

The foreign exchange market in London

This is the second in a series of background articles intended for the general reader.⁽¹⁾ It describes the structure of the foreign exchange market in London, discusses how exchange rates are quoted and what determines them, and explains how deals in foreign exchange are done. There is a short account of the Bank of England's operations in the market and of its supervisory role. Because the article attempts to explain a sometimes complex area in a fairly straightforward way, the descriptions of some of the more difficult concepts have been simplified.

Introduction

Most domestic trading and investment transactions are settled by a transfer of bank deposits from buyer to seller, usually by means of a cheque. In the case of international transactions, however, buyer and seller will frequently use different currencies. For example, although an American buyer of UK goods could pay for them by means of a US dollar cheque drawn on an American bank, or by some similar instrument, and the UK seller could retain these dollars in an account in his own name,⁽²⁾ it is more likely that the UK seller will want to receive payment in sterling. In other words, he (or the American importer) will use a bank deposit in US dollars to buy a bank deposit in sterling. The foreign exchange market exists to facilitate this type of transaction, and exchange rates are essentially the prices at which bank deposits in one currency are exchanged for bank deposits in another. The banks are the natural channel for this business, and many of them operate in the foreign exchange market not only on behalf of their customers, but also on their own account. The related market in bank notes and coin is also centred on the banks, but virtually the only business settled this way is for travel and tourism, and the market is much less important than that in bank deposits. In another related market (the euro-currency market), bank deposits in various currencies are borrowed and lent (rather than bought and sold).

Alongside the banks in the market are the brokers. Their function—a particularly valuable one in a market in which so many banks participate—is to provide information on current exchange rates and to bring buyers and sellers together.

The market's customers comprise a variety of institutions; the most important are foreign commercial banks, central banks and governments, and industrial, commercial and financial companies at home and abroad.

Markets in securities and commodities often have a specific location where participants meet to trade. This is not the case with the foreign exchange market in London or indeed in a number of other leading centres. Although in many countries in Western Europe the main participants in the

foreign exchange market have a brief daily meeting where 'official' rates are fixed for certain transactions, most exchange trading goes on throughout the day and outside such meetings. The London foreign exchange market has not met for trading since before the First World War, when bills denominated in foreign currencies were traded twice a week in the Royal Exchange. Since then, the main traders have been linked by telephone, and subsequently also by telex.

Easy communication has made the foreign exchange market a world-wide one, with leading banks represented in all the main trading centres through branches or affiliates. Sterling and other major currencies are traded in all these main centres. Because of the United Kingdom's geographical position, banks in London can deal with the Far East, Middle East and North America, as well as with the rest of Europe, in the course of the working day. This consideration, together with the experience gained when sterling was the main international currency and the presence in London of many other international markets which bring foreign exchange business with them, helps the London foreign exchange market to maintain a leading position. Although banks elsewhere in the United Kingdom are frequently approached by customers with foreign exchange business, it is their practice to pass the business to their London office; there is no foreign exchange market in the United Kingdom outside London.

Market participants

Banks

At present, almost 300 institutions in the United Kingdom are recognised as banks under the Banking Act 1979. Recognition as a bank depends partly on the range of banking services that the institution provides, but a bank would certainly be expected to offer its customers a service in foreign exchange.⁽³⁾ Not all banks are active dealers in foreign exchange on their own account, however, and some do not transact business in the market except to cover customers' needs. But customer business is uneven in timing and amount, and exchange rates would be more volatile if many banks did not also deal on their own

(1) The first article 'Financing British industry', appeared in the September *Bulletin*, page 319.

(2) Until October 1979, when exchange control was ended, he would normally have been required to sell the dollars for sterling.

(3) In addition, there are a similar number of licensed deposit-takers, and a few institutions whose standing has yet to be decided. Licensed deposit-takers are not expected to offer a full range of banking services, but the category includes institutions which are active in foreign exchange. What this article says about banks applies also to them.

account. Their operations give the market depth and continuity, and facilitate the transaction of customer business.

