

Sixth Edition

EXCHANGE RATES AND INTERNATIONAL FINANCE

Laurence Copeland



Exchange Rates and International Finance

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Laurence S. Copeland

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Preface and acknowledgements

It is now 25 years since the first edition of this textbook was published and although it has evolved over previous editions, it was due for a more serious overhaul, which is precisely what I have done now. The major changes are as follows.

The book has been given a new structure in the hope of making its logic clearer and more coherent, in particular:

- Exhibits have been added at a number of points – mostly articles from the financial press or relevant websites, but in one case including a cartoon – to enliven the text and illustrate its relevance.
- Chapter 17 focusing on heterogeneous information is completely new.
- The chapter on the risk premium (Chapter 15 in the fifth edition, now Chapter 13) has been rewritten and extended to include Section 13.3.6 on the stochastic discount factor and Section 13.4.2 on recent approaches to empirical work in this area.
- The chapters Crises and credibility and Optimum currency areas and monetary union (previously Chapters 18 and 11, now Chapters 15 and 16) have been rewritten to incorporate new sections on the banking crisis triggered by the 2008 Lehman Brothers crisis and on the problems of the eurozone respectively. Section 15.4.1 on currency wars is also new.
- Chapter 5 discusses the trade relationship between China and America as a case study in the monetary model.

As in previous editions, I have updated the graphs and tables where necessary. More important, I have brought the story of the international financial markets up to date. Given the earthquakes which have shaken the world economy since the last edition was published, this alone has been a considerable undertaking, especially as both ongoing crises, in the world's banks and in the eurozone, impinge on the material in this book at a number of points. Where I have indulged my own opinions, I have tried to flag the fact clearly. Nonetheless, I am sure some readers, especially among my professional colleagues, will find plenty to disagree with. I hope, however, they will recognise the benefit of provoking informed debate over issues which are so often discussed elsewhere with great passion and little understanding.

Target readership

The caveats I included in the Preface to the First edition are still valid 25 years later. This is not intended to be a reference book of published research on international finance or macroeconomics, and nor is it a manual for currency traders or for treasurers of multinational corporations, though it may well be of interest and use to them both.

In terms of its level of difficulty, the centre of gravity of the book, its 'expected reader' as it were, is a third-year economics undergraduate or possibly a non-specialist graduate on an MBA international finance module. In other words, although the first few chapters may well

be covered in a first- or second-year course, some of the topics in the later chapters are more likely to find a place in a specialist postgraduate degree. The progression is not entirely monotonic. In particular, Chapter 10 probably contains the hardest material, but it belongs naturally in the middle of the book because it is essentially non-stochastic. As edition succeeds edition, there is a tendency for the proportion of more advanced material to increase because in most cases the new chapters cover research that previously seemed too recondite for inclusion.

The more challenging sections of the book have been signalled by an asterisk(*). In some cases, these sections have been preceded by simplified versions of the analysis in order to offer an alternative to the ‘high road’. Wherever possible, I try to manage without relying on mathematics, though it is unavoidable in places. I owe an apology to readers for the fact that, much as I would like to have done so, I found it impossible to remain 100 per cent consistent in the symbols I use throughout the book, the most egregious example being lower-case f , which refers to the forward discount in Chapters 3 and 17, but the log of the forward rate elsewhere. I hope the correct interpretation will be clear from the context.

Throughout the book, the emphasis is on delivering the *intuition* behind the results. Rigour is available in abundance in the original literature, references to which are provided at the end of each chapter. In order to preserve the clarity of the argument, I include only the absolute minimum of institutional detail and mention the mechanics of trading only when absolutely necessary. For the same reason, the empirical work is covered briefly, with only the most important methodological issues addressed (hence, econometrics is not a prerequisite), and the literature survey is limited in most cases to one or two seminal contributions.

