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.

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CHAPTER 22

International Business Finance

Finding new projects doesn't necessarily mean coming up with a new product. It may simply mean taking an existing product and finding a new market. That's what we saw in the introduction to Chapter 9 when we looked at Universal's plans to build a theme park in Shanghai, China. It's also been the direction McDonald's has taken in recent years. Today, McDonald's operates in over 70 countries with more than 20,000 restaurants. One of the biggest is a 700-seat McDonald's in Moscow. 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, McDonald's faces many different and challenging factors as they open outlets outside of the United States. First, in order to keep the quality level identical with what is served at any McDonald's anywhere in the world, they spent six years putting together a supply chain that would provide the necessary raw materials at the quality level 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, they cut off three zeros. Unfortunately, that wasn't enough to 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 lost control, and in August the entire banking system failed.

When it was all over at the end of 1998, the exchange rate had fallen to 23 rubles per dollar, a drop of more than 280 percent. Because McDonald's sells it burgers for rubles, when it came time to trade the rubles for U.S. dollars, the Russian McDonald's sales weren't worth nearly as much as they were the year before. In spite of all this, the Moscow McDonald's has proven to be enormously successful since it opened. In fact, by 2003, McDonald's had 71 stores in 22 Russian cities, representing an investment of more than $215 million. 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.

CHAPTER PREVIEW

This chapter highlights the complications that an international business faces when it deals in multiple currencies. Effective strategies for the reduction of foreign exchange risk are discussed. Working-capital management and capital structure decisions in the international context are also covered. For the international firm, direct foreign investment is a capital-budgeting decision—with some additional complexities.

As you study this chapter on international business finance, you will be reminded of two of the principles that tie this entire text together: **Principle 1: The Risk-Return Trade-Off—We won't take on additional risk unless we expect to be compensated with additional return;** and **Principle 3: Cash—Not Profits—Is King.** Look for them as you work through the several discussions.

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Objective 1

THE GLOBALIZATION OF PRODUCT AND FINANCIAL MARKETS

Today, there is no ducking the global markets. In fact, it has been estimated that the United States exports about one-fifth of its industrial production and that about 70 percent of all U.S. goods compete directly with foreign goods.

There has also been a rise in the global level of international portfolio and direct investment. Both direct and portfolio investment in the United States have been increasing faster than U.S. investment overseas. Direct investment 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 one year, such as the purchase of foreign stocks and bonds. Total foreign investment in the United States now exceeds such U.S. investment overseas.

Multinational corporation (MNC)
A corporation with holdings and/or operations in one or more countries.

A major reason for long-run overseas investments of U.S. companies is the high rates of return obtainable from these investments. 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 last decade, these firms have been increasing their sales and setting up production facilities abroad, especially in the United States.

Capital flows between countries for international financial investment purposes 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 larger than any domestic financial market. 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. 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.

The foreign exchange markets have also grown rapidly, and the weekly trading volume in these globally integrated markets (between $4 and $7 trillion) exceeds the annual trading volume on the world's securities markets. 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.

CONCEPT CHECK

1. Why do U.S. companies invest overseas?
2. What kinds of risks are introduced when a firm invests overseas?

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EXCHANGE RATES

Objective 2

Recent History of Exchange Rates

Between 1949 and 1970, the exchange rates between the major currencies were fixed. All countries were required to set a specific *parity rate* for their currency vis-à-vis the U.S. dollar. For example, consider the German currency, the deutsche mark (DM). In 1949, the parity rate was set at DM 4.0 per dollar (DM 4.0/$). The actual exchange rate prevailing on any day was allowed to lie within a narrow band around the parity rate. The DM was allowed to fluctuate between DM 4.04 and DM 3.96/$. A country could effect a major adjustment in the exchange rate by changing its parity rate with respect to the dollar. When the currency was made cheaper with respect to the dollar, this adjustment was called a *devaluation*. A *revaluation* resulted when a currency became more expensive with respect to the dollar. In 1969, the DM parity rate was adjusted to DM 3.66/$. This adjustment was a revaluation of the DM parity by 9.3 percent. The new bands around the parity were DM 3.7010 and DM 3.6188/$. The DM strengthened against the dollar because fewer DM were needed to buy a dollar.

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.[1] Most major currencies, including the U.S. dollar, fluctuate freely, depending upon their values as perceived by the traders in foreign exchange markets. The 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 in the determination of exchange rates.[2] Short-term, day-to-day fluctuations in exchange rates are caused by changing supply and demand conditions in the foreign exchange market.

Floating-rate international currency system
An international currency system in which exchange rates between different national currencies are allowed to fluctuate with supply and demand conditions. This contrasts with a fixed rate system in which exchange rates are pegged for extended periods of time and adjusted infrequently.

Introduction of the Euro

In July of 2002 the national currencies of 11 countries of the European Union, often referred to as Euroland, including Germany, France, Italy, Spain, Portugal, Belgium, the Netherlands, Luxembourg, Ireland, Finland, and Austria, were replaced with the Euro. 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 made it easier for goods, people, and services to travel across national borders. As a result, the economies of the European Union flourished. A common currency eliminated the exchange costs that occur when trading German marks for French francs. It also eliminated the uncertainty associated with exchange rate fluctuations. It, for example, also helped to eliminate cost differences for goods in different countries. For example, just before the Euro was introduced, "The Classics" Swatch watch was selling for 39.2 Euros ($45.97) in Belgium and only 25.7 Euros ($30.14) in Italy. The introduction of the Euro made it easier to compare prices and eliminate the discrepancies.

What did all this mean for the United States? It meant several things: First, it meant the competition from abroad was stronger. It also made the exchange rate between the Euro and the U.S. dollar a very important exchange rate. If the Euro is strong, it helps

[1] The system of floating rates is referred to as the "floating-rate regime."

