



## ✧ LEARNING OBJECTIVES ✧

After reading this chapter, you should be able to:

1. Discuss the internationalization of business.
2. Explain why foreign exchange rates in two different countries must be in line with each other.
3. Discuss the concept of interest rate parity.
4. Explain the purchasing-power parity theory and the law of one price.
5. Explain what exchange rate risk is and how it can be controlled.
6. Identify working-capital management techniques that are useful for international businesses to reduce exchange rate risk and potentially increase profits.
7. Explain how the financing sources available to multinational corporations differ from those available to domestic firms.
8. Discuss the risks involved in direct foreign investment.

# International Business Finance

Finding new projects doesn't necessarily mean coming up with a new product; it may mean taking an existing product and introducing it to a new market. That's certainly been the direction that McDonald's has taken in recent years. Today, McDonald's operates more than 29,000 restaurants in over 119 countries. The busiest McDonald's restaurant in the world is not in America but thousands of miles away in Pushkin Square in Moscow, Russia. The store serves 30,000 customers a day, as many as on its opening day, January 31, 1990. The menu is essentially the same as in the United States, with the addition of cabbage pie, among other traditional Russian food items.

Was this an expensive venture? It certainly was. In fact, the food plants that McDonald's built to supply burgers, fries, and everything else sold there cost more than \$60 million. In addition to the costs, there are a number of other factors that make opening an outlet outside of the United States both different and challenging. First, in order to keep the quality consistent with what is served at any McDonald's anywhere in the world, McDonald's spent 6 years putting together a supply chain that would provide the necessary raw materials McDonald's demands. On top of that, there are risks associated with the Russian economy and its currency that are well beyond the scope of what is experienced in the United States.

These risks all materialized in 1998, when the Russian economy, along with its currency, the ruble, went in the tank. In an attempt to shore up the economy, the Russian government cut the exchange rate from 6,000 rubles for each U.S. dollar to a new rate of 6 rubles per U.S. dollar—in effect, the government cut off three zeros. Unfortunately, that didn't solve the problems the Russian economy faced. In May 1998, the first Russian bank crashed, and the value of the ruble started to drop. That summer, the Russian economy spun out of control, and in August the entire banking system failed.

When it was all over by the end of 1998, the exchange rate had fallen to 23 rubles per dollar, a change of more than 280 percent. Because McDonald's sells its burgers for rubles, when it came time to trade the rubles for U.S. dollars, McDonald's wasn't worth nearly as much as it was the year before. In spite of all this, the Moscow McDonald's has proven to be enormously successful since it opened. In fact, by 2006, McDonald's had 127 stores in 22 Russian cities, and it has plans for 75 more by 2007. It all goes to show that not all capital-budgeting projects have to be new products; they can be existing domestic products that are introduced into international markets.

This chapter highlights the complications that an international business faces when it deals in multiple currencies. Effective strategies for reducing foreign exchange risk are discussed. Working-capital management and capital structure decisions in the international context are also covered.

### Objective 1

Discuss the internationalization of business.

**multinational corporation (MNC)** a corporation with holdings and/or operations in more than one country.

## THE GLOBALIZATION OF PRODUCT AND FINANCIAL MARKETS

To say the least, the market for most products crosses many borders. In fact, some industries and states are highly dependent on the international economy. For example, the electronic consumer products and automobile industries are widely considered to be global industries. Ohio ranks fourth in terms of manufactured exports, and more than half of Ohio workers are employed by firms that depend to some extent on exports.

There has also been a rise in the global level of international portfolio and direct investment. Both direct and portfolio investments in the United States have been increasing faster than U.S. investment overseas. *Direct foreign investment (DFI)* occurs when the **multinational corporation (MNC)**, a corporation with holdings and/or operations in more than one country, has control over the investment, such as when it builds an offshore manufacturing facility. *Portfolio investment* involves financial assets with maturities greater than 1 year, such as the purchase of foreign stocks and bonds. Total foreign investment in the United States now exceeds such U.S. investment overseas.

A major reason for direct foreign investment by U.S. companies is the high rates of return obtainable from these investments. And the amount of U.S. direct foreign investment (DFI) abroad is large and growing. Significant amounts of the total assets, sales, and profits of American MNCs are attributable to foreign investments and foreign operations. Direct foreign investment is not limited to American firms. Many European and Japanese firms have operations abroad, too. During the past decade, these firms have been increasing their sales and setting up production facilities abroad, especially in the United States.

Capital flows (portfolio investment) between countries have also been increasing. Many firms, investment companies, and individuals invest in the capital markets in foreign countries. The motivation 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 reflected in the recent globalization of financial markets. The Eurodollar market is now larger than any domestic financial market, and U.S. companies are increasingly turning to this market for funds. Even companies and public entities that have no overseas presence are beginning to rely on this market for financing.

In addition, most national financial markets are becoming more integrated with global markets because of the rapid increase in the volume of interest rate and currency swaps. (We will discuss currency swaps later in the chapter.) Because of the widespread availability of these swaps, the currency denomination and the source country of financing for many globally integrated companies are dictated by accessibility and relative-cost considerations, regardless of the currency ultimately needed by the firm. Even a *purely domestic firm* that buys all its inputs and sells all its output in its home country is not immune to foreign competition, nor can it totally ignore the workings of the international financial markets.

### Did You Get It?

1. Why do U.S. companies invest overseas?

### Objective 2

Explain why foreign exchange rates in two different countries must be in line with each other.

**floating-rate international currency system** a system in which the exchange rates of different currencies are allowed to fluctuate with supply and demand conditions.

## EXCHANGE RATES

### Floating Exchange Rates

Since 1973, a **floating-rate international currency system**, a system in which exchange rates between different national currencies are allowed to fluctuate with supply and demand conditions, has been operating. For most currencies, there are no “parity rates” and no “bands” within

which the currencies fluctuate.<sup>1</sup> Most major currencies, including the U.S. dollar, fluctuate freely, depending on their values as perceived by the traders in foreign exchange markets. A country's relative economic strengths, its level of exports and imports, the level of monetary activity, and the deficits or surpluses in its balance of payments (BOP) are all important factors that determine exchange rates.<sup>2</sup> Short-term, day-to-day fluctuations in exchange rates are caused by changing supply and demand conditions for different currencies.

## The Euro: The New Currency of Europe

Since 2002, 11 countries in the European Union have begun using a new, single currency, the euro, and phasing out their old currencies. These countries, often referred to as Euroland, are Germany, France, Italy, Spain, Portugal, Belgium, the Netherlands, Luxembourg, Ireland, Finland, and Austria. Without question, Germany and France are the big players, accounting for over 50 percent of Euroland's output.

Why did the European Union go to a single currency? For several reasons: First, it makes it easier for goods, people, and services to travel across national borders. A common currency eliminates the exchange costs that occur when you have to trade your German marks for French francs. It also eliminates the uncertainty associated with exchange rate fluctuations. It should also help eliminate cost differences for goods in different countries. For example, before the single European currency, "The Classics" Swatch watch was selling for an equivalent of 39.2 euros (\$45.97) in Belgium and only 25.7 euros (\$30.14) in Italy. With the introduction of the euro, it made it easier to compare prices and reduce the discrepancies. As a result, the economies of the European Union are flourishing.

What does all this mean for the United States? First, it means the competition from abroad will be stronger. It also makes the exchange rate between the euro and the U.S. dollar a very important exchange rate. If the euro is strong, it helps U.S. exports by making them cheaper. On the other hand, if the euro is weak, U.S. exports suffer. Fortunately, many U.S. multinational firms appear to be in good shape to cash in on any economic surge that may hit Euroland. For example, look at Wal-Mart, which has 21 stores in Germany. In Germany, Wal-Mart is doing just what it does here in the United States—it is wiping out the competition. For the Germans, this is their first sight of wide aisles—(bigger than some of the local streets)—and discount shopping. The euro has allowed Wal-Mart both to offer even more bargains from all over Euroland and to provide a much more diverse selection of goods. That's because in Europe, with all the exchange rate uncertainties, most goods are regional in nature. That's the bottom line: The euro has led greater choice and greater competition—both good for the consumer.

