

# International Finance

# 10

## **Unit Highlights:**

- ® International Finance and Its Features.
- ® Short term Investment Decisions.
- ® Foreign Investment.
- ® International Borrowing Decision.
- ® The Interest Rate Parity Theorem.
- ® International Aspects of Long-Term Financing.

® Organization of International Banking.

## Lesson-1 : International Finance

### Lesson Objectives

After studying this lesson, you will be able to:

- ® define International Finance;
- ® explain the subject matter of international finance;
- ® describe different types of risks in international transactions;
- ® define forward premium and discount on a currency and
- ® understand the concepts of 'currency future' and 'currency options'.

In a tautological way, one can say that international finance deals with finance in an international setting. Think of the camera that you have purchased yesterday from the nearby departmental store. You never cared to know where it was manufactured. Later you discover that it was made in Japan. If you think carefully you will easily convince yourself that from the manufacture to the final sale various persons and institutions had been involved in international investments and movements of money along a tortuous payment network.

A study of the issues and problems surrounding receipts and payments that arise in connections with the buying and selling of goods, services, and financial assets between countries with distinct national currencies and economic policies is the subject of international finance. Events far away from a country's frontiers such as the fall of a government through election, or a revolution, or a rise in the price of an important fuel are apt to send their ripple effects across the national and international financial centres. Money and capital markets are so closely interrelated and integrated now-a-days that it is impossible to study one ignoring others.

A business manager can hardly function effectively in an international setting without being properly informed about developments in the field of international money and capital markets. He must know how his firm will be affected by international events so that he can take steps to insulate his enterprise from their harmful effects or to take advantages of them. Among these events are changes in exchange rates, inflation rates and national incomes, not to mention the important changes in international political environment. These variables are inextricably linked and often change in unpredictable ways. To keep abreast of them, to analyze and to understand them pose constant challenges to the financial management of any internationally oriented firm.

Foreign exchange is the key variable in international finance. In unit 6, we have discussed in general terms how the rate of exchange is determined under the fixed as well as flexible exchange rate regimes and what changes in the foreign exchange mean to various participants in the foreign exchange market. We have also briefly dealt with how persons and institutions facing a foreign exchange risk might try to avoid it through various devices. And in Unit -9 we have examined the reasons why considerations of portfolio management and adjustment induce firms and institutions to engage in short- and long- term borrowing and lending operations.

International transactions involving purchase and sale of goods, services and financial assets give rise to receipts and payments. International finance studies the issues and problems related to these receipts and payments.

In this unit, we look more closely at how the international financial markets operate, what kinds of problems the participants face and how they deal with them. This we propose to do in two stages. First, we discuss the problems of when and why individuals and firms prefer to invest their funds abroad or borrow from foreign countries. Here the problems are those of short-term money market financing. Finally, we take up the problem related to long-term financing decisions involving international capital markets. The issues here are qualitatively different from those of short-term money market financing mainly for two reasons : (a) investors borrowers in long- term securities market cannot deal with the problems of exchange rate fluctuations by the simple expedient of forward cover, and (b) the regulations imposed by the foreign governments on equity positions taken by non-residents may be more stringent than in the case of short-term capital flows.

### Types of Risk

Since international involve foreign currencies, the transactors inevitably face potential foreign exchange risks.

Any individual or institution making a transaction involving a foreign currency inevitably faces a potential foreign exchange risk. The values of foreign currency denominated assets and liabilities must be translated into the domestic currency for purposes of computing domestic taxes and drawing up financial statements. For example, suppose that a US resident has a certain sterling balance at a UK bank which is to be converted into US dollars for accounting purposes. Since the exchange rate fluctuates, the dollar value of the sterling balance will fluctuate too. In general, any uncertainty about the exchange rate at the time of translation will lead to uncertain dollar values of existing assets and liabilities in US account books. This uncertainty gives rise to what is known as translation risk. Related to this is the so-called transaction risk which arises when transactions occur involving foreign currency assets and liabilities ( e.g. when assets are actually sold or liabilities repaid).

Translation and transactions risks are limited to amounts that appear in the book of accounts. But there is another kind of risk to which all those whose foreign incomes have not yet been received or dues have not been paid are always exposed (e.g. exporters and importers). For example, a US exporter may not have any foreign currency denominated assets or liabilities (and have no translation or transaction risk), and yet his sales to U.K. may get a boost if there is a fall in the value of the pound sterling (against dollar), because a depreciation of the pound sterling will make US goods relatively cheaper in U.K. markets (in terms of pounds). On the other hand, a British importer's profitability may be adversely affected by a depreciation of the pound. This kind of risk which is independent of any foreign currency demoninated assets and liabilities is known as 'economic risk' and is said to result from economic exposure (such as exporting and importing).

In the international environment, a firm faces political risks (e.g. expropriation) too.

Foreign exchange risks are only a part of the additional risk that a firm faces in an international environment. A more deadly risk is associated with expropriation, confiscation or destruction of property during a war or revolution and so on. As with foreign exchange risk, there are devices by which potential political risks can be averted or reduced. For instance, the firm can buy an insurance policy against these odds; it can borrow from the markets in which investments are to occur (to discourage expropriation); it can engage in a joint-venture, or it can hold back expertise.

### Forward Premium and Discount

We have mentioned in Unit-6 that the foreign exchange risk can be avoided by engaging in forward exchange transactions. It may be recalled that a forward exchange rate is the rate that is contracted today for the delivery of a currency at a specified future date at a price agreed upon today. On the other hand, the spot rate is the price of a unit of foreign currency at a particular point in time. Needless to say, the future rate will usually differ from the spot rate.

In forward transactions, a currency may be at a premium or at a discount. Let  $F_n$  ( $\$/\pounds$ ) be the n-year forward exchange rate of dollars to pounds. More generally,  $F_{(i/j)}$  is the n-year forward rate of currency i to currency j. If  $F_{1/4}(\$/\pounds) = 1.89$ , it

means that the price of a pound agreed upon today but to be delivered three months later (one quarter) is \$ 1.89. We can define premium (discount) as follows.

$$\text{Premium/ Discount} = \frac{F_n(\$/\pounds) - S(\$/\pounds)}{n S(\$/\pounds)}$$

where  $S(\$/\pounds)$  is the spot price of a pound in terms of dollar. We have divided the difference between the forward and spot rates by n (in addition to S) so as to have the premium / discount expressed on an annual basis (the way the interest rates are quoted). Let us suppose that  $F_2(\$/\pounds) = 2.25$  and  $S(\$/\pounds) = 1.89$ ; then

$$\text{Premium/Discount} = \frac{2.25 - 1.89}{2 \times 1.89} = 0.095238095$$

This is a premium on the pound because the pound costs approximately 9.5% (per annum) higher in the forward exchange market than on the spot market. Evidently, to say that the pound is at a premium is equivalent to saying that the dollar is at a discount.

