Learning Objectives

This chapter focuses on extending our financial decision-making horizons to an international context. In particular it examines how the globalisation of business requires financial managers to consider additional factors in making financial decisions.

When you have completed this chapter you will:

- understand the impact of the globalisation of product and financial markets on the Australian economy;
- be able to read and use foreign exchange rates;
- appreciate the role of interest-rate parity and purchasing-power parity in explaining exchange-rate determination;
- be able to identify the impact of exchange-rate risk on the operations of organisations;
- appreciate the factors influencing multinational working-capital management and international financing and capital-structure decisions;
- understand the role of small and medium enterprises in developing exports.
As more and more firms conduct business activities in more than one country, financial managers need to consider additional factors in managing their foreign operations. Moreover, because of the increasing international integration of product and financial markets, most firms are subject to and are influenced by international events and global economic forces. Thus, managers of all companies must be sensitive to the international aspects of business finance.

Firms can operate internationally in various ways. In the simplest instance, a firm exports to (or imports from) a single foreign country. Other firms operate in many countries simultaneously. For example, a number of the national banks conduct business in many countries, resulting in them lending in some currencies and borrowing in others. Many manufacturing companies set up production facilities in foreign countries, selling the output back in the home country, or selling it abroad.

Some companies have more elaborate international operations. For example, a Japanese automobile company may have a plant in Australia for manufacturing engines, another plant in Japan for automatic transmissions, a third in Belgium for other components, and an assembly plant in Italy. The final product, the automobile, may be destined for all markets in Europe and Africa. This is an example of a multinational corporation (MNC).

The basic problems facing international companies differ from those facing domestic companies. Examples of additional complexities of conducting international business include the following:

1. **Multiple currencies.** Revenues may be denominated in one currency, costs in another, assets in a third, liabilities in a fourth, and share price in a fifth. Thus, the goal of maximisation of the wealth of the owners must consider changing currency values.

2. **Differing legal and political environments.** International variations exist in tax laws, depreciation allowances and other accounting practices, as well as in government regulation and control of business activity. Repatriation of profits may be a problem in certain countries.¹

3. **Differing economic and capital markets.** The extent of government regulation and control of the economy and capital markets may differ greatly across nations. For example, the ability of a company to raise different types and amounts of capital in its home financial market may be restricted.

4. **Internal management and central control.** It may be difficult to organise, evaluate and control different divisions of a company when they are separated geographically and when they operate in different environments.
GLOBALISATION

Globalisation refers to the economic interrelationship of national economies and their firms.

An illustration of globalisation is given by the growth in world trade as a percentage of world aggregate output (global gross national product (GNP)). In the early 1960s global exports and imports were about one-fifth of global aggregate output whereas today they are more than one-third and are likely to grow even further.

In addition to the significant increase in world trade in recent years, there has also been a rise in the global level of international direct and portfolio investment. Direct investment refers to investment by a company in an overseas business over which it has control, such as when it builds an off-shore manufacturing facility or purchases the majority of the shares in an overseas company. Portfolio investment involves investment overseas in financial assets with maturities greater than one year, such as foreign shares and bonds, where the investor does not have control over the management of the investments. The motivation for portfolio investment is twofold: to obtain returns higher than those obtainable in the domestic capital markets and to reduce portfolio risk through international diversification.

The increase in world trade and investment activity is also reflected in the globalisation of financial markets. For example, the globally integrated foreign-exchange markets have grown rapidly in the last twenty years.

An important point for financial management is that even a purely domestic firm that buys all its inputs and sells all its output in its home country is not immune to globalisation, nor can it totally ignore the workings of the international financial markets.

THE FOREIGN-EXCHANGE MARKET

The foreign-exchange market facilitates the exchange of currencies of different countries. The exchange rate between two currencies that is quoted on the foreign-exchange market provides a mechanism for the transfer of purchasing power from one currency to the other. An interesting feature of the foreign-exchange market is that it is not located in one physical place but comprises an international network of electronic connections (telephone, fax, telex, computer, Reuters and Telerate data display screens) between foreign-exchange dealers, brokers and customers. In Australia about 70 foreign-exchange dealers comprising banks and other finance organisations are licensed by the Reserve Bank to buy and sell foreign currencies. Foreign-exchange brokers are other organisations which act as intermediaries between the other market participants.
The foreign-exchange market operates simultaneously at two levels. At the first level, customers buy and sell foreign exchange (i.e. foreign currency) through the banks. This is called the retail segment of the foreign-exchange market. At the second level, dealers buy and sell foreign exchange from other dealers in the same country, from dealers in foreign-exchange markets located in other countries or from their large corporate clients. This is called the interbank or wholesale segment of the foreign-exchange market.

An example will illustrate the international dimension of foreign-exchange trading. An importer in Perth may buy foreign exchange (e.g. UK pounds) from its bank’s foreign-exchange section to make payment to a British supplier. The Australian bank, in turn, may purchase the foreign currency (pounds) it provides to the importer from a Singapore bank which may buy the pounds from another bank in Singapore or from a bank in London.

Because this market provides transactions in a continuous manner for a very large volume of sales and purchases, the currency markets are efficient in the sense that it is difficult to make a profit by shopping around from one dealer to another. Minute differences in the exchange-rate quotes from different dealers are quickly eliminated. Because of this arbitrage mechanism (discussed later), simultaneous quotes by different dealers in Sydney, Singapore and London are likely to be the same.

Two major types of transactions are carried out in the foreign-exchange markets: spot transactions where the currencies are exchanged at the spot rate and forward transactions where the currencies are exchanged at the forward rate.

**Spot transactions**

A typical spot transaction involves an Australian firm buying foreign currency from its bank and paying for it in Australian dollars. Another type of spot transaction occurs when an Australian firm receives foreign currency from abroad and sells the foreign currency to its bank for Australian dollars. These are both called spot transactions, because one currency is exchanged for another currency today. To allow time for the transfer of funds between the customer and the bank, the value date when the currencies are actually exchanged is two business days after the date the spot transaction is agreed to.

**Spot exchange rates** are quoted by foreign-exchange dealers to apply to spot transactions with their customers and comprise two figures. The first is the rate at which the dealer is prepared to buy one currency in exchange for another and the second is the rate at which the dealer is prepared to sell one currency in exchange for another.

Because every foreign-exchange transaction will involve two currencies, we need to know which currency is being bought and sold and for how much
of the other currency. On the foreign-exchange market in Australia, the exchange rate involving the Australian dollar which is quoted to retail customers indicates the number of units of the foreign currency the dealer is prepared to buy and sell in exchange for one unit of the AUD.

Looking at the exchange rates in the retail market of Table 20.1 we can see that the bank is prepared to buy US$0.5360 from a customer in exchange for A$1 and is prepared to sell US$0.5310 to a customer is exchange for A$1. Similarly, the exchange rate quoted between the UK pound and the AUD is the rate at which the bank is prepared to buy £stg 0.3780 from a customer in exchange for AUD 1 and is prepared to sell £stg 0.3716 to a customer in exchange for AUD 1.

You will also notice that for the US$, £stg and Euro there is a second set of exchange rate quotations. These are expressing the standard quotes as an A$ equivalent and are simply the reciprocal of the first quotes. To preserve the buy and sell relationships of the standard quotes, the A$ equivalent rates need

### TABLE 20.1
**RETAIL FOREIGN EXCHANGE RATES**

<table>
<thead>
<tr>
<th>AUSTRALIA DOLLAR</th>
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<td>RETAIL MARKET</td>
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<td>BUY/SELL</td>
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| United States, dollar | 0.5360/0.5310 | N Zealand, dollar | 1.2275/1.219 |
| UK, pound | 0.3780/0.3716 | Norway, krone | 5.0528/4.965 |
| Canada, dollar | 1.0174/0.9997 | Solomon Is, dollar | 2.4516/2.371 |
| United States, dollar | 1.8657/1.8832 | Norway, krone | 5.0528/4.965 |
| $Aust equivalent | 1.2275/1.219 | £stg 0.3780 | 0.3716 |
| Europe, euro | 0.5670/0.5499 | Philippines, peso | 0.3780/0.3716 |
| $Aust equivalent | 1.7636/1.8185 | Saudi Arabia, riyal | 2.7737/2.705 |
| Brunei, dollar | 1.1123/1.0930 | Singapore, dollar | 1.1142/1.094 |
| Denmark, kroner | 4.5622/4.4828 | S Africa, rand | 2.6539/2.595 |
| Fiji, dollar | 1.0763/1.0459 | Sri Lanka, rupee | 36.26/35.51 |
| Fr Pacific, franc | 72.25/70.31 | Sweden, krona | 5.8104/5.710 |
| Hong Kong, dollar | 5.7108/5.6145 | Switzerland, franc | 0.9625/0.945 |
| India, rupee | 23.003/21.893 | Thailand, baht | 18.53/18.14 |
| Indonesia, rupiah | On App. | Tonga, pa‘anga | 0.9668/0.921 |
| Japan, yen | 73.84/72.54 | Vanuatu, vatu | 84.92/82.78 |
| Malaysia, ringgit | On App. | W Samoa, tala | 1.8547/1.768 |
| Malta, pound | 0.2779/0.269 | Gold - 1 oz | 506.74/518.8 |

On App. = On Application
to be read as the number of A$ that the bank is prepared to exchange to buy or sell one unit of the foreign currency. For example, with the USD the bank is advising that it will pay A$1.8657 to a customer in exchange for (the bank buying) US$1 and the bank will take from a customer A$1.8832 in exchange for (the bank selling) US$1.