## The Foreign Exchange Market

The foreign exchange market provides a mechanism for the transfer of purchasing power from one currency to another. This market is not a physical entity like the New York Stock Exchange; it is a network of telephone and computer connections among banks, foreign exchange dealers, and brokers. The market operates simultaneously at three levels. At the first level, customers buy and sell foreign exchange (foreign currency) through their banks. At the second level, banks buy and sell foreign exchange from other banks in the same commercial center. At the last level, banks buy and sell foreign exchange from banks in commercial centers in other countries. Some important commercial centers for foreign exchange trading are New York, London, Zurich, Frankfurt, Hong Kong, Singapore, and Tokyo.

An example illustrates this multilevel trading. A trader in Texas may buy foreign exchange (pounds) from a bank in Houston for payment to a British supplier against some purchase made. The Houston bank, in turn, may purchase the foreign currency (pounds) from a New York bank. The New York bank may buy the pounds from another bank in New York 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 other words, it is difficult

<sup>1</sup> The system of floating rates is referred to as the "floating-rate regime."

<sup>2</sup> The balance of payments for the United States reflects the difference between the import and export of goods (the trade balance) and services. Capital inflows and outflows are tabulated in the capital account.

to make a profit by shopping around from one bank to another. Minute differences in the quotes from different banks are quickly eliminated. Because of constant trading, simultaneous quotes to different buyers in London and New York are likely to be the same.

Two major types of transactions are carried out in the foreign exchange markets: spot transactions and forward transactions, which we explain next.

## Spot Exchange Rates

**spot transaction** a transaction made immediately in the marketplace at the market price.

**exchange rate** the price of a foreign currency stated in terms of the domestic or home currency.

**forward transaction** an agreement today to deliver a specified number of units of a currency on a future date in return for a specified number of units of another currency.

**direct quote** the exchange rate that indicates the number of units of the home currency required to buy one unit of foreign currency.

**indirect quote** the exchange rate that expresses the number of units of a foreign currency that can be bought for one unit of the home currency.

In a typical **spot transaction** *one currency is traded for another currency today*. For example, an American firm might buy foreign currency from its bank and pay for it in dollars. Another type of spot transaction is when an American firm receives foreign currency from abroad and sells the foreign currency to its bank for dollars. *The price of foreign currency in terms of the domestic currency is the exchange rate*. The actual exchange rate quotes are expressed in several different ways, as discussed later. To allow time for the transfer of funds, the *value date* when the currencies are actually exchanged is two days after the spot transaction occurs. Four banks could easily be involved in the transactions: the local banks of the buyer and seller of the foreign exchange, and the money-center banks that handle the purchase and sale. Perhaps the buyer or seller will have to move the funds from one of its local banks to another, bringing even more banks into the transaction. A **forward transaction** (as apposed to a spot transaction) entails an agreement today to deliver a specified number of units of a currency on a *future* date in return for a specified number of units of another currency.

In the spot exchange market, contrasted with the over-the-counter market, the quoted exchange rate is typically called a direct quote. A **direct quote** *indicates the number of units of the home currency required to buy one unit of the foreign currency*. That is, in New York the typical exchange rate quote indicates the number of dollars needed to buy one unit of a foreign currency: dollars per pound, dollars per euro, and so on. The spot rates in column 1 of Table 17-1 are the direct exchange quotes taken from the *Wall Street Journal*. Thus, according to Table 17-1, to buy 1 British pound (£1), \$1.8720 was needed. To buy Swiss francs and euros, \$.8212 and \$1.2795 were needed, respectively.

An **indirect quote** *indicates the number of units of a foreign currency that can be bought for one unit of the home currency*. This reads as pounds per dollar, euros per dollar, and so forth. An indirect quote is the general method used in the over-the-counter market. Exceptions to this rule include British pounds, Irish punts, Australian dollars, and New Zealand dollars, which are quoted via direct quotes for historical reasons. Indirect quotes are given in the last column of Table 17-1.

In summary, a direct quote is the dollar/foreign currency rate (\$/FC), and an indirect quote is the foreign currency/dollar (FC/\$) rate. Therefore, an indirect quote is the reciprocal of a direct quote and vice versa. The following example illustrates the computation of an indirect quote from a given direct quote.

### ► EXAMPLE

Suppose you want to compute the indirect quote from the direct quote of the spot rate for pounds given in column 1 of Table 17-1. The direct quote for the U.K. pound is \$1.8720. The related indirect quote is calculated as the *reciprocal* of the direct quote as follows:

$$\text{Indirect quote} = \frac{1}{\text{direct quote}}$$

Thus,

$$\frac{1}{\$1.8720} = \text{£.5342}$$

Notice that the previous direct quote and indirect quote are identical to those shown in Table 17-1.

Direct and indirect quotes are useful in conducting international transactions, as the following examples show.

**TABLE 17-1** Foreign Exchange Rates Reported May 25, 2006**KEY CURRENCY CROSS RATES**

LATE NEW YORK TRADING THURSDAY, MAY 25, 2006							
	DOLLAR	EURO	POUND	SFRANC	PESO	YEN	CDNLR
Canada	1.1067	1.4160	2.0717	0.9088	.09934	.00990	...
Japan	111.78	143.02	209.26	91.795	10.034	...	101.006
Mexico	11.1408	14.2547	20.856	9.1488	...	0.9967	10.0668
Switzerland	1.2177	1.5581	2.2796	...	.10930	.01089	1.1003
U.K.	.53420	.6835	...	.4387	.4795	.00478	.48269
Euro	.78160	...	1.4631	.64181	.07015	.00699	.70621
U.S.	...	1.2795	1.8720	.82120	.08976	.00895	.90360

Source: Reuters

**EXCHANGE RATES**

May 25, 2006

The foreign exchange midrange rates below apply to trading among banks in amounts of \$1 million and more, as quoted at 4 p.m. Eastern time by Reuters and other sources. Retail transactions provide fewer units of foreign currency per dollar.

	U.S. \$ EQUIVALENT	CURRENCY PER U.S. \$		U.S. \$ EQUIVALENT	CURRENCY PER U.S. \$
Country			Country		
Argentina (Peso)-y	.3244	3.0826	New Zealand (Dollar)	.6400	1.5625
Australia (Dollar)	.7607	1.3146	Norway (Krone)	.1636	6.1125
Bahrain (Dinar)	2.6526	.3770	Pakistan (Rupee)	.01662	60.169
Brazil (Real)	.4377	2.2847	Peru (new Sol)	.3064	3.2637
Canada (Dollar)	.9036	1.1067	Philippines (Peso)	.01890	52.910
1-month forward	.9042	1.1060	Poland (Zloty)	.3253	3.0741
3-months forward	.9058	1.1040	Russia (Ruble)-a	.03698	27.042
6-months forward	.9082	1.1011	Saudi Arabia (Riyal)	.2666	3.7509
Chile (Peso)	.001900	526.32	Singapore (Dollar)	.6335	1.5785
China (Renminbi)	.1246	8.0250	Slovak Rep. (Koruna)	.03383	29.560
Colombia (Peso)	.0003999	2500.63	South Africa (Rand)	.1533	6.5232
Czech, Rep. (Koruna)					
Commercial rate	.04544	22.007	South Korea (Won)	.0010536	949.13
Denmark (Krone)	.1715	5.8309	Sweden (Krona)	.1374	7.2780
Ecuador (US Dollar)	1.0000	1.0000	Switzerland (Franc)	.8212	1.2177
Egypt (Pound)-y	.1734	5.7663	1-month forward	.8238	1.2139
Hong Kong (Dollar)	.1289	7.7564	3-months forward	.8291	1.2061
Hungary (Forint)	.004897	204.21	6-months forward	.8368	1.1950
India (Rupee)	.02185	45.767	Taiwan (Dollar)	.03115	32.103
Indonesia (Rupiah)	.0001068	9363	Thailand (Baht)	.02613	38.270
Israel (Shekel)	.2215	4.5147	Turkey (New Lira)-d	.6525	1.5325
Japan (Yen)	.008946	111.78	U.K. (Pound)	1.8720	.5342
1-month forward	.008984	111.31	1-month forward	1.8728	.5340
3-months forward	.009059	110.39	3-months forward	1.8748	.5334
6-months forward	.009171	109.04	6-months forward	1.8777	.5326
Jordan (Dinar)	1.4110	.7087	United Arab (Dirham)	.2724	3.6711
Kuwait (Dinar)	3.4581	.2892	Uruguay (Peso)		
Lebanon (Pound)	.0006634	1507.39	Financial	.04180	23.923
Malaysia (Ringgit)-b	.2742	3.6470	Venezuela (Bolivar)	.000466	2145.92
Malta (Lira)	2.9798	.3356	SDR	1.4883	.6719
Mexico (Peso) Floating rate	.0898	11.1408	Euro	1.2795	.7816

Special Drawing Rights (SDR) are based on exchange rates for the U.S., British, and Japanese currencies. Source: International Monetary Fund.

a-Russian Central Bank rate. b-Government rate. d-Rebased as of Jan. 1, 2005. y-Floating rate.