Forward contracts are not always outright agreements, but often take the form of swaps. Outright agreements generally take place between bank and non-bank customers for a straight forward purchase or sale of a foreign currency. Swaps, on the other hand, may take place between banks or between a bank and a large corporation. Swaps involve two transactions and have two contracts.

A foreign exchange swap is an agreement to both buy and sell foreign exchange at pre-determined (and agreed upon) exchange rates, but buying and selling are separated in time. In many swaps, one transaction is a spot transaction, while the second is a forward transaction. Such swaps are called 'spot-forward' swaps, where the trader buys (sells) on the spot market. As a result, the original exchange is reversed. When the reversal takes place on adjacent days, the transaction is called a roll-over.

Swaps are valuable to anyone intending to invest or borrow abroad. An investor in a foreign treasury bill can sell forward the maturity value of the bill at the same time he purchases the foreign currency on the spot market. Similarly a borrower can buy forward the foreign currency needed for repayment in future and at the same time can convert the borrowed funds on the spot market. While swaps are popular with international investors and borrowers, they are not very attractive to exporters and importers because they face long delays in receiving or making payments. They generally tend to prefer outright forward purchase (importers) or forward sale (exporters).

Forward exchange transactions can help avoid foreign exchange risks.

Forward contracts often take the form of swaps in which buying and selling are separated in time.

## Currency Futures

These are also forward transactions in currencies, but have two distinguishing features. First, the contracts are relatively homogeneous which lends them the characteristics of commodity futures. The homogeneity requirement means that there are relatively few value dates. Contracts are traded in whole units such as £ 25,000 or DM 60,000. Secondly, currency futures are traded in specialized formal future exchanges (like the International Money Market (IMM) of the Chicago Mercantile Exchange) which are physical locations like stock exchanges.

Unlike the futures, forward contracts are neither very liquid, nor very marketable.

Forward exchange contracts are agreements between banks and their customers (usually other banks) which are made in informal markets. On the other hand, currency futures involve agreements between future dealers and their customers. Forward contracts can be tailor-made to meet the requirement of two counter parties, in terms of both the size of transactions and the dates of future delivery. But forward contracts are neither very liquid nor very marketable. On the other hand, the futures being standardized contracts can be easily exchanged between counter parties. Not surprisingly because of their greater flexibility, the forward contracts are favoured by most exporters and importers, and by large borrowers and lenders.

The currency market for forwards is much larger than that for futures. But despite the large differences in size, one can significantly impact on the other. This interdependence is due to the fact that when prices in the two markets differ, the arbitrageur can make profit by taking offsetting positions in these markets. For example, suppose that the 3-month forward buying price of the pound is \$ 1.8960/£, while the selling price on the same day on the Chicago IMM is \$ 1.8980. Then the arbitrageur could buy forward from a bank and sell forward on the IMM, making a profit of \$ 0.0020 per pound. But note that this arbitrage involves some risk, because the futures market requires 'maintenance', as daily contract prices vary. This partly explains why the forward and future prices may vary. But at the same time, the difference cannot be too large. Arbitrage can ensure that the sale price of the forward currency does not exceed the bid price of currency futures, and vice versa.

## Currency Options

Forward exchange contracts or currency futures must be exercised, and so they are not options.

Forward exchange contracts or currency futures must be exercised; they are not options. It is true that a currency future can be sold back to the futures exchange and that a forward contract can be offset by a reverse agreement with a bank. However, it remains true that all (outstanding) forward contracts and currency futures must be honoured (settled) by both parties on the delivery date. There is no question of allowing a party to renege on the ground that the events have not turned out to be in its favour.

The options are different. An option gives the holder the right but not the obligation to buy or sell an underlying security at a fixed price (the exercise price or the strike price) on or before a specified date (the maturity date or the expiry date). A call option gives the right to buy a security, while the put option gives the right to sell a security. For example, an American call option on the stock of an American corporation may give the holder of the option the right to buy a certain number of its shares at a given price per share (say \$ 100) before a particular date. If the market price of the share falls below the stipulated price (say, falls to \$

80) on the expiry date, the holder will not exercise his option (but if the price is \$ 120, he can exercise his option). In return for the insurance (against the possible unfavourable outcomes) provided by the option, a price (i.e. the option premium) has to be paid. Note that a European option can be exercised only on the expiry date, whereas the American option can be exercised at any time before expiry date.

A currency option allows the holder to buy or sell a currency at a stated "strike" price, if it is preferable to the spot rate. The exporters and importers can use currency options to reduce their downside risk. An importer, for example, will buy a call option (option to buy) of the currency that he needs at a stipulated exchange rate which will remain valid until the date of expiry. If the spot rate goes up before the expiry date, he can exercise his option. This means that he knows exactly the maximum amount that he will have to pay in local currency for his imports. But he may get away paying less than the maximum amount, if the spot rate falls below the stipulated rate, because in that case it is in his interest not to exercise the option. Similarly, an exporter can buy a put option (a option to sell) that gives him the right to sell a given amount of a foreign currency at a fixed rate before a stipulated date. This allows him to figure out the minimum amount in local currency that he will receive for his exports. He may, however, get more than that if the spot rate goes up in the mean time. Note that as with currency forwards, no payment is made until the option is exercised (and most options are not exercised).

Most options  
are not  
exercised.

## Questions for Review

MCQ (tick the right answer)

1. International finance deals with finance
  - a. in inter-city transactions
  - b. intra-city transactions
  - c. in an international setting
  - d. none of the above.
2. Translation risks and transaction risks are:
  - a. absolutely different
  - b. related
  - c. same
  - d. none of the above
3. Foreign exchange contracts are agreement between:
  - a. banks and their customers
  - b. two customers
  - c. future dealers and their
  - d. none of the above
4. A call option gives the right to
  - a. buy a security
  - b. sell a security
  - c. both buy and sell a security
  - d. do none of the above
5. A put option gives the right to
  - a. buy a security
  - b. sell a security
  - c. both buy and sell a security
  - d. do none of the above
6. A forward contract
  - a. can never be offset
  - b. can be offset by presenting it to the central bank
  - c. can be offset by a reverse agreement with a bank
  - d. need not be honoured.
7. If it is preferable to the spot rate, a currency option allows the holder
  - a. to buy a currency at a stated 'strike' price
  - b. to sell a currency at a stated 'strike' price
  - c. both (a) & (b)
  - d. none of the above.