[2] 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.

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AN ENTREPRENEUR'S PERSPECTIVE

"SHIP THOSE BOXES, CHECK THE EURO!"—HOW A TINY FIRM RIDES FOREIGN-EXCHANGE WAVES

Plymouth Meeting, Pa.—THE FIRST THING Kim Reynolds, president of Markel Corp., does each morning is meet with his top factory-floor managers to see if all is well on the production line. The second thing he does is scan the latest intelligence from global currency markets to see if all's well on his bottom line.

Markel, whose Teflon-like tubing and insulated lead wire is used in the automotive, appliance, and water-purification industries, expects 40 percent of its $26 million in sales this year will be overseas, mostly in Europe. "We use a fixed [currency-price] conversion when we quote prices, and we assume the currency loss or gain," says Cheryl Jolly, Markel's export manager, as she supervises the weighing of boxes bound for Germany.

To protect himself and his company Mr. Reynolds has forged a business strategy that allows it to survive, and perhaps even prosper, when a key element of his profitability is far beyond his control. Markel's is a four-part approach: charge customers relatively stable prices in their own currencies to build overseas market share; tap "forward" currency markets to provide revenue stability over the next few months; improve efficiency to make it through the times when currency trading turns ugly; and roll the dice and hope things get better.

Markel signs contracts that lead to the delivery of wads of Euros months or even years down the road, when the value of those Euros in dollars may be much less than it was at signing. To minimize the uncertainty over the span of a few months, Markel's Chief Financial Officer, James A. Hoban, buys forward contracts through PNC Financial Services Group in Pittsburgh. Markel promises the bank, say, 50,000 Euros in four months, and the bank guarantees a certain number of dollars no matter what happens to the exchange rate.

When he thinks the dollar is on its way up, Mr. Hoban might hedge his entire expected Euro revenue stream with a forward contract. When he thinks the dollar is heading down, he will hedge perhaps 50 percent and take a chance that he will make more dollars by remaining exposed to currency swings.

He doesn't always guess right. Sometime this month, for instance, Markel will have to provide PNC with 50,000 Euros from a contract the company bought in early January. The bank will pay $1.05 per Euro, or $52,500. Had Mr. Hoban waited, Markel could have sold at the going rate, $1.08, and made an additional $1,500. To make matters worse, Markel cut the supply deal with Germany's Kuster in 1998 and set the sales price assuming the Euro would be at $1.18 by now, just a tad stronger than it traded at when introduced officially at the beginning of 1999. "Dumb us," Mr. Reynolds says. "At the time it was introduced, nobody thought it would immediately plunge."

In fact, the Euro sank like a rock, bottoming out near 82 cents on Oct. 26, 2000, and that meant each Euro Markel received for its products was worth far less in dollars than the company had expected. In 2001 and 2002 combined, Markel identified more than $625,000 in currency losses, and the company posted overall losses in both years.

Most of Markel's current deals were written assuming that the Euro would be valued between 90 cents and 95 cents. But at the current $1.08, helped by worries about the U.S. trade deficit, jittery U.S. financial markets, and a possible war in Iraq, it has been a currency windfall for Markel. Company executives figure that if the Euro remains between $1.05 and $1.07, and the British pound remains at about $1.60, Markel will post $400,000 to $500,000 in currency gains this year.

Source: Michael M. Phillips, "'Ship Those Boxes, Check the Euro!'—How a Tiny Firm Rides Foreign-Exchange Waves," *The Wall Street Journal*, excerpt, February 7, 2003, page C1.

U.S. exports by making them cheaper. However, if the Euro is weak, U.S. exports may 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 will allow Wal-Mart to offer even more bargains from all over Euroland, and it will allow Wal-Mart to provide a much more diverse selection of goods. That's because in Europe, because of all the exchange rate uncertainties, most goods are regional in nature. That's the bottom line—the Euro should introduce greater choice and greater competition—both good for the consumer. See the An Entrepreneur's Perspective box, " 'Ship Those Boxes, Check the Euro!'—How a Tiny Firm Rides Foreign-Exchange Waves."

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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 such as 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 (that is, 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 will illustrate 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 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 the arbitrage mechanism, 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 and forward transactions.

Spot Exchange Rates

A typical spot transaction involves an American firm buying foreign currency from its bank and paying for it in dollars. The price of foreign currency in terms of the domestic currency is the **exchange rate**. Another type of spot transaction occurs when an American firm receives foreign currency from abroad. The firm typically would sell the foreign currency to its bank for dollars. These are both **spot transactions** because one currency is traded for another currency today. 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 in the interbank market. 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 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.

Exchange rate
The price of foreign currency stated in terms of the domestic or home currency.

Spot transaction
A transaction made immediately in the marketplace at the market price.

On 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 mark, and so on. The spot rates in Table 22-1 are the direct exchange quotes taken from *The Wall Street Journal.* Thus, according to Table 22-1, to buy 1 British pound (£1), $1.6229 was needed. To buy Japanese Yen and Euros, $0.008623, and $1.1574 were needed, respectively.

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

An **indirect quote** indicates the number of units of foreign currency that can be bought for one unit of the home currency. This reads as Euros per dollar, pecos per dollar, and so forth. An indirect quote is the general method used in the over-the-counter

Indirect quote
The exchange rate that expresses the required number of units of foreign currency to buy one unit of home currency.