The more active banks maintain working balances in the currencies in which they trade, and may also run modest positions in these currencies in accordance with the way they see developments—holding 'long' positions (with an excess of assets over liabilities) in some, and 'short' positions (with an excess of liabilities over assets) in others. They may also take a view about interest rates, and arrange the maturity of their assets and liabilities accordingly.

Some banks are 'market-makers' (or 'price-makers') in one or more currencies. This means that they consistently quote rates at which they are ready to buy or sell; this provides a considerable service to other participants in the market because it enables business to be executed quickly and in substantial amounts. Naturally, such market-making banks must be quick to adjust the rates which they quote if they are to avoid losses in a fast-moving market. When rates are moving sharply, banks will generally aim to protect themselves by reducing the amounts for which they will deal and by widening the 'spread' (the difference between the rates at which they will buy and sell a currency).

The heaviest trading in London is in terms of sterling against US dollars. But just as not all banks active in the sterling/dollar market are in London, so some London institutions are very active in trading other currencies, notably the dollar against the deutschemark and the Yen. Others make markets in less active currencies.

Brokers

The twelve firms of foreign exchange brokers in London provide an information system from which banks can ascertain the best available rates. Without brokers, a bank which wanted to carry out a particular transaction would have to canvass other banks until it found one—or a combination of several—willing to match it. But, even when the bank had found a counterparty, it would not know whether by prolonging the search it would find others willing to deal at a more favourable rate. Brokers earn a fee ('brokerage') by bringing together buyers and sellers. Once a broker has quoted a rate to a bank, and the bank has chosen to deal, the broker is committed to providing a counterparty. The brokers are purely intermediaries; unlike banks, they do not take positions in foreign exchange. Not all market transactions are arranged by brokers in London; probably a larger proportion of total business is transacted directly with other banks in London or abroad, or through brokers abroad.

Broad influences on exchange rates

For most of the first twenty-seven years following the war, sterling, like most other currencies, remained within a narrow band around a declared parity against the US dollar, in accordance with rules for the international

monetary system laid down at the Bretton Woods Conference. In June 1972, however, sterling was left to find its own level; and the parity system has been generally abandoned since.

In a system of floating exchange rates, it can be misleading to judge movements in a currency from its rate against a single other currency, even one as important as the dollar. Thus a fall in the sterling/dollar rate may reflect a general strength of the dollar rather than a weakness of sterling, which may have risen against other currencies. The 'effective' exchange rate index for sterling changes when sterling rises or falls against a weighted average of currencies, the weights used being such that a 1% change in the sterling index brought about by any combination of exchange rate changes should have a trade effect for the United Kingdom equivalent to a 1% change in sterling against all currencies.⁽¹⁾ The same principle applies to the calculation of effective exchange rates for other currencies.

In this general sense, the level of the exchange rate is subject to many influences. Although the flow of payments and receipts for imports and exports of goods and services, for interest and dividends, and for transfers of all kinds, will to a large extent balance out, there will generally be a net supply of, or demand for, the domestic currency which may sometimes be sizable and persistent. Capital flows also contribute significantly to activity in the foreign exchange market. Often they will be dictated by the needs of business, without being very sensitive to present or prospective interest and exchange rates; this is often true for direct investment and trade credit. In other cases, interest and exchange rate considerations will be important, at times dominating the market. Transactions which respond to actual and expected interest and exchange rates are often connected with trade and involve changes in the timing of payments and receipts—so-called 'leads and lags'. But various other capital flows are also strongly influenced by such considerations.

The spot market

How exchange rates are quoted

Although banks deal with customers in, for example, sterling against deutschemarks or French francs against Yen, the practice within the market is to quote all currencies against the US dollar; this reduces the number of individual rates that need to be quoted. The exchange rate between any two non-dollar currencies is calculated from the rate for each currency against the dollar. Where an exchange rate is quoted without qualification, the currencies concerned will be exchanged on the second working day after the transaction; this is the earliest date in common use and allows time for paperwork to be completed and for the appropriate transfers of funds to be arranged.⁽²⁾ Exchange rates quoted on this basis are known as 'spot' rates.

(1) See the March 1977 *Bulletin*, page 46.

(2) It is, however, possible to deal for same day or next day settlement.