Let us now put these exchange rates to use with some examples.

**EXAMPLE 20.1**

You are about to travel to both the United States and the United Kingdom for two months holiday and you want to obtain US$2,000 and £stg 1,000 before you go. Using the retail rates quoted in Table 20.1, how many A$ will this cost you?

The purchase by you of the foreign currencies will require the bank to sell these foreign currencies to you and consequently the quoted sell rates will be used to determine the amounts to be exchanged. We can use either the standard exchange rate quote or the A$ equivalent quote:

1. **Standard quote.** The right-hand rate, detailing the rate at which the bank will sell foreign currencies, will apply to your spot transaction:
   - **US$:** The bank is quoting it will sell to you US$0.5310 for A$1. Therefore, to obtain US$2,000 you will have to pay to the bank $2,000/0.5310 = A$3,766.
   - **£stg:** The bank is quoting it will sell to you £stg 0.3716 for A$1. Therefore, to obtain £stg 1,000 you will have to pay to the bank £1,000/0.3716 = A$2,691.

2. **A$ equivalent quote.** The right-hand rate, detailing the rate at which the bank will sell one unit of the foreign currency to you, will apply to your transaction:
   - **US$:** The bank is quoting it will sell to you US$1 for A$1.8832. Therefore, to obtain US$2,000 you will have to pay to the bank 2,000 × 1.8832 = A$3,766.
   - **£stg:** The bank is quoting it will sell to you £stg 1 for A$2.6910. Therefore, to obtain £stg 1,000 you will have to pay to the bank 1,000 × 2.6910 = A$2,691.
EXAMPLE 20.2

An Australian business must pay 1,000 Euros to a German firm. How many dollars will be required for this transaction using the rates from Table 20.1?

As the business wants to buy Euro, the bank will have to sell Euro and it is quoting to sell Euro at a rate of 0.5499 for A$1. Therefore, to buy 1,000 the business would have to pay 1,000/0.5499 = A$1,818 to the bank.

EXAMPLE 20.3

An Australian business has received 1 million Yen which it wants to exchange for A$. How many A$ will the business receive at the rates quoted in Table 20.1?

As the business wants to sell Yen, the bank will have to buy Yen and it is quoting a buy Yen rate of Yen 73.84/A$. Therefore, to sell its Yen 1 million, the business would receive 1,000,000/73.84 = A$13,542.79 from the bank.

Exchange rates and arbitrage

The foreign-exchange market is international, with dealers around the world linked electronically with each other. Therefore, at any point in time the exchange rate quoted in different countries for the same currencies should be the same. If the exchange-rate quotations were out of line, then an enterprising trader could make a profit by buying in the market where the currency was cheaper and selling it in the other. Such a buy-and-sell strategy would involve a zero net investment of funds with no risk, yet would provide a sure profit. A person who undertakes such activity is called an arbitrageur, and the process of buying and selling in more than one market to make a riskless profit is called arbitrage. Spot exchange markets are said to be efficient in the sense that arbitrage opportunities do not persist for any length of time. That is, the exchange rates between currencies quoted in two different markets are quickly brought in line, aided by the arbitrage process. Simple arbitrage eliminates exchange-rate differentials across the markets for a single currency. Triangular arbitrage does the same across the markets for all currencies. Covered interest arbitrage eliminates differentials across currency and interest-rate markets.

Bid and ask (offer) rates

As we have seen above, each exchange-rate quotation has two components, the buy rate and the sell rate. In foreign-exchange market terminology these are called the bid and ask rates respectively. Therefore, with our examples, the bid rate is the rate at which the dealer buys the foreign currency from the customer. The ask rate is the rate at which the dealer “asks” the customer to pay in home
currency for foreign currency sold by the dealer. The ask rate is also known as the **offer rate**.

From the buy/sell (bid/ask) rates in Table 20.1 we can see that the bank buys more foreign currency from a customer per A$ than it sells to a customer. The difference is known as the **bid-ask spread**. When there is a large volume of transactions exchanging two currencies and the trading is continuous, the bid-ask spread is small and can be less than 0.5% of the spot rate for the major currencies. The spread is much higher for infrequently traded currencies. For example, looking at the rates quoted in Table 20.1, we can see that for the US$/A$1 rate the spread is equal to \(0.5360 - 0.5310 = \text{US} \$0.005/\text{A}\$1\), which is approximately 0.9% of the spot rate, whereas for the Indian rupee the spread is \(23.003 - 21.893 = \text{Rs} \ 1.11/\text{A}\$1\), which is approximately 5.0% of the spot rate. The spread exists as a margin to compensate the banks for holding the risky foreign currency and for providing the service of exchanging currencies.

**Cross rates**

The listing of the retail market exchange rates in Table 20.1 in each case involves the Australian dollar as one of the currencies. What happens if you want a rate to exchange two other currencies? For example, you might have come back from your overseas trip with US$1,000 and you want to exchange it to New Zealand dollars. At what rate would the banks effect this exchange? This rate is called a **cross rate** and is derived from the exchange rates between the two currencies concerned and a common third currency. In this case we could use the US$/A$1 and NZ$/A$1 rates to calculate a US$/NZ$ cross rate.

In practice, this example’s calculation would not be done because in the foreign-exchange market every currency has a primary exchange rate quotation which is its rate against the US$ (e.g. US$/NZ$, US$/A$). Then the exchange rates between every other pair of currencies that doesn’t include the US$ are calculated as cross rates. Therefore in Table 20.1 the US$/A$ exchange rate is the primary exchange rate for A$ and all the other rates that are quoted (which don’t include the US$) are in fact cross rates.

**Forward exchange contract**

A **forward exchange contract** is an agreement between a customer and a foreign-exchange dealer which requires delivery, at a specified future date after the spot date, of one currency for a specified amount of another currency. The exchange rate for the forward transaction is called the **forward exchange rate** and is agreed today; with the actual payment of one currency and the receipt of the other currency taking place at the future date specified in the contract. For example, a 30-day forward contract entered into on March 1 will require delivery of the currencies on March 31. Note that the forward rate quoted today is not likely to be the same as the spot rate that will apply in the future,
as that spot rate will depend on the market conditions at that time and it may be more or less than today’s forward rate. Therefore, we can identify exchange-rate risk as the risk that tomorrow’s spot exchange rate will differ from today’s spot rate and that there is uncertainty as to what tomorrow’s spot rate will be.

Why would you use a forward exchange contract? Suppose you are an Australian exporter who is going to receive a payment denominated in pounds from a British customer in 30 days. If you wait for 30 days and exchange the pounds at the spot rate, you will receive an Australian dollar amount reflecting the exchange rate 30 days hence (i.e. the future spot rate). As of today, you have no way of knowing the exact dollar value of your future pound receipts. Consequently, you cannot make precise plans about the use of these dollars. On the other hand, if you agree today to a forward contract in which the rate of exchange to apply in 30 days time is known, then you know the exact dollar value of your future receipts, and you can make precise plans concerning their use. The forward contract, therefore, can reduce your uncertainty about the future, so a major advantage and use of the forward market is that of risk reduction.

Forward contracts are usually quoted for monthly periods (e.g. 1 month, 2 months etc.). A contract for any intermediate value date can be obtained, usually with the payment of a small premium.

Forward rates, are quoted as a margin to be added to or subtracted from the current spot rate.

Examples of exchange-rate risk
The concept of exchange-rate risk introduced above applies to all types of international businesses. The measurement of these risks, and the type of risk, may differ among businesses. Let us see how exchange risk affects international trade contracts, international portfolio investments, and direct foreign investments.

Exchange-rate risk in international trade contracts
The idea of exchange-rate risk in trade contracts is illustrated in the following situations.