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TABLE 22-1 Foreign Exchange Rates Reported on May 16, 2003

KEY CURRENCY CROSS RATES — **LATE NEW YORK TRADING, FRIDAY, MAY 16, 2003**

	DOLLAR	EURO	POUND	SFRANC	PESO	YEN	CDNDIR
Canada	1.3648	1.5796	2.2150	1.0441	.13239	.01177	—
Japan	115.97	134.22	188.21	88.716	11.249	—	84.970
Mexico	10.3093	11.9320	16.731	7.8866	—	0.8890	7.5536
Switzerland	1.3072	1.5129	2.1214	—	.12680	.01127	.9578
U.K.	.61620	.7132	—	.4714	.05977	.00531	.45148
Euro	.86400	—	1.4022	.66096	.08381	.00745	.63306
U.S.	—	1.1574	1.6229	.76500	.09700	.00862	.73270

Source: Reuters.

EXCHANGE RATES

The foreign exchange mid-range 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.

COUNTRY	U.S. $ EQUIVALENT	CURRENCY PER U.S. $
Argentina (Peso)-y	.3407	2.9351
Australia (Dollar)	.6527	1.5321
Brazil (Real)	.3398	2.9429
Canada (Dollar)	.7327	1.3648
1-month forward	.7315	1.3671
3-months foward	.7288	1.3721
6-months forward	.7245	1.3803
China (Renminbi)	.1208	8.2781
Czech. Rep. (Koruna)		
Commerical rate	.03700	27.027
Denmark (Krone)	.1558	6.4185
Hong Kong (Dollar)	.1282	7.8003
Hungary (Forint)	.004719	211.91
India (Rupee)	.02124	47.081
Indonesia (Rupiah)	.0001182	8460
Israel (Shekel)	.2230	4.4843
Japan (Yen)	.008623	115.97
1-month forward	.008633	115.83
3-months forward	.008651	115.59
6-months forward	.008675	115.27
Kuwait (Dinar)	3.3526	.2983
Malaysia (Ringgit)-b	.2632	3.7994
Mexico (Peso)		
Floating rate	.0970	10.3093
New Zealand (Dollar)	.5810	1.7212
Russia (Ruble)-a	.03238	30.883
Saudi Arabia (Riyal)	.2667	3.7495
South Africa (Rand)	.1297	7.7101
South Korea (Won)	.0008334	1199.90
Sweden (Krona)	.1253	7.9177
Switzerland (Franc)	.7650	1.3072
1-month forward	.7654	1.3065
3-months forward	.7665	1.3046
6-months forward	.7680	1.3021
Taiwan (Dollar)	.02890	34.602
Thailand (Baht)	.02374	42.123
Turkey (Lira)	.00000067	1492537
U.K. (Pound)	1.6229	.6162
1-month forward	1.6197	.6174
3-months forward	1.6134	.6198
6-months forward	1.6040	.6234
Venezuela (Bolivar)	.000626	1597.44
SDR	1.4066	.7109
Euro	1.1574	.8640

Special Drawings 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. y-Floating rate.

Source: *The Wall Street Journal,* May 19, 2003, page C11.

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market. Exceptions to this rule include British pounds, Irish punts, Australian dollars, and New Zealand dollars, which are quoted via direct quote for historical reasons. Indirect quotes are given in the last column of Table 22-1.

In summary, a direct quote is the dollar/foreign currency rate ($/FC), and an indirect quote is the foreign currency/dollar (FC/$). 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: Indirect Quote

Suppose you want to compute the indirect quote from the direct quote of spot rates for pounds given in column 1 of Table 22-1. The direct quote for the pound is $1.6229. The related indirect quotes are calculated as the *reciprocal* of the direct quote as follows:

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

Thus,

$$\text{pounds } \frac{1}{\$1.6229/£} = £.6162$$

Notice that this quote and indirect quote are identical to those shown in the second column of Table 22-1.

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

Example: Converting Euros to Dollars

An American business must pay 1,000 Euros to a German firm on May 16, 2003. How many dollars will be required for this transaction?

$\$1.1574/€ \times €1{,}000 = \$1{,}157.42$

Example: Converting Dollars to Pounds

An American business must pay $2,000 to a British resident on May 16, 2003. How many pounds will the British resident receive?

$£.6162/\$ \times \$2{,}000 = £1{,}232.40$

Exchange Rates and Arbitrage

The foreign exchange quotes in two different countries must be in line with each other. The direct quote for U.S. dollars in London is given in pounds per dollar. Because the foreign exchange markets are efficient, the direct quotes for the per U.S. dollar rate in London on May 16, 2003, must be very close to the indirect rate prevailing in New York on that date.

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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 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.

Arbitrageur
A person involved in the process of buying and selling in more than one market to make riskless profits.

Simple arbitrage
Trading to eliminate exchange rate differentials across the markets for a single currency, for example, for the New York and London markets.

Triangular arbitrage
Arbitrage across the markets for all currencies.

Covered-interest arbitrage
Arbitrage designed to eliminate differentials across currency and interest rate markets.

Suppose that London quotes £.6300/$ instead of £.6162/$. If you simultaneously bought a pound in New York for £.6162/$ and sold a pound in London for £.6300/$, you would have (1) taken a zero net investment position since you bought £1 and sold £1, (2) locked in a sure profit of £.0138/$ 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 New York will lead to a higher quote there and the increased supply of pounds will lead to a lower quote in London. The workings of the market will produce a new spot rate that lies between £.6162/$ and £.6300/$ 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 22-1 contains only the selling, offer, or asked rates, and not the buying rate.

Asked rate
The rate a bank or foreign exchange trader "asks" the customer to pay in home currency for foreign currency when the bank is selling and the customer is buying.

Selling rate
Same as the asked rate.

Bid rate
The rate at which the bank buys the foreign currency from the customer by paying in home currency.

Buying rate
The bid rate in a currency transaction.

The bank 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.

Bid-asked spread
The difference between the asked quote and the bid quote.

