



18: Long-Term Financing

Multinational corporations (MNCs) typically use long-term sources of funds to finance long-term projects. They have access to both domestic and foreign sources of funds. It is worthwhile for MNCs to consider all possible forms of financing before making their final decisions. Financial managers must be aware of their sources of long-term funds so that they can finance international projects in a manner that maximizes the wealth of the MNC.

The specific objectives of this chapter are to:

- explain why MNCs consider long-term financing in foreign currencies,
- explain how to assess the feasibility of long-term financing in foreign currencies, and
- explain how the assessment of long-term financing in foreign currencies is adjusted for bonds with floating interest rates.

Long-Term Financing Decision

Since MNCs commonly invest in long-term projects, they rely heavily on long-term financing. The decision to use equity versus debt was covered in the previous chapter. Once that decision is made, the MNC must consider the possible sources of equity or debt and the cost and risk associated with each source.

Sources of Equity

MNCs may consider a domestic equity offering in their home country in which the funds are denominated in their local currency. Second, they may consider a global equity offering in which they issue stock in their home country and in one or more foreign countries. They may consider this approach to obtain partial funding in a currency that they need to finance a foreign subsidiary's operations. In addition, the global offering may provide them with some name recognition. Investors in a foreign country will be more interested in a global offering if the MNC places a sufficient number of shares in that country to provide liquidity. The stock will be listed on an exchange in the foreign country so that investors there can sell their holdings of the stock.

Third, MNCs may offer a private placement of equity to financial institutions in their home country. Fourth, they may offer a private placement of equity to financial institutions in the foreign country where they are expanding. Private placements are beneficial because they may reduce transaction costs. However, MNCs may not be able to obtain all the funds that they need with a private placement. The funding must come from a limited number of large investors who are willing to maintain the investment for a long period of time because the equity has very limited liquidity.

Sources of Debt

When MNCs consider debt financing, they have a similar set of options. They can engage in a public placement of debt in their own country or a global debt offering. In addition, they can engage in a private placement of debt in their own country or in the foreign country where they are expanding. They may also obtain long-term loans in their own country or in the foreign country where they are expanding.

Most MNCs obtain equity funding in their home country. In contrast, debt financing is frequently done in foreign countries. Thus, the focus of this chapter is on how debt financing decisions can affect the MNC's cost of capital and risk.

GOVERNANCE

Stockholder versus Creditor Conflict

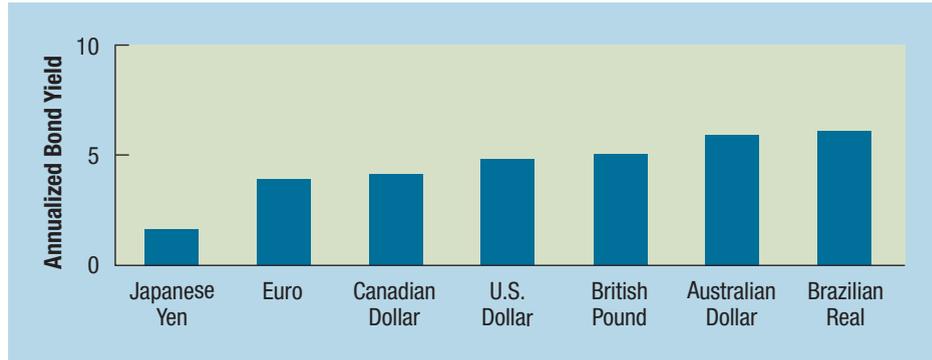
MNCs may use funding to pursue international projects that have a high potential for return but also increase their risk. This can be beneficial for shareholders but adversely affects the bondholders that provided credit to the MNCs. The bondholders are promised a specific interest rate on the money they provided to the MNC. The interest rate reflected the risk at the time the money was provided. If an MNC increases its risk after the money is received, the likelihood that it will not repay the debt increases. However, the MNC was able to obtain the debt without directly paying for that higher level of risk if it increased the risk after obtaining the funds. Bondholders attempt to prevent an MNC's actions by imposing various constraints on the MNC's management. However, it is difficult to determine whether some decisions are intended to serve shareholders at the expense of bondholders. For example, an MNC might argue that its plan to pursue a large project in Russia is to diversify internationally and reduce its risk. Yet, if the project has a high potential for return but also a high probability of failure, the project is likely increasing the chance that the MNC will be unable to repay its debt. ■

Cost of Debt Financing

An MNC's long-term financing decision is commonly influenced by the different interest rates that exist among currencies. The actual cost of long-term financing is based on both the quoted interest rate and the percentage change in the exchange rate of the currency borrowed over the loan life. Just as interest rates on short-term bank loans vary among currencies, so do bond yields. Exhibit 18.1 illustrates the long-term bond yields for several different countries. The wide differentials in bond yields among countries reflect a different cost of debt financing for firms in different countries.

Because bonds denominated in foreign currencies sometimes have lower yields, U.S. corporations often consider issuing bonds denominated in those currencies. For example, Hewlett-Packard, IBM, PepsiCo, and Walt Disney recently issued bonds denominated in Japanese yen to capitalize on low Japanese interest rates. Since the actual financing cost to a U.S. corporation issuing a foreign currency-denominated bond is affected by that currency's value relative to the U.S. dollar during the financing period, there is no guarantee that the bond will be less costly than a U.S. dollar-denominated bond. The borrowing firm must make coupon payments in the currency denominating the bond. If this currency appreciates against the firm's home currency, more funds will be needed to make the coupon payments. For this reason, a firm will not always denominate debt in a currency that exhibits a low interest rate.

To make the long-term financing decision, the MNC must (1) determine the amount of funds needed, (2) forecast the price at which it can issue the bond, and (3) forecast periodic exchange rate values for the currency denominating the bond. This information can be used to determine the bond's financing costs, which can be compared with the financing costs the firm would incur using its home currency. The

Exhibit 18.1 Annualized Bond Yields among Countries (as of March 10, 2007)

uncertainty of the actual financing costs to be incurred from foreign financing must be accounted for as well.

Measuring the Cost of Financing

From a U.S.-based MNC's perspective, the cost of financing in a foreign currency is influenced by the value of that currency when the MNC makes coupon payments to its bondholders and when it pays off the principal at the time the bond reaches maturity.

EXAMPLE

Piedmont Co. needs to borrow \$1 million over a 3-year period. This reflects a relatively small amount of funds and a short time period for bond financing but will allow for a more simplified example. Piedmont believes it can sell dollar-denominated bonds at par value if it provides a coupon rate of 14 percent. It also has the alternative of denominating the bonds in Singapore dollars (S\$), in which case it would convert its borrowed Singapore dollars to U.S. dollars to use as needed. Then, it would need to obtain Singapore dollars annually to make the coupon payments. Assume that the current exchange rate of the Singapore dollar is \$.50.

Piedmont needs S\$2 million (computed as \$1million/\$.50 per Singapore dollar) to obtain the \$1 million it initially needs. It believes it can sell the Singapore dollar-denominated bonds at par value if it provides a coupon rate of 10 percent.

The costs of both financing alternatives are illustrated in Exhibit 18.2, which provides the outflow payment schedule of each financing method. The outflow payments if Piedmont finances with U.S. dollar-denominated bonds are known. In addition, if Piedmont finances with Singapore dollar-denominated bonds, the number of Singapore dollars needed at the end of each period is known. Yet, because the future exchange rate of the Singapore dollar is uncertain, the number of dollars needed to obtain the Singapore dollars each year is uncertain. If exchange rates do not change, the annual cost of financing with Singapore dollars is 10 percent, which is less than the 14 percent annual cost of financing with U.S. dollars.