Case I:
A Brisbane new-car dealer contracts to buy cars from the manufacturer in Melbourne. The dealer agrees to pay A$10,500 on delivery of each car, which is expected to be 30 days from today. The cars are delivered on the 30th day and the distributor pays $10,500 each. Notice that, from the day this contract was written until the day the cars are delivered, the buyer knew the exact Australian dollar amount of the liability. There was, in other words, no uncertainty about the value of the contract.

Case II:
A Perth new-car dealer enters into a contract with a British supplier to buy cars
from the United Kingdom for 5,500 pounds each. The amount is payable on the delivery of the cars, 30 days from today. From Figure 20.1, we see the range of spot rates that we believe can occur on the date the contract has to be paid. On the 30th day, the Australian importer will pay some amount in the range of A$13,750 (5,500 × 2.500) to A$14,850 (5,500 × 2.700) for each car. Today, the Australian firm is not certain what its future dollar outflow will be 30 days hence. That is, the Australian dollar value of the contract is uncertain.

These two examples help illustrate the idea of foreign-exchange risk in international trade contracts. In the domestic trade contract (Case I), the exact dollar amount of the future dollar payment is known today with certainty. In the case of the international trade contract (Case II), where the contract is written in the foreign currency, the exact dollar amount of the contract is not known. The variability of the future spot exchange rate induces variability in the future dollar cash flow.

Exchange-rate risk exists when the contract is written in terms of the foreign currency, that is, denominated in a foreign currency. There is no direct exchange risk if the international trade contract is written in terms of the domestic currency. In Case II, if the contract were written in Australian dollars, the Australian importer would face no direct exchange risk, whereas the British exporter would bear all the exchange risk because the British exporter’s future pound receipts would be uncertain. That is, the British exporter would receive payment in Australian dollars, which would have to be converted into pounds at an unknown (as of today) pound-Australian dollar exchange rate. In international trade contracts of the type discussed here, at least one of the two parties to the contract always bears the exchange risk.

Certain types of international trade contracts are denominated in a third currency, different from either the importer’s or the exporter’s domestic currency. In Case II the contract might have been denominated in, say, the Euro. With a Euro contract, both importer and exporter would be subject to exchange-rate risk.

Exchange risk is not limited to two-party trade contracts; it exists also in foreign portfolio investments and direct foreign investments.

**Exchange risk in foreign portfolio investments**

Let us look at an example of exchange risk in the context of portfolio investments. An Australian investor buys shares in a German company which are listed on the German stock exchange. The exact return on the share investment is unknown. Thus, the share is a risky investment. The investment return in the holding period of, say, three months stated in Euros could be anything from –2 to +8%. In addition, the Australian dollar may be worth more or less Euros in the three-month period during which the investment is
held. The return to the Australian investor, in Australian dollars, will therefore be dependent on the return from the investment as well as the future Euro/A$1 spot exchange rate. Clearly, for the Australian investor, the foreign-exchange factor induces a greater variability in the Australian dollar rate of return. Hence, exchange-rate fluctuations may increase the riskiness of foreign investments.

**Exchange risk in direct foreign investment**

The exchange risk of a direct foreign investment (DFI) is more complicated than a portfolio investment. In a DFI the parent company invests in assets denominated in a foreign currency with the result that the balance sheet and the income statement of the foreign investment will be in terms of the foreign currency. Thus, the exchange risk concept applies to fluctuations in the home-currency value of the net assets located abroad as well as to the fluctuations in the home-currency-denominated profit stream. Exchange risk not only affects immediate profits, but it may affect the future profit stream as well.

Although exchange-rate risk can be a serious complication in international business activity, remember the principle of the risk-return trade-off. Traders and companies find numerous reasons why the returns from international transactions outweigh the risks. We will return to examining exchange-rate risk later.

**INTEREST RATE PARITY**

The convention in the foreign-exchange market is that forward rates are quoted as a margin to be added to or subtracted from current spot rates. When comparing the current spot rate with a current forward rate we can say that the currencies to be exchanged are trading at a forward discount or forward premium. For example, the Australian dollar is trading at a forward discount if the current forward rate (e.g. 30 days) has less foreign currency per A$1 than the current spot rate, and is trading at a forward premium if the current forward rate (e.g. 30 days) has more foreign currency per A$1 than the current spot rate.

We can calculate the annual percentage amount of the forward discount or premium of the home currency (e.g. A$) in relation to another currency from the respective spot and forward rates as follows:

\[
P \text{ (or } D) = \frac{F - S}{S} \times \frac{12}{n} \times 100 \quad (20-1)
\]

where

- \( n \) = number of months in the forward contract
- \( P \) = the annualised percentage premium, if \( F > S \)
- \( D \) = the annualised percentage discount if \( F < S \)
EXAMPLE 20.4

The 30-day forward Euro is selling at €0.5490 per A$1, whereas the current spot rate is €0.5499 per A$1. This difference represents a forward discount percent p.a. for A$ of:

\[
\frac{0.5490 - 0.5499}{0.5499} \times \frac{12}{1} \times 100 = -1.96\%
\]

That is, A$1 is worth 1.96% fewer Euros forward than currently at spot.

Forward premiums and discounts differ between currencies and between maturities for the some currencies because they are determined solely by the difference in the level of interest rates between the two countries, called the *interest rate differential*. In fact the value of the forward premium or discount can be theoretically computed from the *interest rate parity (IRP) theory*. This theory states that (except for the effects of small transactions costs) the forward premium or discount should be equal to the difference in the national interest rates for securities of the same risk and maturity.

Specifically, the premium or discount on a percent-per-annum basis should be equal to

\[
P \text{ (or } D \text{)} = \left( I^f - I^d \right) \left( 1 + I^d \right)^{-1}
\]

where

- \( P \) (or \( D \)) = the % p.a. (expressed as a decimal) premium (or discount) on the forward rate
- \( I^f \) = the annualised interest rate on a foreign instrument having the same maturity as the forward contract
- \( I^d \) = the annualised interest rate on a domestic instrument having the same maturity as the forward contract

To compute the forward discount/premium on, say, a 30-day forward Euro contract, we would need the 30-day treasury-bill rate in Australia and its counterpart in Europe, both expressed as annual rates.

When the interest rates are relatively low, equation (20-2) can be approximated by:

\[
P \text{ (or } D \text{)} \approx I^f - I^d
\]

Using the answer from the previous example and equation 20-2, IRP says that the 30-day interest rate in Euro must be approximately 1.96% (annualised) less than the 30-day treasury-bill rate in Australia.


**Covered interest arbitrage**

The rationale for IRP is provided by the covered interest arbitrage argument. This argument states that if the premiums (or discounts) reflected in current forward rates are not exactly equal to the current interest-rate differential (approximately equal to the right-hand side of equation 20-3), then arbitrage or riskless profits can be made.

This arbitrage would be accomplished by simultaneously borrowing in one money market, investing in another money market, and covering the exchange position in the forward-exchange market. The entire process is known as covered interest arbitrage.

So, an arbitrage profit would be possible when the forward discount from the actual exchange rates is not equal to the forward discount required from the interest-rate differential. Under such circumstances, arbitrageurs enter the market, increase the demand for the forward foreign currency, and drive up the price of the forward contract. The equilibrium price of the forward contract would then obey the IRP theory.

Therefore, if the forward contract rate quoted in the foreign-exchange market is different from the computed price, there is the potential to make arbitrage profits using the covered-interest-arbitrage routine.

The forward markets are efficient in the sense that the quotes in the market represent the “correct” price of the contract. The markets’ efficiency also implies that no profit can be made by computing the prices at every instant and buying/selling forward when they appear incorrect. Some minor deviations from the computed correct price may exist for short periods. These deviations, however, are such that after the transactions costs have been recognised, no net profit can be made. Numerous empirical studies attest to the efficiency of the forward markets.

### PURCHASING POWER PARITY

Long-run changes in spot exchange rates are influenced by international differences in inflation rates and the purchasing power of each nation’s currency. For example, the foreign exchange value of the currency of countries with high rates of inflation will tend to decline. This is because according to the purchasing power parity theory (PPP), spot exchange rates will tend to adjust in such a way that each currency will have the same purchasing power (especially in terms of internationally traded goods). Thus, if the United Kingdom experiences a 4% rate of inflation in a year that Europe experiences only a 2% rate, the UK currency (the pound) will be expected to decline in value by approximately 2% (4% – 2%) against the Euro. More accurately, according to the PPP:
\[ S_{t+1} = S_t \left( 1 + P_f \right) / \left( 1 + P_d \right)^n \]
\[ \approx S_t \left( 1 + P_f - P_d \right)^n \]

where \( S_{t+1} \) = the spot exchange rate (units of foreign currency per unit of the domestic currency) at time \( t + 1 \)
\( S_t \) = the exchange rate at time \( t \)
\( P_f \) = the foreign inflation rate
\( P_d \) = the domestic inflation rate
\( n \) = number of time periods

Thus, if the beginning value of the Euro was £0.40/€1, then a 2% inflation rate in Europe and a 4% inflation rate in the United Kingdom would mean that to purchase the same goods in 12 months would require either £0.416 (i.e. 0.40 \times 1 + 0.04) or €102 (i.e. 100 \times 1 + 0.02). According to the PPP, this would result in the expected spot exchange rate of the Euro at the end of that year (\( S_{t+1} \)) to be £0.40 \times (1.04/1.02), or £0.408. This is the rate that will convert £0.416 to €102 and thereby preserve the purchasing power of the two currencies.