## Short Questions

1. "Foreign exchange is the key variable in international finance." Explain.
2. What are translation and transaction risks? Are they different from foreign exchange risks? Elaborate.
3. In forward transactions a currency may be at a premium or at a discount. Explain what is meant by this statement. Use numerical examples to illustrate your point.
4. What is a foreign exchange swap? How is it different from a outright forward contract?

5. What are forward exchange contracts and currency futures? Is there any difference between the two? Explain.
6. Explain how the market for forwards and the market for futures can impact on each other.
7. Can you explain why most options are not exercised?

**Essay-type Questions**

1. What is international finance? Discuss.
2. Describe the different types of risks in international trade.
3. Define the following concepts:  
Forward premium; currency futures; and currency options.

## Lesson-2 : Short term and Long-term Investment and Borrowing decisions

### Lesson Objectives

After studying this lesson, you will be able to:

- Ⓡ understand the criteria for short-term investment decisions;
- Ⓡ understand when a domestic investor will invest abroad;
- Ⓡ explain interest rate parity theorem and the Fisher open condition;
- Ⓡ see why long-term borrowing and investment decision rules are different; and
- Ⓡ understand the role of inflation in causing exchange rate variations.

### Short Term Investment Decisions : Domestic vs Foreign Market

We are now in a position to develop the criteria for short term borrowing and investment decisions involving securities trading in the money markets (securities with origin term to maturity of less than a year). We take up the investment decision first.

Investment abroad faces translation and transaction risks, while investment in domestic money market instruments is free of these risks.

Suppose that a US investor has to decide whether to invest his funds abroad, when he has the option of investing in US money market instruments which mature in three months. While the former involves translation and transactions risks (referred to earlier), the latter is free of such complications. Suppose also that the annualized interest rate on US money market instruments is  $r_a$  (in percentage terms). Then for every dollar invested in US, the investor will receive, when the instrument matures, a sum of dollars equal to  $\left(1 + \frac{r_a}{4}\right)$

Where  $\frac{r_a}{4}$  gives the interest received on \$ 1.00 invested for a quarters (3 months). For example, if the rate of interest is 12% (=0.12), then \$ 1.00 will bring \$ 0.03 as interest for there months.

If the investor wants to invest in the UK money market, the first step is to convert his dollars into pound sterling. For each dollar converted at the spot rate,  $S(\$ / \pounds)$ , the investor will receive  $1/S$  pounds, if there is no transaction cost involved (from now on we will use  $S$  for  $S(\$ / \pounds)$  for the sake of brevity) Now suppose that the annualized U.K. interest rate on 3-month treasury bills is  $r_b$ . Then for every dollar invested in U.K. the investor will receive after 3 months a sum of pounds equal to

Investing abroad involves exchange risk, but it can be avoided by buying forward contracts.

$$\pounds \left[ \frac{1}{S} \left( 1 + \frac{r_b}{4} \right) \right] \dots\dots\dots(10.1)$$

For example, if  $S=\$1.90$  and  $r_b=18\% = 0.18$ , then for each dollar invested in U.K. will bring the investor

$$\pounds \left[ \frac{1}{1.90} \left( 1 + \frac{0.18}{4} \right) \right] = \pounds 0.55$$

While it is certain that the investor will receive £ 0.55 at the end of 3 months, he is not certain how much £ 0.55 will be worth in terms of dollars, because the exact amount will depend on the prevailing exchange rate (i.e. the spot rate at the date of

maturity). But as we have seen, the investor can easily get rid of this uncertainty by buying a forward contract. It will offer him a complete hedge and will unambiguously tell him how many dollars he will finally receive.

Denote the 3 month forward exchange rate by  $F_{1/4}$  (\$/£), or simply  $F_{1/4}$ . Then by multiplying (10.1) by this rate, we get the number of dollars received for each pound sold forward. The return in U.K. from a dollar invested there is then given by

$$\frac{F_{1/4}}{S} \left(1 + \frac{r_b}{4}\right) \dots\dots\dots (10.2)$$

For example if  $F_{1/4} = 1.9160$ , then £0.55 will be equivalent to \$1.9160 x 0.55=\$1.0538. Therefore, the annualized interests on \$1 invested in U.K. will be

$$4 \left( \frac{1.0538 - 1.0000}{1.0000} \right) = 0.2152 \text{ or } 21.52\%$$

It must be noted carefully that the dollar amount represented by (10.2) is a certain amount, because the purchase of spot pounds, the U.K. treasury bill and the forward sale of the U.K. pounds all take place at the same time, leaving no doubt about the number of dollars to be received on \$ 1.00 invested in U.K. after 3 months.

Now we are ready to develop the decision rule, on the assumption that the investor wants the highest possible yield on the funds invested. He should invest in the domestic (US) money market if

$$\left(1 + \frac{r_a}{4}\right) > \frac{F_{1/4}}{S} \left(1 + \frac{r_b}{4}\right)$$

When the reverse inequality holds, it is more profitable for him to invest in the U.K. money market. And when

$$\left(1 + \frac{r_a}{4}\right) = \frac{F_{1/4}}{S} \left(1 + \frac{r_b}{4}\right) \dots\dots\dots (10.3)$$

the investor would be indifferent between investing at home or abroad. In order to present these criteria from a different angle, we subtract  $\left(1 + \frac{r_b}{4}\right)$  from both side of (10.3) and after necessary manipulations, we get

$$r_a = r_b + 4 \left( \frac{F_{1/4} - S}{S} \right) \left(1 + \frac{r_b}{4}\right)$$

$$\text{or, } r_a = r_b + 4 \left[ \frac{F_{1/4} - S}{S} + \frac{F_{1/4} - S}{S} \cdot \frac{r_b}{4} \right] \dots\dots\dots (10.4)$$

Now the second term within the parenthesis on the right hand side of (10.4) will frequently be very small (being the product of two small fractions), and so we will ignore it to highlight the more important factors. Then (10.4) reduces to

If the domestic interest rate exceeds the foreign interest rate plus the annualized forward premium/discount on the foreign currency, the domestic investors will profit more by investing in the home country. If the contrary holds they will prefer foreign investment

$$r_a = r_b + 4 \left( \frac{F_{1/4} - S}{S} \right) \dots\dots\dots (10.5)$$

Using (10.5) we can reformulate the criteria for investment decision. The US investor will find it more profitable to invest in US if the domestic interest rate exceeds the foreign interest rate plus the annualized forward premium / discount on the foreign currency. In the opposite case, he would be better off investing in U.K. He will be indifferent between domestic and foreign investment , if the equality (10.5) holds. Or, to put the same point differently, we can say that to decide where to invest an investor will compare the domestic interest rate with the sum of foreign interest rate and the cost of spot-forward swap of pounds for dollars, where the swap is put on annualized terms.