With the exception of sterling, it is the practice in London to quote the major currencies in terms of units of currency per US dollar—that is, the price of a dollar in terms of the other currency. Sterling is quoted the other way round, and a rate of 2.4000 would thus represent the dollar price of a pound. Banks usually quote a two-way price in the market—that is, a rate at which they are ready to buy a currency, and a (dearer) rate at which they are prepared to sell it, the spread between the two being a potential source of profit. For example, a bank quoting a sterling/dollar rate of 2.3995–2.4005 will be prepared to buy pounds at a rate of \$2.3995 per £1 (the ‘bid’ rate) and to sell them at \$2.4005 per £1 (the ‘offer’).⁽¹⁾ On the other hand, a bank which quotes 1.8015–1.8025 for the dollar against the deutschemark will be prepared to buy dollars at the rate of \$1 per DM 1.8015 or to sell them at \$1 per DM 1.8025.

These rates will be good for large, round amounts. For very large amounts, or for smaller or odd amounts, a bank would normally quote a wider spread; and the range of amounts for which a quotation is good will vary to some extent with the currency concerned and market conditions. Generally, however, a quotation in sterling/dollar would be good for round amounts of £½ million between £½ million and £5 million, and a quotation in dollar/deutschemark would be good for round amounts of \$½ million between \$½ million and \$10 million. In sterling/dollar transactions, it is usual to deal for a round number of pounds; in other foreign exchange transactions, it is usual to deal for a round number of dollars.

How deals are done in the market . . .

A hypothetical example may help to explain the mechanics of dealing. Each price-making bank is in frequent contact with one or more of the brokers. Perhaps one price-making bank quotes the brokers a sterling/dollar rate of 2.3995–2.4005. Another bank, keener than the first to buy sterling, may quote 2.4000–2.4010; while a third, keener to sell, may quote 2.3993–2.4003. Indeed, the second bank may quote just the bid (2.4000) and the third just the offer (2.4003). The prices are understood to be good until a certain time has elapsed, and for a certain amount and for a certain category of counterparty, unless the bank stipulates otherwise. The broker recognises these factors when presenting his clients with the best bid and offer available—in this example 2.4000–2.4003.

When approached by a bank seeking to deal, the broker must give the fullest possible information without revealing the identity of the bank (or banks) whose prices he is quoting until a deal is ready to be completed. For example, the best bid may have come from a bank prepared to do more or less than the standard amount, and the offer from a bank abroad; and the broker will make this known. In general, the broker will aim to keep all his clients, price-making banks and others, informed about the prices at which the most recent deals have been done, telling them

whether price-making banks are tending to be offered sterling or to be bid for it, thus indicating the next likely movement in the exchange rate. Having brought about a deal—a sale of sterling, perhaps, by another bank to the bank which was bidding 2.4000—the broker will reconstruct a two-way price by taking the unchanged offer and what was the previous second-best bid, in this example 2.3995–2.4003. If the deal had left no bid for sterling in the market, the broker would have said so.

Many price-making banks publicise their rates on video screens, although in order to avoid frequently changing rates and making the kind of qualification about size, category of counterparty, etc. with which a broker would be familiar, such rates are normally for information and are not rates at which the bank will feel obliged to deal. Nevertheless, the bank’s reputation would suffer if it regularly refused to deal near these rates with first-class counterparties.

. . . and with customers

Many of the larger corporate customers of the banks have video screens linked to an information system, and so know roughly what the going rate is before they approach a bank to buy or sell foreign exchange. Indeed, the availability of such information helps to keep the market highly competitive. However, few corporate customers can deal on the finest terms. Usually, a customer will want to deal for an uneven amount, quite possibly below the minimum for which the best rates are available in the market, thus leaving the bank with an amount to cover on less favourable terms, unless it has other customer business to offset it. The bank may have to aggregate several such small deals and cover them together, in the meantime remaining vulnerable to an adverse change in exchange rates. Moreover, the bank must reckon with the risk that the counterparty might fail to fulfil his side of the contract—a failure which would leave the bank with an unbalanced position and therefore, if rates moved unfavourably, a potential loss. The difference between the finest rates at which business is done—for large, round amounts between banks of the highest standing—and the rates at which banks normally deal with customers reflects the higher cost and possible risk of doing such customer business.⁽²⁾

A large deal with a commercial customer might proceed as follows. The customer asks one or more banks at what rate they would deal with him, usually indicating the size of his business but not revealing in the first instance whether he is a buyer or seller. Depending on the amount of the transaction and the state of the market, and also on whether the bank is active in the currencies concerned, the bank may quote a firm rate immediately and, if the quotation is acceptable, do the business; or it may approach a broker (or perhaps another bank in London or abroad) to see on what terms it could cover the deal, and quote the customer accordingly.