Source: *Wall Street Journal*, May 24, 2006, p. B6.

### ► EXAMPLE

An American business must pay 1,000 euros to a German firm on May 25, 2006. How many dollars will be required for this transaction?

$$\$1.2795/\text{€} \times \text{€}1,000 = \$1,279.50$$

### ► EXAMPLE

An American business must pay \$2,000 to a U.K. resident on May 25, 2006. How many pounds will the U.K. resident receive?

$$£.5342/\$ \times \$2,000 = \text{£}1,068.40$$

**arbitrageur** an individual involved in the process of buying and selling in more than one market to make a riskless profit.

**simple arbitrage** trading to eliminate exchange rate differentials across the markets for a single currency.

**triangular arbitrage** arbitrage across three markets for three currencies.

**covered-interest arbitrage** designed to eliminate differentials across currency and interest rate markets.

**asked rate** the rate the bank or the foreign exchange trader “asks” the customer to pay in home currency for foreign currency when the bank is selling and the customer is buying. The asked rate is also known as the selling rate or the offer rate.

**selling rate** the rate the bank or the foreign exchange trader “asks” the customer to pay in home currency for foreign currency when the bank is selling and the customer is buying. The selling rate is also known as the asked rate or the offer rate.

**bid rate** the rate at which the bank buys the foreign currency from the customer by paying in home currency. The bid rate is also known as the buying rate.

**buying rate** the rate at which the bank buys the foreign currency from the customer by paying in home currency. The buying rate is also known as the bid rate.

**bid-asked spread** the difference between the asked quote and the bid quote.

## Exchange Rates and Arbitrage

The foreign exchange quotes in two different countries must be in line with each other. If the exchange rate quotations between the London and New York spot exchange markets 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 and no risk bearing, yet it would provide a sure profit. Such a person 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 efficient in the sense that arbitrage opportunities do not persist for any length of time. That is, the exchange rates between 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**, as in the preceding example for the New York and London quotes. **Triangular arbitrage does the same across the markets for all currencies**. **Covered-interest arbitrage eliminates differentials across currency and interest rate markets**.

Suppose that London quotes £.5500/\$ instead of £.5342/\$. If you simultaneously bought a pound in London for £.5500/\$ and sold a pound in New York for £.5342/\$, you would have (1) taken a zero net investment position because you bought £1 and sold £1, (2) locked in a sure profit of £.0158/\$ *no matter which way* the pound subsequently moves, and (3) set in motion the forces that will eliminate the different quotes in New York and London. As others in the marketplace learn of your transaction, they will attempt to make the same transaction. The increased demand to buy pounds in London will lead to a higher quote there, and the increased supply of pounds will lead to a lower quote in New York. The workings of the market will produce a new spot rate that lies between £.5342/\$ and £.5500/\$ and is the same in New York and in London.

## Asked and Bid Rates

Two types of rates are quoted in the spot exchange market: the asked and the bid rates. The **asked rate** is the *rate the bank or the foreign exchange trader “asks” the customer to pay in home currency for foreign currency when the bank is selling and the customer is buying*. The asked rate is also known as the **selling rate** or the *offer rate*. The **bid rate** is the *rate at which the bank buys the foreign currency from the customer by paying in home currency*. The bid rate is also known as the **buying rate**. Note that Table 17-1 contains only the selling, offer, or asked rates, not the buying rate.

The banks sells a unit of foreign currency for more than it pays for it. Therefore, the direct asked quote (\$/FC) is greater than the direct bid quote. *The difference between the asked quote and the bid quote* is known as the **bid-asked spread**. When there is a large volume of transactions and the trading is continuous, the spread is small and can be less than 1 percent (.01) for the major currencies. The spread is much higher for infrequently traded currencies. The spread exists to compensate the banks for holding the risky foreign currency and for providing the service of converting currencies.

## Can You Do It?

### USING THE SPOT RATE TO CALCULATE A FOREIGN CURRENCY PAYMENT

An American business must pay the equivalent of \$10,000 in shekels to an Israeli firm on May 25, 2006. Using the information in Table 17-1, how many shekels will the Israeli citizen receive?

(The solution can be found on page 526.)

### Cross Rates

A **cross rate** is the computation of an exchange rate for a currency from the exchange rates of two other currencies. These are given at the top of Table 17-1. The following example illustrates how this works.

**cross rate** the computation of an exchange rate for a currency from the exchange rates of two other currencies.

#### EXAMPLE

Taking the dollar/pound and the euro/dollar rates from columns 1 and 2 of Table 17-1, determine the euro/pound and pound/euro exchange rates. We see that

$$(\$/\text{£}) \times (\text{€}/\$) = (\text{€}/\text{£})$$

or

$$1.8720 \times .7816 = \text{€}1.46316/\text{£}$$

Thus, the pound/euro exchange rate is

$$1/1.46316 = \text{£}.68345/\text{€}$$

You'll notice that, other than the number of decimal places, these rates are the same as those given in the top portion of Table 17-1 under Key Currency Cross Rates.

Cross-rate computations make it possible to use quotations in New York to compute the exchange rate between pounds, euros, and other currencies. Arbitrage conditions hold in cross rates, too. For example, the pound exchange rate in euros (the direct quote euros/pound) must be €1.4631/£. The euro exchange rate in London must be £.6835/€. If the rates were different from the computed cross rates, using quotes from New York, a trader could use three different currencies to lock in arbitrage profits through triangular arbitrage.

### Forward Exchange Rates

A **forward exchange contract** requires delivery, at a specified future date, of one currency for a specified amount of another currency. The exchange rate for the forward transaction is agreed on today; the actual payment of one currency and the receipt of another currency take place at the future date. For example, a 30-day contract agreed upon March 1 will be delivered March 31. Note that the forward rate is not the same as the spot rate that will prevail in the future. The actual spot rate that will prevail is not known today; only the forward rate is known. The actual spot rate will depend on the market conditions at that time; it may be more or less than today's forward rate. **Exchange rate risk** is the risk that tomorrow's exchange rate will differ from today's rate.

**forward exchange contract** a forward contract that requires delivery, at a specified future date, of one currency for a specified amount of another currency.

**exchange rate risk** the risk that tomorrow's exchange rate will differ from today's rate.

As indicated earlier, it is extremely unlikely that the future spot rate will be exactly the same as the forward rate quoted today. Assume that you are going to receive a payment denominated in pounds from a British customer in 30 days. If you wait for 30 days

## How Did You Do?

### USING THE SPOT RATE TO CALCULATE A FOREIGN CURRENCY PAYMENT

On the previous page you were asked to determine how much an American firm had to pay an Israeli firm if the Israeli firm was to receive an equivalent of \$10,000 in Israeli shekels.

$$4.5147 \text{ shekels}/\$ \times \$10,000 = 45,147 \text{ shekels}$$

and exchange the pounds at the spot rate, you will receive a dollar amount reflecting the exchange rate 30 days hence (that is, 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. If, conversely, you buy a futures contract, 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. In fact, the major advantage of the forward market is that of risk reduction.

Forward contracts are usually quoted for periods of 30, 90, and 180 days. A contract for any intermediate date can be obtained, usually with the payment of a small premium. Forward contracts for periods longer than 180 days can be obtained by special negotiations with banks. Contracts for periods greater than 1 year can be costly.

Forward rates, like spot rates, are quoted in both direct and indirect form. The direct quotes for the 30-day, 90-day, and 180-day forward contracts on pounds, Swiss francs, Canadian dollars, and Japanese yen are given in the lower half of Table 17-1. The indirect quotes are also indicated. The direct quotes are the dollar/foreign currency rate, and the indirect quotes are the foreign currency/dollar rate similar to the spot exchange quotes.

In Table 17-1 the 1-month forward quote for pounds is \$1.8728 per pound. This means that the bank is contractually bound to deliver £1 at this price, and the buyer of the contract is legally obligated to buy it at this price in 30 days. Therefore, this is the price the customer must pay regardless of the actual spot rate prevailing in 30 days. If the spot price of the pound is less than \$1.8728, then the customer pays *more* than the spot price. If the spot price is greater than \$1.8728, then the customer pays *less* than the spot price.