A comparison between the costs of financing with the two different currencies can be conducted by determining the annual cost of financing with each bond, from Piedmont's perspective. The comparison is shown in the last column of Exhibit 18.2. The annual cost of financing represents the discount rate at which the future outflow payments must be discounted so that their present value equals the amount borrowed. This is similar to the so-called yield to maturity but is assessed here from the borrower's perspective rather than from the investor's perspective. When the price at which the bonds are initially issued equals the par value and there is no exchange rate adjustment, the annual cost of financing is simply equal to the coupon rate. Thus, the annual cost of financing for the U.S. dollar-denominated bonds would be 14 percent. ■

For Piedmont, the Singapore dollar-denominated debt appears to be less costly. However, it is unrealistic to assume that the Singapore dollar will remain stable over

Exhibit 18.2 Financing with Bonds Denominated in U.S. Dollars versus Singapore Dollars

| Financing Alternative | End of Year: | | | Annual Cost of Financing |
|--|--------------|------------|--------------|--------------------------|
| | 1 | 2 | 3 | |
| (1) U.S. dollar–denominated bonds (coupon rate = 14%) | \$140,000 | \$140,000 | \$1,140,000 | 14% |
| (2) Singapore dollar–denominated bonds (coupon rate = 10%) | S\$200,000 | S\$200,000 | S\$2,200,000 | — |
| Forecasted exchange rate of S\$ | \$.50 | \$.50 | \$.50 | — |
| Payments in dollars | \$100,000 | \$100,000 | \$1,100,000 | 10% |

time. Consequently, some MNCs may choose to issue U.S. dollar–denominated debt, even though it appears more costly. The potential savings from issuing bonds denominated in a foreign currency must be weighed against the potential risk of such a method. In this example, risk reflects the possibility that the Singapore dollar will appreciate to a degree that causes Singapore dollar–denominated bonds to be more costly than U.S. dollar–denominated bonds.

Normally, exchange rates are more difficult to predict over longer time horizons. Thus, the time when the principal is to be repaid may be so far away that it is virtually impossible to have a reliable estimate of the exchange rate at that time. For this reason, some firms may be uncomfortable issuing bonds denominated in foreign currencies.

Impact of a Strong Currency on Financing Costs. If the currency that was borrowed appreciates over time, an MNC will need more funds to cover the coupon or principal payments. This type of exchange rate movement increases the MNC's financing costs.

E X A M P L E

After Piedmont decides to issue Singapore dollar–denominated bonds, assume that the Singapore dollar appreciates from \$.50 to \$.55 at the end of Year 1, to \$.60 at the end of Year 2, and to \$.65 by the end of Year 3. In this case, the payments made by Piedmont are displayed in Exhibit 18.3. By comparing the dollar outflows in this scenario with the outflows that would have occurred from a U.S. dollar–denominated bond, the risk to a firm from denominating a bond in a foreign currency is evident. The period of the last payment is particularly crucial for bond financing in foreign currencies because it includes not only the final coupon payment but the principal as well. Based on the exchange rate movements assumed here, financing with Singapore dollars was more expensive than financing with U.S. dollars would have been. ■

Impact of a Weak Currency on Financing Costs. Whereas an appreciating currency increases the periodic outflow payments of the bond issuer, a depreciating currency will reduce the issuer's outflow payments and therefore reduce its financing costs.

E X A M P L E

Reconsider the case of Piedmont Co., except assume that the Singapore dollar depreciates from \$.50 to \$.48 at the end of Year 1, to \$.46 at the end of Year 2, and to \$.40 by the end of Year 3. In this case, the payments made by Piedmont are shown in Exhibit 18.4. When one compares the dollar outflows in this scenario with the outflows that would have occurred from a U.S. dollar–denominated bond, the potential savings from foreign financing are evident. ■

Exhibit 18.3 Financing with Singapore Dollars during a Strong-S\$ Period

| | End of Year: | | | Annual Cost of Financing |
|--|--------------|------------|--------------|--------------------------|
| | 1 | 2 | 3 | |
| Payments in Singapore dollars | S\$200,000 | S\$200,000 | S\$2,200,000 | — |
| Forecasted exchange rate of Singapore dollar | \$.55 | \$.60 | \$.65 | — |
| Payments in dollars | \$110,000 | \$120,000 | \$1,430,000 | 20.11% |

Exhibit 18.4 Financing with Singapore Dollars during a Weak-S\$ Period

| | End of Year: | | | Annual Cost of Financing |
|--|--------------|------------|--------------|--------------------------|
| | 1 | 2 | 3 | |
| Payments in Singapore dollars | S\$200,000 | S\$200,000 | S\$2,200,000 | — |
| Forecasted exchange rate of Singapore dollar | \$.48 | \$.46 | \$.40 | — |
| Payments in dollars | \$96,000 | \$92,000 | \$880,000 | 2.44% |

HTTP://

<http://biz.yahoo.com/ffc/>
Information on the debt situation for each country.

Exhibit 18.5 compares the effects of a weak currency on financing costs to the effects of a stable or a strong currency. An MNC that denominates bonds in a foreign currency may achieve a major reduction in costs but could incur high costs if the currency denominating the bonds appreciates over time.

Actual Effects of Exchange Rate Movements on Financing Costs

To recognize how exchange rate movements have affected the cost of bonds denominated in a foreign currency, consider the following example, which uses actual exchange rate data for the British pound from 1984 to 2007.

EXAMPLE

In January 1984, Parkside, Inc., sold bonds denominated in British pounds with a par value of £10 million and a 10 percent coupon rate, thereby requiring coupon payments of £1 million at the end of each year. Assume that this U.S. firm had no existing business in the United Kingdom and therefore needed to exchange dollars for pounds to make the coupon payments each year. Exhibit 18.6 shows how the dollar payments would fluctuate each year according to the actual exchange rate at that time.

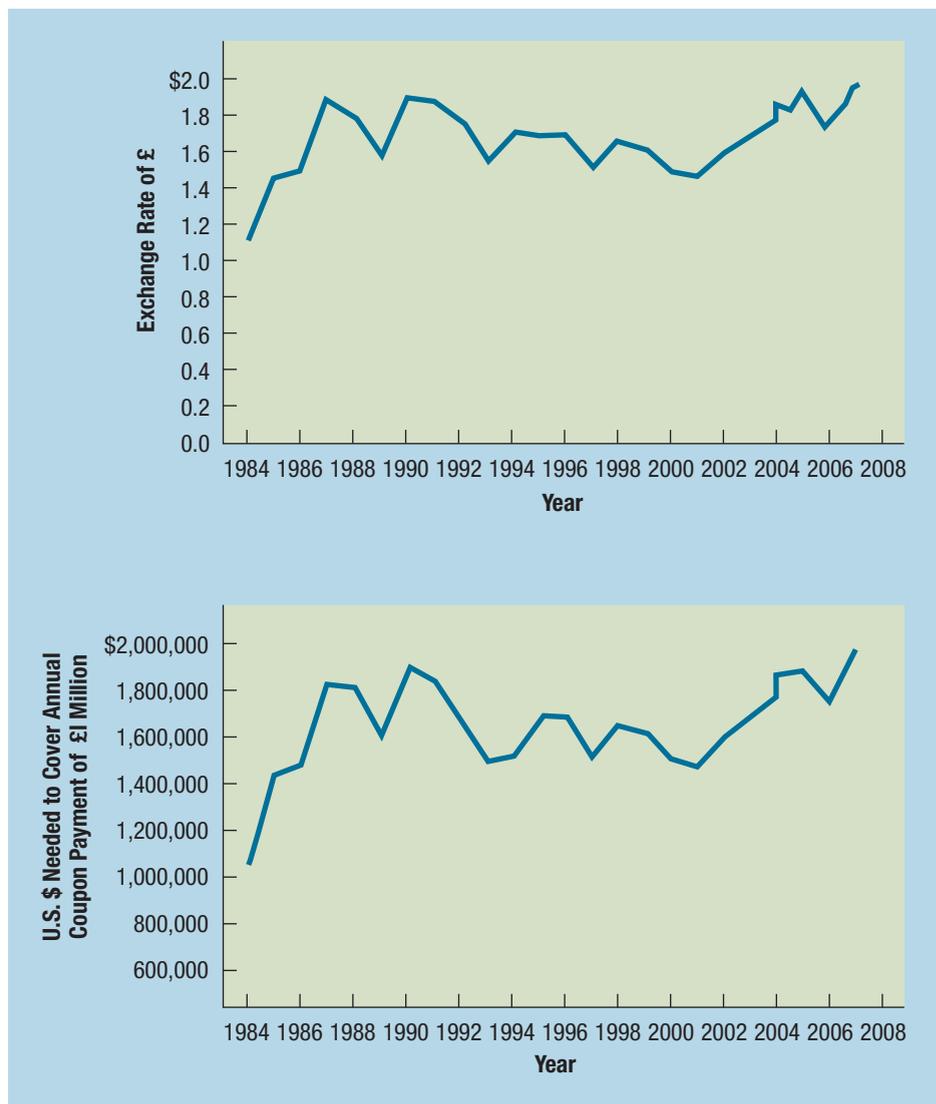
In 2000, when the pound was worth \$1.600, the coupon payment was \$1,600,000. Just 7 years later, the pound was worth \$2.000, causing the coupon payment to be \$2,000,000. Thus, the firm's dollar coupon payment in 2007 was 25 percent higher than that paid in 2000, even though the same number of pounds was needed (£1 million) each year.