(1) A dealer would normally call the rate ‘95-05’ rather than quote it in full.

(2) Dealing in notes and, particularly, coin is far more expensive; banks incur storage, handling and insurance costs, and must finance their stock of notes and coin (on which no interest is earned). The rates which banks quote their customers for note and coin deals reflect this.

The bank also would not normally reveal (and indeed still might not know) whether it would be a buyer or seller. Having dealt with the customer, the bank will probably seek to cover its position in the market fairly quickly, though the size of the deal may be such that it has to wait until enough customer deals have been done to make a tradeable amount. A bank with substantial customer business will often be able to match much of it without approaching the market at all.

Sometimes a commercial customer will have a very large order, well above the normal tradeable amount. Rather than broadcast his business by sharing it among a number of banks and perhaps setting the market against him, he may do better to entrust the trade to a single bank, which will execute it on the best terms possible.

Forward deals and swaps

So far, the discussion has been in terms of spot settlement for foreign exchange deals: a bank contracts with another bank, or with a customer, to exchange one currency for another two working days hence. But it is also possible to contract to exchange currencies, at rates agreed now, months, or even years ahead. Such 'forward' deals—for settlement more than two working days ahead⁽¹⁾—are a valuable facility in the financing of international trade, because companies can thereby predict with certainty the domestic currency equivalent of future receipts and outgoings in foreign currency. For example, an exporter may approach his bank to sell forward dollars which he expects to receive in a month's time. Also, those with investments or debts denominated in foreign currency can use the forward market to eliminate exchange risk. In order to explain the nature of the forward market, it is convenient to consider first how the bank covers such deals.

How the bank covers a forward deal with a customer

Provided that a market exists in which the currencies concerned can be borrowed and lent, the bank need not undertake a forward transaction to cover a forward deal with a customer. For example, where an exporter sells dollar receipts expected in a month's time against sterling—making an 'outright' forward purchase of sterling from the bank—the bank can cover the transaction by borrowing dollars, using them to buy sterling in the spot market, and holding sterling for the duration of the forward contract. After the month has elapsed, the bank uses the dollars which the exporter delivers to it to repay the loan; and has sterling at its disposal to pay the exporter. Indeed, this seems to have been the way in which banks first covered forward contracts with customers. For the bank, the main cost of accommodating the customer, and so the determinant of the forward rate which it quotes him, is the

rate of interest which it has to pay to borrow dollars *less* the rate which it earns on the sterling deposit (or money-market asset) which it holds for the period of the forward contract. Forward sterling will tend to be cheaper than spot sterling if sterling interest rates exceed dollar interest rates, and more expensive if dollar interest rates are the higher.⁽²⁾

Although the procedure outlined above generally allows banks to cover forward deals with customers,⁽³⁾ there is a possible disadvantage for the bank in that arranging forward cover in this way expands its balance sheet and, if used extensively, might bring pressure on capital ratios.⁽⁴⁾ But this disadvantage can be overcome if the bank uses the 'swap' market—an extension of the deposit and loan markets in which a bank buys one currency spot against another and in the same transaction sells it back forward: the relationship between the spot and forward rates, called the 'swap margin', is also largely influenced by interest rates on the currencies. In the present example, the bank can cover the exchange risk on a forward sale of sterling to a customer by buying sterling in the spot market, and then selling spot the sterling which it has just bought (so cancelling the initial spot purchase) and simultaneously buying it back forward to match the original forward sale of sterling to the customer. The bank is then left with a contingent, offsetting forward asset and liability.⁽⁵⁾ Because the transaction is similar to a deposit or loan operation—in each case the bank gives up the use of sterling for an agreed time—selling sterling spot and buying it back forward is called 'lending sterling on the swap'; buying it spot and selling it forward is termed 'borrowing sterling on the swap'.