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 22-1. 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: Cross Rates

Taking the dollar/pound and the Euro/dollar rates from columns 1 and 2 of Table 22-1, determine the Euro/pound and pound/Euro exchange rates. We see that

$$(\$/£) \times (€/\$) = (€/£)$$

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or

$1.6229 \times .8640 = €1.4022/£$

Thus, the pound/Euro exchange rate is

$1/1.4022 = £.7132/€$

Cross-rate computations make it possible to use quotations in New York to compute the exchange rate between pounds, dollars, and Euros. Arbitrage conditions hold in cross rates, too. For example, the pound exchange rate in London (the direct quote Euros/pound) must be 1.4022 as shown in the example. The Euro exchange rate in London must be .7132 Euros/mark. If the rates prevailing in Frankfurt and London 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 a process called *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 on March 1 is for delivery on 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 contract that requires delivery on a specified future date of one currency in return for a specified amount of another currency.

Exchange rate risk
The risk that tomorrow's exchange rate will differ from today's.

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 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 future 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, and 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 one year can be costly.

Forward rates, like spot rates, are quoted in both direct and indirect form. The direct quotes for the 30-day and 90-day forward contracts on pounds, francs, and marks are given in column 1 of Table 22-1. The indirect quotes for forward contracts, like spot rates, are reciprocals of the direct quotes. The indirect quotes are indicated in column 2 of Table 22-1. 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 22-1, the 30-day forward quote for pounds is $1.6197 per pound. This means that the bank is contractually bound to deliver £1 at this price, and the buyer of the

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contract is legally obligated to buy it at this price. 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 $1.6197, then the customer pays *more* than the spot price. If the spot price is greater than $1.6197 then the customer pays *less* than the spot price.

The forward rate is often quoted at a premium to or discount from the existing spot rate. For example, the 30-day forward rate for the pound may be quoted as .0032 discount (1.6197 forward rate – 1.6229 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. Notice in Table 22-1 that while the British pound and Canadian dollar are selling at a discount relative to the dollar, both the Swiss franc and Japanese yen are selling at a premium to the dollar. This premium or discount is also called the **forward-spot differential**.

Forward-spot differential
The premium or discount between forward and spot currency exchange rates.

Notationally, the relationship may be written:

$$F - S = \text{premium } (F > S) \text{ or discount } (S > F) \quad \textbf{(22-1)}$$

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:

$$\frac{F - S}{S} \times \frac{12}{n} \times 100 = \text{annualized percentage}$$
$$\text{premium } (F > S) \text{ or discount } (S > F) \quad \textbf{(22-2)}$$

where n = the number of months of the forward contract

Example: Computing the Percent-per-annum Premium

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

Step 1. Identify F, S, and n.

$F = 1.6197$, $S = 1.6229$, $n = 1$ month

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

$$D = \frac{1.6197 - 1.6229}{1.6229} \times \frac{12 \text{ months}}{1 \text{ month}} \times 100$$
$$= -2.37\%$$

The percent-per-annum discount on the 30-day pound is –2.37 percent. The percent-per-annum discount on the 30-day and 90-day Canadian dollar, Swiss franc, and Japanese yen contracts are computed similarly with the exception that a 90-day contract is annualized by dividing 12 months by 3 months rather than 1 month. The results for pounds and Swiss francs are:

	30-Day	90-Day
British pound	–2.37%	–2.34%
Swiss francs	+0.627%	+0.784%

Examples of Exchange Rate Risk

The concept of exchange rate risk applies to all types of international businesses. The measurement of these risks, and the type of risk, may differ among businesses. Let us see

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how exchange risk affects international trade contracts, international portfolio investments, and direct foreign investments.

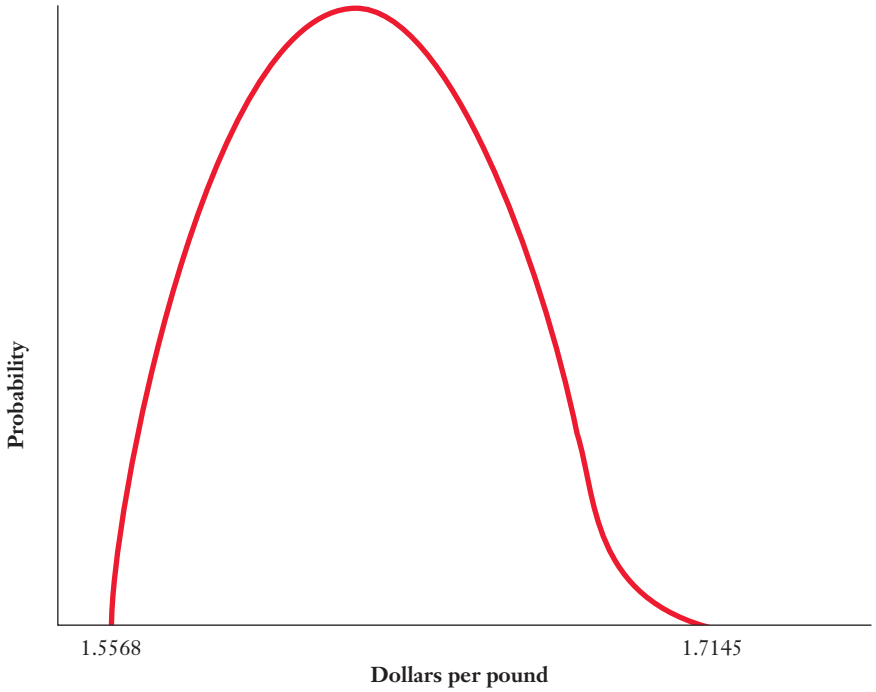
EXCHANGE RATE RISK IN INTERNATIONAL TRADE CONTRACTS The idea of exchange rate risk in trade contracts is illustrated in the following situations.