Instead, the aim in the sections on empirical results is to give a concise summary of what we know (or think we know) on the topic and some indication of which questions remain open. If my own experience is typical, students and laymen often have difficulty understanding why economists find it so hard to answer apparently straightforward questions such as: *Does purchasing power parity hold? Is there a risk premium? Are expectations rational?* Wherever possible, I have tried to explain the main problems faced by researchers in this field, while always bearing in mind that the overwhelming majority of readers have no desire to lay the foundations of an academic career.

The book will have achieved its objective if, after finishing a chapter, the reader is able to understand the economic argument in the published literature, even if the technicalities remain out of reach. It is to be hoped that ambitious readers will be stimulated to approach the learned journals with sufficient enthusiasm to overcome the technical barriers to entry.

I should like to acknowledge the contribution of the many colleagues, students and readers from all over the world without whose comments this book would have contained more errors and fewer explanations of the material it covers. In addition, I am grateful to Ms Jia Cao for help in updating tables and charts, and to the Pearson editorial staff for making this the most readable edition so far.

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Chapter 1

Introduction

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Introduction

Exchange rates, foreign currency, international finance – they are unavoidable in the global economy however much people may wish it otherwise. If they ever were, exchange rates are no longer an arcane interest confined to a handful of economic specialists and traders. They are simply ubiquitous, to the point where it almost seems that whatever the subject under discussion – the outlook for the domestic or world economy, stock markets, industrial competitiveness at the level of the firm or the industry, even the outcome of the next election – the answer almost invariably turns out to involve exchange rates at some point. The eurozone eliminated eleven currencies overnight, but instead of making the issues surrounding exchange rates less crucial, it has in many respects made them loom even larger, and that was true even before the eurozone crisis broke. In fact, by 2010, according to the best estimates, trade in foreign currency was at the level of about \$4 trillion *per day*.¹ To put that in perspective, it means that in the space of about three weeks a sum roughly as great as the income of the whole world changes hands.

To some extent, the increased importance being attached to exchange rates is a result of the globalisation of modern business, the continuing growth in world trade relative to national economies, the trend towards economic integration (though that may now be going into reverse in Europe, at least), and the rapid pace of change in the technology of money

transfer. It is also in large part a consequence of the fact that exchange rates are not only variable but also highly volatile. The attention given to them can be traced to the role they play as the joker in the pack: the unpredictable element in the calculations that could turn a profitable deal into a disastrous lossmaker, or make an attractive investment project into the albatross on the company's balance sheet, or push the cost of your family holiday way beyond your budget.

All of these problems could be solved if we could predict what was going to happen to the values of each currency in, say, the next three months, but it would be dishonest to claim that the reader will learn from this book how to forecast future exchange rate movements. Neither the author nor anyone else really knows how to do that – and the chances are that anyone who *did* know how would never tell the rest of us. (Guess why.)

Instead, the objectives of this book are to enable the reader to understand:

- Why exchange rates change – at least, in so far as economists know why they do.
- Why it is so difficult to forecast exchange rate changes.
- How exchange rate risks can be hedged.
- The main research questions: what we know and what we do not yet know.
- How to evaluate critically the comments on the exchange rate found in the financial press, brokers' circulars, speeches by bankers and politicians, and so on.
- The main issues of policy with respect to exchange rates – in general terms (floating versus fixed rates, international monetary reform, and so on) and in particular instances, for example, the European Monetary Union (EMU) membership controversy in the UK.
- How to interpret new research results.

Notice what is *not* claimed. The book will not enable the reader to embark on original research. To see why, take a quick glance at one of the technical references in the Reading guide at the end of one of the later chapters. It will immediately be obvious that the prerequisites for undertaking serious research in what is already a well-worked area include:

- A thorough knowledge of the existing literature on exchange rates.
- A good grounding in general macro- and microeconomics and modern finance.
- A reasonable competence in the specialised applications of statistics to economic models, in other words in econometrics.