*The forward rate is often quoted at a premium or a discount from the existing spot rate.* For example, the 30-day forward rate for the pound may be quoted as a .0008 premium (1.8728 forward rate – 1.8720 spot rate). If the British pound is more expensive in the future than it is today, it is said to be selling at a premium relative to the dollar, and the dollar is said to be selling at a discount to the British pound. This premium or discount is also called the **forward-spot differential**.

Notationally, the relationship may be written

$$F - S \text{ premium } (F > S) \text{ or discount } (S > F) \quad (17-1)$$

where  $F$  = the forward rate, direct quote

$S$  = the spot rate, direct quote

The premium or discount can also be expressed as an annual percentage rate, computed as follows:

$$\frac{F - S}{S} \times \frac{12}{n} \times 100 = \text{annualized percentage} \\ \text{premium } (F > S) \text{ or discount } (S > F) \quad (17-2)$$

where  $n$  = the number of months of the forward contract.

#### forward-spot differential

the premium or discount between forward and spot currency exchange rates.

## Can You Do It?

### COMPUTING A PERCENT-PER-ANNUM PREMIUM

Using the information in Table 17-1, compute the percent-per-annum premium on the 90-day (3 month) yen.  
(The solution can be found on page 529.)

#### ► EXAMPLE

Compute the percent-per-annum premium on the 30-day pound.

Step 1. Identify  $F$ ,  $S$ , and  $n$ .

$$F = 1.8728, S = 1.8720, n = 1 \text{ month}$$

Step 2. Because  $F$  is greater than  $S$ , we compute the annualized percentage premium:

$$\begin{aligned} &= \frac{1.8728 - 1.8720}{1.8720} \times \frac{12 \text{ months}}{1 \text{ month}} \times 100 \\ &= 0.5128\% \end{aligned}$$

The percent-per-annum premium on the 30-day pound is 0.5128 percent.

### Exchange Rate Risk

The concept of exchange rate risk applies to all types of international business. The measurement of these risks, and the type of risk, differ among businesses. Let us see how exchange rate 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** An American automobile distributor agrees to buy a car from the manufacturer in Detroit. The distributor agrees to pay \$25,000 on delivery of the car, which is expected to be 30 days from today. The car is delivered on the 30th day and the distributor pays \$25,000. Notice that from the day this contract was written until the day the car was delivered, the buyer knew the *exact dollar amount* of the liability. There was, in other words, *no uncertainty* about the value of the contract.

**Case II** An American automobile distributor enters into a contract with a British supplier to buy a car from Britain for £13,500. The amount is payable upon the delivery of the car, 30 days from today. Unfortunately, the exchange rate between British pounds and U.S. dollars may change in the next 30 days. In effect, the American firm is not certain what its future dollar outflow will be 30 days hence. That is, the *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), in which the *contract is written in the foreign currency*, the exact dollar amount of the contract is not known. The variability of the exchange rate causes variability in the future cash flow of the firm.

Exchange rate risk exists when the contract is written in terms of the foreign currency, or *denominated* in foreign currency. There is no direct exchange rate risk if the international trade contract is written in terms of the domestic currency. That is, in Case II, if the contract were written in dollars, the American importer would face *no* direct exchange rate risk. With

## Across the Hall

### MARKETING

When reaching out to global markets, you not only need a good product, but you also need one that fits the culture of the market. As a result, although some products that are successful in the United States can be successfully introduced in global markets, others need to be adapted to the culture into which they are being introduced. For example, McDonald's has found great success globally, but it has done so by adapting its product line to fit the culture of the country it is entering. Understanding this is important because, whereas a new project will generally be evaluated using capital-budgeting techniques by the people in finance, determining how a product should be culturally adapted is the job of marketers. Their ability to modify and price the product so that it appeals abroad will go a long way toward determining whether or not a new capital-budgeting approach succeeds.

For this reason, as a marketing student, you must understand exchange rates so you can price the new product in a way that creates wealth for the corporation. You also need to understand how the product must be culturally adapted for the new market. For example, although a Big Mac may taste pretty good

to most people in the United States, that may not be the case around the world. As a result, McDonald's marketing staff many times offers alternative items that fit the cultural eating habits of different countries. For example, in Thailand McDonald's sells the McPork Burger with Thai Basil, in Japan it offers the Tatsuta Burger, and in India it offers the Maharaja Mac, which has two all-mutton patties, special sauce, lettuce, cheese, pickles, onions on a sesame seed bun—kinda sounds familiar, doesn't it? Similarly, when Gerber entered the baby food market in Japan, rather than strained peas and blueberry delight, it introduced sardines ground up in white radish sauce, cod roe spaghetti, and mug-wort casserole.

Moreover, a good product can fail abroad because of translation problems in its advertising campaign. A classic example is the Coors beer advertising slogan, "get loose with Coors," which translates in Spanish to "get the runs with Coors." The bottom line here is that in the international arena, marketing can take a good idea for a new product and help turn it into a success or a failure.

the contract written in dollars, the British exporter would bear *all* of the exchange rate risk because the British exporter's future pound receipts would be uncertain. That is, the British exporter would receive payment in dollars, which would have to be converted into pounds at an unknown (as of today) pound/dollar exchange rate. In international trade contracts of this type, at least one of the two parties to the contract *always* bears the exchange rate risk.

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

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

### Exchange Rate Risk in Foreign Portfolio Investments

Let us look at an example of exchange rate risk in the context of portfolio investments. An American investor buys a Hong Kong security. The exact return on the investment in the security is unknown. Thus, the security is a risky investment. The investment return in the holding period of, say, 3 months stated in HK\$ could be anything from  $-2$  to  $+8$  percent. In addition, the U.S. dollar/HK\$ exchange rate may depreciate by, say, 4 percent or appreciate by 6 percent during in the 3-month period. The return to the American investor in U.S. dollars will, therefore, be in the range of  $-6$  to  $+14$  percent. Hence, the exchange rate fluctuations may increase the riskiness of the investments.

### Exchange Rate Risk in Direct Foreign Investment

The exchange rate risk of a direct foreign investment (DFI) is more complicated. In a DFI, the parent company invests in assets denominated in a foreign currency. That is, the balance sheet and the income statement of the subsidiary are written in terms of the foreign currency. The parent company, if based in the United States, receives the repatriated (or converted) profit stream from the subsidiary in dollars. Thus, the exchange rate risk concept applies to fluctuations in the dollar value of the assets located abroad as well as to the fluctuations in the home currency-denominated profit stream. Moreover, exchange risk not only affects immediate profits, but it may also affect the future profit stream as well.

## How Did You Do?

### COMPUTING A PERCENT-PER-ANNUM PREMIUM

Compute the percent-per-annum premium on the 90-day yen.

Step 1: Identify  $F$ ,  $S$ , and  $n$ .

$$F = \$0.009059/\text{¥}, S = \$0.008946/\text{¥}, \text{ and } n = 3 \text{ months}$$

Step 2: Because  $F$  is greater than  $S$ , we compute the annualized percentage premium:

$$\frac{0.009059 - 0.008946}{0.008946} \times \frac{12 \text{ months}}{3 \text{ months}} \times 100 = 5.0525\%$$

The percent-per-annum discount on the 90-day yen is 5.0525 percent.

### Remember Your Principles

In international transactions, just as in domestic transactions, the key to value is the timing and amounts of cash flow spent and received. However, economic transactions across international borders add an element of risk because cash flows are denominated in the currency of the country in which business is being transacted. Consequently, the dollar value of the cash flows will depend on the exchange rate that exists at the time the cash changes hands. The fact remains, however, that it's cash spent and received that matters. This is the point of **Principle 3: Cash—Not Profits—Is King**.

Although exchange rate risk can be a serious complication in international business activity, remember the principle of the risk–return trade-off: Traders and corporations find numerous reasons why the returns from international transactions outweigh the risks.

### Did You Get It?

1. What is a spot transaction? What is a direct quote? An indirect quote?
2. Who is an arbitrageur? How does an arbitrageur make money?
3. What is a forward exchange rate?
4. Describe exchange rate risk in direct foreign investment.