**Foreign Investment : Selecting the Right Country**

In the exercise above, the US investor had to compare US returns with returns from investment in a single foreign country(U.K.). As a matter of fact, he will have to shop around and compare yields from many countries in order to come to an optimal decision. The bottom line of Table 10.1 summarizes the results of such an exercise. It shows the annualized yields from investments in several financial centres of different countries. These yields have been obtained by using the formula:

$$\text{Yield in centre } j = r_j + 4 \left( \frac{F_{1/4} - S}{S} \right) \left( \frac{1+r_j}{4} \right)$$

**Table 10.1 : Exchange and Interest Rates in Major Money Markets: Yields on Treasury Bills**

New York	London			Frankfirst*			Paris			Tokyo≠		
Ya	F <sub>b</sub>	S(\$/£)	F <sub>1/4</sub> (\$/£)	r <sub>g</sub>	S(\$/DM)	F <sub>1/4</sub> (\$/DM)	r <sub>f</sub>	S(\$/Fr)	F <sub>1/4</sub> (\$/Fr)	r <sub>j</sub>	S(\$/¥)	F <sub>1/4</sub> (\$/¥)
12.50	14.82	1.8930	1.8960	5.73	0.4535	0.4591	16.75	0.1809	0.1795	5.63	0.004372	0.004472
Convert Yields**												
12.50%	14.48%			10.74%			13.52%			14.91%		

\* German treasury bills are for 180 days

≠ Japanese treasury bills are for 60 days

\*\* Covered yield are computed as  $r_j + \left( \frac{F_{1/4} (\$/j) - S(\$/j)}{S(\$/j)} \right) \left( 1 + \frac{r_j}{4} \right)$

Lower interest rates in some financial centers may be compensated by higher forward premiums there.

**Source :** The Wall Street Journal, New York, and the Harris Bank, Weekly Review, Oct. 9,1981.

where j stands for the j-th financial center. In this example, the country with highest yield is U.K, which incidentally does not offer the highest interest rate. Also note that the yield differentials are smaller than the interest rate differentials.

This is explained by the fact that lower interest rates in some financial centers have been compensated by higher forward premiums there.

Now we can calculate the size of extra gains to the U.S. investor with a fund of \$ 8, 000, 000 to invest when he decides to invest abroad rather than at home. The total (risk-free) returns from U.K. investment is

$$\$ 8,000,000 \left(1 + \frac{.1548}{4}\right) = \$ 8,309,600$$

while the total (again risk-free by assumption) returns from domestic investment is

$$\$ 8,000,000 \left(1 + \frac{.1250}{4}\right) = \$ 8,250,600$$

Thus, the US investor would have deprived himself of \$59,600 (= \$ 8,309,600 - \$ 8,250,600) if he had invested in US rather than abroad (U.K.)

### International Borrowing Decisions

A borrower would like to borrow from a source where the cost of borrowing per unit is the lowest, other things equal. From our discussion above, it is now relatively easy to develop the criterion for borrowing at home or abroad. For each dollar borrowed at home by a US borrower, the total payment (principal plus interest) after a period of 3 months is

$$\$ \left(1 + \frac{r_a}{4}\right) \text{ -----(10.6)}$$

If the borrower had access to UK markets, for each dollar borrowed in UK, he will pay (interest plus principal)

$$£ \left[ \frac{1}{S} \left(1 + \frac{r_b}{4}\right) \right] \text{ -----(10.7)}$$

The amount of dollars that will be required to pay for each dollar borrowed in U.K. is uncertain because of the fact that S(\$/£) is subject to fluctuations. But, as we have seen, this uncertainty can be totally eliminated, if the borrower buys forward the amount of pounds given in (10.7). If  $F_{1/4}$  the 3-month forward rate, then the borrower will pay for each dollar borrowed abroad

$$\$ \left[ \frac{F_{1/4}}{S} \left(1 + \frac{r_b}{4}\right) \right] \text{ -----(10.8)}$$

Therefore, the borrower will borrow abroad if

$$\left(1 + \frac{r_a}{4}\right) > \frac{F_{1/4}}{S} \left(1 + \frac{r_b}{4}\right) \text{ ----- (10.9)}$$

He will borrow domestically, if the inequality (10.9) is reversed, and will be indifferent between domestic and foreign borrowing if (10.6) equals (10.8). Not surprisingly, the decision rules for borrowing are just the reverse of the investment decision rules.

### Borrowing and Investing for Arbitrage Profit

A large corporation or a bank can easily borrow large sums in its home money market and or in foreign money markets. As before, let us suppose that it can

A borrower would like to borrow from the cheapest source, even if it is a foreign source. In this respect, a simple comparison of domestic and foreign interest rates will not help.

borrow for 3 months in the home country (US) at the annualized rate of interest of  $r_a$ . Then for each dollar borrowed, it has to pay  $\$ \left(1 + \frac{r_a}{4}\right)$  as principal plus interest. For each dollar it transfers to UK money market, it gets  $1/S (\$/\pounds)$  pounds which, when invested at the annualized interest rate of  $r_b$ , will amount to  $\frac{1}{S} \left(1 + \frac{r_b}{4}\right)$  pounds at maturity. These can be sold forward at the rate  $F_{1/4}$  ( $\$/\pounds$ ) for sum of

$$\frac{F_1}{S} \left(1 + \frac{r_b}{4}\right)$$

Interest  
arbitrage  
activities are  
usually confined  
to large scale  
commercial  
banks.

dollars. Forward cover ensures that there is no foreign exchange risk in this investment. But more important is the fact that the firm need not have any fund of its own; it is borrowing in order to lend in an effort to make profits. It will succeed if the inequality

$$\left(1 + \frac{r_a}{4}\right) < \frac{F_1}{S} \left(1 + \frac{r_b}{4}\right)$$

holds. If the left hand side is smaller than the right hand side, the bank or the corporation will gain by borrowing at home and lending abroad. But if the reverse inequality holds, it will still be making profit by borrowing in U.K. and lending in US. This act of borrowing for the purpose lending is known as 'interest arbitrage'. If as a result of the arbitrage,

$$\left(1 + \frac{r_a}{4}\right) = \frac{F_1}{S} \left(1 + \frac{r_b}{4}\right)$$

then there will be no scope for making profit from further arbitrage. Moreover, in that case, borrowers and investor will be indifferent, other things equal, between which markets to choose for borrowing or investing. Note in this connection that interest arbitrage activities are usually limited to large scale commercial banks. This is because they can borrow and invest funds with narrow spreads and do not have to incur any significant transaction costs for buying and selling.