There is no market in outright forward exchange among banks; they cover forward deals with customers in one or other of the ways described. To recapitulate; if the bank has a contract to pay sterling to a customer against a receipt of dollars in one month's time, it can cover this position in one of the following ways:

- The bank borrows dollars for a month (or reduces its dollar assets), sells them spot, and places the sterling proceeds in a one-month sterling deposit. After a month, the sterling deposit matures, providing sterling to pay to the customer; the bank repays the dollar loan with the dollars which it contracted to buy from the customer.
- The bank buys spot sterling, and then undertakes a swap in which it sells sterling spot and buys it back one month forward. The spot deals cancel out; the bank has a contract to receive sterling and pay out dollars in a month's time, to match the contract with the customer.

(1) In a forward transaction, one currency will be delivered, and the other received, on the same future day. Thus, for example, an exporter selling, for sterling, dollars which he expects to receive in one month's time will pay dollars in one month to the bank with which he does the forward deal, and simultaneously receive sterling from the bank.

(2) See the appendix for examples of the relationship between interest rates and spot and forward exchange rates, and consequent 'technical' influences on rates.

(3) It is, of course, necessary for the bank to have access to loan and deposit markets in the various currencies.

(4) See the September *Bulletin*, page 324.

(5) Banks usually cover forward transactions with customers first in the spot market, and undertake the swap later, because spot exchange rates are usually more volatile than the interest rates which largely determine the swap margin; this explains why the effect of forward deals with customers is usually quickly felt in the spot market.

How forward exchange rates are quoted

In principle, exchange rates for deals to be settled on any date could be quoted in the way described earlier—in the case of the sterling/dollar rate, the number of dollars which can be exchanged for £1. In practice, however, the market quotes only the spot rate in this manner; and an exchange rate quoted without qualification will always be for spot delivery. Rates for other settlement dates are always quoted in the market as swap margins—differences from the spot rate.

For example, where the spot rate is quoted around 2.4000, one month forward dollars (in this case, assumed to be more expensive than spot dollars) might be quoted at 0.0130–0.0120. For short, a dealer would quote the difference as 130–120 points, a point being one hundredth of a US cent. The rate for one month forward sterling/dollar would then be 2.4000 less 0.0130 (i.e. 2.3870) on the bid side, and 2.4000 less 0.0120 (i.e. 2.3880) on the offer side. That is, the dealer would pay at a rate of \$2.3870 per £1 for sterling for delivery to him in one month, and he would offer to deliver sterling himself for the same date at \$2.3880 per £1.⁽¹⁾

The 'cost of forward cover' (which may be negative) is the swap margin expressed as a percentage of the forward rate and converted to an annual basis. (The average of bid and offer rates is used.) With a spot rate of 2.4000, and with the dollar at a one month swap premium of 125 points, the implicit one month forward rate is 2.4000 less 0.0125, i.e. 2.3875. The cost of forward cover at an annual rate is then $6\frac{3}{8}\%$.⁽²⁾

A currency is said to be at a 'forward premium' if it is more expensive forward than spot, and at a 'forward discount' if it is cheaper.

Although a bank would not quote an outright forward rate in the market, it will quote one to a customer—in the present example, perhaps 2.3865–2.3885 for one month forward sterling/dollar. The exporter will have bought forward sterling at the bank's offer rate of 2.3885.

Links between the markets

Balance sheet considerations apart, the choice between covering the sale of forward sterling to the exporter by, on the one hand, borrowing dollars, selling the proceeds of the loan for sterling, and holding a deposit (or money-market instrument) in sterling, and, on the other hand, buying spot sterling and lending it on the swap, depends on dollar and sterling interest rates and the cost of forward cover. If the cost of forward cover is 6% per annum, and the bank can earn 7% more on a sterling deposit than it pays to borrow dollars, the first course is the more attractive. If, however,

the bank can earn only 5% more on a sterling deposit than it pays to borrow dollars, it is cheaper to cover in the second way—by buying sterling spot and lending it on the swap. Many banks, whether they have customer business to cover or not, will watch for discrepancies between interest rates and the cost of cover which would make it profitable to borrow a currency on the money market and then lend it on the swap, or, alternatively, to borrow it on the swap and place the proceeds on deposit or in a money-market asset.