Case I. An American automobile distributor agrees to buy a car from the manufacturer in Detroit. The distributor agrees to pay $15,000 on delivery of the car, which is expected to be 30 days from today. The car is delivered on the thirtieth day and the distributor pays $15,000. 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 Great Britain for £8,800. The amount is payable on the delivery of the car, 30 days from today. From Figure 22-1, we see the range of spot rates that we believe can occur on the date the contract is consummated. On the thirtieth day, the American importer will pay some amount in the range of $13,699.84 (8,800 × 1.5568) to $15,087.60 (8,800 × 1.7145) for the car. Today, 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), where the contract is written in the foreign currency, the exact dollar amount of the contract is not known. The variability of the exchange rate induces variability in the future cash flow.

FIGURE 22-1 A Subjective Probability Distribution of the Pound Exchange Rate, 30 Days in the Future



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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 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 risk. With the contract written in dollars, the British exporter would bear all 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 the type discussed here, 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, different from either the importer's or the exporter's domestic currency. In Case II, the contract might have been denominated in, say, the deutsche mark. With a mark contract, both 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 New Zealand security in denominated New Zealand dollars (NZD). 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, three months stated in marks could be anything from –2 to +8 percent. In addition, the NZD/US dollar exchange rate may depreciate by 4 percent or appreciate by 6 percent in the three-month period during which the investment is held. The return to the American investor, in dollars, will therefore be in the range of –6 to +14 percent.[3] Notice that the return to a New Zealand investor, in euros, is in the range of –2 to +8 percent. Clearly, for the American investor, the exchange factor induces a greater variability in the dollar rate of return. 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 receives the repatriated profit stream 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. 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 corporations find numerous reasons that the returns from international transactions outweigh the risks.

[3] Example: Assume the spot exchange rate is \$.50/NZD. In three months, the exchange rate would be $.50 \times (1 - .04) = .48$ to $.50 \times (1 + .06) = .53$. A \$50 investment today is equivalent to an NZD 100 investment. The NZD 100 investment would return NZD 98 to € 108 in three months. The return, in the worst case, is NZD $98 \times .48 =$ \$47.04. The return, in the best case, is NZD $108 \times .53 =$ \$57.24. The holding-period return, on the \$50 investment, will be between –6 percent (\$47.04 – \$50)/\$50 and +14 percent (\$57.24 – \$50)/\$50.

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BACK TO THE 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.***

CONCEPT CHECK

1. What is a spot transaction? What is a direct quote? An indirect quote?
2. What 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

Objective 3

Forward rates generally entail a premium or a discount relative to current spot rates. However, these forward premiums and discounts differ between currencies and maturities as we saw with the British pound and Swiss franc. 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.

Interest-rate parity (IRP) 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 differences 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 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.

CONCEPT CHECK

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

PURCHASING-POWER PARITY

Objective 4

Purchasing-power parity (PPP) theory
In the long run, exchange rates adjust so that the purchasing power of each currency tends to remain 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 currency.

Long-run changes in exchange rates are influenced by international differences in inflation rates and the purchasing power of each nation's currency. Exchange rates of countries with high rates of inflation will tend to decline. According to the **purchasing-power parity**

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(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 currency. Thus, if Great Britain experiences a 10 percent rate of inflation in a year that Switzerland experiences only a 6 percent rate, the UK currency (the pound) will be expected to decline in value approximately by 3.77 percent (1.10/1.06) against the Swiss currency (the Swiss franc). More accurately, according to the PPP:

$$\text{expected spot rate} = \text{current spot rate} \times \text{expected difference in inflation rate}$$

$$\begin{array}{c}\text{expected spot rate}\\ \text{(domestic currency}\\ \text{per unit of foreign}\\ \text{currency)}\end{array} = \begin{array}{c}\text{current spot rate}\\ \text{(domestic currency}\\ \text{per unit of foreign}\\ \text{currency)}\end{array} \times \frac{(1 + \text{expected domestic inflation rate})}{(1 + \text{expected foreign inflation rate})}$$

Thus, if the beginning value of the Swiss franc were £.40, with a 6 percent inflation rate in Switzerland and a 10 percent inflation rate in Great Britain, according to the PPP, the expected value of the Swiss franc at the end of that year will be £.40 × [1.10/1.06], or £.4151.

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 purchasing-power parity 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
The proposition that in competitive markets the same goods should sell for the same price where prices are stated in terms of a single currency.

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 goods sold in different countries sell 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.

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 purchasing-power parity theory and the law of one price; however, we must remember that this theory is based upon 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.

International Fisher Effect

According to the domestic Fisher effect (FE) (remember our discussion in Chapter 6), nominal interest rates reflect the expected inflation rate and a real rate of return. In other words,

$$\begin{array}{c}\text{nominal}\\ \text{interest rate}\end{array} = \begin{array}{c}\text{expected}\\ \text{inflation rate}\end{array} + \begin{array}{c}\text{real rate}\\ \text{of interest}\end{array}$$

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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 Great Britain and Switzerland 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 difference 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.

CONCEPT CHECK

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

EXPOSURE TO EXCHANGE RATE RISK

Objective 5

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.

Three measures of foreign exchange exposure are translation exposure, transaction exposure, and economic exposure. Translation exposure arises because the foreign operations of MNCs have accounting statements denominated in the local currency of the country in which the operation is located. 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. 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 (that is, the dollar) from foreign operations is exposed to exchange rate risk. Indeed, the whole stream of future cash flows is exposed. The Japanese automaker situation highlights the effect of economic exposure on an MNC's revenue stream. The three measures of exposure now are examined more closely.

TRANSLATION EXPOSURE

Foreign currency assets and liabilities are considered exposed if their foreign currency value for accounting purposes is to be translated into the domestic currency using the currency exchange rate—the exchange rate in effect on the balance sheet date. Other

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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 accounts—are not considered to be exposed. The rate (current or historic) used to translate various accounts depends on the translation procedure used.