## INTEREST RATE PARITY THEORY

Forward rates generally entail a premium or a discount relative to current spot rates. However, these forward premiums and discounts can differ between currencies and maturities. These differences depend solely on the difference in the level of interest rates between the two countries, called the *interest rate differential*. The value of the premium or discount can be theoretically computed from the **interest rate parity (IRP) theory**. This theory states that *(except for the effects of small transaction costs) the forward premium or discount should be equal and opposite in size to the difference in the national interest rates for securities of the same maturity*.

Stated very simply, what does all this mean? It means that because of arbitrage, the interest rate differential between two countries must be equal to the difference between the forward and spot exchange rates. If this were not true, arbitrageurs would buy in the forward market and sell in the spot market (or vice versa) until prices were back in line and there were no profits left to be made. For example, if prices in the forward market were too

### Objective 3

Discuss the concept of interest rate parity.

**interest rate parity (IRP) theory** a theory that states that (except for the effects of small transaction costs) the forward premium or discount should be equal and opposite in size to the difference in the national interest rates for securities of the same maturity.

low, arbitrageurs would enter the market, increase the demand for the forward foreign currency, and drive up the prices in the forward market until those prices obeyed the interest rate parity theory.

*Did You Get It?* .....

1. In simple terms, what does the interest rate parity theory mean?

**Objective 4**

Explain the purchasing-power parity theory and the law of one price.

**purchasing-power parity (PPP) theory** a theory that states that, in the long run, exchange rates adjust so that the purchasing power of each currency tends to be the same. Thus, exchange rate changes tend to reflect international differences in inflation rates.

**PURCHASING-POWER PARITY THEORY**

Long-run changes in exchange rates are influenced by international differences in inflation rates and the purchasing power of each nation’s currency. According to the **purchasing-power parity (PPP) theory**, *in the long run, exchange rates adjust so that the purchasing power of each currency tends to be the same. Thus, exchange rate changes tend to reflect international differences in inflation rates. Countries with high rates of inflation tend to experience declines in the value of their currencies.* Thus, if Britain experiences a 10 percent rate of inflation in a year that Japan experiences only a 6 percent rate, the U.K. currency (the pound) will be expected to decline in value approximately by 3.77 percent  $[(1.10/1.06) - 1]$  against the Japanese currency (the yen). More accurately, according to the PPP theory,

$$\begin{aligned} \text{Expected spot rate} &= \text{current spot rate} \times \text{expected difference in inflation rate} \\ \text{Expected spot rate} &= \text{current spot rate} \times \frac{1 + \text{expected domestic}}{\text{domestic currency}} \times \frac{\text{inflation rate}}{1 + \text{expected foreign}} \end{aligned} \tag{17-3}$$

Thus, if the beginning value of the Japanese yen were £.00478, with a 6 percent inflation rate in Japan and a 10 percent inflation rate in Britain, according to the PPP, the expected value of the Japanese yen at the end of that year will be £.00478  $\times [1.10/1.06]$ , or £.00496.

Again, stated very simply, what does this mean? It means that a dollar should have the same purchasing power anywhere in the world—well, at least on average. Obviously, this is not quite true. However, what the PPP theory tells us is that we should expect, on average, that differences in inflation rates between two countries should be reflected in changes in the exchange rates. In effect, the best forecast of the difference in inflation rates between two countries should also be the best forecast of the change in the spot rate of exchange.

**The Law of One Price**

**law of one price** a proposition that in competitive markets in which there are no transportation costs or barriers to trade, the same goods sold in different countries sell for the same price if all the different prices are expressed in terms of the same currency.

Underlying the PPP relationship is the **law of one price**. This law is actually *a proposition that in competitive markets in which there are no transportation costs or barriers to trade, the same goods sold in different countries should sell for the same price if all of the different prices are expressed in terms of the same currency.* The idea is that the worth 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.

There are enough obvious exceptions to the concept of purchasing-power parity that it may, at first glance, seem difficult to accept. For example, recently a Big Mac cost \$2.36 in the United States, and given the then-existing exchange rates, it cost an equivalent of \$2.02 in Mexico, \$2.70 in Japan, and \$3.22 in Germany. On the surface this might appear to violate the PPP theory and the law of one price; however, we must remember that this theory is based on the concept of arbitrage. In the case of a Big Mac, it’s pretty hard to imagine buying Big Macs in Mexico for \$2.02, shipping them to Germany, and reselling them for \$3.22. But for commodities such as gold and other items that are relatively inexpensive to ship and do not have to be consumed immediately, the law of one price holds much better.

## The International Fisher Effect

According to the domestic Fisher effect (FE), nominal interest rates reflect the expected inflation rate, a real rate of interest and the product of the real rate of interest and the inflation rate. In other words,

$$\text{Nominal interest rate} = \text{expected inflation rate} + \text{real rate of interest} + \left( \text{expected inflation rate} \times \text{real rate of interest} \right) \quad (17-4)$$

Although there is mixed empirical support for the international Fisher effect (IFE), it is widely thought that, for the major industrial countries, the real rate of interest is about 3 percent when a long-term period is considered. In such a case, with the previous assumption regarding inflation rates, interest rates in Britain and Japan would be  $(.10 + .03 + .003)$  or 13.3 percent and  $(.06 + .03 + .0018)$  or 9.18 percent, respectively.

In effect, the IFE states that the real interest rate should be the same all over the world, with the difference in nominal or stated interest rates simply resulting from the differences in expected inflation rates. As we look at interest rates around the world, this tells us that we should not necessarily send our money to a bank account in the country with the highest interest rates. That course of action might only result in sending our money to a bank in the country with the highest expected level of inflation.

### Did You Get It? .....

1. What does the law of one price say?
2. What is the international Fisher effect?

## EXPOSURE TO EXCHANGE RATE RISK

An asset denominated or valued in terms of foreign-currency cash flows will lose value if that foreign currency declines in value. It can be said that such an asset is exposed to exchange rate risk. However, this possible decline in asset value may be offset by the decline in value of any liability that is also denominated or valued in terms of that foreign currency. Thus, a firm would normally be interested in its *net exposed position* (exposed assets – exposed liabilities) for each period in each currency.

Although expected changes in exchange rates can often be included in the cost–benefit analysis relating to such transactions, in most cases there is an unexpected component in exchange rate changes, and often the cost–benefit analysis for such transactions does not fully capture even the expected change in the exchange rate. For example, price increases for the foreign operations of many MNCs often have to be less than those necessary to fully offset exchange rate changes, owing to the competitive pressures generated by local businesses.

Recall from Chapter 15 that three measures of foreign exchange exposure are translation exposure, transaction exposure, and economic exposure. The three measures of exposure now are examined more closely.

### Translation Exposure

**Translation exposure** arises because the foreign operations of MNCs have financial statements denominated in the local currency of the country in which the operation is located. But for U.S. MNCs, the *reporting currency* for its consolidated financial statements is the dollar, so the assets, liabilities, revenues, and expenses of the foreign operations must be translated into dollars.

Foreign currency assets and liabilities are considered exposed if their foreign currency value for accounting purposes has to be translated into the domestic currency using the currency exchange rate—the exchange rate in effect on the balance sheet date. Other assets and liabilities and equity amounts that are translated at the historic exchange rate—the rate in effect when these items were first recognized in the company’s books—are not considered

### Objective 5

Explain what exchange rate risk is and how it can be controlled.

**translation exposure** risk that arises because the foreign operations of MNCs have financial statements denominated in the local currencies of the countries in which the operation are located. These denominations must be translated into the MNCs home currency at the prevailing exchange rate.

to be exposed. The rate (current or historic) used to translate various accounts depends on the translation procedure used.

Whereas transaction exposure can result in exchange rate change–related losses and gains that are realized and have an impact on both reported and taxable income, translation exposure results in exchange rate losses and gains that are reflected in the company’s accounting books but are unrealized and have little or no impact on taxable income. Theoretically, then, a firm should not have to waste real resources hedging against possible paper losses caused by translation exposure. After all, it’s the firm’s stock price that really matters. However, there are times a firm may indeed find it economical to hedge against translation losses or gains.

## Transaction Exposure

Receivables, payables, and fixed-price sales or purchase contracts are examples of foreign currency transactions whose monetary values are fixed at a time different from the time when these transactions are actually completed. **Transaction exposure** is a term that *describes the net contracted foreign currency transactions for which the settlement amounts are subject to changing exchange rates*. A company normally must set up an additional reporting system to track transaction exposure because several of these amounts are not recognized in the accounting books of the firm.