Now this book aims to provide a starting point for the first of these prerequisites. As far as the second is concerned, it tries to take as little for granted as possible, though inevitably some knowledge of economics has had to be assumed at various points in the book. Certainly, the coverage of topics outside the field of exchange rates can be nowhere near sufficient to equip the reader who wants to generate his own research results. As far as the third requirement is concerned, the decision has been taken to avoid almost completely any discussion of econometric issues or research results, and to limit the commentary to '... evidence was found to support the view that ...' and so on. The reasoning behind what will appear to some readers a perverse decision is that covering the econometrics would make the book inaccessible to the many readers who lack the relevant background, while not really helping those who do, since surveys of the empirical literature are available in a number of different places (as will be made clear in the Reading guide at the end of each chapter and on the book web page www.pearsoned.co.uk/copeland). In any case, after having finished

the chapter here, the reader who can cope with econometrics should be in a position to go on and read the literature without hesitation.

Instead, the emphasis in this book will be on conveying *at an intuitive level* the main propositions in the literature. As a result, the reader with little economics background will be able to grasp propositions that would otherwise have been completely inaccessible. For the professional or academic economist coming to the subject fresh from other specialist areas and wanting to get to grips with the exchange rate literature in the shortest possible time, the coverage (particularly in the later chapters) is intended to offer a flying start.

This introductory chapter clears the ground for what is to come, starting with an explanation of what we mean by the exchange rate – bilateral, trade-weighted, spot or forward. In Section 1.2, we look in general terms at supply and demand in the currency markets, an exercise that provides the essential framework for analysing how exchange rates are determined. In the process, we see what is involved in fixing an exchange rate. The next section provides, for those readers who need it, an explanation of the balance of payments and its relationship to events in the currency markets. Section 1.4 looks at the conventional wisdom on exchange rates and the balance of payments – a worthwhile exercise if only because, for some purposes, what people believe to be true can sometimes be as important as the truth itself (even if we knew it). Section 1.5 contains a potted history of the international monetary system since World War II – essential to understanding the present situation in world financial markets and also a source of the real-world examples cited in later chapters. Section 1.6 gives an overview of the rest of the book, while the last two sections contain, as in all the other chapters, a summary and a Reading guide.

1.1 What is an exchange rate?

The first thing to understand about the exchange rate is that it is simply a *price*. Or, putting it the other way round, prices as we normally understand the term are themselves exchange rates: the UK price of this book is the exchange rate between a particular good (the book) and pounds sterling. Suppose that it is quoted as £50, which means a book sells for £50, or can be bought at that price. It changes hands at an exchange rate of 1 book = £50.

Notice, as far as the bookseller is concerned, that means ‘money can be bought’ at the rate of £50 per book. From the bookseller’s point of view, the price of £1 is 1/50th of a copy of this book. If its price were £51, the shop would need to supply only 1/51st of a copy in order to earn £1. So a *rise* in the price of the book, from £50 to £51, is the same as a *fall* in the price of money, from 1/50th to 1/51st of a book.

In the same way, an exchange rate of £1 = €1.50 means that the price of a euro in UK currency is £(1/1.50) = £0.66. To a German or Italian, a pound costs €1.50. In general, the exchange rate of currency A in terms of currency B is the number of units of B needed to buy a unit of A.

Unfortunately, although it is normal to talk of the (money) price of books rather than the (book) price of money, there is no *normal* way to express an exchange rate. Both £1 = €1.50 and €1.00 = £0.66 are acceptable ways of expressing the same exchange rate. Strangely enough, both British and the Germans usually choose the former. In general, the continental Europeans and the Japanese tend to think of exchange rates as the price of foreign currency: *direct quotations*, in market jargon. The British (invariably) and the Americans (usually, though not always) prefer to think in terms of the purchasing power of the pound

or dollar² respectively – nobody in currency markets seems very concerned to make life simple for the textbook reader (or writer).