Although 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. Thus, if financial markets are efficient and managerial goals are consistent with owner wealth maximization, a firm should not have to waste real resources hedging against possible paper losses caused by translation exposure. However, if there are significant agency or information costs or if markets are not efficient, a firm may indeed find it economical to hedge against translation losses or gains.

Transaction Exposure

Transaction exposure
The net contracted foreign currency transactions for which the settlement amounts are subject to changing exchange rates.

Receivables, payables, and fixed-price sales or purchase contracts are examples of foreign currency transactions whose monetary value was 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 may be neutralized or hedged by a change in the asset and liability position in the foreign currency. 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 hedge 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 assures 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 (that is, the amount it owes) 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 Great 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 $4,820.50 (2,970.30 × 1.6229).

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Step 3. Invest £2,970.30 in a United Kingdom one-month money-market instrument. This investment will compound to exactly £3,000 in one month. The future liability of £3,000 is covered by the £2,970.30 investment.[4]

Note: If the American business does not own this amount today, it can borrow $4,820.50 from the U.S. money market at the going rate of 1.5 percent. In 30 days, the American business will need to repay $4,892.81 [$4,820.50 × (1 + .015)].

Assuming that the American business borrows the money, its management may base its calculations on the knowledge that the British goods, on delivery in 30 days, will cost it $4,892.81. The British business will receive £3,000. The American business need not wait for the future spot exchange rate to be revealed. On today's date, the future dollar payment of the contract is known with certainty. This certainty helps the American business in making 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 covering a net asset position in the foreign currency are the exact reverse of the mechanics of covering the liability position. With a net asset position in pounds: Borrow in the United Kingdom money market in pounds, convert to dollars on the spot exchange market, invest in the U.S. money market. When the net assets are converted into pounds (i.e., 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, owing especially to the need for information about the market. These traders use the exchange-market or the 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 (liability) position is covered by a liability (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 may 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 $1.6197/£.

Step 2. On the thirtieth day pay the banker $4,859.10 (3,000 × $1.6197) and collect £3,000. Pay these pounds to the British supplier.

By the use of the forward contract the American business knows the exact worth of the future payment in dollars ($4,859.10). 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 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. The alert student may have noticed that the dollar payments in the money-market hedge and the forward-market hedge examples were, respectively, $4,820.50 and $4,859.10.

[4] Observe that £2,970.30 × (1 + .01) = £3,000.

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A FOCUS ON HARLEY-DAVIDSON
ROAD RULES

MANAGING FOREIGN EXCHANGE RISK EXPOSURE AT HARLEY-DAVIDSON—THE EURO EXPERIENCE

Harley-Davidson is one of those companies that focus on the long-run growth, and one of the markets that it looks to for future growth is Europe. The potential there for Harley is tremendous. In fact, according to Jim Brostowitz, the Vice President Controller/Treasurer at Harley-Davidson, the number of heavyweight motorcycles registered in Europe is only slightly less than in the United States, with Harley controlling about 6.6 percent of that market. As a result, Harley has set its sights on Europe and has set the seeds for a bright future. It has done that by developing dealer networks, H.O.G. (Harley Owners Group) events, and Harley-Davidson events just like the ones that have been so successful in the United States. Things looked bright in Europe.

When the Euro was first introduced in January 1999, it looked like that might make managing exchange risk much easier, but that was not the case. In the next two years the bottom fell out of the Euro as the exchange rate dropped from \$1.17/€ to \$0.84/€. Then, by the summer of 2003, the exchange rate was back up to \$1.17/€. To say the least, this was a financial nightmare.

At Harley-Davidson, the job of overseeing this nightmare has fallen in the lap of Jim Brostowitz. One of the problems Harley faces is the fact that virtually all of its motorcycles sold in Europe are made in the United States, and its workers and suppliers are paid in U.S. dollars. However, when Harleys are sold in Europe, the payment comes in the form of Euros. What happens if the Euro falls by 28 percent between the time the motorcycle is built and payment is received? In that case, Harley receives the purchase price in Euros, but they are worth 28 percent less than expected.

How does Jim Brostowitz go about protecting Harley's bottom line against this exchange rate fluctuation risk? He does it with a combination of hedging in the forward markets, a topic we cover in Chapter 22, and price adjustments. As Brostowitz notes with respect to the drop in the dollar in 2000, "Motorcycle prices are set with the introduction of new models, just like car prices are set, and there generally aren't any mid-year price increases. To eliminate short-term exchange rate risk we hedge forward contracts, going out about 6 months. This gives us short-term stability. In the longer-term, you've got to adjust prices. For example, for the 2001 model year, which was introduced in July 2000, the general U.S. price increase was about 1.5 percent, but in Europe, the price increase was between 5 and 10 percent depending on the model." As Harley is well aware, risks from economic and currency problems abroad can be devastating. For that reason, it prepares ahead of time for those risks.

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. See the Focus on Harley-Davidson box.

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 required delivery of foreign currency at maturity, exchange traded options permit fixed (strike) price foreign currency transactions anytime before maturity. Futures contracts and options differ from forward contracts in that, unlike forward contracts, which are customized regarding amount and maturity date, 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. The purchase of futures requires the fulfillment of margin requirements

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(about 5 to 10 percent of the face amount), whereas the purchase of forward contracts requires only good credit standing with a bank. The purchase of options requires an immediate outlay that reflects a premium above the strike price and an outlay equal to the strike price when and if the option is executed.

Economic 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 transactions 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 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 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 margins 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.

CONCEPT CHECK

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

MULTINATIONAL WORKING-CAPITAL MANAGEMENT

Objective 6

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 an MNC with subsidiaries in many

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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 an 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 such decisions may not be best for the MNC as a whole. To effect global management, sophisticated computerized models—incorporating many variables for each subsidiary—are solved 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

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 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. 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 otherwise have.