In general, the dollar coupon payments increased during the late 1980s (as the pound appreciated) and then declined during the early 1990s (as the pound depreciated). The pound was less volatile in the middle and late 1990s, so its effect on the coupon payment was not so pronounced. As the pound generally appreciated from 2002 through 2007, the dollar coupon payments increased again. The influence of exchange rate movements on the cost of financing with bonds denominated in a foreign currency is very obvious in this exhibit. The actual effects would vary with the currency of denomination since exchange rates do not move in perfect tandem against the dollar. ■

Exhibit 18.5 Exchange Rate Effects on Outflow Payments for S\$-Denominated Bonds

| Exchange Rate Scenario | Payment in U.S. Dollars at End of Year: | | | Annual Cost of Financing |
|------------------------------------|---|-----------|-------------|--------------------------|
| | 1 | 2 | 3 | |
| Scenario 1: No change in S\$ value | \$100,000 | \$100,000 | \$1,100,000 | 10.00% |
| Scenario 2: Strong S\$ | \$110,000 | \$120,000 | \$1,430,000 | 20.11% |
| Scenario 3: Weak S\$ | \$96,000 | \$92,000 | \$880,000 | 2.44% |

Exhibit 18.6 Actual Costs of Annual Financing with Pound-Denominated Bonds from a U.S. Perspective



Assessing the Exchange Rate Risk of Debt Financing

Given the importance of the exchange rate when issuing bonds in a foreign currency, an MNC needs a reliable method to account for the potential impact of exchange rate fluctuations. It can use a point estimate exchange rate forecast of the currency used to denominate its bonds for each period in which an outflow payment will be provided to bondholders. However, a point estimate forecast does not account for uncertainty surrounding the forecast, which varies depending on the volatility of the currency. From a U.S. borrower's perspective, for example, a bond denominated in Canadian dollars is subject to less exchange rate risk than a bond denominated in most other foreign currencies (assuming the borrower has no offsetting position in these currencies). The Canadian dollar exhibits less variability against the U.S. dollar over time and therefore is less likely to deviate far from its projected future exchange rate. The uncertainty surrounding a point estimate forecast can be accounted for by using probabilities or simulation, as described next.

Use of Exchange Rate Probabilities

One alternative to using point estimates of future exchange rates is to develop a probability distribution for an exchange rate for each period in which payments will be made to bondholders. The *expected value* of the exchange rate can be computed for each period by multiplying each possible exchange rate by its associated probability and totaling the products. Then, the exchange rate's expected value can be used to forecast the cash outflows necessary to pay bondholders over each period. The exchange rate's expected value may vary from one period to another. After developing probability distributions and computing the expected values, the MNC can estimate the expected cost of financing and compare that with the cost of financing with a bond denominated in the home currency.

Using this approach, a single outflow estimate is derived for each payment period, and a single estimate is derived for the annual cost of financing over the life of the bond. This approach does not indicate the range of possible results that may occur, however, so it does not measure the probability that a bond denominated in a foreign currency will be more costly than a bond denominated in the home currency.

Use of Simulation

After an MNC has developed its probability distributions of the foreign currency's exchange rate at the end of each period, as just described, it can feed those probability distributions into a computer simulation program. The program will randomly draw one possible value from the exchange rate distribution for the end of each year and determine the outflow payments based on those exchange rates. Consequently, the cost of financing is determined. The procedure described up to this point represents one iteration.

Next, the program will repeat the procedure by again randomly drawing one possible value from the exchange rate distribution at the end of each year. This will provide a new schedule of outflow payments reflecting those randomly selected exchange rates. The cost of financing for this second iteration is also determined. The simulation program continually repeats this procedure, perhaps 100 times or so (as many times as desired).

Every iteration provides a possible scenario of future exchange rates, which is then used to determine the annual cost of financing if that scenario occurs. Thus, the simulation generates a probability distribution of annual financing costs that can then be compared with the known cost of financing if the bond is denominated in U.S.

dollars (the home currency). Through this comparison, the MNC can determine the probability that issuing bonds denominated in a foreign currency will be cheaper than dollar-denominated bonds.

Reducing Exchange Rate Risk

The exchange rate risk from financing with bonds in foreign currencies can be reduced by using one of the alternative strategies described next.

Offsetting Cash Inflows

Some firms may have inflow payments in particular currencies, which could offset their outflow payments related to bond financing. Thus, a firm may be able to finance with bonds denominated in a foreign currency that exhibits a lower coupon rate without becoming exposed to exchange rate risk. Nevertheless, it is unlikely that the firm would be able to perfectly match the timing and amount of the outflows in the foreign currency denominating the bond to the inflows in that currency. Therefore, some exposure to exchange rate fluctuations will exist. The exposure can be substantially reduced, though, if the firm receives inflows in the particular currency denominating the bond. This can help to stabilize the firm's cash flow.

EXAMPLE

Many MNCs, including Honeywell and The Coca-Cola Co., issue bonds in some of the foreign currencies that they receive from operations. PepsiCo issues bonds in several foreign currencies and uses proceeds in those same currencies resulting from foreign operations to make interest and principal payments. Nike issued bonds denominated in yen at low interest rates and uses yen-denominated revenue to make the interest payments.

General Electric has issued bonds denominated in Australian dollars, British pounds, Japanese yen, New Zealand dollars, and Polish zloty to finance its foreign operations. Its subsidiaries in Australia use Australian dollar inflows to pay off their Australian debt. Its subsidiaries in Japan use Japanese yen inflows to pay off their yen-denominated debt. By using various debt markets, General Electric can match its cash inflows and outflows in a particular currency. The decision to obtain debt in currencies where it receives cash inflows reduces the company's exposure to exchange rate risk. ■

Offsetting Cash Flows with High-Yield Debt. U.S.-based MNCs that generate earnings in countries where yields on debt are typically high may be able to offset their exposure to exchange rate risk by issuing bonds denominated in the local currency. Issuing debt denominated in the currencies of some developing countries such as Brazil, Indonesia, Malaysia, and Thailand is an example. If a U.S.-based MNC issues bonds denominated in the local currency in one of those countries, there may be a natural offsetting effect that will reduce the MNC's exposure to exchange rate risk because it can use its cash inflows in that currency to repay the debt.