Such transactions between the markets—'arbitrage' deals—tend to keep the cost of cover approximately equal to the difference between interest rates for the same term on the two currencies concerned. A currency in which assets offer a superior return to those denominated in another currency after allowing for the cost of forward cover is said to be at an intrinsic premium (there is a 'covered differential in its favour'); the other currency is said to be at an intrinsic discount. Where the two currencies are equal on this comparison, they are said to be at 'interest parity'.

To the individual bank, a swap and a deposit (or a purchase of a sterling money-market instrument) may be seen as alternative ways of investing the sterling bought to cover the forward sale to the customer. But in reality the swap market is an extension of the money markets in the currencies concerned; without markets in which currencies can be borrowed and lent, there would be no swap market, and the banks could not accommodate an imbalance of customer forward business without exposing themselves to risk. Moreover, the money markets need to offer loans, deposits and other instruments for a range of periods, since the banks' customers will want to deal forward for a variety of dates. The lack of suitable money-market instruments, with the consequence that there is no swap market, explains why it is difficult for customers to arrange forward transactions in many currencies, or for irregular and very long dates in most currencies. Only in dollars, sterling and Deutschmarks, is it easy for a bank to cover a forward transaction for much more than a year or two, unless another customer's needs happen to match it; and in many currencies it is virtually impossible to do so, except perhaps (in the case of a forward sale of the currency to a customer) by holding a deposit in the currency with a correspondent bank for the duration of the contract. The harder it is to cover, the worse the rates which banks quote their customers; and for many currencies and periods they may refuse to deal forward at all, because they consider the risk unacceptable. The possibility that exchange controls may impede fulfilment of the various contracts on settlement day is another reason why banks are cautious about forward deals in certain currencies (or with banks or others resident in certain countries), even if appropriate instruments are available.

(1) When quoting sterling/dollar, dealers state first the rate at which they will buy sterling, and second, the (more expensive) rate at which they will sell it. Thus, if a dealer quotes 130–120, it will be clear to others in the market that they should deduct the swap margin from the spot rate in order to calculate the (implicit) forward rate, i.e. that sterling is cheaper forward than spot. A swap margin of 120–130, on the other hand, would indicate that sterling was more expensive forward than spot and would be added to the spot rate. (The opposite is the case for currencies which are quoted as so many units to the dollar; there, a smaller figure first indicates that the currency concerned is cheaper forward than spot, and the swap margin should be added.)

(2) That is $\left(\frac{0.0125 \times 365}{30} \div 2.3875\right) \times 100$.

Bank of England operations in the exchange market . . .

The Bank deals actively in foreign exchange on behalf of its customers, chiefly government departments, and central banks and other monetary institutions abroad. The Bank is named as agent in many loan agreements in foreign currency contracted by the Government and by other borrowers in the public sector, and is responsible for seeing that the proceeds of the loans are properly received and that the loans are duly serviced and repaid. The Bank is also responsible for carrying out transactions with the International Monetary Fund and other international organisations.⁽¹⁾ Discharging these various functions may also require transactions in the foreign exchange market.

The Bank also manages, on behalf of the Government, the Exchange Equalisation Account (EEA) in which the official foreign exchange reserves are vested. In this role, it may also enter the market from time to time in order to influence the rate at which sterling is trading.⁽²⁾ In the past, such intervention has sometimes been very heavy, notably before June 1972 when for most of the time sterling was permitted to move within only a narrow range against the US dollar, but also more recently, especially in 1976, when sterling fell heavily, and again in 1977 when an attempt was made to hold down the rise in the rate. (That attempt was abandoned because official sales of sterling eventually added too much to the money supply.) Recently, intervention has been largely confined to smoothing out fluctuations in the rate—for example, selling sterling when it is in strong demand, with the aim of buying it back at a profit quite soon, perhaps even the same day. Such operations help to lessen short-term fluctuations without affecting the overall trend.