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 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 minimized. It bears repeating that, owing to the global strategy of the MNC, the tax liability of the subsidiary in country A may be greater than it would otherwise have been, but the overall tax payment for all units of the MNC is minimized.

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

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.

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CONCEPT CHECK

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

INTERNATIONAL FINANCING AND CAPITAL-STRUCTURE DECISIONS

Objective 7

An MNC has access to many more financing sources than does 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 may enjoy preferential credit standards because of its size and investor preference for its home currency. An 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 spread, 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 a more continuous access to external finance compared to 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 may differ depending on the legal residency terms of the company raising funds. A company that cannot use its 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, and 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. 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 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 capital structure 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 toward exchange rate

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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 its wider access to financial markets, its ability to diversify economic and political risks, and its other advantages over domestic companies.

BACK TO THE 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.*

CONCEPT CHECK

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

Objective 8

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 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 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 response of 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

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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 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 as follows:

1. Expropriation of plants 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 the products, wages, and compensation to personnel, hiring of personnel, making of transfer payments to the parent, and local borrowing.
6. Some governments require certain amounts of local equity participation in the business. Some require that the majority of the equity participation belong to their country.

All of these controls and governmental actions introduce risks in 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 types 1 and 2. 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 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 fixed assets is best measured by the effects of the 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 rate risk affects the dollar-denominated profit stream of the parent company, whether or not it affects the foreign-currency profits.

CONCEPT CHECK

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

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HOW FINANCIAL MANAGERS USE THIS MATERIAL

As the magnitude of international trade has expanded over the past two decades, so has the role of the multinational corporation. Firms routinely report their operating results by breaking out revenues *both* from major product lines *and* country-of-origin where direct foreign investment has taken place.

The expanded U.S. multinational presence has made financial executives acutely aware of the problems associated with foreign exchange rate risk. Management of the Walt Disney Company has said: "The Company's objective in managing the exposure to foreign currency fluctuations is to reduce earnings and cash flow volatility associated with foreign exchange rate changes to allow management to focus its attention on its core business issues and challenges."

The preponderance of multinational corporations do indeed focus on their main lines of business and do not, therefore, voluntarily enter into either foreign currency transactions or interest rate transactions for purposes of speculation on possible profit-making opportunities.

International markets have also been fertile grounds for finding new products. In fact, for many firms, finding new projects doesn't necessarily mean coming up with a new product; it may mean taking an existing product and applying it to a new market. That's certainly been the direction that McDonald's has taken in recent years. Today, McDonald's operates in over 70 countries with more than 20,000 restaurants. One of the biggest is a 700-seat McDonald's in Moscow. Was this an expensive venture? It certainly was. In fact, the food plant that McDonald's built to supply burgers, buns, fries, and everything else sold there cost over $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 of what McDonald's sells identical with what is served at any McDonald's anywhere in the world, McDonald's spent six years putting together a supply chain that would provide the necessary raw materials at the quality level McDonald's demands. On top of that, there are the 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 its economy, the Russian government cut its exchange rate from 6,000 rubles for each U.S. dollar to a new rate of 6 rubles per U.S. dollar—in effect, it cut off three zeros. Unfortunately, that didn't solve the problems the Russian economy faced. In May of 1998, the first Russian bank crashed and the value of the ruble started to drop. Then, in the summer of 1998, the Russian economy lost control and, finally, 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 drop of over 280 percent. McDonald's sells its burgers for rubles, so when it comes time to trade the rubles in for U.S. dollars, McDonald's won't be worth nearly as much as it was a year prior. In spite of all of this, since it opened, the Moscow McDonald's has proven to be enormously successful. 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 the international markets.

SUMMARY

Objective 1 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.

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Objective 2

Exchange rate mechanics are discussed in the context of the prevailing floating rates. Under this system, exchange rates between currencies vary in an apparently random fashion in accordance with the 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. 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.

Objective 3

Objective 4

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 (premium) forward from the spot rate when the forward rate is greater (less) than the spot rate, in direct quotation. In addition, the influences of purchasing-power parity (PPP) and the international Fisher effect (IFE) in determining the exchange rate are discussed. In rational and efficient markets, forward rates are unbiased forecasts of future spot rates that are consistent with the PPP.

Objective 5

Exchange rate risk exists because the exact spot rate that prevails on a future date is not known with certainty today. The concept of exchange rate 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 exchange rate risk. There are different ways of measuring the foreign exposure, including the net asset (net liability) measurement. Different strategies are open to businesses to counter the exposure to this risk, including the money-market hedge, the forward-market hedge, futures contracts, and options. Each involves different costs.

Objective 6

In discussing working-capital management in an international environment, we find leading and lagging techniques useful in minimizing exchange rate risks and increasing profitability. In addition, funds positioning 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 does 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.

Objective 7

Objective 8

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 abroad. 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.

KEY TERMS

Arbitrageur, 780
Asked rate, 780
Bid rate, 780
Bid-asked spread, 780
Buying rate, 780
Covered-interest arbitrage, 780
Cross rate, 780
Direct quote, 777
Exchange rate, 777
Exchange rate risk, 781
Floating-rate international currency system, 775
Forward exchange contract, 781
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Interest-rate parity (IRP) theory, 785
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Multinational corporation (MNC), 774
Purchasing-power parity (PPP) theory, 785
Selling rate, 780
Simple arbitrage, 780
Spot transaction, 777
Transaction exposure, 788
Transfer price, 792
Triangular arbitrage, 780

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STUDY QUESTIONS

22-1. What additional factors are encountered in international as compared with domestic financial management? Discuss each briefly.

22-2. What different types of businesses operate in the international environment? Why are the techniques and strategies available to these firms different?