Alternatively, the MNC might obtain debt financing in dollars at a lower interest rate, but it will not be able to offset its earnings in the foreign currency. Recall that countries where bond yields are high tend to have a high risk-free interest rate and that a high risk-free interest rate usually occurs where inflation is high (the Fisher effect). Also consider that the currencies of countries with relatively high inflation tend to weaken over time (as suggested by purchasing power parity). Thus, the U.S.-based MNC could be highly exposed to exchange rate risk when using dollar-denominated debt to finance business in a country with high costs of local debt because it would have to convert cash inflows generated in a potentially depreciated currency to cover the debt repayments. Thus, U.S.-based MNCs face a dilemma when they consider obtaining long-term financing: issue debt in the local currency and reduce

exposure to exchange rate risk, or issue dollar-denominated debt at a lower interest rate but with considerable exposure to exchange rate risk. Neither solution is especially desirable.

Implications of the Euro for Financing to Offset Cash Inflows.

The decision of several European countries to adopt the euro as their currency has important implications for MNCs that require long-term financing and wish to offset some of their cash inflows with debt payments. MNCs that have cash inflows in many of the participating European countries can now issue bonds denominated in euros and then use their cash inflows from operations in these countries to make the debt payments.

Prior to the adoption of the euro, an MNC might have preferred to finance in the currency of each European country where it was conducting business so that it could cover its financing payments with cash inflows in the same currency. This strategy would have reduced the MNC's ability to use bonds because it might not have needed enough financing in every country to justify bond offerings in each of several currencies. Thus, the MNC might have had to use local bank financing in each country instead of bond financing, even when local bank financing was more expensive. Now, however, the MNC can issue bonds denominated in euros to cover its financing needs in all euro zone countries where it has operations, distribute the proceeds for use among these countries, and then aggregate cash inflows from these countries to cover the financing payments. In this way, the adoption of the euro has increased the use of bond financing and reduced the cost of financing for MNCs conducting business in Europe.

In addition, since countries such as Italy and Spain have adopted the euro, their interest rates are similar to those of the other participating countries. Thus, MNCs are able to finance projects in these countries and use cash inflows to cover their debt payments while achieving lower financing costs than when those countries had their own currencies.

The Eurobond market has historically been dominated by government bond offerings. Recently, however, corporations have increased their use of the Eurobond market by issuing bonds denominated in euros to offset their euro cash inflows. The difference in yields paid (and therefore cost of financing) on these bonds by the issuing firms is primarily determined by the credit risk of the issuer.

Forward Contracts

When a bond denominated in a foreign currency has a lower coupon rate than the firm's home currency, the firm may consider issuing bonds denominated in that currency and simultaneously hedging its exchange rate risk through the forward market. Because the forward market can sometimes accommodate requests of 5 years or longer, such an approach may be possible. The firm could arrange to purchase the foreign currency forward for each time at which payments are required. However, the forward rate for each horizon will most likely be above the spot rate. Consequently, hedging these future outflow payments may not be less costly than the outflow payments needed if a dollar-denominated bond were issued. The relationship implied here reflects the concept of interest rate parity, which was discussed in earlier chapters, except that the point of view in this chapter is long term rather than short term.

Currency Swaps

A currency swap enables firms to exchange currencies at periodic intervals. Ford Motor Co., Johnson & Johnson, General Motors, and many other MNCs use currency swaps.

E X A M P L E

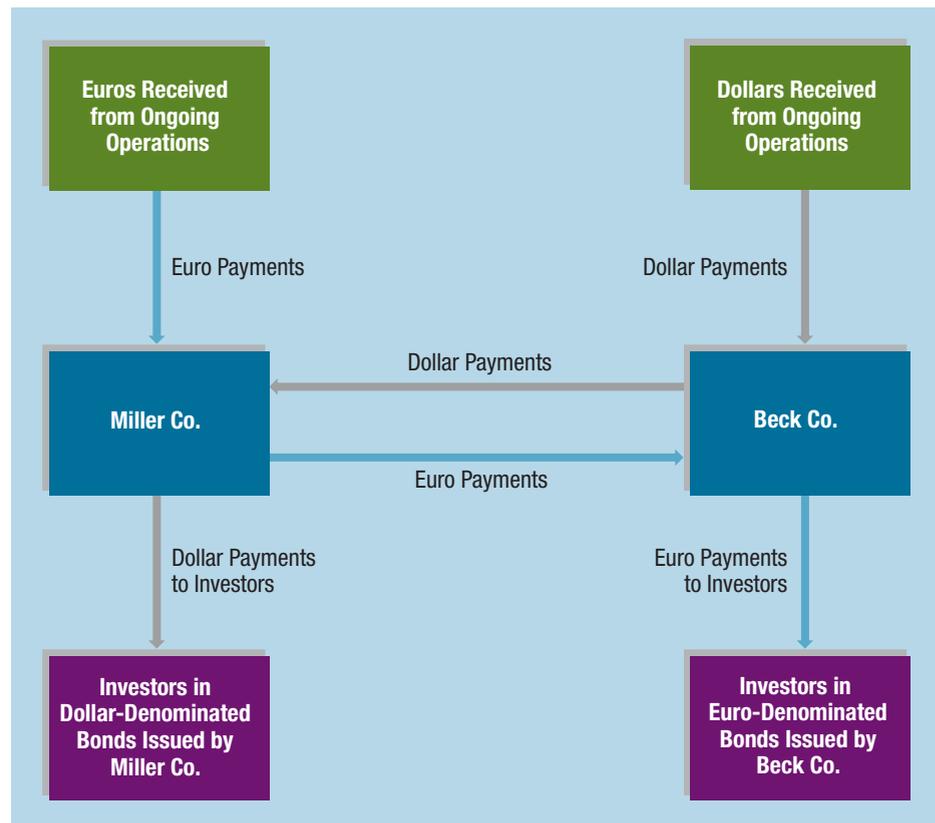
Miller Co., a U.S. firm, desires to issue a bond denominated in euros because it could make payments with euro inflows to be generated from existing operations. However, Miller Co. is not well known to investors who would consider purchasing euro-denominated bonds. Meanwhile Beck Co. of Germany desires to issue dollar-denominated bonds because its inflow payments are mostly in dollars. However, it is not well known to the investors who would purchase these bonds.

If Miller is known in the dollar-denominated market while Beck is known in the euro-denominated market, the following transactions are appropriate. Miller issues dollar-denominated bonds, while Beck issues euro-denominated bonds. Miller will provide euro payments to Beck in exchange for dollar payments. This swap of currencies allows the companies to make payments to their respective bondholders without concern about exchange rate risk. This type of currency swap is illustrated in Exhibit 18.7. ■

The swap just described was successful in eliminating exchange rate risk for both Miller Co. and Beck Co. Miller essentially passes the euros it receives from ongoing operations through to Beck and passes the dollars it receives from Beck through to the investors in the dollar-denominated bonds. Thus, even though Miller receives euros from its ongoing operations, it is able to make dollar payments to the investors without having to be concerned about exchange rate risk. The same logic applies to Beck Co. on the other side of the transaction.

Many MNCs simultaneously swap interest payments and currencies. The Gillette Co. engaged in swap agreements that converted \$500 million in fixed rate dollar-

Exhibit 18.7 Illustration of a Currency Swap



denominated debt into multiple currency variable rate debt. PepsiCo enters into interest rate swaps and currency swaps to reduce borrowing costs.

The large commercial banks that serve as financial intermediaries for currency swaps sometimes take positions. That is, they may agree to swap currencies with firms, rather than simply search for suitable swap candidates.