**The law of one price**

Underlying the PPP relationship is the law of one price. This law is actually a proposition that, in competitive markets where there are no transportation costs or barriers to trade, the same good sold in different countries sells for the same price if all the different prices are expressed in terms of the same currency. The idea is that the “worth” (in terms of marginal utility) of a good does not depend on where it is bought or sold. Because inflation will erode the purchasing power of any currency, its exchange rate must adhere to the PPP relationship if the law of one price is to hold over time. The following example illustrates the workings of this proposition.

Given the information above, assume that today a widget costs €100.00 in Germany and £40.00 in the United Kingdom. At the current exchange rate of £0.40/€ the law of one price appears to be holding since Germans can buy British widgets for €100.00 (£40 + £0.40/€), and the British can buy German widgets for £40.00 (€100 \times £0.40/€). It is possible to determine how the exchange rate must change for the law of one price to hold in relative form— for example, over the next year. We might expect that the exchange rate will change to reflect the decline in each currency’s domestic purchasing power caused by next year’s inflation. Today we know:

\[ €100.00 = 1 \text{ widget} = £40.00 \]

At this point, it would make no difference whether Germans bought German widgets or British widgets. Given that inflation in the United Kingdom is expected to be 4%, one British widget can be expected to cost
£41.60 = (£40.00)(1 + 0.02). At the current exchange rate (£0.40/€), in one year British widgets would cost Germans €104.

\[
€104 = 1 \text{ widget} = £41.60
\]

\[
= £41.60 \div £40/€
\]

If we ignore the effects of German inflation for the moment, Germans would not buy British widgets for €104 in one year; they would buy German widgets for €100. Thus, at the current exchange rate, PPP would not hold. Germans might, however, be willing to continue spending €100 one year from now for British widgets. This could happen only if the Euro were to strengthen against the pound. If this were to occur the new exchange rate suggested by the United Kingdom inflation is:

\[
€100 = 1 \text{ widget} = £41.60
\]

\[
(£/€) = £41.60 \div €100 = £0.416/€
\]

or:

\[
(£/€) = £0.40 \times (1 + P_{UK}) = £0.40 \times 1.04
\]

Note that the terms of trade are important. Germans want the same amount of goods for the same number of Euro before and after the British inflation. After the British inflation, the Euro buys more pounds at the new exchange rate (£0.416/€1). Note also that the British will be paying £40.00 per widget in today’s pounds—all British goods will cost 4% more next year because of inflation. That is, although widgets will cost more in nominal terms next year in the United Kingdom, the real cost of widgets will be unchanged.

Now we will consider German inflation. Because the Euro’s purchasing power is expected to decline by 2% over the next year, Germans would be willing to pay €102.00 [€100 \times (1 + P_{Ger})] for a British widget in one year because this is what they would have to pay for a German widget at that time. The new exchange rate becomes the same as the PPP estimate calculated earlier.

\[
€102 = 1 \text{ widget} = £41.60
\]

\[
(£/€) = £41.60 \div €102 = £0.408/€
\]

or:

\[
(£/€) = £0.40 \times (1 + P_{UK})/ (1 + P_{Ger}) = £0.408/€
\]

**International Fisher Effect (IFE)**

According to the domestic Fisher effect (FE), nominal interest rates (i) which are observed in the financial markets reflect the expected inflation rate (r) and a real rate of return (R):
\[ 1 + i = (1 + R)(1 + r) \]

and

\[ i = R + r + rR \]

While there is mixed empirical support for the Fisher effect internationally (IFE), it is widely thought that, for the major industrial countries, the real rate, \( R \), is about 3% p.a. when a long-term period is considered. In such a case, with the previous assumption regarding inflation rates, the annual nominal interest rates in the United Kingdom and Germany would be 7.12\% \[ (1 + 0.03)(1 + 0.04) – 1 \] and 5.06\% \[ (1 + 0.03)(1 + 0.02) – 1 \] respectively.

In addition, according to Interest Rate Parity (IRP), the expected premium for the Euro forward rate should be 1.96\% \[ (0.0712 – 0.0506)/1.0506 \]. Starting with a current spot rate value of £0.40/E gives us a one-year forward rate of £0.40 (1.0196) = £0.408/E. As you may notice, this one-year forward rate is exactly the same as the PPP expected spot rate one year from today. In other words, if the real rate (\( R \)) is the same in both Germany and the United Kingdom, and expectations regarding inflation rates hold true, today’s one-year forward rate is likely to be the same as the future spot rate one year from now. Thus, in efficient markets, with rational expectations, the forward rate is an unbiased (not necessarily accurate) forecast of the future spot rate (unbiased forecast rate or UFR). These relationships between inflation and interest rates, and spot and forward rates are depicted in Figure 20.2.

Given the available information of inflation rates and interest rates, we have done our best to forecast accurately. As we will see in the next section,

**FIGURE 20.2**
**EFFICIENT FOREIGN EXCHANGE MARKET RELATIONSHIPS**

<table>
<thead>
<tr>
<th>Rates</th>
<th>Example</th>
<th>Expected inflation rates</th>
<th>Interest rates</th>
<th>Forward rates</th>
<th>PPP</th>
<th>IFE</th>
<th>IRP</th>
<th>UFR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UK</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation:</td>
<td>4%</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current spot:</td>
<td>£0.40/E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPP forecast of future spot:</td>
<td>£0.408/E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest:</td>
<td>7.12%</td>
<td>5.06%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFE-determined forward:</td>
<td>£0.408/E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UFR = unbiased forward rate; IFE = International Fisher effect; IRP = interest rate parity; PPP = purchasing power parity
such forecasts are useful in eliminating exchange risk for near-term international transactions, a process called hedging. However, there is no easy way to hedge long-term cash flows for international operations. As will be discussed in the next section and in the section on direct foreign investment, the problem is that the terms of trade can also change. That is, exchange-rate changes can go beyond PPP-induced changes, leading to real exchange-rate changes.

If PPP holds, and if there are no real exchange-rate changes, currency gains and losses from nominal exchange-rate changes will generally be offset over time by differences in relative rates of inflation between two countries, as we saw in the preceding widget example. However, real exchange-rate changes lead to real exchange gains and losses. Consider the situation of Japanese car makers exporting cars to Australia over a one-year period. Assume Australian inflation to be about 10% annually over this period with Japanese inflation at 2% p.a. The given yen/A$ spot exchange rates leads to the following situation:

<table>
<thead>
<tr>
<th>Year</th>
<th>Australian price of Japanese car</th>
<th>Actual Yen/A$</th>
<th>Yen equivalent revenue</th>
<th>Yen costs</th>
<th>Yen profit/(loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A$10,000</td>
<td>200.48</td>
<td>2,004,800</td>
<td>(1,400,000)</td>
<td>604,800</td>
</tr>
<tr>
<td></td>
<td>Inflation</td>
<td>10%</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A$11,000</td>
<td>125.41</td>
<td>1,379,510</td>
<td>(1,428,000)</td>
<td>(48,490)</td>
</tr>
</tbody>
</table>

Because the yen strengthened to Yen125.41/$A1, which is far beyond what the PPP forecast would suggest (i.e. Yen200.48 \times (1.02/1.10) = Yen185.90/A$), the yen’s value increased in real terms. To the extent that revenues were dollar-based and costs were yen-based (the cars were made in Japan), the Japanese car makers were at a competitive disadvantage relative to cars manufactured in Australia. Their costs did not change much while their yen-equivalent revenues fell by one-third. It is interesting that some Japanese car companies have created economic hedges to control for this risk, by building car plants in Australia so that they now have Australian dollar-based revenues and costs. However, they are still exposed to exchange-rate risk if they repatriate the dollars to Japan!

**EXPOSURE TO EXCHANGE-RATE RISK**

Assets or cash flows valued or denominated in a foreign currency will have different domestic currency values whenever the exchange rate changes. It can be said that the assets and cash flows are exposed to exchange-rate risk. However, a possible decline in domestic currency value of assets and cash flows may be offset by the decline in domestic currency value of liabilities that are also denominated or valued in the foreign currency. Thus, a firm would
normally be interested in its net exposed position (exposed assets minus exposed liabilities, exposed cash inflows minus exposed cash outflows) for each period in each currency.