We had better make our choice here at the start of the book and stick with it. So:

**Convention
1.1**

Throughout the analysis, the exchange rate (symbol S) will be defined as the domestic currency price of foreign currency. So a rise in S_t means a rise in the price of foreign exchange at the time t , hence a relative cheapening of the domestic currency, or a *depreciation*. Conversely, a fall in S implies a reduction in the number of units of domestic currency required to buy a unit of foreign exchange; that is, a rise in the relative value of the home country's money, or an *appreciation*.

The only exception is that when we look at the facts (which we try to do after each new dose of theory), we sometimes talk in terms of dollars per pound, simply because it is so much more familiar. On all other occasions in this book, we follow continental European practice, as in Convention 1.1 – which also happens to be much the more popular choice in the academic literature.

1.1.1 Bilateral versus trade-weighted exchange rates

Suppose, one day, I hear the pound has depreciated against the US dollar – in other words, the price of dollars has risen. Does that mean the pound's international value has fallen? Or would it be more accurate to say that the value of the US currency has risen?

From a purely bilateral perspective, the two amount to the same thing. However, for many purposes, a two-country view is far too narrow. For example, suppose we wish to explain *why* the bilateral exchange rate has moved against the pound and in favour of the dollar. Plainly, if we have grounds for believing that it is the US currency that has strengthened rather than the pound that has weakened, we ought to look at developments in the USA rather than the UK to explain the change in the exchange rate, and vice versa if we believe the pound to have weakened and the dollar to have remained unchanged.

The problem is exactly the same as trying to explain a rise in the price of, say, beef. Our first step ought to be to decide whether it is the *relative* price of beef that has risen, in which case the explanation is presumably to be found in changes in the beef market, or whether, on the other hand, it is the price of goods *in general* that has risen (that is, inflation), which would suggest a macroeconomic cause.

Notice that when the price of a single good or class of goods goes up, while all others stay the same, we say the price of beef or meat or whatever has risen. When the price of beef rises, *at the same time as all other prices*, we say the value of money has fallen.

In the same way, if the (sterling) price of dollars goes up, while the (sterling) price of all other currencies is unchanged, we say the US currency has strengthened. On the other hand, if all exchange rates move against the pound, then the pound has weakened. The difference is not purely semantic. If the pound suddenly weakens against *all* other currencies, one would intuitively expect to find the cause in some change in the UK rather than the American or German economies, and vice versa if it is the dollar that has risen in value.

All of which should serve to illustrate why, for some purposes, it will suffice to look at the exchange rate between two countries only, while for other purposes this narrow approach could be completely misleading. So far, we have thought of exchange rates only in a two-country context. To be more precise, we need the following definition:

The bilateral exchange rate between, say, the UK and the USA, is the price of dollars in terms of pounds.

So, what has been said is that a change in the UK–US bilateral exchange rate in favour of the dollar could be indicative of *either* a decline in the international value of the pound *or* a rise in that of the dollar – or both, of course. How can we be sure which? How can we get some indication of what has happened to the *overall* value of the pound or the dollar?

One way would be simply to look at how both UK and US currencies have moved against the euro – which would involve looking at two bilateral exchange rates for the UK (£/\$, £/€) and two for the US (\$/£, \$/€). To give a real-world example, look at Table 1.1, which is taken from the currencies page of the *Financial Times* of 14 September 2007, and shows cross rates – to be explained shortly – for the previous day.

Look at the bottom row, labelled USA. The numbers in that row, starting 1.033, 5.371, 0.721, 115.1, . . . are the number of Canadian dollars, Danish kroner, euros, yen, etc. that could be bought with \$US1.00 in the currency market at the close of business on the day in question. The row ends with 0.497, the number of pounds bought with a dollar, and 1, the number of dollars per dollar. For the same reason, there are 1s along the diagonal of the table. The final column of the table starting 0.968, 1.862, 1.387, 0.869, . . . gives exchange rates in terms of dollar prices; it costs \$0.968 (or 96.8 cents) to buy a Canadian dollar, \$1.862 to buy 10 Danish kroner, \$1.387 to buy 1 euro, and so forth, which are just the reciprocals of the numbers in the bottom row.