### The Interest-Rate Parity Theorem

We have already established [in (10.3)] that a US investor intending to invest for a 3-month period will be indifferent between the US and the U.K. money markets if

$$\left(1 + \frac{r_a}{4}\right) = \frac{F_1}{S} \left(1 + \frac{r_b}{4}\right)$$

or, in general terms, if

$$\frac{1 + nr_j}{1 + nr_i} = \frac{F_n(j/i)}{S(j/i)} \text{----- (10.10)}$$

The interest  
parity theorem  
may sound  
depressing, but  
what it says is  
not surprising.

And we have just shown that when this equality (10.10) holds, interest arbitrage is no longer profitable.

The interest parity theorem (IPT) says that (10.10) will indeed hold, and, therefore, there will be no advantage to be derived from borrowing or investing in any particular money market or from interest arbitrage.

This may sound depressing after we have invested so much effort in developing the decision criteria for investing and borrowing at home and abroad. But note that the IPT does not tell us anything contrary to what we have learnt. We learnt that if and only if the relevant inequalities hold, it will be profitable to borrow or invest in one money market or the other. What the interest parity theorem asserts is that when this process works itself out and equilibrium is reached, the covered yields in all money markets will be the same. And then the investor or the borrower will not have to worry about which market to choose, until the equality is disturbed for one reason or another. In practice, the interest parity theorem does not strictly hold, and there are several reasons why this should be true. **First**, in the actual financial markets, brokerage cost have to be incurred for buying and selling of foreign exchange and/or securities. These are known as 'transaction costs'. The presence of these costs allows some covered interest advantage to exist, but the advantage should not be larger than the cost of doing arbitrage. The transaction costs are usually small, but can become significant when covered interest yields are annualized. **Secondly**, there are political risks in foreign investments. Funds invested in a foreign country may be frozen, confiscated, or rendered inconvertible. In some countries, the political risk in the home country may be perceived to be higher than in foreign country. Then some foreign investments can take place even at a covered interest disadvantage. But generally, we would expect a premium from a foreign investment. **Thirdly**, taxes can and do vary among countries which cause interest rates to move away from parity levels. But the effect of tax differentials is small. **Finally**, covered foreign investments are less liquid because additional exchange transaction costs have to be incurred for liquidating foreign securities.

In practice, the IRP theorem does not hold strictly because of various transaction costs.

### The Speculator

One frequently found actor in the forward exchange market is the speculator. Unlike other participants-borrowers, lenders, exporters, importers- he is there to court risk in an effort to make a profit, if possible. Two traditional ways of speculation in the foreign exchange market are 'spot speculation' and 'forward speculation'.

Spot speculation is based on uncovered interest arbitrage. Let us assume that the speculator is speculating in pounds. If he wants to have £1 in a year's time, he must buy today  $\frac{1}{1+r_b}$  pounds, where  $r_b$  is the U.K. interest rate. In dollar terms,

this will amount to  $\frac{S}{1+r_b}$ , which can be thought of as the current dollar cost of having a pound a year from now. The speculator, not having funds of his own, decides to borrow this amount from the US market. If the US rate of interest is  $r_a$ (per annum), then borrowing  $\frac{S}{1+r_b}$  dollars means that he will pay at the end of the year a sum of dollars equal to  $\frac{S(1+r_a)}{(1+r_b)}$ .

Spot speculation and forward speculation are two well-known forms of speculation in the foreign exchange market.

This is the dollar cost of acquiring £1 for 1 year ahead.

Let  $s_1^*$  (\$/£) be the spot exchange rate 1 year ahead that the speculator thinks will prevail. Then he will like to borrow in the US to acquire pound one year ahead if  $S_1^* > \frac{S(1+r_a)}{(1+r_b)}$ . If his expectations are realized, he will convert the pound into dollars at the spot rate at the end of the year and pay his creditor in US. He will find that he has made a profit. But if the actual spot rate ( $S_1$ ) is less than  $\frac{S(1+r_a)}{(1+r_b)}$ , the speculator will lose money (dollar). For example, suppose that the U.K. interest rate is  $r_b=10\%$  and the US interest rate,  $r_a=15\%$  then to get £1 for 1 year ahead, the speculator must purchase today  $\text{£}0.91 \left( = \frac{1}{1+0.10} \right)$  which is equivalent to \$1.82 at the spot rate  $S=\$ 2/\text{£}$ . If he borrows \$1.82 in US, he must pay at the end of the year  $\$2.093 (=1.82 (1+.15))$ . At the end of the year he sells £1 at the spot rate then prevailing ( $S_1$ ). For instance, if  $S_1=\$3.00/\text{£}$ , then the speculator's profit per £ of speculation is  $\$0.907 (=3.000-2.093)$ . If, on the other hand, the spot rate ( $S_1$ ) happens to be less than  $\$2.093/\text{£}$ , then the speculator will lose money.

In our illustration the speculator borrowed dollars to buy pounds. This is known as going 'long' in pounds (and short in dollars). In the opposite form of spot speculation (going short in pounds, and long in dollars), the speculator will borrow in U.K. to speculate in dollars. It can be shown that if the speculator thinks

$$S_1^* (\$/\text{£}) < \frac{S(1+r_a)}{(1+r_b)},$$

then the short-pound spot speculation will be profitable. If his expectations are actually realized, he will make a profit. But if the spot value of the pound turns out to be greater, then

$$\frac{S(1+r_a)}{(1+r_b)} \text{ the short speculation will be unprofitable.}$$

### Forward Speculation

Speculation in the forward exchange rate involves comparison of the forward exchange rate and the speculator's expected future spot rate. As before, let us say that  $S_n^*$  (\$/£) is the spot exchange rate that the speculator expects  $n$  years ahead. Then ignoring any risk premia, we can say that a forward speculator will like to sell pounds for delivery  $n$  years forward, if  $F_n(\$/\text{£}) > S_n^*(\$/\text{£})$ , and that in the opposite case, he will buy pounds. We will illustrate the latter. Suppose that  $F_1=1.8800$  and that the speculator's expected spot rate 1 year ahead  $S_1^*=1.8850$ . Then the speculator will buy pounds forward. Expected profit per pound will be \$.0050, or, for £1,000,000 the profit is \$5,000.