Parallel Loans

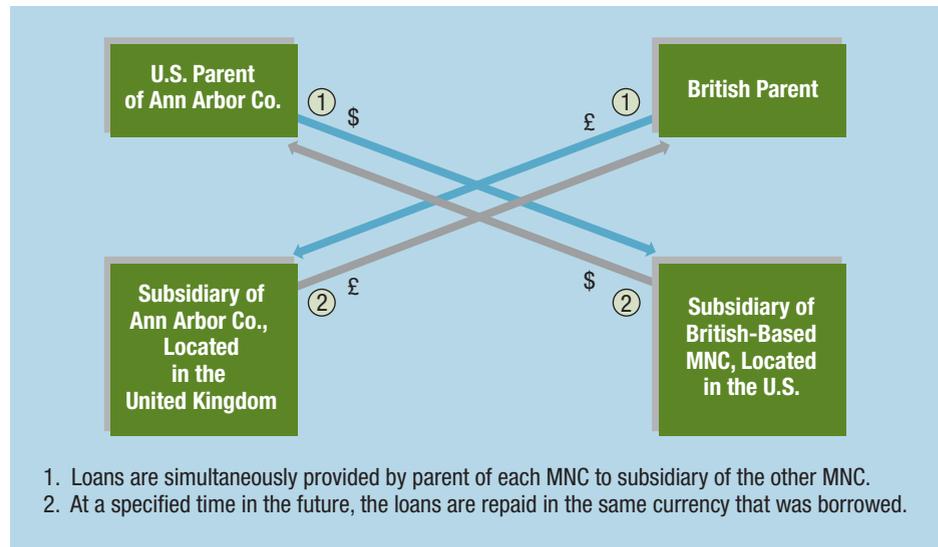
Firms can also obtain financing in a foreign currency through a parallel (or back-to-back) loan, which occurs when two parties provide simultaneous loans with an agreement to repay at a specified point in the future.

EXAMPLE

The parent of Ann Arbor Co. desires to expand its British subsidiary, while the parent of a British-based MNC desires to expand its American subsidiary. The British parent provides pounds to the British subsidiary of Ann Arbor Co., while the parent of Ann Arbor Co. provides dollars to the American subsidiary of the British-based MNC (as shown in Exhibit 18.8). At the time specified by the loan contract, the loans are repaid. The British subsidiary of Ann Arbor Co. uses pound-denominated revenues to repay the British company that provided the loan. At the same time, the American subsidiary of the British-based MNC uses dollar-denominated revenues to repay the U.S. company that provided the loan. ■

Using Parallel Loans to Hedge Exchange Rate Risk for Foreign Projects. The ability to reduce or eliminate exchange rate risk can also affect the attractiveness of projects in foreign countries. Sometimes, parallel loans can function as a useful alternative to forward or futures contracts as a way to finance foreign projects. The use of parallel loans is particularly attractive if the MNC is conducting a project in a foreign country, will receive the cash flows in the foreign currency, and is worried that the foreign currency will depreciate substantially. If the foreign currency is not heavily traded, other hedging alternatives, such as forward or

Exhibit 18.8 Illustration of a Parallel Loan



futures contracts, may not be available, and the project may have a negative net present value (*NPV*) if the cash flows remain unhedged.

EXAMPLE

Schnell, Inc., has been approached by the government of Malaysia to engage in a project there over the next year. The investment in the project totals 1 million Malaysian ringgit (MR), and the project is expected to generate cash flows of MR1.4 million next year. The project will terminate at that time.

The current value of the ringgit is \$.25, but Schnell believes that the ringgit will depreciate substantially over the next year. Specifically, it believes the ringgit will have a value of either \$.20 or \$.15 next year. Furthermore, Schnell will have to borrow the funds necessary to undertake the project and will incur financing costs of 13 percent.

If Schnell undertakes the project, it will incur a net outflow now of $\text{MR}1,000,000 \times \$.25 = \$250,000$. Next year, it will also have to pay the financing costs of $\$250,000 \times 13\% = \$32,500$. If the ringgit depreciates to \$.20, then Schnell will receive $\text{MR}1,400,000 \times \$.20 = \$280,000$ next year. If the ringgit depreciates to \$.15, it will receive $\text{MR}1,400,000 \times \$.15 = \$210,000$ next year. For each year, the cash flows are summarized below.

Scenario 1: Ringgit Depreciates to \$.20

| | Year 0 | Year 1 |
|-------------------|------------|-----------|
| Investment | −\$250,000 | |
| Interest payment | | −\$32,500 |
| Project cash flow | 0 | \$280,000 |
| Net | −\$250,000 | \$247,500 |

Ignoring the time value of money, the combined cash flows are −\$2,500.

Scenario 2: Ringgit Depreciates to \$.15

| | Year 0 | Year 1 |
|-------------------|------------|-----------|
| Investment | −\$250,000 | |
| Interest payment | | −\$32,500 |
| Project cash flow | 0 | \$210,000 |
| Net | −\$250,000 | \$177,500 |

Ignoring the time value of money, the combined cash flows are −\$72,500. Although this example includes the interest payment in the cash flows and ignores discounting for illustrative purposes, it is obvious that the project is not attractive for Schnell. Furthermore, no forward or futures contracts are available for ringgit, so Schnell cannot hedge its cash flows from exchange rate risk.

Now assume that the Malaysian government offers a parallel loan to Schnell. According to the loan, the Malaysian government will give Schnell MR1 million in exchange for a loan in dollars at the current exchange rate. The same amount will be returned by both parties at the end of the project. Next year, Schnell will pay the Malaysian government 15 percent interest on

the MR1 million, and the Malaysian government will pay Schnell 7 percent interest on the dollar loan. Graphically, the parallel loan would be as follows:



By using the parallel loan, Schnell is able to reduce the net cash flows denominated in Malaysian ringgit it will receive in one year. Consider both the dollar and ringgit cash flows:

Schnell's Cash Flows

| | Dollar Cash Flows | |
|--|-------------------|------------------|
| | Year 0 | Year 1 |
| Loan to Malaysia | -\$250,000 | |
| Interest payment | | -\$32,500 |
| Interest received on loan ($\$250,000 \times 7\%$) | | \$17,500 |
| Return of loan | | <u>\$250,000</u> |
| Net cash flow | -\$250,000 | \$235,000 |

| | Ringgit Cash Flows | |
|--|--------------------|--------------------|
| | Year 0 | Year 1 |
| Loan from Malaysia | MR1,000,000 | |
| Investment in project | -MR1,000,000 | |
| Interest paid on loan ($\text{MR1,000,000} \times 15\%$) | | -MR150,000 |
| Return of loan | | -MR1,000,000 |
| Project cash flow | | <u>MR1,400,000</u> |
| Net cash flow | 0 | MR250,000 |

Scenario 1: Ringgit Depreciates to \$.20

The net cash flow in Year 1 of MR250,000 is converted to dollars at the \$.20 spot rate to generate $\text{MR}250,000 \times \$0.20 = \$50,000$. Thus, the total dollar cash flows using the parallel loan are as follows:

| | Year 0 | Year 1 |
|------------------------------|------------|-----------------|
| Dollar cash flows | −\$250,000 | \$235,000 |
| Converted ringgit cash flows | | <u>\$50,000</u> |
| Net cash flow | −\$250,000 | \$285,000 |

Again ignoring time value, the combined cash flows over both years are now \$35,000.

Scenario 2: Ringgit Depreciates to \$.15

The net cash flow in Year 1 of MR250,000 is converted to dollars at the \$.15 spot rate to generate $\text{MR}250,000 \times \$0.15 = \$37,500$. Thus, the total dollar cash flows using the parallel loan are as follows:

| | Year 0 | Year 1 |
|------------------------------|------------|-----------------|
| Dollar cash flows | −\$250,000 | \$235,000 |
| Converted ringgit cash flows | | <u>\$37,500</u> |
| Net cash flow | −\$250,000 | \$272,500 |

The combined cash flows over both years are \$22,500 in this scenario.

Notice that the cash flows have improved dramatically by using the parallel loan, as the following table illustrates:

| | Scenario 1 | Scenario 2 |
|---------------------------------------|------------|------------|
| Total cash flow without parallel loan | −\$2,500 | −\$72,500 |
| Total cash flow with parallel loan | \$35,000 | \$22,500 |

Not only was Schnell able to reduce its exchange rate risk by financing the project through the loan, but it was also able to generate positive total cash flows. The reason for this is that the very large expected percentage depreciation in the ringgit (20 or 40 percent) exceeds the incremental cost of financing ($15\% - 7\% = 8\%$). By using the parallel loan, Schnell has reduced the ringgit amount it must convert to dollars at project termination from MR1.4 million to MR250,000. It was therefore able to reduce the amount of its cash flows that would be subject to the expected depreciation of the ringgit.