The Bank usually intervenes covertly through the agency of commercial banks (and may continue to deal in other markets outside normal trading hours in London). These banks will handle the Bank's business with the discretion and confidentiality which they would give any other customer. Occasionally, however, the Bank wants its presence to be more widely known, and in these circumstances it gives the broking system exchange rates at which it will deal in stated amounts in the same way as would any price-making bank. It would be a breach of market practice for the broker to publicise the Bank's presence, but he must divulge it to the counterparties with whom the Bank deals, and they may be numerous. In these circumstances, it will become widely known that the Bank is in the market.

The Bank's operations are not confined to the spot market. In the years before the November 1967 devaluation, official purchases of forward sterling were very large. Following the decision in 1964 not to devalue sterling, the Bank

bought sterling forward, relying on the process described earlier to provide support for the spot rate, until economic policies took effect, without any call on the small stock of reserves held at the time. In the event, however, sterling was devalued; the EEA incurred losses on its forward transactions, and in retrospect it seems likely that the volume of the Bank's forward purchases far exceeded the spot reserves saved, since the tactic of forward support, whereby others could sell to the Bank sterling which they did not own and did not need to borrow, encouraged heavier sales.

When sterling came under pressure in the 1970s, it became the occasional practice for the Bank to sell sterling forward (rather than buy it), though with an offsetting spot purchase (i.e. to do swaps). The effect of borrowing sterling in the exchange market in this manner was to widen the difference between spot and forward rates, increasing simultaneously the cost of closing out speculative positions by a spot purchase and the cost of continuing them. If others had responded to the greater difference between spot and forward rates by selling sterling spot and buying it back forward, the Bank's work would simply have been undone. However, exchange control prevented UK non-bank residents (and, outside rather tight limits, UK banks) from responding, and in general did not allow non-residents to borrow sterling in London. Non-residents could take advantage as their sterling deposits matured, and as fast as they could arrange to sell marketable sterling assets, but the tactic proved briefly useful on critical occasions.

It is sometimes profitable for the EEA to lend sterling on the swap, buying dollars spot and selling them back forward, to relieve a shortage of sterling in the money market (or in other circumstances to borrow sterling, to absorb a surplus). Such transactions are occasionally undertaken where they help the joint objectives of smoothing fluctuations in the exchange rate and domestic money-market management.

Finally, in some circumstances, the EEA will help the banks to absorb long-term forward sales of dollars and deutschmarks arising from export sales guaranteed by the Export Credits Guarantee Department.

. . . and its supervisory role

The Bank of England has taken a close interest in market structure and practice and in standards of conduct in the market at least since the late 1930s. Accordingly, the Bank encouraged the formation among the banks of a committee to deal with foreign exchange matters of common interest, which has now developed into the Foreign Exchange Committee of the British Bankers' Association. It also encouraged the formation of a brokers' association, which developed into the present Foreign Exchange and Currency

(1) Including the European Monetary Co-operation Fund, with which 20% of the gold and dollars in the reserves are deposited. However, since sterling does not participate in the exchange rate mechanism of the European Monetary System (EMS), the Bank is not obliged to engage in foreign exchange transactions on this account. (See the June 1979 *Bulletin* for an account of intervention arrangements in the EMS.)

(2) The operation of the EEA is broadly as was described in an article in the December 1968 *Bulletin*, page 377.

Deposit Brokers' Association, and has instituted a system of recognition for brokers wishing to operate in the London market. In 1973, the Bank established a Joint Standing Committee as a regular forum for communication between banks and brokers, providing the chairman and the secretary.

Since the markets re-opened after the war, the Bank has monitored the foreign exchange positions of banks in London. Under exchange control the object was primarily to conserve the official foreign exchange reserves; the formal

limits on the banks' positions accordingly related to their positions in all foreign currencies against sterling. The limits, however, also had a prudential aspect; and the Bank could also monitor each bank's position in individual foreign currencies from other statistics which banks were obliged to provide.⁽¹⁾

Although exchange control has now ended, the Bank—for prudential purposes—still wishes to monitor the foreign exchange positions of the banks, and a consultative paper on future arrangements has been circulated.