Note that speculators need not be looked upon as villains. In the course of going long and short, the speculator can contribute a great deal towards stabilizing the foreign exchange markets, and thereby perform a useful function.

The speculators need not be looked upon as villains. They can contribute to stabilization of the foreign exchange market.

**Variations in the Exchange Rate: The Role of Inflation**

Inflation lowers the domestic purchasing power of the home currency. It also lowers the amount of foreign currency that a unit of domestic currency can buy, because the higher the rate of inflation at home, the less will a unit of foreign currency buy in the home market. It is, therefore, reasonable to assume that the rate of inflation and the rate of exchange will be related, at least in the long run. It is quite possible, however, that day-to-day variations in the exchange rates are determined by a variety of other events.

The rate of inflation and the rate of exchange are related, at least, in the long run.

**The Purchasing Power Parity (PPP) Condition**

In different locations of a domestic market, the price of a commodity should ultimately be equal, if we abstract if from transportation and related costs. If this were not true, there will be people who will buy from the market where the price is low and sell where it is high. This is what is called commodity arbitrage. As a result of this arbitrage activity, prices will be equalized across markets, and then there will be no further scope for profitable arbitrage. It has been claimed that what commodity arbitrage can do to the price of a commodity in domestic market, it can do the same to the price of a good traded internationally, if we ignore transportation costs, tariffs and other kinds of taxes. The absolute version of this idea known as the absolute purchasing power parity theory asserts that

The absolute version of the purchasing power parity cannot strictly hold for various reasons including restriction on free commodity arbitrage.

$$P_a = S(\$/\pounds) \cdot P_b \text{ ----- (10.11)}$$

where  $P_a$  and  $P_b$  are prices in US and U.K. respectively of a standard basket of wholesale goods, and  $S(\$/\pounds)$  is the spot exchange rate. For example, if  $S = 2$  and  $P_b = \pounds 10$ , then  $P_a$  must be \$20. It is easy to see that static or absolute version of the purchasing power parity (PPP) theory cannot strictly hold, because of differential shipping costs, differential tariffs on different suppliers and other restrictions on free commodity arbitrage. This deficiency has led to the formulation of a relative of "dynamic" version or the PPP theory.

**Relative Form of PPP**

Let  $S(\$/\pounds)$  be the percentage change in the spot exchange rate over a year, and  $P_a$  and  $P_b$  the annual inflation rates respectively in US and U.K. Using these notations, we can write the absolute version of PPP for two successive years:

$$P_a = S(\$/\pounds) \cdot P_b \text{ ----- (10.12)}$$

$$\text{and } P_a(1+P_a) = S[1+S] P_b (1+P_b)$$

Dividing (10.13) by (10.12), we get

$$(1+P_a) = (1+S) (1+P_b)$$

$$\text{or, } P_a - P_b = S(1+P_b) \text{----- (10.14)}$$

Equation (10.14) gives the 'relative' or 'dynamic' form of the PPP. If we assume that the foreign rate of inflation is relatively small (i.e.  $P_b$  is small), then, ignoring  $P_b$ , we can write

The relative form of PPP says that the change in the exchange rate is approximately equal to the difference between the domestic and foreign interest rates.

$$P_a - P_b = S (\$ / \pounds) \text{ ----- (10.15)}$$

which says that the change in the exchange rate is approximately equal to the difference between the inflation rates. We should not expect PPP to hold precisely within a short period of time. For example, under the fixed exchange rate system, the PPP may be upset by regulated exchange rate of the central bank, which may not allow devaluation in the face of rapid inflation. Even when the exchange rate is flexible, departures from PPP are possible. In this scenario, the exchange rate will be affected not only by the inflation rates, but also by factors such as interest rate differentials, relative growth rates of national income and important political developments. But in the long run, other factors become less important and PPP takes hold. Therefore, PPP is said to be true, if at all, only in the long run.

### Combining PPP and Interest Parity : The Fisher-open Condition

We can obtain another important relation in international finance by combining the purchasing power parity condition with a condition similar to the interest parity condition. The resulting relation is called the Fisher-open condition. The interest parity condition that is conventionally used to derive the Fisher - open condition is of the following form:

$$r_a = r_b + S^*(\$/\pounds) \quad (10.16)$$

where  $S^*$  is the expected annual rate of change in the number of dollars per pound. When a pound appreciation is expected, we have  $S^* > 0$ , and when a pound depreciation is expected, we have  $S^* < 0$ . What the 'modified' interest parity condition (10.16) says is simply this: the expected yields (or costs of borrowing) in two countries are equal if the domestic interest rate at home equals the interest rate abroad plus the annual rate of appreciation (or, minus the annual rate of depreciation) of the foreign currency.

Assuming that the relative form of PPP will also hold in the ex ante (expected) sense, we can write (10.15) as

$$P_a^* - P_b^* = S^* \quad (10.17)$$

which says that one should expect the exchange rate to change by an amount which is equal to the difference between the two expected rates of inflation (Note that an asterisk means the expected value of the variable concerned).

Now comparing (10.17) with the interest parity condition in (10.16) we notice a clear similarity.

$$P_a^* - P_b^* = S^* \quad (10.17)$$

$$r_a - r_b = S^* \quad (10.16)$$

We can now write

$$r_a - r_b = P_a^* - P_b^* \quad (10.18)$$

$$\text{or, } r_a - p_a^* = r_b - p_b^* \quad (10.19)$$

The Fisher-open condition asserts that the expected real rate of interest at home and abroad tends to get equalized.