The Malaysian government also benefits from the loan because it receives incremental interest payments of 8 percent from the arrangements. Of course, the Malaysian government also incurs the implicit cost of the depreciating ringgit since it must reexchange ringgit for dollars after one year. Nevertheless, it may offer such a loan if its expectations for the ringgit's value differ from those of Schnell. That is, the government may expect the ringgit to appreciate or to depreciate by less than Schnell expects. In addition, the government may not have many other options for completing the project if local companies do not have the expertise to perform the work. ■

Diversifying among Currencies

A U.S. firm may denominate bonds in several foreign currencies, rather than a single foreign currency, so that substantial appreciation of any one currency will not drastically increase the number of dollars needed to cover the financing payments.

EXAMPLE

Nevada, Inc., a U.S.-based MNC, is considering four alternatives for issuing bonds to support its U.S. operations:

1. Issue bonds denominated in U.S. dollars.
2. Issue bonds denominated in Japanese yen.
3. Issue bonds denominated in Canadian dollars.
4. Issue some bonds denominated in Japanese yen and some bonds denominated in Canadian dollars.

Nevada, Inc., has no net exposure in either Japanese yen or Canadian dollars. The coupon rate for a U.S. dollar-denominated bond is 14 percent, while the coupon rate is 8 percent for a yen- or Canadian dollar-denominated bond. It is expected that any of these bonds could be sold at par value.

If the Canadian dollar appreciates against the U.S. dollar, Nevada's actual financing cost from issuing Canadian dollar-denominated bonds may be higher than that of the U.S. dollar-denominated bonds. If the Japanese yen appreciates substantially against the U.S. dollar, Nevada's actual financing cost from issuing yen-denominated bonds may be higher than that of the U.S. dollar-denominated bonds. If the exchange rates of the Canadian dollar and Japanese yen move in opposite directions against the U.S. dollar, then both types of bonds could not simultaneously be more costly than U.S. dollar-denominated bonds, so financing with both types of bonds would almost ensure that Nevada's overall financing cost would be less than the cost from issuing U.S. dollar-denominated bonds.

There is no guarantee that the exchange rates of the Canadian dollar and Japanese yen will move in opposite directions. The movements of these two currencies are not highly correlated, however, so it is unlikely that both currencies will simultaneously appreciate to an extent that will offset their lower coupon rate advantages. Therefore, financing in bonds denominated in more than one foreign currency can increase the probability that the overall cost of foreign financing will be less than that of financing with the dollars. Nevada decides to issue bonds denominated in Canadian dollars and in yen. ■

The preceding example involved only two foreign currencies. In reality, a firm may consider several currencies that exhibit lower interest rates and issue a portion of its bonds in each of these currencies. Such a strategy can increase the other costs (advertising, printing, etc.) of issuing bonds, but those costs may be offset by a reduction in cash outflows to bondholders.

Currency Cocktail Bonds. A firm can finance in several currencies without issuing various types of bonds (thus avoiding higher transaction costs) by developing a **currency cocktail bond**, denominated in not one but a mixture (or “cocktail”) of currencies. A currency cocktail simply reflects a multicurrency unit of account. Several currency cocktails have been developed to denominate international bonds, and some have already been used in this manner. One of the more popular currency cocktails is the **special drawing right (SDR)**, which was originally devised as an alternative foreign reserve asset but is now used to denominate bonds and bank deposits and to price various services. With the creation of the euro, the use of currency cocktail bonds in Europe is limited because numerous European countries now use a single currency.

Interest Rate Risk from Debt Financing

Regardless of the currency that an MNC uses to finance its international operations, it must also decide on the maturity that it should use for its debt. Its goal is to use a maturity that will minimize the total payments on the debt needed for each business unit. Normally, an MNC will not use a maturity that exceeds the expected life of the business in that country.

When it uses a relatively short maturity, the MNC is exposed to interest rate risk, or the risk that interest rates will rise, forcing it to refinance at a higher interest rate. It can avoid this exposure by issuing a long-term bond (with a fixed interest rate) that matches the expected life of the operations in the foreign country. The disadvantage of this strategy is that long-term interest rates may decline in the near future, but the MNC will be obligated to continue making its debt payments at the higher rate. There is no perfect solution, but the MNC should consider the expected life of the business and the yield curve of the country in question when weighing the tradeoff. The yield curve is shaped by the demand for and supply of funds at various maturity levels in a country's debt market.

The Debt Maturity Decision

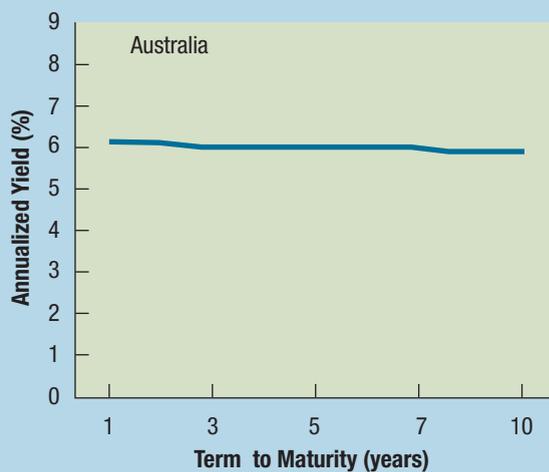
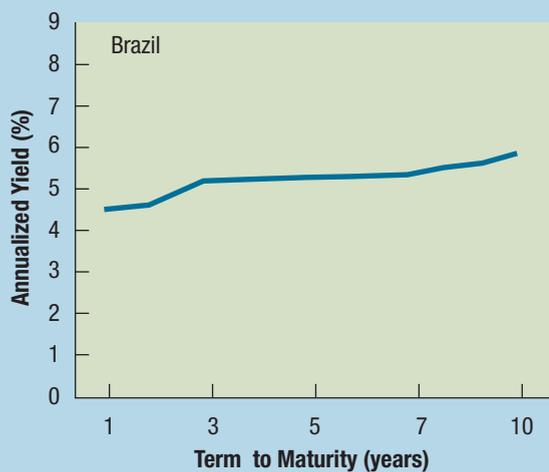
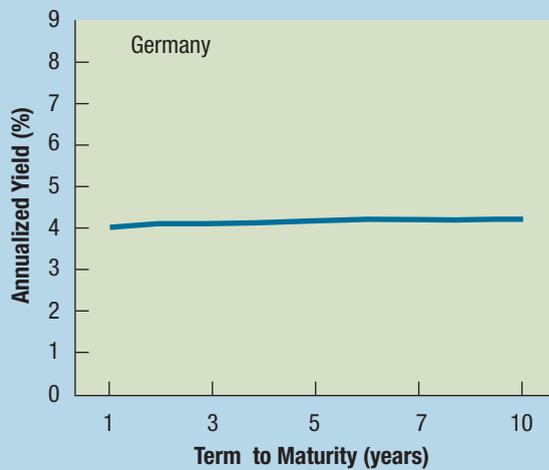
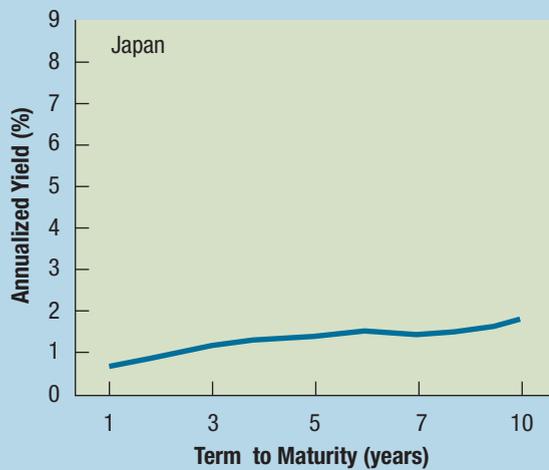
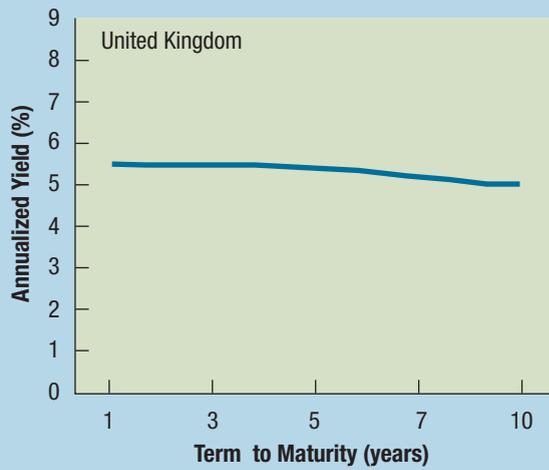
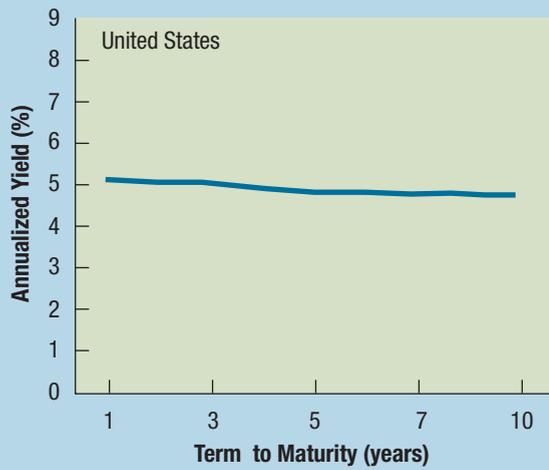
Before making the debt maturity decision, MNCs assess the yield curves of the countries in which they need funds. Examples of yield curves as of March 2007 for six different countries are shown in Exhibit 18.9. First, notice that at any given debt maturity, the interest rate varies among countries. Second, notice that the shape of the yield curve can vary among countries. For example, Japan and Brazil have an upward-sloping yield curve, which means that the annualized yields are lower for short-term debt than for long-term debt. One argument for the upward slope is that investors may require a higher rate of return on long-term debt as compensation for lower liquidity. The market value of long-term debt is more sensitive to market interest rate movements, so investors face a greater risk of a loss if they need to sell the debt before its maturity. Exhibit 18.9 illustrates that the yield curve is not always upward sloping because other forces such as interest rate expectations may affect the demand and supply conditions for debt at various maturity levels. In some countries, the yield curve is commonly flat or downward sloping for longer maturities.