While expected changes in exchange rates can often be included in the cost-benefit analysis relating to foreign-currency transactions, in most cases there is an unexpected component in exchange-rate changes and often the cost-benefit analysis for foreign currency assets and liabilities does not fully capture even the expected change in the exchange rate. For example, sales price increases for the products of the foreign operations may often have to be less than those necessary to fully offset exchange-rate changes because of the competitive pressures of local competitors in the foreign country. We saw this situation earlier with the example of the Japanese car exporters selling in the Australian market.

Three measures of foreign-exchange exposure that we will examine in more detail are translation exposure, transactions exposure and economic exposure. Translation exposure arises because the foreign operation of a domestic business has its accounting statements denominated in the currency of the country in which the operation is located. So, for example, with Australian parent companies, where the reporting currency for their consolidated financial statements is the Australian dollar, the assets, liabilities, revenues and expenses of the foreign operations must be translated into Australian dollars.

International transactions often require a payment to be made or received in a foreign currency in the future, so these transactions are exposed to exchange-rate risk. Economic exposure exists over the long term because the value of future cash flows in the reporting currency (e.g. the Australian dollar) from foreign operations are exposed to exchange-rate risk. Indeed, the whole stream of future cash flows is exposed and therefore their economic value to the business can be affected. The three measures of foreign-exchange exposure are now examined more closely.

**Translation exposure**

Foreign currency assets and liabilities are considered exposed if their foreign currency value is to be translated into the parent company currency at a future date using the exchange rate current at the time of translation, that is, the spot exchange rate in effect at the balance-sheet date. This is because the domestic currency value of these foreign currency assets and liabilities will change from one balance-sheet date to another if the current spot exchange rate used for the translation changes. These changes in domestic currency value will be reported as exchange gains and losses in the domestic currency financial statements.

Asset, liability and equity amounts that are translated at the historic
exchange rate—that is, the rate in effect when these items were first recognised in the company’s accounts—are not considered to be exposed. This is because the domestic currency values of these amounts will not change as a result of spot exchange-rate changes. The rate (current or historic) used to translate various accounts depends on the translation procedure used and will be specified by accounting standards.

Any translation exchange-rate gains and losses that are reported in the domestic currency accounts are *unrealised*, as the underlying foreign currency value has not changed, only its domestic currency translated value. Thus, if financial markets are efficient and managerial goals are consistent with owner wealth maximisation (and if agency and signalling costs are negligible so that investors recognise that the gains and losses are a product of accounting procedures and not cash flows), a firm should not have to use real resources for hedging against possible unrealised losses caused by translation exposure. However, if there are significant agency or information costs or if markets are not efficient (that is, if translation losses and gains raise information costs for investors, or if they endanger the firm’s ability to satisfy debt or other covenants, or if the evaluation of the firm’s managers depends on translated accounting data), a firm may indeed find it economical to hedge against translation losses or gains.

**Transactions exposure**

Foreign currency accounts receivable, foreign currency accounts payable, foreign currency fixed-price sales and foreign currency purchase contracts are examples of transactions where the foreign currency value is fixed at a time that is different from the time when the transactions produce foreign currency cash flows. Therefore, at the time these contracts are entered into there is uncertainty (due to uncertain future spot rates) as to what the domestic currency value of the resulting foreign currency cash flows will be. **Transactions exposure** identifies the amount of net contracted foreign currency for which the settlement domestic currency cash-flow amounts will vary due to changing exchange rates. A company normally must set up an additional reporting system to track transactions exposure, because several of these amounts are not recognised in the accounting books of the firm.

Translation and transaction exposure may be neutralised or hedged by a change in the asset and liability position in the foreign currency. For example, an exposed asset position (e.g. a foreign currency account receivable) can be *hedged* or *covered* by creating a liability of the same amount and maturity denominated in the foreign currency (e.g. a forward contract to *sell* the foreign currency). An exposed liability position (e.g. a foreign currency account payable) can be covered by acquiring assets of the same amount and maturity
in the foreign currency (e.g. a forward contract to buy the foreign currency). The objective is to have a zero-net-asset position in the foreign currency. This eliminates exchange risk, since the loss (gain) in the value of the liability (asset) is exactly offset by the gain (loss) in the value of the asset (liability) when the spot rate changes. Two popular forms of hedge are the money-market hedge and the forward-market hedge. In both types of hedge the amount and the duration of the asset (liability) positions are matched. Note as you read the next two subsections how IRP theory assures that each hedge provides the same cover outcome.

**Money-market hedge**

In a money-market hedge, the exposed foreign currency amount is offset by borrowing or lending in the money market. For example, consider the case of an Australian firm with a net foreign currency liability position (i.e. the amount it owes) of 3,000 Malaysian ringgit. The firm knows the exact amount of its ringgit liability in 30 days, but it does not know the liability in Australian dollars. Assume that the money-market rates in both Australia and Malaysia are 1% for lending and 1.5% for borrowing for 30 days and that the current spot rate is RM1.8695/A$. The Australian business can take the following steps to hedge:

**Step 1:** Calculate the present value of the foreign currency liability (RM 3,000) that is due in 30 days using the money-market rate applicable for the foreign country (1% in Malaysia). The present value of RM 3,000 is RM 2,970.30, computed as follows: 3000/(1 + 0.01).

**Step 2:** Exchange dollars on today’s spot market to obtain the RM 2,970.30. The dollar amount needed today is A$1,588.82 (2,970.30 / RM 1.8695).

**Step 3:** Invest RM 2,970.30 in a Malaysian one-month money-market instrument at 1%. This investment will compound to exactly RM 3,000 in one month. Thus, the future liability of RM 3,000 is covered by the RM 2,970.30 investment made today.²

Note that if the Australian business does not own today the A$ required in step 2, it can borrow A$1,588.82 from the Australian money market at the going rate of 1.5%. In 30 days the Australian business will need to repay A$1,612.65 [i.e. A$1,588.82 × (1 + 0.015)].

Assuming that the Australian business borrows the money, its management may base its decisions on the knowledge that the Malaysian goods will cost it A$1,612.65 in 30 days to pay the Malaysian business RM 3,000 ringgit. Thus, the Australian business need not wait for the future spot exchange rate to be revealed. On today’s date, the future dollar payment of $A1,612.65 for RM 3,000 is known with certainty. This certainty helps the
Australian business in making its pricing and financing decisions.

Many large businesses can hedge in the money market. To do so, the firm needs to borrow (creating a liability) in one market, lend or invest in the other money market, and use the spot exchange market on today's date. The mechanics of covering a net-asset position in the foreign currency are the exact reverse of the mechanics of covering the liability position. A net-asset position in ringgit would require the Australian business to (1) borrow in the Malaysian money market in ringgit, (2) convert to dollars on the spot exchange market, (3) invest in the Australian money market, and (4) when the net assets are converted into ringgit (i.e. when the firm receives what it is owed), pay off the ringgit loan and the interest. The cost of a money-market hedge is the cost of doing business in three different markets. Information about the three markets is needed, and analytical calculations of the type indicated here must be made.

Small businesses and infrequent traders find the cost of the money-market hedge prohibitive, owing especially to the need for information about the money market. These firms instead use the forward market hedge provided by the foreign-exchange market, which has very similar hedging benefits to the money-market hedge.

*The forward-market hedge*

The forward market provides a second possible hedging mechanism. A net-asset (liability) position is covered by a liability (asset) in the forward market. Consider again the case of the Australian firm with a liability of 3,000 ringgit that must be paid in 30 days. The firm may take the following steps to cover its liability position.

Step 1: Enter into a forward contract today with a foreign exchange bank to purchase RM 3,000 in 30 days. The 30-day forward rate quoted by the bank is RM 1.8587 per A$1.

Step 2: On the 30th day pay the bank A$1,614.03 (3,000 / RM 1.8587) and collect RM 3,000. Pay these ringgit to the Malaysian supplier.

By the use of the forward contract the Australian business knows the exact value of the future payment in dollars (A$1,614.03). The exchange risk in ringgit is totally eliminated by the net-asset position in the forward ringgit. In the case of a net-asset exposure, the steps open to the Australian firm would be the exact opposite—sell the ringgit forward, and on the future day receive and deliver the ringgit to collect the agreed-on Australian dollar amount.

The use of the forward market as a hedge against exchange risk is simple and direct. The firm directs its banker that it needs to buy or sell a foreign currency on a future date, and the banker gives a forward quote.
The forward-market hedge and the money-market hedge give an identical future dollar payment (or receipt) if the forward contracts are priced according to the interest-rate-parity theory. You may have noticed that the dollar payments in the examples of the money-market hedge and the forward-market hedge were, respectively, A$1,612.65 and A$1,614.04. Recall from our previous discussions that in efficient markets the forward contract rate does indeed conform to IRP theory. However, the numbers in our example are not identical because the forward rate used in the forward hedge is not exactly equal to the interest rates in the money-market hedge. There may be arbitrage opportunities!