But the nominal market rate of interest minus the expected rate of inflation is the expected 'real' rate of interest. So what (10.19) says is that the expected real rate of interest in US and in UK. will get equalized. **The relation (10.19) is known as the Fisher -open condition.**

We write below the ex ante variants of

$$\begin{aligned} \text{"interest parity"} & : r_a - r_b = S^*(\$/\pounds) \\ \text{PPP} & : P_a^* - P_b^* = S^*(\$/\pounds) \\ \text{Fisher -open} & : r_a - p_a^* = r_b - p_b^* \end{aligned}$$

We can immediately discover, that we can derive any one from the other two. Finally, note that, even through none of them holds precisely, the PPP, interest parity and the Fisher-open condition represent ways in which economies of different countries are linked.

### International Aspects of Long Term Financing

Many unique issues arise for a firm (or an individual) which wishes to engage in long-term borrowing or investment in an international setting. For one thing, the foreign exchange risk cannot usually be avoided by recourse to forward exchange market, simply because such markets do not exist for long-term loans and investments. For another the political control of foreign investment is often stricter in the long-term, not to speak of the risk of outright loss of assets through seizure or confiscation. In the long-term setting, other methods must be available for coping with the inevitable foreign exchange and political risk of foreign transactions. We first discuss the issue of debt financing and then move on to equity financing.

Forward exchange markets do not exist for long term loans and investments. So for these, the foreign exchange risk cannot be avoided by forward transactions.

#### Ordinary Bond Finance : Modified Criteria

We have seen that a firm in US would prefer to borrow abroad if

$$r_a > r_b + S^*(\$/\pounds) \quad (10.20)$$

i.e. , if the rate of interest in US is higher than the sum of interest rate in UK and the borrower's expected rate of increase in the spot price of pound over the year. If, on the other hand,

$$r_a < r_b + S^*(\$/\pounds)$$

the borrower will prefer to sell bonds in the domestic market. As an example, suppose that  $r_a = 12\%$ ,  $r_b = 16\%$  and  $S^* = -7\%$ . In such a situation,

$$r_a > r_b + S^*(\$/\pounds) \quad (\text{because } .12 > .16 - .07)$$

and therefore the borrower should sell bonds in U.K.

Note that in (10.20) we have used the expected (by the management) rate of change in the exchange rate because, as state before, forward cover is not available for the life of bonds, which could be 10 years or more. In this long

Over a long period, the final exchange rate may deviate a great deal from the initial exchange rate. This makes long-term investment decisions more complicated than the short-term ones.

period the actual rates of exchange may deviate considerably from those applied to come to a borrowing (lending) decision.

And when this happens, a large loss or a large gain may result. History is full of examples in which currencies have shown wild gyrations. One reason for this is that small yearly changes in the exchange rates (in a given direction) can add up to a mighty total in the course of a decade or so.

What all this means is that before deciding to borrow (or invest) abroad, the foreign country must offer some non-trivial advantage to compensate for the risk of foreign ventures. For example, the management may think that for borrowing abroad to be worth the risk, the foreign cost (the right hand side of (10.20) should be lower by more than a certain percentage (say, 4%). Then we have to revise the inequality (10.20) as follows:

$$r_a > r_b + S^* (\$/\pounds) + .07 \text{ ----- (10.21)}$$

If (10.21) is satisfied, then the expected borrowing cost will be sufficiently lower in U.K. to justify borrowing in that market.

As before, suppose that

$$r_a = 12\%$$

$$r_b = 16\%$$

$$S^* = -7\%$$

Now the criterion for foreign borrowing as given in (10.21) will not be satisfied, since

$$r_a < r_b + S^* + .04 \quad (\text{because } .12 < .13)$$

We see that after the addition of 7% risk premium, the decision with respect to the source of borrowing has to be reversed. The risk premium to be applied is, of course, a matter of judgment of the management. During times of greater uncertainty and potential volatility of the exchange markets, a higher premium will usually be applied to compensate for the greater risks involved.

It should be noticed that what is needed for a 'correct' decision is to compare the interest rate differential with the actual, not the expected, annual change in the exchange rate. Since the actual rate of change can only be known ex-post, the management tries to make up for this lack of knowledge at the time of decision making by applying a risk premium. The larger the risk premium, the more often is the decision likely to be correct in retrospect. But at the same time large premium will imply missing of many opportunities.

### Income in Foreign Currency

A firm may sometimes earn a steady and relatively predictable long-term income in a foreign country. For such a firm there is less risk in borrowing abroad than at home. That is especially so if the firm is such that it has sizeable foreign operations. Why? Because the foreign currency receivables could act as a basis for a negative premium on foreign borrowing.

The risk premium to be applied is largely a matter of judgment and cannot be objectively derived.

Eurobonds are not regarded as foreign bonds because the currency of their denomination is not the same as the currency of the country in which bonds are sold.

## Foreign Bonds & Eurobonds

One way of reducing borrowing costs is to issue foreign bonds. A Japanese firm might sell dollar denominated bonds in New York. Or, a Korean company may sell bonds in Germany which are denominated in German marks. Both Japanese and Korean bonds are foreign bonds. A borrower may choose to sell foreign bonds because it thinks that in this way it can take advantage of the lower cost of borrowing and also raise large funds, because foreign bonds are often popular with foreign buyers (partly because they do not have to bear the exchange risk which is borne by the issuing company)

A bond that is sold in country which do not use the currency of denomination of the bond is a Eurobond. Suppose a British or a German firm sell dollar denominated bonds outside USA (say, France). These are Eurobonds. Why are these not foreign bonds? These are not foreign bonds, because the currency of their denomination is not the same as that of the country in which the bonds are sold. Some Eurobonds are multi-currency bonds where the lender can pick up the currency of his choice.

Finally, it may be noted that some bond financing (borrowing) abroad may be dictated by the desire to insure investments abroad. If a firm's assets are seized, the firm may refuse to repay local debts and thereby reduce its losses.

## Equity Financing

A firm may buy stocks in different countries in order to form a portfolio with lower risk. Why? The degree of dependence among yields will generally vary. Risk can be reduced by holding only a portion of the wealth in any of the assets whose yields are relatively independent. This device may not give the maximum overall rate of return, because some wealth will be invested in assets, with lower expected yields. But if the investor has some degree of risk-aversion, the lower risk will compensate him for lower return.

Now yields on securities of a given country may show some independence, but they are also affected in the same general way by overall domestic activity (say, a fall in national income). As a result, the gain from diversification using domestic securities is rather limited. Across different countries, greater degrees of independence of yields on securities are to be expected, as confirmed by a number of studies. Therefore, there are more gains to be had from international diversification than from domestic diversification. The systematic (undiversifiable) risk in the internationally diversified portfolio is less than in a domestically diversified one. This, in turn, means that international diversification reduces the cost of equity capital to the firm.