Exchange rate risk can be neutralized, or hedged, by a change in the firm’s asset and liability position in the foreign currency. For example, an exposed asset position (such as an account receivable) can be hedged, or covered, by creating a liability of the same amount and maturity denominated in the foreign currency (such as a forward contract to sell the foreign currency). An exposed liability position (such as an account payable) can be covered by acquiring assets of the same amount and maturity in the foreign currency (such as 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 rate risk because the loss (gain) in the liability (asset) is exactly offset by the gain (loss) in the value of the asset (liability) when the foreign currency appreciates (depreciates). Two popular forms of hedges are the money-market hedge and the exchange-market, or 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 ensures that each hedge provides the same cover.

### Money-Market Hedge

In a money-market hedge, the exposed position in a foreign currency is offset by borrowing or lending in the money market. Consider the case of the American firm with a net liability position of £3,000. The firm knows the exact amount of its pound liability in 30 days, but it does not know the liability in dollars. Assume that the 30-day money-market rates in both the United States and Britain are, respectively, 1 percent for lending and 1.5 percent for borrowing. The American business can take the following steps:

- Step 1. Calculate the present value of the foreign currency liability (£3,000) that is due in 30 days. Use the money-market rate applicable for the foreign country (1 percent in the United Kingdom). The present value of £3,000 is £2,970.30, computed as follows:  $£3,000 / (1 + .01)$ .
- Step 2. Exchange dollars on today’s spot market to obtain the £2,970.30. The dollar amount needed today is \$5,560.40 ( $£2,970.30 \times 1.8720$ ).
- Step 3. Invest £2,970.30 in a United Kingdom 1-month, money-market instrument. This investment will compound to exactly £3,000 in 1 month. The future liability of £3,000 is therefore covered by the £2,970.30 investment.<sup>3</sup>

*Note:* If the American business does not own this amount today, it can borrow \$5,560.40 from the U.S. money market at the going rate of 1.5 percent. In 30 days the American business will need to repay \$5,643.81 [ $\$5,560.40 \times (1 + .015)$ ].

Assuming that the American business borrows the money, it may base its calculations on the knowledge that the British goods, upon delivery in 30 days, will cost it \$5,643.81. The

<sup>3</sup> Observe that  $£2,970.30 \times (1 + .01) = £3,000$ .

### transaction exposure

risk associated with transaction exposure, that is, risk associated with contracts on which the monetary value is fixed at a time different from when the transaction is actually completed and will be impacted by exchange rate changes.

British business will receive £3,000. The American business need not wait for the future spot exchange rate to be revealed because the future dollar payment of the contract is known with certainty. This certainty helps the American business make its pricing and financing decisions.

Many businesses hedge in the money market. 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 hedging a net asset position in the foreign currency are the exact reverse of the mechanics of hedging the liability position. With a net asset position in pounds: Borrow in the U.K. money market in pounds, convert it to dollars on the spot exchange market, and invest it in the U.S. money market. When the net assets are converted into pounds (that is, when the firm receives what it is owed), pay off the loan and the interest. The cost of hedging in the money market 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.

Many small and infrequent traders find the cost of the money-market hedge prohibitive, especially because of the need for information about the market. These traders use the exchange-market, or forward-market, hedge, which has very similar hedging benefits.

### The Forward-Market Hedge

The forward market provides a second possible hedging mechanism. It works as follows: A net asset (or liability) position is covered by a liability (or asset) in the forward market. Consider again the case of the American firm with a liability of £3,000 that must be paid in 30 days. The firm can take the following steps to cover its liability position:

- Step 1. Buy a forward contract today to purchase £3,000 in 30 days. The 30-day forward rate is \$1.8728/£.
- Step 2. On the 30th day pay the banker \$5,618.40 ( $£3,000 \times \$1.8728$ ) and collect £3,000. Pay these pounds to the British supplier.

By using the forward contract, the American business knows the exact worth of the future payment in dollars (\$5,618.40). The exchange rate risk in pounds is totally eliminated by the net asset position in the forward pounds. In the case of a net asset exposure, the steps open to the American firm are the exact opposite: Sell the pounds forward and on the future day receive and deliver the pounds to collect the agreed-on dollar amount.

The use of the forward market as a hedge against exchange rate risk is simple and direct—that is, match the liability or asset position against an offsetting position in the forward market. The forward-market hedge is relatively easy to implement. The firm directs its banker that it needs to buy or sell a foreign currency on a future date, and the banker gives the firm a forward quote.

The forward-market hedge and the money-market hedge result in an identical future dollar payment (or receipt) if the forward contracts are priced according to the interest rate parity theory. The alert student may have noticed that the dollar payments in the money-market hedge and the forward-market hedge examples were, respectively, \$5,560.40 and \$5,618.40. Recall from our previous discussions that in efficient markets, the forward contracts do indeed conform to IRP theory. However, the numbers in our example are not identical because the forward rate used in the forward-market hedge is not exactly equal to the interest rates in the money-market hedge.

### Currency-Futures Contracts and Options

The forward-market hedge is not adequate for some types of exposure. If the foreign currency asset or liability position occurs on a date for which forward quotes are not available, the forward-market hedge cannot be accomplished. In certain cases the forward-market hedge may cost more than the money-market hedge. In these cases, a corporation with a large amount of exposure may prefer the money-market hedge. In addition to forward-market and money-market hedges, a company can also hedge its exposure by buying (or selling) some relatively new instruments—foreign currency-futures contracts and foreign currency options. Although futures contracts are similar to forward contracts in that they provide fixed prices for the delivery of foreign currency in the future, foreign currency options permit fixed-price delivery to be made anytime *before* maturity.

Both futures contracts and options differ from forward contracts in that, unlike forward contracts, which have customized amounts and maturity dates, futures and options are traded in standard amounts with standard maturity dates. In addition, although forward contracts are written by banks, futures and options are traded on organized exchanges, and individual traders deal with the exchange-based clearing organization rather than with each other.

## Economic Exposure

**economic exposure** the impact of exchange rate changes on the value of the firm including both the strategic impact of comparative relationships arising from exchange rate change and the economic impact of transaction exposure.

The economic value of a company can 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 transaction exposure and, if any, translation exposure.

Economic exposure to exchange rate changes depends on the competitive structure of the markets for a firm's inputs and outputs and 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, and the 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 your ability to understand and model the structure of the markets for the firm's major inputs (purchases) and outputs (sales).

However, a company need not engage in any cross-border business activity to be exposed to 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, a Canadian chemical company that did no cross-border business nevertheless found that its profit margin depended directly on the U.S. dollar/Japanese yen exchange rate. The company used coal as an input in its production process, and the Canadian price of coal was heavily influenced by the extent to which the Japanese bought U.S. coal, which in turn depended on the dollar/yen exchange rate.

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 by the office of the corporate treasurer. Economic exposure is difficult to define in operating terms, and very few companies manage it actively. In most companies, economic exposure is generally considered part of the strategic planning process, rather than a treasurer's or finance function.

### Did You Get It?

1. Give a simple explanation of translation exposure.
2. Give a simple explanation of transaction exposure.
3. Give a simple explanation of economic exposure.

## Objective 6

Identify working-capital management techniques that are useful for international businesses to reduce exchange rate risk and potentially increase profits.

## MULTINATIONAL WORKING-CAPITAL MANAGEMENT

The basic principles of working-capital management for a multinational corporation are similar to those for a domestic firm. However, tax and exchange rate factors are additional considerations for the MNC. For the MNC with subsidiaries in many countries, the optimal decisions in the management of working capital are made by considering the market as a whole. The global, or centralized, financial decisions for the MNC are 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 these decisions may not be best for the MNC as a whole. To achieve global management, sophisticated computerized models incorporating many variables for each subsidiary are utilized to provide the best overall decision for the MNC.

Before considering the components of working-capital management, we examine two techniques that are useful in the management of a wide variety of working-capital components.

### Leading and Lagging Strategies

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

Recall that holding a net asset (long) position is not desirable in a weak or potentially depreciating currency. If a firm has a net asset position in such a currency, it should expedite the disposal of the asset. The firm should get rid of 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. Likewise, if the firm has a net liability (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 have otherwise.

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 the currency will depreciate or appreciate. This is why the risk of exchange rate changes cannot be eliminated. Nevertheless, the reduction of risk, or the increased 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 the Positioning of Funds

The positioning of funds takes on an added importance in the international context. For example, an MNC can move funds from a subsidiary in one country to a subsidiary in another country so foreign exchange exposure and the tax liability of the MNC as a whole are minimized.