**Currency option contracts**

The forward-market hedge is not adequate for some types of exposure. For example, the foreign currency asset or liability position may not be known with certainty so the forward hedge cannot be accomplished. In addition to forward-market and money-market hedges, a company can also hedge its exposure by entering into a foreign currency option contract.

These contracts give the holder the right to *choose* at or before a specified future date to buy or sell a foreign currency at an exchange rate which is set at the time the option contract is entered into. In compensation for being given this right to choose, the option holder pays an amount at the time of entering into the option contract called the *option premium*. The advantage of an option over a money-market or forward-market hedge is that the option holder can choose to exercise the option if it is to the holder's advantage to do so and can choose not to exercise the option if so desired. The cost of not exercising the option is the option premium paid at the start.

**Economic exposure**

The economic value of a firm can be defined as the present value of its future cash flows and this value may vary in response to exchange-rate changes. This change in value may be caused by a rate-change-induced decline in the level of expected cash flows and/or by an increase in the riskiness of these cash flows. *Economic exposure* refers to the overall impact of exchange-rate changes on the value of the firm and includes not only the strategic impact of changes in competitive relationships that arise from exchange-rate changes, but also the economic impact of transactions exposure and, if any, of translation exposure.

Economic exposure to exchange-rate changes depends on the competitive structure of the markets for a firm’s inputs and its outputs, and on how these markets are influenced by changes in exchange rates. This influence, in turn, depends on several economic factors, including price elasticities of the products, the degree of competition from foreign markets, as well as direct (through prices) and indirect (through incomes) impact of exchange-rate
changes on these markets. Assessing the economic exposure faced by a particular firm thus depends on the ability to understand and model the structure of the markets for its major inputs (purchases) and outputs (sales).

A company need not engage in any overseas business activity to be exposed to the economic effects of exchange rate changes because product and financial markets in most countries are related and influenced to a large extent by the same global forces. The output of a company engaged in business activity only within one country may be competing with imported products, or it may be competing for its inputs with other domestic and foreign purchasers. For example, an Australian chemical company that does no international business may nevertheless find that its profit margins depend directly on the US dollar – Australian dollar exchange rate. This is because the company uses oil as an input in its production process, and the Australian domestic price of oil is heavily influenced by the international price of oil which is denominated in US$.

In summary, although translation exposure need not be managed, it might be useful for a firm to manage its transaction and economic exposures because they affect firm value directly. In most companies, transaction exposure is generally tracked and managed. Economic exposure is difficult to define in operating terms, and very few companies manage it actively. Therefore, in most companies, economic exposure is generally considered part of the strategic planning process, rather than as a finance function.

**MULTINATIONAL WORKING-CAPITAL MANAGEMENT**

The basic principles of working-capital management for a multinational corporation (MNC) are similar to those for a domestic firm. However, tax and exchange-rate factors are additional considerations for the MNC. For an MNC with subsidiaries in many countries, the optimal decisions in the management of working capital are made by considering the company as a whole. This is because the global or centralised financial decision for an MNC is superior to the set of independent optimal decisions for the subsidiaries. This is the control problem of the MNC. If the individual subsidiaries make decisions that are best for them individually, the consolidation of such decisions may not be best for the MNC as a whole. To effect global management, sophisticated computerised models—incorporating many variables for each subsidiary—are required to provide the best overall decision for the MNC.

In this section we examine some techniques that are useful in the management of working-capital.

**Leading and lagging**

Two important risk-reduction techniques for many working-capital problems
are called **leading** and **lagging**. Sometimes, forward-market and money-market hedges are not available in some currencies to eliminate exchange risk. Under such circumstances, leading and lagging may be used to *reduce* exchange risk.

A net-asset (also known as a long) position is not desirable in a weak or potentially depreciating foreign currency as it will be worth less domestic currency in the future. If a firm has a net-asset position in such a currency, it should expedite the disposal of the asset. The firm should sell the asset earlier than it otherwise would have, or *lead*, and convert the funds into assets in a relatively stronger currency. By the same reasoning, the firm should *lag*, or delay the collection against a net-asset position in a strong currency. If the firm has a net-liability (also known as a short) position in the weak currency, then it should delay the payment against the liability, or lag, until the currency depreciates. In the case of an appreciating or strong foreign currency and a net-liability position, the firm should lead the payments—that is, reduce the liabilities earlier than it would otherwise have.

**EXAMPLE 20.5**

System Grapho Ltd has US$1 million on deposit with its bank, with one month’s notice of withdrawal. The current indicative spot rate is US$0.5300/A$1 and the company expects the value of the AUD to rise in the future by US$0.0100 per month (i.e. $US expected to depreciate). When should the company withdraw the US$ and exchange the funds for A$?

<table>
<thead>
<tr>
<th>Date</th>
<th>Expected spot rate</th>
<th>A$ value of US$1 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently</td>
<td>US$0.5300/A$1</td>
<td>A$1,886,792</td>
</tr>
<tr>
<td>1 month’s time</td>
<td>US$0.5400/A$1</td>
<td>A$1,851,852</td>
</tr>
<tr>
<td>2 months’ time</td>
<td>US$0.5500/A$1</td>
<td>A$1,818,182</td>
</tr>
<tr>
<td>3 months’ time</td>
<td>US$0.5600/A$1</td>
<td>A$1,785,714</td>
</tr>
</tbody>
</table>

As System Grapho Ltd has an asset in a foreign currency which is expected to fall in domestic currency value, it should lead and give notice of withdrawal now so that it can exchange the US$1 million of A$ as soon as possible. Given the requirement for one month’s notice of withdrawal, the earliest the company can exchange the US$ asset for A$ is in one month’s time when its expected value will be A$1,886,792. If it waits longer to withdraw the US$ then it will receive even less A$.

These principles are useful in the management of working capital of an MNC. They cannot, however, eliminate the foreign-exchange risk. When exchange rates change continuously, it is almost impossible to guess whether or when a currency will fall in value (depreciate) or rise in value (appreciate). This
is why the risk of exchange-rate changes cannot be eliminated. Nevertheless, the reduction of risk, or the increasing of gain from exchange-rate changes, via the lead and lag, is useful for cash management, accounts receivable management, and short-term liability management.

**Cash management and positioning of funds**
Positioning of funds takes on an added importance in the international context. Funds may be transferred from a subsidiary of the MNC in country A to another subsidiary in country B such that the foreign-exchange exposure and the tax liability of the MNC as a whole are minimised. It bears repeating that, owing to the *global strategy* of the MNC, the tax liability of the subsidiary in country B may be greater than it would otherwise have been, but the overall tax payment for all units of the MNC is minimised.

The transfer of funds among subsidiaries and the parent company is done by royalties, fees and transfer pricing. A *transfer price* is the price a subsidiary or a parent company charges other companies that are part of the MNC for its goods or services. A parent that wishes to transfer funds from a subsidiary in a depreciating-currency country may charge a higher price on the goods and services sold to this subsidiary by the parent or by subsidiaries from strong-currency countries. The ability to do this will however be affected by the transfer pricing tax laws of various countries.

In summary, centralised cash management of all the affiliates at the global level, achieved with the help of computer models, reduces both the overall cost of holding cash and the foreign-exchange exposure of the MNC as a whole.

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**INTERNATIONALFINANCING AND CAPITAL-STRUCTURE DECISIONS**

Access to national financial markets is regulated by each country’s government. For example, in Australia access to capital markets is governed by federal government regulations administered by the Australian Securities and Investments Commission, whereas access to Japanese capital markets is governed by regulations issued by the Japanese Ministry of Finance. Depending on government regulations, a country’s financial markets can vary from being very open to being very restricted, where access by foreigners to local finance and access by locals to overseas financial markets is limited or even prohibited. As the Australian financial markets are relatively open, Australian businesses have potential access to not only the financial markets of Australia but also to the those of many overseas countries.

With the increasing availability of interest-rate and currency swaps, a firm can raise funds in the lowest-cost maturities and currencies and swap
them into funds with the maturity and currency denomination it requires. Because of its ability to tap a larger number of financial markets, a large domestic firm may have a lower cost of capital than smaller firms limited to raising funds domestically. Also, these larger firms may be better able to avoid the problems or limitations of any one financial market, and therefore may have a more continuous access to external finance compared to a purely domestic fund raising company.

