6	8.5	7.9
Krone	0.217	0.219	0.1976	3.1	2.7	2.45
Punt	0.00759	0.00871	0.008552	1.2	1.2	1.1
Drachma*		1.15	1.44		1.3	0.8
Peseta			6.885			5.3
Escudo*			1.393			0.8

Source: ECU-EMS Information. 1984 refers to the revised basket established in September 1984; 1989 to the basket established in September 1989. Asterisks denote currencies not yet in the exchange rate mechanism. Luxembourg's currency is linked to Belgium's.

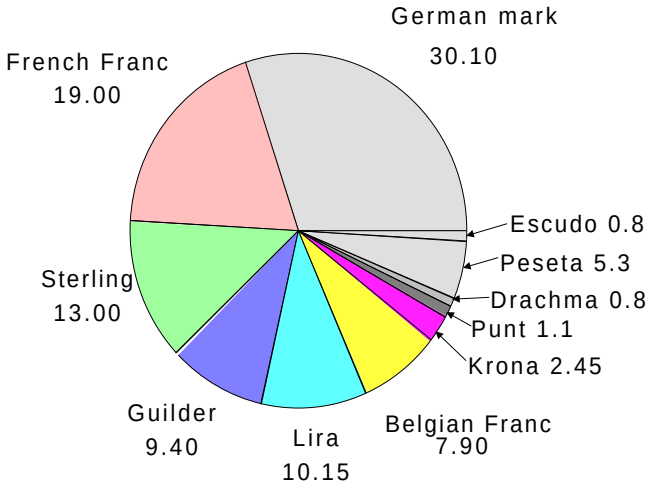

Figure 11.10 Currency weights within the ECU since September 1989

Source: as figure 2.

Table 11.3: EMS divergence indicators

	%
German Mark	1.176
French Franc	1.362
Guilder	1.528
Lira	1.516
Belgian Franc	1.551
Krone	1.645
Punt	1.669
Sterling	3.915
Peseta	4.271

Source: Financial Times.

1989. Again taking the German Mark as an example, the reduction in the number of Marks in the basket has offset the effects of their rising value. Note that sterling is included in the ECU even though it is not part of the exchange rate mechanism.

The ECU is important for a number of reasons. One is that it is used in European Community transactions, such as payments under the Common Agricultural Policy. Another is that it forms the centre of the exchange rate mechanism of the EMS. Finally, the ECU has increasingly been used in commercial markets, particularly as a denomination for bank deposits and certain types of bond issue.

The Exchange Rate Mechanism (ERM). When people talk about whether the UK should participate fully in the EMS what they have in mind is participation in the exchange rate mechanism of the EMS. This is a system designed to peg the values of the European currencies together, paving the way towards eventual monetary unification. Each currency has a *par value* in terms of the ECU.

Around this is constructed a *parity grid* which gives the set of bilateral exchange rates implied by these par values. This parity grid is very important because countries are required to keep their bilateral exchange rates within 2.25 per cent of their par values, except for Spain and the UK which have a limits of 6 per cent (Italy used to have a 6 per cent limit). Eventually, as a further step towards European monetary union, all countries are required to move to a narrow band, the wider band being allowed as a temporary arrangement to ease the transition to a fixed exchange rate. If one bilateral rate reaches this limit, *both* countries are required to take action to stop the exchange rate from

exceeding it. This requirement applies to the country whose currency is above the parity as much as to the one whose currency is below parity. This mechanism, focusing on bilateral exchange rates, is the main mechanism for keeping the EMS currencies in line with each other.

This mechanism of bilateral action to maintain bilateral exchange rates works as long as the problem is not that one currency is seriously out of line with all the others. Under these circumstances it is necessary for that country to take unilateral action. The necessity for this is indicated by *divergence indicators*. Currencies are permitted to diverge from their parity against the ECU by only 75 per cent of the maximum permitted by the parity grid (6 per cent for Spain and the UK, and 2.25 per cent for other countries). There is a technical problem here, because when, for example, a currency appreciates, this raises the value of the ECU. For currencies such as the Irish Punt or the Belgian Franc, this is insignificant, because these currencies make up such a small proportion of the ECU. For the German Mark, on the other hand, this is a major problem as it makes up about a third of the ECU: if the German Mark were to appreciate by 1 per cent relative to *all* other currencies, the ECU would appreciate by 0.32 per cent, and so the German Mark's appreciation relative to the ECU would be only 0.68 per cent. If all countries could fluctuate by the same percentage relative to the ECU, therefore, currencies that carry high weights in the ECU would be able to fluctuate much more than those with low weights. To overcome this, divergence indicators are constructed as $0.75(1 - W)$ times either 2.25 per cent or 6 per cent of par values, where W is the weight of the currency concerned in the ECU. When a currency reaches its divergence indicator, unilateral action is called for. Divergence indicators for March 1990 are shown in table 11.3.