The transfer of funds among subsidiaries and the parent company is done via 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*. For example, a parent that wishes to transfer funds from a subsidiary in a depreciating-currency country might charge a higher price on the goods and services sold to this subsidiary by the parent or by subsidiaries in strong-currency countries.

**transfer price** the price a subsidiary or a parent company charges other companies that are part of the MNC for its goods or services.

### Did You Get It? .....

1. Describe the risk-reduction techniques of leading and lagging.
2. How can a parent company use transfer pricing to move funds from a subsidiary in a depreciating-currency country to a strong-currency country?

## INTERNATIONAL FINANCING AND CAPITAL STRUCTURE DECISIONS

An MNC has access to many more financing sources than a domestic firm. It can tap not only the financing sources in its home country that are available to its domestic counterparts but also sources in the foreign countries in which it operates. Host countries often provide access to low-cost subsidized financing to attract foreign investment. In addition, the MNC

### Objective 7

Explain how the financing sources available to multinational corporations differ from those available to domestic firms.

**currency swaps** the exchange of principal and interest in one currency for the same in another currency for an agreed period of time.

may enjoy preferential credit standards because of its size and investors' preferences for its home currency. For financing purposes, the MNC may be able to access third-country capital markets—countries in which it does not operate but that may have large, well-functioning capital markets. Finally, an MNC can also access external currency markets: Eurodollar, Eurocurrency, or Asian dollar markets. These external markets are unregulated, and because of their lower spreads, can offer very attractive rates for financing *and* for investments. 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, the MNC may have a lower cost of capital; and because it may be better able to avoid the problems or limitations of any one financial market, it may have more continuous access to external financing compared with a domestic company.

Access to national financial markets is regulated by governments. For example, in the United States, access to capital markets is governed by SEC regulations. Access to Japanese capital markets is governed by regulations issued by the Ministry of Finance. Some countries have extensive regulations; other countries have relatively open markets. These regulations can differ depending on the legal residency of the company raising funds. A company that cannot use a local subsidiary to raise funds in a given market will be treated as foreign. In order to increase their visibility in a foreign capital market, a number of MNCs are now listing their equities on the stock exchanges of many of these countries.

The external currency markets are predominantly centered in Europe, but about 80 percent of their value is denominated in terms of the U.S. dollar. Thus, most external currency markets can be characterized as Eurodollar markets. Such markets consist of an active short-term money market and an intermediate-term capital market with maturities ranging up to 15 years and averaging about 7 to 9 years. The intermediate-term market consists of the Eurobond and the Syndicated Eurocredit markets. Recall from Chapter 7 that Eurobonds are usually issued as unregistered bearer bonds and generally tend to have higher flotation costs but lower coupon rates compared with similar bonds issued in the United States. A *Syndicated Eurocredit* loan is simply a large-term loan that involves contributions by a number of lending banks.

In arriving at its capital structure decisions, an MNC has to consider a number of factors. First, the capital structure of its local affiliates is influenced by local norms regarding that industry and in that country. Local norms for companies in the same industry can differ considerably from country to country too. Second, the local-affiliate capital structure must also reflect corporate attitudes toward exchange rate and political risks in that country. Third, the 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 its wider access to financial markets, its ability to diversify its economic and political risks, and its other advantages over domestic companies.

### Did You Get It?

1. What factors might an MNC consider in making a capital structure decision?

### Objective 8

Discuss the risks involved in direct foreign investment.

## DIRECT FOREIGN INVESTMENT

An MNC often makes direct foreign investments abroad in the form of plants 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

### Remember Your Principles

Investment across international boundaries gives rise to special risks not encountered when investing domestically. Specifically, political risks and exchange rate risk are unique to international investing. Once again, **Principle 1: The Risk–Return Trade-Off—We Won't Take On Additional Risk Unless We Expect to Be Compensated with Additional Return** provides a rationale for evaluating these considerations. Where added risks are present, added rewards are necessary to induce investment.

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 in these cash flows, and the choice of the proper discount rate. 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 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 response of a business to economic conditions in the foreign country. Thus, the U.S. MNC needs to be aware of the business climate in both the United States 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 in the profit stream by the firm's financial 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. Many foreign governments, especially those in the third world, are less stable than the U.S. 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 nationalization or even outright expropriation (government seizure) 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. Some examples of political risk are listed here:

1. Expropriation of plant and equipment without compensation.
2. Expropriation with minimal compensation that is below actual market value.
3. Nonconvertibility of the subsidiary's foreign earnings into the parent's currency—the problem of *blocked funds*.
4. Substantial changes in the laws governing taxation.
5. Governmental controls in the foreign country regarding the sale price of certain products, wages and compensation paid to personnel, the hiring of personnel, transfer payments made to the parent, and local borrowing.
6. Some governments require certain amounts of local ownership in the business.

All these controls and governmental actions put the cash flows of the investment to the parent company at risk. Thus, these risks must be considered before making the foreign investment decision. For example, the MNC might decide against investing in countries with risks of types 1 and 2. Whereas other risks can be borne—provided that the returns from the foreign investments are high enough to compensate for them. In fact, insurance against some types of political risks can be purchased from private insurance companies or from the U.S. Government Overseas Private Investment Corporation. It should be noted that although an MNC cannot protect itself against all foreign political risks, political risks are also present in domestic business.

## Exchange Rate Risk

The exposure of the firm's fixed assets is best measured by exchange rate changes that affect the firm's future earnings stream: that being economic exposure rather than translation exposure. For instance, changes in the exchange rate can adversely affect sales by making competing imported goods cheaper. Changes in the cost of goods sold can result if some components are imported and their foreign currency prices change. The thrust of these examples is that the effect of exchange rate changes on income statement items should be properly measured

to evaluate exchange rate risk. Finally, exchange rate risk affects the dollar-denominated profit stream of the parent company, whether or not it affects the firm’s foreign-operations profits.

*Did You Get It?* .....

1. What are some of the risks associated with direct foreign investments?

**Objective 1**

Discuss the internationalization of business.

**Objective 2**

Explain why foreign exchange rates in two different countries must be in line with each other.

**Objective 3**

Discuss the concept of interest rate parity.

**Objective 4**

Explain the purchasing-power parity theory and the law of one price.

**Objective 5**

Explain what exchange rate risk is and how it can be controlled.

**Objective 6**

Identify working-capital management techniques that are useful for international businesses to reduce exchange rate risk and potentially increase profits.

**Objective 7**

Explain how the financing sources available to multinational corporations differ from those available to domestic firms.

**Objective 8**

Discuss the risks involved in direct foreign investment.

**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.

Under floating systems, exchange rates between currencies vary depending upon supply and demand conditions in the 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 and interest rates. Several important exchange rate terms are introduced. These include the asked and the bid rates, which represent the selling and buying rates of currencies. The direct quote is the units of home currency per unit of foreign currency, and the indirect quote is the reciprocal of the direct quote. Cross-rate computations reflect the exchange rate between two foreign currencies.

The forward exchange market provides a valuable service by quoting rates for the delivery of foreign currencies in the future. The foreign currency is said to sell at a discount relative to the spot rate when the forward rate is lower than the spot rate. It is said to sell at a premium relative to the spot rate when the forward rate is higher than the spot rate. According to the interest rate parity theory, these premiums and discounts depend solely on the differences in the level of the interest rates of countries.

According to the purchasing-power parity (PPP) theory, in the long run, exchange rates adjust so that the purchasing power of each currency tends to be the same. Thus, exchange rate changes tend to reflect international differences in inflation rates. As a result, countries with high rates of inflation tend to experience declines in the value of their currency. Underlying the PPP relationship is the law of one price. This law is actually a proposition that in competitive markets in which there are no transportation costs or barriers to trade, the same goods sold in different countries sell for the same price if all of the different prices are expressed in terms of the same currency.

An MNC faces three types of exchange rate risk: Transaction exposure, translation exposure, and economic exposure. The company can offset its exposure using various tools including: by setting up an offsetting asset or liability of the same amount as the foreign-currency asset or liability; by using money-market and forward-market hedges, futures-market contracts and options, and currency swaps.

With regard to working-capital management in an international environment, we find leading and lagging techniques useful in minimizing exchange rate risk and increasing profitability. In addition, positioning funds is a useful tool for reducing exchange rate 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 rate 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 the 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 abroad. This makes estimating future cash flows and choosing the proper discount rates more complicated than for the domestic investment situation.