The external financial markets are predominantly centred in Europe, and they are referred to as Euromarkets. The Euromarkets consist of an active short-term money market and an intermediate-term capital market with maturities averaging about 7 to 9 years and ranging up to 15 years. The intermediate-term market consists of the Eurobond and the Syndicated Euro credit markets. Eurobonds are usually issued as unregistered bearer bonds and generally tend to have higher flotation costs but lower coupon rates compared to similar bonds issued in the home country. A Syndicated Euro credit loan is simply a large term loan that involves contributions by a number of lending banks. Most Australian banks, government finance authorities and large companies are active in the external capital markets and raise funds in a range of currencies.

In arriving at its capital-structure decisions, a company with foreign operations has to consider a number of factors. First, the capital structure of its local affiliates is influenced by local norms regarding debt and equity in that industry and in that country. Local norms for companies in the same industry can differ considerably from country to country. Second, the local affiliate capital structure must also reflect corporate attitudes towards exchange rate and political risk in that country, which would normally lead to higher levels of local debt and other local capital. Third, local affiliate capital structure must reflect home-country requirements with regard to the company’s consolidated capital structure. Finally, the optimal MNC capital structure should reflect the company’s wider access to financial markets, its ability to diversify economic and political risks, and its other advantages over domestic companies.

**DIRECT FOREIGN INVESTMENT**

An MNC often makes direct foreign investments abroad in the form of plant and equipment. The decision process for this type of investment is very similar to the capital-budgeting decision in the domestic context— with some additional twists. Most real-world capital-budgeting decisions are made with uncertain future outcomes. Recall that a capital-budgeting decision has three major components: the estimation of the future cash flows (including the initial
cost of the proposed investment), the estimation of the risk of these cash flows, and the choice of the proper discount rate to reflect the risk. We will assume that the NPV criterion is appropriate as we examine (1) the risks associated with direct foreign investment and (2) factors to be considered in making the investment decision that may be unique to the international scene.

**Risks in direct foreign investments**

Risks in domestic capital budgeting arise from two sources: business risk and financial risk. The international capital-budgeting problem incorporates these risks as well as political risk and exchange risk.

*Business risk and financial risk*

International business risk is due to the uncertainty of economic conditions in the foreign country. Thus, the Australian MNC needs to be aware of the business climate in both Australia and the foreign country. Additional business risk is due to competition from other MNCs, local businesses, and imported goods. Financial risk refers to the risks introduced into the profit stream by the firm’s capital structure. The financial risks of foreign operations are not very different from those of domestic operations.

*Political risk*

Political risk arises because the foreign subsidiary conducts its business in a political system different from that of the home country. For example, many foreign governments are less stable than the Australian government. A change in a country’s political setup frequently brings a change in policies with respect to businesses—and especially with respect to foreign businesses. An extreme change in policy might involve nationalisation or even outright expropriation of certain businesses. These are the political risks of conducting business abroad. A business with no investment in plant and equipment is less susceptible to these risks as it can more easily move its operations elsewhere.

Some examples of political risk are listed below:

- expropriation of plant and equipment without compensation;
- expropriation with minimal compensation that is below actual market value;
- non-convertibility of the subsidiary’s foreign earnings into the parent’s currency—the problem of *blocked funds*;
- substantial changes in the laws governing taxation;
- governmental controls in the foreign country regarding the sale price of the products, wages and compensation to personnel, hiring of personnel, making of transfer payments to the parent, and local borrowing;
- requirements of certain amounts of local equity participation in the business. Some governments require that the majority of the equity participation should belong to their country.
All these controls and governmental actions introduce risks to the cash flows of the investment to the parent company. These risks must be considered before making the foreign-investment decision. The MNC may decide against investing in countries with risks of expropriation. Other risks can be borne—provided that the returns from the foreign investments are high enough to compensate for them. Insurance against some types of political risks may be purchased from private insurance companies or from the Australian government Export Finance and Investment Corporation (EFIC).

**Exchange risk**

The exposure of the firm’s assets is best measured by the effects of exchange-rate changes on the firm’s future-earnings stream—that being *economic* exposure rather than *translation* exposure. For instance, changes in the exchange rate may adversely affect sales by making competing imported goods cheaper. Changes in the cost of goods sold may result if some components are imported and their price in the foreign currency changes because of exchange-rate fluctuations. The thrust of these examples is that the effect of exchange-rate changes on income-statement items should be properly measured to evaluate exchange risk. Finally, exchange risk affects the dollar-denominated profit stream of the parent company, whether or not it affects the foreign-currency profits.

If the foreign sales volume is expected to be low, the MNC may consider setting up a *sales office* in the foreign country. The product may be exported to the foreign country from production facilities in the home country or from some other foreign subsidiary. An NPV calculation may now be employed and the acceptance of this scheme is ensured, because no direct capital investment is needed. If the estimated sales levels are high enough that the establishment of a plant in the foreign country appears profitable (owing to the potential savings in the transportation costs), yet the NPV of the direct foreign investment (DFI) is negative, the MNC may consider *licensing* or *an affiliate arrangement* with a local company. The MNC provides the technology, and the interested domestic firm finances and sets up the plant. The MNC does not bear the risks of a DFI, but receives a royalty payment from the sales of the affiliate company instead.

### EXPORT AND SMALL AND MEDIUM ENTERPRISES

When discussing international aspects, especially international financing, we tend to think of large multinational companies. However, there is an important international perspective for small and medium enterprises (SMEs) in relation to exports.

Australia is part of a world-wide trend whereby SMEs are playing an
increasingly significant role in exporting to specialised world markets. For example, in the United States more than half of all exporting firms are estimated to have less than 100 employees. Over 80% of exporters in the Australian manufacturing sector and 60% of exporting firms in the service sector have been classified as being small or medium size. Big companies remain essential, but there is a fundamental shift in the way that much of the world does business and Australia is part of the global change.

**Foreign investment**

Foreign or offshore investment need not be confined to large companies. There are numerous benefits for SME exporters who receive and/or make foreign investments. This is especially important for foreign equity as there is a shortage of equity finance for SMEs in Australia.

Alliances with overseas investors and companies provide access not only to funds, but also to technology, management skills and new markets.

**Government assistance**

Many countries have external trade organisations to provide export facilitation assistance in the form of general information, market research, promotion, and detailed information such as technical requirements and export documentation. Loan guarantees, credit insurance and financial assistance for exports may be provided. Such assistance is usually available to firms of all sizes; however, some countries such as the US and Japan have specifically targeted SMEs for export assistance. Australian governments have from time to time initiated programs to facilitate small and medium-sized business export activity mostly administered by Austrade.

**HOW FINANCIAL MANAGERS USE THIS MATERIAL**

Financial managers are responsible for the firm’s financial assets, obligations and cash flows. If these are denominated in a foreign currency then financial managers need to be familiar with the material in this chapter. In particular, they need to know how to read exchange rates, assess exchange-rate risk and use the various tools available to manage that risk.

**SUMMARY**

The growth of our global economy, the increasing number of multinational corporations, and the increase in foreign trade itself underscore the importance of the study of international finance.

For most currencies, exchange rates vary in an apparently random fashion in accordance with the supply-and-demand conditions in the foreign exchange market. Important economic factors affecting the level of exchange
rates include the relative economic strengths of the countries involved, the balance-of-payments mechanism, and the countries’ monetary policies. Several important exchange-rate terms were introduced. These include the bid and ask rates, which represent the buying and selling rates of currencies quoted by foreign-exchange dealers. Cross-rates reflect the exchange rate between two foreign currencies which don’t include the US$. Finally, simple arbitrage was shown to hold in an efficient market. The efficiency of spot exchange markets implies that no arbitrage (riskless) profits can be made by buying and selling currencies in different markets.

The forward-exchange market provides a valuable service by quoting rates for the delivery of foreign currencies in the future. The home currency is said to sell at a forward premium (discount) when the home currency is worth more (less) foreign currency forward than at spot. The computation of the percent-per-annum deviation of the forward rate from the spot rate was used to demonstrate the interest-rate-parity (IRP) theory, which states that the forward contract sells at a discount or premium from the spot rate, owing solely to the interest-rate differential between the two countries. The IRP theory was shown to hold by means of the covered-interest-arbitrage. In addition, the influences of purchasing power parity (PPP) and the international Fisher effect (IFE) in determining exchange rates were discussed. If markets are rational and efficient, forward rates are unbiased forecasts of future spot rates that are consistent with the PPP.

Exchange risk exists because the exact spot rate that prevails on a future date is not known with certainty today. The concept of exchange risk is applicable to a wide variety of businesses including export-import firms and firms involved in making direct foreign investments or international investments in securities. Exchange exposure is a measure of the amount of foreign currency exposed to exchange risk. There are different ways of measuring the exchange exposure, including the net asset (net liability) measurement. Different strategies are open to businesses to counter the uncertainties of the domestic currency value of foreign currency exposure, including the money-market hedge, the forward-market hedge and options. Each involves different costs.