Some MNCs may use a country's yield curve to compare annualized rates among debt maturities, so that they can choose a maturity that has a relatively low rate. Other MNCs use a yield curve to assess the prevailing market demand for and supply of funds for particular debt maturities, which may indicate the future movement in interest rates. This type of information may help an MNC decide whether to lock in a long-term rate or borrow for a short-term period and refinance in the near future.

EXAMPLE

Washington Co. expects to generate earnings in Indonesia, Malaysia, and Thailand for the next 10 years. It expects that the Indonesian rupiah and Malaysian ringgit will weaken substantially against the dollar over that period and therefore plans to finance the respective operations with local debt from those countries. Its earnings from Thailand may be discontinued in 5 years when a contract with the Thai government expires. Washington's best guess is that the Thai baht's future value will be similar to today's spot rate, but it is concerned about the exchange rate risk of its baht-denominated revenue. The 10-year bond yield is about 12 percent for each country, but the yield curve is upward sloping (implying lower annualized yields for shorter debt maturities) in Malaysia and Thailand and downward sloping (higher annualized yields for shorter debt maturities) in Indonesia. It expects that future interest rates in these countries should be somewhat stable over time.

Exhibit 18.9 Yield Curves among Foreign Countries (as of March 10, 2007)



Washington Co. decides to issue Thai notes with a maturity of 5 years to finance the Thai operations because it does not want to have debt in the business beyond the period when its operations may be discontinued. In addition, the upward-sloping yield curve allows it to issue 5-year notes at a lower annualized yield than a 10-year bond in Thai baht. Washington decides to issue 10-year bonds to finance its operations in Indonesia; because the yield curve is downward sloping, if it issued shorter-term debt, it would have to pay a higher annualized yield and would then be exposed to the possibility of higher interest rates when it refinances the debt. Finally, it decides to issue short-term debt to finance its operations in Malaysia because it will pay a lower annualized yield on short-term debt. In this case, Washington will be exposed to the possibility that interest rates will increase by the time it refinances the debt. ■

The Fixed versus Floating Rate Decision

MNCs that wish to use a long-term maturity but wish to avoid the prevailing fixed rate on long-term bonds may consider floating rate bonds. In this case, the coupon rate will fluctuate over time in accordance with interest rates. For example, the coupon rate is frequently tied to the **London Interbank Offer Rate (LIBOR)**, which is a rate at which banks lend funds to each other. As LIBOR increases, so does the coupon rate of a floating rate bond. A floating coupon rate can be an advantage to the bond issuer during periods of decreasing interest rates, when otherwise the firm would be locked in at a higher coupon rate over the life of the bond. It can be a disadvantage during periods of rising interest rates. In some countries, such as those in South America, most long-term debt has a floating interest rate.

If the coupon rate is floating, then forecasts are required for interest rates as well as for exchange rates. Simulation can be used to incorporate possible outcomes for the exchange rate and for the coupon rate over the life of the loan and can develop a probability distribution of annual costs of financing.

HTTP://

<http://www.bloomberg.com>
Information about international financing, including the issuance of debt in international markets.

Hedging with Interest Rate Swaps

When MNCs issue bonds that expose them to interest rate risk, they may use interest rate *swaps* to hedge the risk. Interest rate swaps enable a firm to exchange fixed rate payments for variable rate payments. Bond issuers use interest rate swaps because they may reconfigure the future cash flows in a manner that offsets their outflow payments to bondholders. In this way, MNCs can reduce their exposure to interest rate movements.

Financial institutions such as commercial and investment banks and insurance companies often act as dealers in interest rate swaps. Financial institutions can also act as brokers in the interest rate swap market. As a broker, the financial institution simply arranges an interest rate swap between two parties, charging a fee for the service, but does not actually take a position in the swap. MNCs frequently engage in interest rate swaps to hedge or to reduce financing costs.

Plain Vanilla Swap

A plain vanilla swap is a standard contract without any unusual contract additions. In a plain vanilla swap, the floating rate payer is typically highly sensitive to interest rate changes and seeks to reduce interest rate risk. A firm with a large amount of highly interest rate-sensitive assets may seek to exchange floating rate payments for fixed rate payments. In general, the floating rate payer believes interest rates are going to decline. The fixed rate payer in a plain vanilla interest rate swap, on the other hand, expects interest rates to rise and would prefer to make fixed rate payments. Fixed rate payers may include firms with a large amount of highly interest rate-sensitive liabilities or a relatively large proportion of fixed rate assets.

E X A M P L E

Two firms plan to issue bonds:

- Quality Co. is a highly rated firm that prefers to borrow at a variable interest rate.
- Risky Co. is a low-rated firm that prefers to borrow at a fixed interest rate.