(1) Exchange control limits on the banks' foreign currency positions were explained in the December 1975 *Bulletin*, page 355.

Appendix

Interest rates, the link between spot and forward exchange rates, and 'technical' influences

This appendix explains in more detail the relationship between spot and forward rates for different periods and differences in interest rates on assets denominated in the two currencies being exchanged. It is convenient to start with the rate for a foreign exchange transaction for settlement 'today', and then to consider why the rate for settlement 'tomorrow', the spot rate (for settlement two working days hence), and forward rates for settlement further ahead, will all generally differ from it. This involves a brief explanation of so-called 'technical' influences on rates.

Participants in the foreign exchange market contract to exchange bank deposits. In general, interest rates in different currencies will vary, so that a typical transaction will involve the exchange of a bank deposit yielding more or less than another one. Thus if interest rates on sterling are higher than on dollars, dollars will be slightly more expensive (or sterling cheaper) if settlement is tomorrow instead of today, because the buyer of dollars earns the higher rate of interest on sterling for an extra day; they will be more expensive again if settlement is spot (in two days' time); and yet more expensive if settlement is in a month's time.

An example may make this clearer. Here, the difference between interest rates is assumed to be the same for all periods. Suppose that the rate at which sterling can be sold for settlement today ('value today') is \$2.4000 per £1. Then if the day-to-day interest rate on sterling bank deposits is 16% per annum and on dollar bank deposits 10% per annum, sterling sold for settlement tomorrow will be $(0.06 \times 1/365 \times 2.4000)$ points—about 4 points—cheaper, i.e. 2.3996 (a point being one hundredth of a cent). For settlement two days hence sterling will be about 8 points cheaper (2.3992), and, for settlement in three months' time, about $(0.06 \times 91/365 \times 2.4000)$ points—360 points—cheaper i.e. 2.3640. The rate for settlement a year ahead will be around 2.2556. Thus interest rates on the currencies concerned influence exchange rates for different settlement dates.

For similar reasons, exchange rates also vary from day to day in the week, independently of underlying influences on the market. The settlement date of any foreign exchange transaction must be a working day in both centres in which funds are transferred; so spot deals are always settled two *working* days hence. But, as bank deposits earn interest over weekends and

bank holidays, the spot rate will vary during the week. Thus, assuming higher interest rates in London, spot dollars are more expensive on a Thursday than on a Wednesday, because the buyer will not have to pay for them until Monday and so will keep his higher-yielding sterling for an extra two days over the weekend. The dollars would be even more expensive if the following Monday happened to be a holiday in London or New York.

So far, it has been assumed that the sterling which has been sold and the dollars which have been bought respectively cease and start to earn interest at the same time. When sterling is bought, it earns interest from the day on which the bank account is credited. This is the case with dollars, too, if the bank at which the buyer of dollars is paid receives dollars simultaneously on its own account with a Federal Reserve bank. The buyer of dollars is then said to have bought 'Federal' funds. His bank will pay interest from the day the dollars are credited to his account, or he can pay them away the same day if he wishes. However, dollar rates quoted without qualification are not for Federal funds, but for 'clearing house' funds—where the commercial bank in the United States with which the buyer of dollars places the proceeds of his purchase itself receives dollars on its clearing house account. This account cannot be drawn on until the following working day, and the buyer of dollars earns no interest until then.⁽¹⁾ Clearing house dollars are therefore cheaper to buy than Federal funds, to compensate for the loss of interest. The exact difference depends on the day-to-day interest rate in New York, and on the proximity of the next working day. With dollar interest rates at 10% per annum, and no intervening public holidays, spot clearing house dollars will be about 7 points cheaper than spot Federal funds dollars on a Tuesday (for settlement on Thursday to earn interest from Friday); but on a Wednesday they will be 21 points cheaper, to compensate for the loss of interest until the following Monday.

Similar considerations affect day-to-day movements in interest rates on deposits and loans in clearing house dollars (for example, euro-dollar rates, unless they are stated to be for Federal funds), and accordingly influence swap margins.

(1) There is a proposal that the New York clearing house should move to same-day clearing in 1981.