In discussing working-capital management in an international environment we find leading and lagging techniques useful in minimising exchange risks and increasing profitability. In addition, funds positioning is a useful tool for reducing exchange-risk exposure. The MNC may have a lower cost of capital because it has access to a larger set of financial markets than a domestic company. In addition to the home, host, and third-country financial markets, the MNC can tap the rapidly growing external currency markets. In making capital-structure decisions, the MNC must consider political and exchange risks and host and home country capital-structure norms.
The complexities encountered in the direct foreign-investment decision include the usual sources of risk—business and financial—and additional risks associated with fluctuating exchange rates and political factors. Political risk is due to differences in political climates, institutions, and processes between the home country and overseas countries. Under these conditions the estimation of future cash flows and the choice of the proper discount rates are more complicated than for the domestic investment situation. Rejection of a direct foreign investment proposal may lead either to the setting-up of a sales office abroad or to an affiliate arrangement with a foreign company.

Finally, the importance of small and medium enterprises in developing the export sector of the Australian economy was identified, together with some of the ways in which the federal government is assisting this development.

**STUDY QUESTIONS**

20-1 What additional factors are encountered in international financial management as compared with domestic financial management? Discuss each factor briefly.

20-2 What different types of businesses operate in the international environment? Why are the techniques and strategies available to these firms different?

20-3 What is meant by *arbitrage profits*?

20-4 What are the markets and mechanics involved in generating (a) simple arbitrage profits, (b) covered interest arbitrage profits?

20-5 How do the purchasing power parity, interest rate parity, and the Fisher effect explain the relationships between the current spot rate, the future spot rate, and the forward rate?

20-6 What is meant by (a) exchange risk, (b) political risk?

20-7 How can exchange risk be measured?

20-8 What are the differences between transaction, translation and economic exposures? Should all of them be ideally reduced to zero?

20-9 What steps can a firm take to reduce exchange risk? Indicate at least two different techniques.

20-10 How are the forward-market and the money-market hedges effected? What are the major differences between these two types of hedges?

20-11 Assume that in the Australian foreign-exchange market the forward rate for the Indian currency, the rupee, is not quoted. If you were exposed to exchange risk in rupees, how could you cover your position?

20-12 Indicate two working-capital management techniques that are useful for international businesses to reduce exchange risk and potentially increase profits.

20-13 How do the financing sources available to a large company with access to overseas financial markets differ from those available to a firm that can only access the domestic markets? What do these differences mean for the company’s cost of capital?
20-14 What risks are associated with direct foreign investment? How do these risks differ from those encountered in domestic investment?

20-15 How is the direct foreign-investment decision made? What are the inputs to this decision process? Are the inputs more complicated than those to the domestic investment problem? If so, why?

20-16 A corporation desires to enter a particular foreign market. The analysis indicates that a direct investment in the plant in the foreign country is not profitable. What other course of action can the company take to enter the foreign market? What are the important considerations?

20-17 What are the reasons for the acceptance of a sales office or licensing arrangement when the direct foreign investment itself is not profitable?

**SELF-TEST PROBLEMS**

A foreign exchange dealer in Sydney currently quotes buying/selling French franc (FRF):

<table>
<thead>
<tr>
<th>Country</th>
<th>Contract</th>
<th>FRF/AUD 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>France (franc)</td>
<td>Spot</td>
<td>3.893/3.824</td>
</tr>
<tr>
<td></td>
<td>30 day</td>
<td>3.876/3.802</td>
</tr>
<tr>
<td></td>
<td>90 day</td>
<td>3.834/3.754</td>
</tr>
</tbody>
</table>

Use the above data for self-test problems ST-1 and ST-2.

**ST-1** You own A$10,000. In Tokyo at the same time you could exchange your A$ for franc 39,750. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

**ST-2** If the interest rates on 30-day money market instruments in Australia and France are 14% and 10% (annualised) respectively, what is the correct price of the 30-day forward franc?

**STUDY PROBLEMS**

A dealer in Sydney quotes buying/selling foreign currencies:

<table>
<thead>
<tr>
<th>Country</th>
<th>Contract</th>
<th>Foreign currency/AUD 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada (dollar)</td>
<td>Spot</td>
<td>1.1043/1.1030</td>
</tr>
<tr>
<td></td>
<td>30 day</td>
<td>1.1023/1.1008</td>
</tr>
<tr>
<td></td>
<td>90 day</td>
<td>1.0980/1.0963</td>
</tr>
<tr>
<td>Japan (yen)</td>
<td>Spot</td>
<td>73.78/72.48</td>
</tr>
<tr>
<td></td>
<td>30 day</td>
<td>73.41/72.06</td>
</tr>
<tr>
<td></td>
<td>90 day</td>
<td>72.58/71.23</td>
</tr>
<tr>
<td>Switzerland (franc)</td>
<td>Spot</td>
<td>0.9542/0.9370</td>
</tr>
<tr>
<td></td>
<td>30 day</td>
<td>0.9579/0.9402</td>
</tr>
<tr>
<td></td>
<td>90 day</td>
<td>0.9640/0.9461</td>
</tr>
</tbody>
</table>

Use the above data for the following study problems.
20-1 An Australian business needs to pay in 2 business days (a) 10,000 Canadian dollars, (b) 2 million yen, and (c) 50,000 Swiss francs to businesses abroad. What are the dollar payments required to obtain the foreign currencies?

20-2 An Australian business pays $10,000, $15,000, and $20,000 to suppliers in, respectively, Japan, Switzerland and Canada. How much, in local currencies, do the suppliers receive in 2 days business time?

20-3 Compute the A$ equivalent for the spot Canadian dollar, yen and Swiss franc spot exchange rates.

20-4 You own A$10,000. The spot exchange rate quoted in Tokyo is Yen 75.20/73.90 per A$1. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

20-5 Compute the percent-per-annum premium (discount) on the 30-day and 90-day yen, Swiss franc, and Canadian dollar buying quotes.

20-6 Assume that the interest rate on the Australian 30-day treasury bill is 15% (annualised). The corresponding Canadian rate is 18%. Can an Australian trader make arbitrage profits? If the trader had A$100,000 to invest, indicate the steps he or she would take. What would be the net profit? (Ignore transactions and other costs.)

20-7 If the interest rates on the 30-day instruments in Australia and Japan are 15% and 12% (annualised) respectively, what should be the correct price of the 30-day forward dealer selling yen rate? Use the spot rate from the table.

20-8 The 30-day treasury-bill rate in Australia is 15% annualised. Using the 30-day forward selling quotes, compute the 30-day interest rates in Canada, Switzerland and Japan implied by the forward rates.

SELF-TEST SOLUTIONS

SS-1 The Sydney dealer is selling French francs at a spot rate of FRF 3.800/A$1, while in Tokyo the same rate is quoted as FRF 3.975/A$1 [FRF 39,750/10,000]. Assuming no transaction costs, the rates between Sydney and Tokyo are out of line. Thus, arbitrage profits are possible.

Step 1: Because the A$ is worth more francs in Tokyo you should sell your A$10,000 for francs to the Tokyo dealer at FRF 3.975/A$1 [dealer sell francs rate] and receive FRF 39,750.

Step 2: Simultaneously agree to sell the francs in Sydney at the quoted rate of FRF 3.893 /A$1 [dealer buy FRF]. The amount received on the sale of the francs would be: francs 39,750/3.893 = A$10,210.63. Thus, you would make a net arbitrage gain of A$210.63

SS-2 Step 1: Compute the percent-per-annum discount/premium on the forward rate using equation 20-2:

\[ P \ (or \ D) = \frac{0.10 - 0.14}{1 + 0.14} = -0.035 = 3.5\% \ p.a. \ forward \ discount \ of \ A$ \]
Step 2: Using this discount, calculate the forward rate from equation 20-1:

\[-3.5 = \frac{F - 3.893}{3.893} \times \frac{12}{1} \times 100 = \text{FRF 3.882}\]

This result indicates that IRP is not applying, as the quoted 30-day buying rate of FRF 3.876 is different from the rate calculated from the interest-rate differentials FRF 3.882. As a consequence, covered interest arbitrage opportunities exist.

**NOTES**

1. Repatriation of profits refers to the withdrawal of profits from foreign operations to the home country of the MNC.
2. Observe that 2,970.30 ringgit × (1 + 0.01) = 3,000 ringgit.
3. With an unregistered bearer bond the bond owner's identity is not known to the bond issuer. The coupon payments and final principal payments are made to the person who physically presents the bond (the bearer) to the issuer at the appropriate payment dates.