Now let us pick another entry in the table, for example the fourth number in the third row, which tells us that €1.00 = yen 159.6. Ask yourself the question: is this telling us anything we could not have worked out for ourselves simply from knowing the numbers in *either* the USA row *or* the USA column alone? Obviously, we ought to have:

$$\text{Yen price of euros} = \frac{\text{dollar price of euros}}{\text{dollar price of (100) yen}}$$

Table 1.1 Exchange cross rates

14 September		C\$	DKr	Euro	Y	NKr	SK	SFr	£	\$
Canada	C\$	1	5.201	0.698	111.4	5.448	6.477	1.152	0.481	0.968
Denmark	DKr	1.923	10	1.342	214.2	10.48	12.45	2.215	0.926	1.862
Euro	Euro	1.432	7.449	1	159.6	7.804	9.276	1.650	0.689	1.387
Japan	Y	0.898	4.668	0.627	100	4.890	5.813	1.034	0.432	0.869
Norway	NKr	1.835	9.545	1.281	204.5	10	11.89	2.114	0.883	1.777
Sweden	SKr	1.544	8.030	1.078	172.0	8.412	10	1.779	0.743	1.495
Switzerland	SFr	0.868	4.514	0.606	96.71	4.729	5.622	1	0.418	0.840
UK	£	2.077	10.80	1.450	231.5	11.32	13.45	2.393	1	2.012
USA	\$	1.033	5.371	0.721	115.1	5.627	6.689	1.190	0.497	1

Danish kroner, Norwegian kroner and Swedish kroner per 10; yen per 100.

Source: *Financial Times*, derived from WM Reuters.

$$159.6 = \frac{1.387}{0.869/100}$$

otherwise there would be a profit opportunity waiting to be exploited.

Question

Suppose the euro/yen exchange rate actually stood at 159.2? Or at 160.0? What would you do in order to profit from the situation? What problems might you face in the process?

So, most of the 81 numbers in the matrix are redundant. In fact, all the rates can be, and in practice actually *are*, calculated from the nine exchange rates in the US dollar column. If we introduce the following definition:

A cross-exchange rate is an exchange rate between two currencies, A and B, neither of which is the US dollar. It can be calculated as the ratio of the exchange rate of A to the dollar, divided by the exchange rate of B to the dollar.

we can then say that, given N currencies including the numeraire (the dollar), there will be $N(N-1)/2$ cross rates. In Table 1.1, we have $N=9$ currencies, so there are 8 (that is, $N-1$) dollar rates, and $(9 \times 8)/2 = 36$ cross rates – the remaining entries are either 1s or the reciprocals of the cross rates.

Now suppose that we were to look at the cross rates and find that the pound has *depreciated* against the US dollar but *appreciated* against the yen. Is the net effect on the pound a rise (appreciation) or fall (depreciation) in its international value?

There is no completely adequate answer to this question. The nearest we can get to a satisfactory solution is to apply the same logic we use in dealing with changes in the domestic purchasing power of money. In situations where some (goods) prices are rising and others are falling, we measure changes in the price of goods *in general* by computing a price index (see Section 2.3).

In the same way, we can arrive at some indication of what has happened to the price of foreign currencies *in general* by looking at an index of its international value, defined as follows:

The effective or trade-weighted exchange rate of currency A is a weighted average³ of its exchange rate against currencies B, C, D, E, . . . The weights used are usually the proportion of country A's trade that involves B, C, D, E, . . . , respectively.

Notice that the effective exchange rate is *multilateral* rather than bilateral. Furthermore, as is the case with the Retail Price Index, there is no meaning to be attached to the absolute level of the effective exchange rate – it all depends on our choice of base year. So, for example, the fact that the effective exchange rate of the euro stood at 115.44 on 19 March

2008 meant that its average value against the world's other major currencies was just over 15% above its average level in the base period, the first quarter of 1999.