22-3. What is meant by *arbitrage profits?*

22-4. What are the markets and mechanics involved in generating (a) simple arbitrage profits, and (b) triangular arbitrage profits?

22-5. 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?

22-6. What is meant by (a) exchange risk, and (b) political risk?

22-7. How can exchange risk be measured?

22-8. What are the differences among transaction, translation, and economic exposures? Should all of them be ideally reduced to zero?

22-9. What steps can a firm take to reduce exchange risk? Indicate at least two different techniques.

22-10. How are the forward market and the money-market hedges affected? What are the major differences between these two types of hedges?

22-11. 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 cover your position?

22-12. Compare and contrast the use of forward contracts, futures contracts, and options to reduce foreign exchange exposure. When is each instrument most appropriate?

22-13. Indicate two working-capital management techniques that are useful for international businesses to reduce exchange risk and potentially increase profits.

22-14. 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?

22-15. What risks are associated with direct foreign investment? How do these risks differ from those encountered in domestic investment?

22-16. 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?

22-17. A corporation desires to enter a particular foreign market. The DFI 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?

22-18. What are the reasons for the acceptance of a sales office or licensing arrangement when the DFI itself is not profitable?

SELF-TEST PROBLEMS

The data for Self-Test Problem ST-1 are given in the following table:

Selling Quotes for the Saudi Riyal in New York

COUNTRY-CURRENCY	CONTRACT	$/FOREIGN CURRENCY
Saudi—riyal	Spot	.3893
	30-day	.3910
	90-day	.3958

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ST-1. You own $10,000. The dollar rate on the Saudi riyal is 2.5823 riyal/$. The Saudi riyal rate 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?

STUDY PROBLEMS (SET A)

The data for Study Problems 22-1A through 22-6A are given in the following table:

Selling Quotes for Foreign Currencies in New York

COUNTRY-CURRENCY	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

22-1A. (*Converting currencies*) 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?

22-2A. (*Converting currencies*) 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?

22-3A. (*Indirect quotes*) Compute the indirect quote for the spot and forward Canadian dollar, yen, and Swiss franc contracts.

22-4A. (*Bid, spot, and forward rates*) The spreads on the contracts as a percent 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.

22-5A. (*Foreign exchange arbitrage*) You own $10,000. The dollar rate in Tokyo is 216.6743£. The yen rate in New York is given in the previous table. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

22-6A. (*Spot 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.

First take a look at the FX Converter (**www.oanda.com/convert/classic**). Use it to convert 100 Fiji dollars into U.S. dollars. How much are the 100 Fiji dollars worth in U.S. dollars?

Now use the Bank of Canada currency converter (**www.bankofcanada.ca/en/exchform.htm**) to convert 100 Croatian kunas to U.S. dollars. How much are they worth?

Now try the Yahoo! Finance currency calculator (**finance.yahoo.com/m3?u**) to convert 100 U.S. dollars into Euros. How many Euros would you get for $100?

Now, use whatever currency calculator you'd like and move 100 U.S. dollars to Euros, then convert those Euros to Japanese yen, then convert those Japanese yen into U.S. dollars. How many U.S. dollars do you have?

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INTEGRATIVE PROBLEM

For your job as the business reporter for a local newspaper, you are given the assignment of putting together a series of articles on the 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. In addition, before you begin this assignment, I want to make sure we are all reading from the same script, as accuracy has always been the cornerstone of the *Daily Planet*. I'd like a response to the following questions before we proceed:

1. What new problems and factors are encountered in international as opposed to domestic financial management?
2. What does the term *arbitrage profits* mean?
3. What can a firm do to reduce exchange risk?
4. What are the differences between a forward contract, a futures contract, and options?

Use the following data in your response 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

5. 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?
6. 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?
7. Compute the indirect quote for the spot and forward Canadian dollar contract.
8. 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?
9. Compute the Canadian dollar/yen spot rate from the data in the preceding table.

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STUDY PROBLEMS (SET B)

The data for Study Problems 22-1B through 22-6B are given in the following table:

Selling Quotes for Foreign Currencies in New York

COUNTRY-CURRENCY	CONTRACT	$/FOREIGN CURRENCY
Canada—dollar	Spot	.8439
	30-day	.8410
	90-day	.8390
Japan—yen	Spot	.004680
	30-day	.004720
	90-day	.004787
Switzerland—franc	Spot	.5140
	30-day	.5179
	90-day	.5335

22-1B. (*Converting currencies*) 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?

22-2B. (*Converting currencies*) 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?

22-3B. (*Indirect quotes*) Compute the indirect quote for the spot and forward Canadian dollar, yen, and Swiss franc contracts.

22-4B. (*Bid, ask, and forward rates*) The spreads on the contracts as a percent of the asked rates are 4 percent for yen, 3 percent for Canadian dollars, and 6 percent for Swiss francs. Show, in a table similar to the previous one, the bid rates for the different spot and forward rates.

22-5B. (*Foreign exchange arbitrage*) You own $10,000. The dollar rate in Tokyo is 216.6752£. The yen rate in New York is given in the previous table. Are arbitrage profits possible? Set up an arbitrage scheme with your capital. What is the gain (loss) in dollars?

22-6B. (*Spot rates*) Compute the Canadian dollar/yen and the yen/Swiss franc spot rate from the data in the preceding table.

SELF-TEST SOLUTIONS

ST-1. The Saudi rate is 2.5823 riyals/$1, while the (indirect) New York rate is 1/.3893 = 2.5687 riyals/$.

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

Step 1. Because the riyal is cheaper in Saudi Arabia, buy $10,000 worth of riyals in Saudi Arabia. The number of riyals purchased would be $10,000 × 2.5823 = 25,823 riyals.

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

25,823 riyals × $.3893/riyals = $10,052.89
net gain is $10,052.89 – $10,000 = $52.89

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