A firm can form a portfolio with lower risk by buying stocks of different countries.

### Questions for Review

Multiple Choice Questions (tick the correct answer)

1. To select the right country to invest in, the investor has to shop around and compare..... from many countries.
  - a. yields
  - b. offers
  - c. assistance
  - d. imports.
2. A borrower would like to borrow from a source where the ..... per unit is the .....
  - a. profit; highest
  - b. cost of borrowing; lowest
  - c. cost of borrowing; highest
  - d. return from borrowing; highest.
3. Transaction cost is one kind of
  - a. brokerage cost
  - b. transport cost
  - c. production cost
  - d. none of the above.
4. A speculator in the forward exchange market
  - a. always earns profit
  - b. always incurs loss
  - c. never incurs loss
  - d. none of the above.
5. Inflation ..... the amount of foreign currency that a domestic currency can.....
  - a. enhance; buy
  - b. lowers; buy
  - c. justifies; afford
  - d. none of the above.

### Short Questions

1. "Investment in the domestic money market is free of transaction and translation risk." Do you agree? If not, would you say that foreign investment too involves no risk of any kind?
2. When is the domestic investor likely to profit more by investing at home than abroad? When will he come to the opposite conclusion? Explain.
3. If you find that in some large financial center interest rates are low but forward premiums are high, what would you conclude from this?
4. A simple comparison of domestic and foreign interest rates will not suffice if not interest is to decide whether to lend to or borrow from foreign countries. Do you find this agreement convincing? Why?
5. Can you explain why interest arbitrage activities are usually confined to large scale commercial banks?
6. "If the interest rate parity theorem holds, then one should not engage in interest arbitrage activities." Do you agree? Why?
7. Distinguish between spot and forward speculations in foreign exchange.

8. What does the relative version of the PPP say? Would you expect PPD to hold precisely within a short period? Why?
9. What is Fisher-Open condition? What does it asset? Does it tell you that economics of different countries are liked? How?
10. For long term borrowing and leading, the exchange risk cannot be avoided by forward exchange operations. Why?
11. What are foreign bounds and foreign bonds? Are they really different?
12. "Equity financing is an important way of reducing risks of long term leading." In what sense? Explain.

### **Essay-type Questions**

1. Explain how the decisions to invest in home or foreign market are made by an investor?
2. How does an investor select the right country to invest his money in?
3. State how international borrowing decisions are made.
4. Explain the role of inflation in changing the exchange rate.
5. Discuss the international aspects of long term financing.

## Lesson-3 : **Organization of International Banking**

### **Lesson Objectives**

After studying this lesson, you will be able to understand

- ® the logic of correspondent banking;
- ® the functions of foreign branches of banks in international finance; and
- ® the role of consortium banks arranging large loans.

Banks occupy an important place in national as well as in international finance. To facilitate international transactions banks in different countries have to maintain close ties with one another, and these ties are both formal and informal. Let's discuss these matters briefly.

### **Correspondent Banking**

Correspondent accounts facilitate international payments. On the other hand, foreign branches can perform clearing operations more quickly than correspondent banking.

Banks in different countries sometimes maintain correspondent accounts with one another, thereby setting up an informal linkage. Many banks in US maintain correspondent relationship with banks in countries in which they do not have branches. Maintaining correspondent accounts facilitate international payment and collections for customers. For example, if a US corporation wants to pay its Korean suppliers, it may ask its US bank to initiate the necessary procedures. Accordingly, the US bank would ask its correspondent bank in Korea where it holds account. The Korean bank will credit the supplier's account, while the American bank will debit the account of the American corporation. Then the two banks will settle among themselves. Correspondent banking permits banks to help their customers in international transactions without having to maintain any personal or overseas office.

### **Bank Agencies**

An agency is like a full-fledged bank, except that it does not handle deposits. It arranges loans, clear drafts and cheques and channel funds into financial markets. It may sometimes arrange loans for customers, but they deal primarily on behalf of the home office.

### **Foreign Branches**

Foreign branches are like local banks, but their director and owners are residents elsewhere. With the help of foreign branches, customers in different countries can enjoy the advantage of very quick cheque clearance, because the debit and credit operations are internal matters which can be initiated by a simple telephone call. This obviates the need for time-consuming clearing operations via correspondent banks. In some small countries, the foreign branches sometimes provide those services which only large banks can provide, but cannot be provided by relatively small local banks. Many governments restrict by law the opening of foreign branches in their countries, mainly to protect local banks from aggressive foreign competition.

### **Foreign Subsidiaries and Affiliates**

A foreign branch is part of the parent organization incorporated in a foreign country. A foreign subsidiary, on the other hand, is locally incorporated, but owned partly or wholly, by a foreign parent. Foreign subsidiaries perform almost all functions that a local bank performs. Foreign affiliates are, like foreign subsidiaries, locally incorporated, but they are joint ventures. No individual foreigner has control over it, though a group of such owners may have such control.

Foreign affiliates, though locally incorporated, are joint ventures.

### **Consortium Banks**

These are joint ventures of large commercial banks from numerous countries. They are primarily concerned with investment, arranging loans and underwriting stocks and bonds. They do not take deposits and deal with large corporation or perhaps governments. They also participate in takeovers and mergers.

## Questions for Review

### Multiple Choice Questions (tick the correct answer)

1. Correspondent banking is an —— between the banks of different countries:
  - a. formal linkage
  - b. informal linkage
  - c. agreement (formal)
  - d. none of the above.
2. Foreign branches are like ——
  - a. local banks
  - b. an affiliated agency
  - c. an exchange market
  - d. none of the above.
3. Foreign affiliates are:
  - a. joint ventures
  - b. not like foreign subsidiaries
  - c. controlled by an individual foreigner
  - d. none of the above.
4. Consortium banks-----
  - a. are not concerned with investment
  - b. do not take deposits
  - c. do not arrange loans
  - d. none of the above.

### Essay-type Questions

1. Discuss functions of the following in international finance:
  - a. correspondent banking
  - b. bank agencies
  - c. foreign branches
  - d. consortium banks.

### Answer key for MCQ's

Lesson-1: 1.c, 2.b, 3.a, 4.a, 5.b, 6.c, 7.c

Lesson-2:L 1.a, 2.b, 3.a, 4.d, 5.b

Lesson-3: 1.a, 2.a, 3.a, 4.b