This is no place to discuss at length the question of when to use effective and when to use bilateral exchange rates. All that needs to be said is that the theoretical literature sometimes looks at the relationship between the economies of two countries, the domestic and the foreign, so that the conclusions naturally relate to the bilateral exchange rate. In other cases, it tries to explain the value of a single country's currency relative to other currencies in general, so that the obvious interpretation in terms of real-world data is the effective exchange rate. None the less, even in the latter case, we can always handle the theory as though the exchange rate being determined is the one between the domestic economy and another all-enveloping country – the Rest of the World (ROW).

To simplify matters and to clarify the exposition as far as possible, whenever the analysis takes place in the context of a two-country world, we shall keep to the following:

**Convention
1.2**

Unless otherwise specified, the 'home' country is the UK and the domestic currency is the pound sterling.

1.1.2 Spot versus forward rates

All of the exchange rates we have referred to so far have had one thing in common. They have all related to deals conducted 'on the spot' – in other words, involving the delivery of currency more or less immediately when the bargain is struck. In the jargon, we have been dealing with *spot rates*.

However, there are many deals struck in currency markets that involve no immediate exchange of money. Contracts that commit the two parties to exchange one currency for another at some future date at a predetermined price – the forward or futures exchange rate, as the case may be – will play an important part in this book and will be explained more fully later. To avoid confusion, we shall stick to the following convention:

**Convention
1.3**

By default, all exchange rates are spot rates, unless specified otherwise.

1.1.3 Buying versus selling rates

There is one more complication to deal with when looking at exchange rate quotations. It arises out of the fact that in the currency market, as in so many other markets, most transactions involve intermediaries who act as temporary buyers for agents wishing to sell, and vice versa for those who want to buy. Of course, these intermediaries are not motivated purely by charity. In some cases, they may charge a fee or commission for the service of, in effect, matching buyers and sellers. For major transactions, however, the source of their profit lies in the gap between the price at which they buy a currency and the price at which they are able to sell it. As usual, there is specialised jargon to cover this situation:

The **bid rate** for currency A in terms of currency B is the rate at which dealers buy currency A (sell currency B). The **offer (or ask) rate** is the rate at which dealers sell currency A (buy currency B). The **(bid/ask) spread** is the gap between the offer and bid rates.

For example, the *Financial Times* of 14 September 2007 contained the rates for the pound and euro quoted in London shown in Table 1.2.

The top half of the table shows rates for the pound and the bottom half for the euro. The first column, labelled ‘Closing mid-point’ gives the average of the bid and ask exchange rates (currency per pound or euro) at the close of business on the day in question. ‘Change on day’ in the next column is the difference between today’s closing rate (i.e. the rate given in the previous column) and the level at the end of yesterday’s trading. So, for example, looking at the Hong Kong row, the pound bought \$HK15.6678 at the end of the day in London, which represented a fall of \$HK0.125 over 24 hours. In other words, the pound closed at \$HK15.5428 (= \$HK15.6678 – \$HK0.125), a depreciation against the Hong Kong dollar of 0.8%⁴ – one of the more turbulent days in the market, but by no means without precedent.

In the ‘Bid/offer spread’ column, we find the Hong Kong dollar quoted as 654–701, meaning that the currency could be bought with pounds at £1 = \$HK15.6654 and sold for pounds at £1 = \$HK15.6701, a bid/ask spread of $(0.0701 - 0.0654)/15.6678 = 0.0003$ or 0.03%. The spread is tight because this is a heavily traded currency pair. In fact, for the pound/US dollar rate, the spread is even smaller. On the other hand, for Slovak koruna, it is $(0.0857 - 0.0049)/48.9453 = 0.17\%$.