**Key Terms**

Arbitrageur	524	Covered-interest arbitrage	524
Asked rate	524	Cross rate	525
Bid-asked spread	524	Currency swaps	536
Bid rate	524	Direct quote	522
Buying rate	524	Economic exposure	534

Exchange rate	522	Multinational corporation (MNC)	520
Exchange rate risk	525	Purchasing-power parity (PPP) theory	530
Floating-rate international currency system	520	Selling rate	524
Forward exchange contract	525	Simple arbitrage	524
Forward-spot differential	526	Spot transactions	522
Forward transaction	522	Transaction exposure	532
Indirect quote	522	Transfer price	535
Interest rate parity (IRP) theory	529	Translation exposure	531
Law of one price	530	Triangular arbitrage	524

## Review Questions

- 17-1. What additional factors are encountered in international as compared with domestic financial management? Discuss each briefly.
- 17-2. What different types of businesses operate in the international environment? Why are the techniques and strategies available to these firms different?
- 17-3. What is meant by arbitrage profits?
- 17-4. What are the markets and mechanics involved in generating (a) simple arbitrage profits and (b) triangular arbitrage profits?
- 17-5. How do purchasing-power parity, interest rate parity, and the Fisher effect explain the relationships among the current spot rate, the future spot rate, and the forward rate?
- 17-6. What is meant by (a) exchange risk and (b) political risk?
- 17-7. How can exchange risk be measured?
- 17-8. What are the differences among transaction, translation, and economic exposures? Should all of them be ideally reduced to zero?
- 17-9. What steps can a firm take to reduce exchange risk? Indicate at least two different techniques.
- 17-10. How are forward-market and the money-market hedges used? What are the major differences between these two types of hedges?
- 17-11. In the New York 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 hedge your position?
- 17-12. Compare and contrast the use of forward contracts, futures contracts, and futures options to reduce foreign exchange exposure. When is each instrument most appropriate?
- 17-13. Indicate two working-capital management techniques that are useful for international businesses to reduce exchange risk and potentially increase profits.
- 17-14. How do the financing sources available to an MNC differ from those available to a domestic firm? What do these differences mean for the company's cost of capital?
- 17-15. What risks are associated with direct foreign investment? How do these risks differ from those encountered in domestic investment?
- 17-16. 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?
- 17-17. A corporation wants to enter a particular foreign market, but a DFI analysis indicates that putting a plant in the foreign country will not be profitable. What other course of action can the company take to enter the foreign market? What are the important considerations?

## Self-Test Problem

(The solution to this problem is found at the end of the chapter.)  
The data for Self-Test Problem ST-1 are given in the following table:

COUNTRY	CONTRACT	\$/FOREIGN CURRENCY
New Zealand—dollar	Spot	.3893
	30-day	.3910
	90-day	.3958

**ST-1.** You own \$10,000. The U.S. dollar rate on the New Zealand dollar is 2.5823 NZ\$/US\$. The New Zealand dollar rate is given in the accompanying table. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

## Study Problems

The data for Study Problems 17-1 through 17-6 are given in the following table:

COUNTRY	CONTRACT	\$/FOREIGN CURRENCY
Canada—dollar	Spot	.8437
	30-day	.8417
	90-day	.8395
Japan—yen	Spot	.004684
	30-day	.004717
	90-day	.004781
Switzerland—franc	Spot	.5139
	30-day	.5169
	90-day	.5315

**17-1.** (*Spot exchange rates*) An American business needs to pay (a) 10,000 Canadian dollars, (b) 2 million yen, and (c) 50,000 Swiss francs to businesses abroad. What are the dollar payments to the respective countries?

**17-2.** (*Spot exchange rates*) An American 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?

**17-3.** (*Indirect quotes*) Compute the indirect quote for the spot and forward Canadian dollar, yen, and Swiss franc contracts.

**17-4.** (*Exchange rates*) The spreads on the contracts as a percentage of the asked rates are 2 percent for yen, 3 percent for Canadian dollars, and 5 percent for Swiss francs. Show, in a table similar to the preceding one, the bid rates for the different spot and forward rates.

**17-5.** (*Exchange rate arbitrage*) You own \$10,000. The dollar rate in Tokyo is 216.6743. The yen rate in New York is given in the preceding table. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

**17-6.** (*Cross rates*) Compute the Canadian dollar/yen and the yen/Swiss franc spot rate from the data in the preceding table.

## Web Works

If you ever need to convert money from one currency to another, the Web is the place to go. There are a number of different currency converters available that are easy to use.

**17-WW1.** Take a look at the FX Converter ([www.oanda.com/convert/classic](http://www.oanda.com/convert/classic)). Use it to convert 100 Fiji dollars to U.S. dollars. How much are the 100 Fiji dollars worth in U.S. dollars?

**17-WW2.** Use the Bank of Canada currency converter ([www.bankofcanada.ca/en/exchform.htm](http://www.bankofcanada.ca/en/exchform.htm)) to convert 100 Croatian kunas to U.S. dollars. How much are they worth?

**17-WW3.** Try the Yahoo! Finance currency calculator ([finance.yahoo.com/m3?u](http://finance.yahoo.com/m3?u)) to convert 100 U.S. dollars into euros. How many euros would you get for \$100?

**17-WW4.** Now use whatever currency calculator you'd like and move 100 U.S. dollars to euros. Convert those euros to Japanese yen and then convert those Japanese yen into U.S. dollars. How many U.S. dollars do you have?

## Mini Case

For your job as the business reporter for a local newspaper, you are asked to put together a series of articles on multinational finance and the international currency markets for your readers. Much recent local press coverage has been given to losses in the foreign exchange markets by JGAR, a local firm that is the subsidiary of Daedlufetarg, a large German manufacturing firm.

Your editor would like you to address several specific questions dealing with multinational finance. Prepare a response to the following memorandum from your editor:

To: Business Reporter  
 From: Perry White, Editor, *Daily Planet*  
 Re: Upcoming Series on Multinational Finance

In your upcoming series on multinational finance, I would like to make sure you cover several specific points. Before you begin this assignment, I want to make sure we are all reading from the same script because accuracy has always been the cornerstone of the *Daily Planet*. I'd like a response to the following questions before we proceed:

- a. What new problems and factors are encountered in international, as opposed to domestic, financial management?
- b. What does the term *arbitrage profits* mean?
- c. What can a firm do to reduce exchange risk?
- d. What are the differences among a forward contract, a futures contract, and options?

Use the following data in your responses to the remaining questions:

Selling Quotes for Foreign Currencies in New York

COUNTRY—CURRENCY	CONTRACT	\$/FOREIGN
Canada—dollar	Spot	.8450
	30-day	.8415
	90-day	.8390
Japan—yen	Spot	.004700
	30-day	.004750
	90-day	.004820
Switzerland—franc	Spot	.5150
	30-day	.5182
	90-day	.5328

- e. An American business needs to pay (a) 15,000 Canadian dollars, (b) 1.5 million yen, and (c) 55,000 Swiss francs to businesses abroad. What are the dollar payments to the respective countries?
- f. An American business pays \$20,000, \$5,000, and \$15,000 to suppliers in, respectively, Japan, Switzerland, and Canada. How much, in local currencies, do the suppliers receive?
- g. Compute the indirect quote for the spot and forward Canadian dollar contract.
- h. You own \$10,000. The dollar rate in Tokyo is 216.6752. The yen rate in New York is given in the preceding table. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?
- i. Compute the Canadian dollar/yen spot rate from the data in the preceding table.

## Self-Test Solution

**SS-1.** The New Zealand rate is 2.5823 NZ\$/US\$, and the (indirect) New York rate is 1/.3893 = 2.5687 NZ\$/US\$.

Assuming no transaction costs, the rates between New Zealand and New York are out of line. Thus, arbitrage profits are possible.

Step 1. Because the New Zealand dollar is cheaper in New Zealand, buy \$10,000 worth of New Zealand dollars in New Zealand. The number of New Zealand dollars purchased would be  $\$10,000 \times 2.5823 = 25,823$  New Zealand dollars.

Step 2. Simultaneously, sell the New Zealand dollars in New York at the prevailing rate. The amount received upon the sale of the New Zealand dollars would be:

$$25,823 \text{ NZ\$} \times \$.3893/\text{NZ\$} = \$10,052.89$$

$$\text{The net gain is } \$10,052.89 - \$10,000 = \$52.89.$$