The European Monetary Co-operation Fund. This fund assists countries in maintaining their exchange rates, and has been financed by countries lending 20 per cent of their gold and foreign exchange reserves to the fund in return for a corresponding amount of ECUs. At present the system is constructed so that national central banks retain ownership of these funds, but the intention was that the EMCF would be extended into a European Monetary Fund, which could operate as the central bank.

The operation of the EMS

The institutions of the EMS have changed remarkably little since its inception, but the way in which the system has in practice been operated has changed substantially. At first, currency realignments

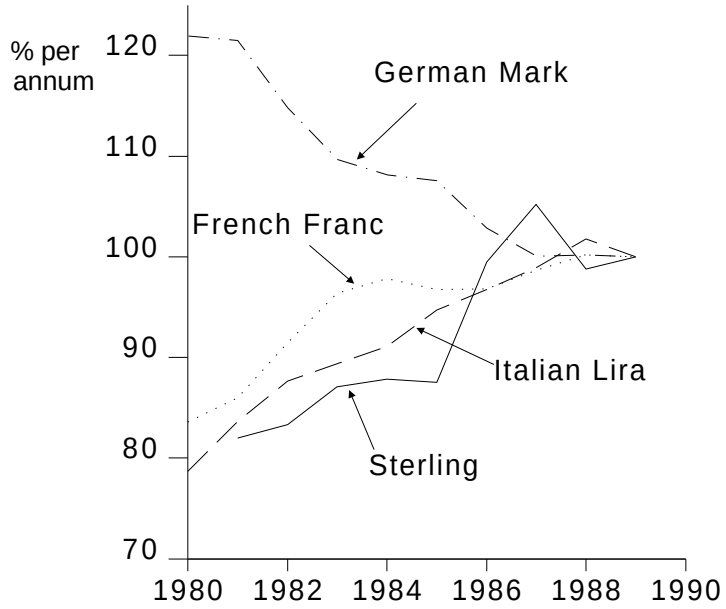

Figure 11.11: Currencies in relation to the ECU, 1980-9

Source: International Financial Statistics.

were frequent, with the German Mark and the Guilder usually going up, and the French Franc, the Lira and the Punt going down. Some of these changes are shown in figure 11.11. Since 1987, on the other hand, there have been no realignments at all, which is reflected in all the exchange rates shown in figure 11.11 (except sterling's) remaining approximately the same after 1987. In other words, what has happened is that the system has moved from being effectively a 'crawling peg' system, where par values change gradually, to a fixed exchange rate system. This has been accompanied by greater consensus about how policy is to be conducted. On the other hand, this shift towards a fixed exchange rate system has been to some extent inevitable. With the abolition of many of the controls on capital movements that took place during the period, scope for speculative activity has increased with the result that the earlier system of periodic realignments might have become unworkable. Rumours of realignments might nowadays set up speculative pressures which would prevent realignments from happening in an agreed, orderly manner. It can thus be argued that the EMS has been successful in that it has achieved its main goal, of stabilizing the exchange rates of member countries. The costs, however, have been

high for some countries. Spain, for example, experienced very high levels of unemployment in the late 1980s in order to bring inflation down to a rate closer to the inflation rates of the other EMS countries. The UK may face similar problems in the 1990s.

11.6 CONCLUSIONS

Any discussion of interest rates and exchange rates now involves two issues: the future of the EMS; and sterling's position in the EMS.

- ❑ The exchange rate mechanism of the EMS is intended to be the first step towards European monetary unification -- the use of a common currency within the European Community. This is an intensely political issue and will depend on the outcome of political negotiations rather than on purely economic factors.

- ❑ Sterling is in the EMS at what some commentators and businessmen believe is an unrealistically high rate. At the same time, inflation is high and it is not clear (in November 1990) how fast it is going to fall. There are clearly many possible outcomes, these including, amongst others: an early realignment of sterling; a fairly rapid fall in inflation; and a period of prolonged, high unemployment as the government seeks to reduce inflation.

FURTHER READING

Exchange rates are the subject of *Oxford Review of Economic Policy* 5(3), 1989. The implications of international capital flows are discussed in A. K. Chrystal 'Have recent high capital flows harmed Britain?' *The Economic Review*, September 1985, pp. 24-8; and A. K. Chrystal and K. Dowd 'Two arguments for the restriction of international capital flows,' *National Westminster Bank Quarterly Review*, November 1986.

The EMS is discussed in F. Giavazzi and A. Giovannini 'The EMS and the dollar,' *Economic Policy* 2, April 1986, pp. 456-85; G. Zis 'The EMS, 1979-84: an assessment,' *Journal of Common Market Studies*, September 1984. The implications of the EMS for the UK are examined in M. J. Artis and M. Miller 'On joining the EMS,' *Midland Bank Review*, Winter 1986, pp. 11-20; F. Giavazzi 'The impact of EEC membership,' in R. Dornbusch and R. Layard (eds.) *The Performance of the British Economy* (Oxford: Oxford University Press). The EMS is one of the issues discussed in *Oxford Review of Economic Policy* 3(3), on 'Policy options for the UK', D. Currie 'Options for UK macroeconomic policy' and R. Dornbusch 'Prosperity or price stability' are particularly worth reading.