A point worth noting is that since one can only *buy* one currency by simultaneously *selling* another, it follows that the ask price for currency A (in terms of currency B) is the reciprocal of the *bid*, not the ask price, for currency B (in terms of A). In other words, whereas in the absence of transaction costs, we can simply say that:

$$S(\text{£ per \$}) = 1/S(\text{\$ per £}) \quad (1.1)$$

this is no longer the case when we allow for the spread between bid and ask rates. Instead, if we write $S^b(A/B)$ to denote the bid price for currency B in terms of currency A, $S^a(A/B)$ for the ask price of B in terms of A, and similarly $S^b(B/A)$ and $S^a(B/A)$ are bid and ask for A in terms of B, then the following relationship holds:

$$S^b(B/A) = 1/S^a(A/B) \text{ and } S^a(B/A) = 1/S^b(A/B) \quad (1.2)$$

One implication of this is that in practice the relationship between cross rates is not quite as simple as it was made to appear in Section 1.1. In fact, it turns out that cross rates can show inconsistencies in proportion to the bid/ask spreads on the currencies involved.

Obviously, dealers require a spread on all transactions, whether spot or forward. As we saw by comparing the Hong Kong dollar and the koruna, the less frequently traded currencies are associated with higher spreads, other things being equal, since dealers may have to keep these currencies on their books (that is, in stock) for far longer than the more heavily traded currencies.⁵

For the most part in this book, we shall regard the distinction between buying and selling rates as merely a technicality affecting precise calculations of the profitability of deals, but not in principle changing our conclusions regarding the basic mechanisms at work in currency markets. With the exception of Section 3.3, and more importantly Chapter 17, which

is in part about the way dealers set the spread, we shall ignore the distinction between bid and ask rates from now on. In fact, we impose the following:

**Convention
1.4**

Unless specified otherwise, all exchange rates, forward and spot, are to be understood as mid-market rates – that is, averages of bid and offered rates.

Continuing with the explanation of Table 1.2, the two columns labelled ‘Day’s mid’ simply give the range of variation over the day (sometimes called the trading range), so that readers can tell how volatile the exchange rate was over the day. So we find that at some point during 14 September 2007, the pound was quoted as high as \$HK15.7541 and at another point as low as \$HK15.6249 against the Hong Kong dollar.

Forward exchange rates have already been mentioned. Table 1.2 gives rates for 1-, 3- and 12-month forward delivery, which were quoted as \$HK15.6502, \$HK15.6027 and \$HK15.4414, respectively. Note the ‘%PA’ column, computed as $[(15.6678/15.6502) - 1] \times 12 = 1.35\%$ for the monthly rate, $[(15.6678/15.6027) - 1] \times 4 = 1.67\%$ for the three-month rate and $[(15.6678/15.4414) - 1] \times 4 = 1.47\%$ for the annual rate. In other words, these percentages indicate the extent to which the pound buys fewer Hong Kong dollars for 1-month, 3-month and 12-month delivery. The fact that these numbers are all positive is expressed by saying the pound was at a discount (and the Hong Kong dollar at a premium) of 1.35% in the one-month forward market. By contrast, the pound was more expensive forward than spot in the case of the Turkish lira, hence the negative numbers in this column for Turkey. The reasons for these differences will be discussed at several points in this book.

Finally, the last column of Table 1.2 gives the level of the effective exchange rate for those currencies for which the Bank of England computes a trade-weighted index in the way described earlier.

1.2 The market for foreign currency

What determines exchange rates? What factors can explain the wild fluctuations in currency values that seem to occur so frequently?

Answering questions such as these will take up most of this book. However, at the simplest possible level, we can give an answer in terms of elementary microeconomics – one that is not in itself very illuminating but that provides an essential framework for thinking about exchange rates.

As with any other market, price is determined by supply and demand. Look at Figure 1.1(b), ignoring for the moment Figure 1.1(a) to its left. The upward-sloping supply and downward-sloping demand curves will look reassuringly familiar to anyone who has ever had any encounter with microeconomics. However, we need to be a little careful in interpreting these curves in the present case.

First, note the price on the vertical axis: it is the variable we are calling S , the exchange rate measured as the price of a dollar in domestic (UK) currency. On the horizontal axis we measure the quantity of dollars traded, because the dollar is the good whose price is measured on the vertical.