Assume that the rates these companies would pay for issuing either floating (variable) rate or fixed rate bonds are as follows:

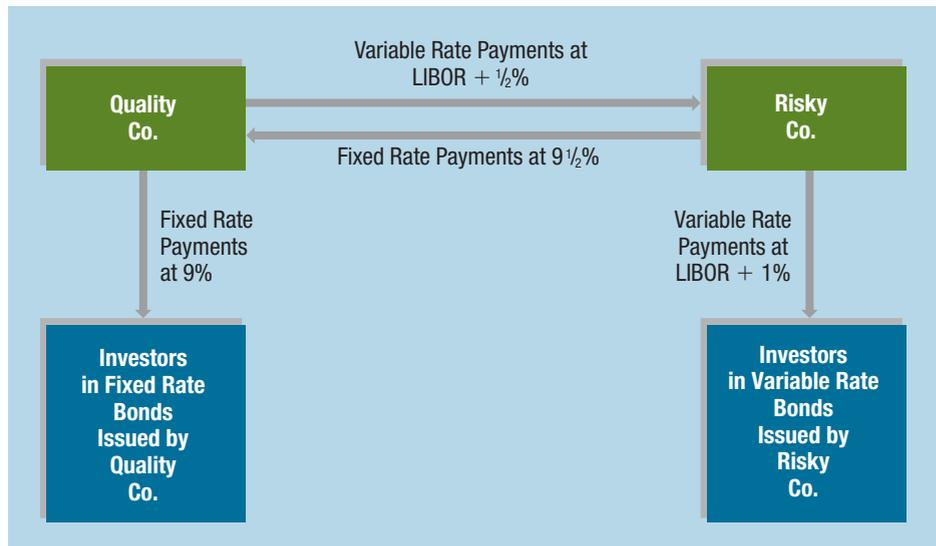
| | Fixed Rate Bond | Floating Rate Bond |
|-------------|-----------------|--------------------|
| Quality Co. | 9% | LIBOR + ½% |
| Risky Co. | 10½% | LIBOR + 1% |

LIBOR changes over time. Based on the information given, Quality Co. has an advantage when issuing either fixed rate or variable rate bonds but more of an advantage with fixed rate bonds. Quality Co. could issue fixed rate bonds while Risky Co. issues variable rate bonds; then, Quality could provide variable rate payments to Risky in exchange for fixed rate payments.

Assume that Quality Co. negotiates with Risky Co. to provide variable rate payments at LIBOR + ½ percent in exchange for fixed rate payments of 9½ percent. The interest rate swap arrangement is shown in Exhibit 18.10. Quality Co. benefits because the fixed rate payments it receives on the swap exceed the payments it owes to bondholders by ½ percent. Its variable rate payments to Risky Co. are the same as what it would have paid if it had issued variable rate bonds. Risky Co. is receiving LIBOR + ½ percent on the swap, which is ½ percent less than what it must pay on its variable rate bonds. Yet, it is making fixed rate payments of 9½ percent, which is 1 percent less than what it would have paid if it had issued fixed rate bonds. Overall, Risky Co. saves ½ percent per year of financing costs. ■

Determining Swap Payments. The payments in an interest rate swap are typically determined using some **notional value** agreed upon by the parties to the swap and established contractually. Importantly, the notional amount itself is never exchanged between the parties but is used only to determine the swap payments. Once

Exhibit 18.10 Illustration of an Interest Rate Swap



the swap payments have been determined using the notional amount, the parties periodically exchange only the net amount owed instead of all payments. Payments are typically exchanged either annually or semiannually.

EXAMPLE

Continuing with the previous example involving Quality Co. and Risky Co., assume that the notional value agreed upon by the parties is \$50 million and that the two firms exchange net payments annually.

From Quality Co.'s viewpoint, the complete swap arrangement now involves payment of LIBOR + ½ percent annually, based on a notional value of \$50 million. From Risky Co.'s viewpoint, the swap arrangement involves a fixed payment of 9½ percent annually based on a notional value of \$50 million. The following table illustrates the payments based on LIBOR over time.

| Year | LIBOR | Quality Co.'s Payment | Risky Co.'s Payment | Net Payment |
|------|-------|--|---|---------------------------------------|
| 1 | 8.0% | 8.5% × \$50 million = \$4.25 million | 9.5% × \$50 million = \$4.75 million | Risky pays Quality \$.5 million. |
| 2 | 7.0% | 7.5% × \$50 million = \$3.75 million | 9.5% × \$50 million = \$4.75 million | Risky pays Quality \$1 million. |
| 3 | 5.5% | 6.0% × \$50 million = \$3 million | 9.5% × \$50 million = \$4.75 million | Risky pays Quality \$1.75 million. |
| 4 | 9.0% | 9.5% × \$50 million = \$4.75 million | 9.5% × \$50 million = \$4.75 million | No payment is made. |
| 5 | 10.0% | 10.5% × \$50 million = \$5.25 million | 9.5% × \$50 million = \$4.75 million | Quality pays Risky \$.5 million. |

Two limitations of the swap just described are worth mentioning. First, there is a cost of time and resources associated with searching for a suitable swap candidate and negotiating the swap terms. Second, each swap participant faces the risk that the counterpart participant could default on payments. For this reason, financial intermediaries are usually involved in swap agreements. They match up participants and also assume the default risk involved. For their role, they charge a fee, which would reduce the estimated benefits in the preceding example, but their involvement is critical to effectively match up swap participants and reduce concern about default risk.

Ashland, Inc., Campbell Soup Co., Intel Corp., Johnson Controls, Union Carbide, and many other MNCs commonly use interest rate swaps. Ashland, Inc., commonly issues fixed rate debt and uses interest rate swaps to achieve lower borrowing costs on variable rate debt. Campbell Soup Co. uses interest rate swaps to minimize its worldwide financing costs and to achieve a targeted proportion of fixed rate versus variable rate debt. GTE (now part of Verizon) used interest rate swaps to convert more than \$500 million of variable rate debt into fixed rate debt.

Other Types of Interest Rate Swaps. Continuing financial innovation has resulted in various additional types of interest rate swaps in recent years. Listed below are some examples:

- *Accretion swap.* An accretion swap is a swap in which the notional value is increased over time.
- *Amortizing swap.* An amortizing swap is essentially the opposite of an accretion swap. In an amortizing swap, the notional value is reduced over time.

- *Basis (floating-for-floating) swap.* A basis swap involves the exchange of two floating rate payments. For example, a swap between 1-year LIBOR and 6-month LIBOR is a basis swap.
- *Callable swap.* As the name suggests, a callable swap gives the fixed rate payer the right to terminate the swap. The fixed rate payer would exercise this right if interest rates fall substantially.
- *Forward swap.* A forward swap is an interest rate swap that is entered into today. However, the swap payments start at a specific future point in time.
- *Puttable swap.* A puttable swap gives the floating rate payer the right to terminate the swap. The floating rate payer would exercise this right if interest rates rise substantially.
- *Zero-coupon swap.* In a zero-coupon swap, all fixed interest payments are postponed until maturity and are paid in one lump sum when the swap matures. However, the floating rate payments are due periodically.
- *Swaption.* A swaption gives its owner the right to enter into a swap. The exercise price of a swaption is a specified fixed interest rate at which the swaption owner can enter the swap at a specified future date. A payer swaption gives its owner the right to switch from paying floating to paying fixed interest rates at the exercise price. A receiver swaption gives its owner the right to switch from receiving floating rate to receiving fixed rate payments at the exercise price.

Standardization of the Swap Market. As the swap market has grown in recent years, one association in particular is frequently credited with its standardization. The **International Swaps and Derivatives Association (ISDA)** is a global trade association representing leading participants in the privately negotiated derivatives industry. This encompasses interest rate, currency, commodity, credit, and equity swaps, as well as related products such as caps, collars, floors, and swaptions. The ISDA was chartered in 1985, after a group of 18 swap dealers began work in 1984 to develop standard terms for interest rate swaps. Today, the ISDA has over 600 member institutions from 46 countries. These members include most of the world's major institutions that deal in derivative instruments, as well as leading end users of privately negotiated derivatives and associated service providers and consultants.

HTTP://

<http://www.bloomberg.com>
Long-term interest rates for major currencies such as the Canadian dollar, Japanese yen, and British pound for various maturities.

Since its inception, the ISDA has pioneered efforts to identify and reduce the sources of risk in the derivatives and risk management business. The ISDA's two primary objectives are (1) the development and maintenance of derivatives documentation to promote efficient business conduct practices and (2) the promotion of the development of sound risk management practices.

One of the ISDA's most notable accomplishments is the development of the ISDA **Master Agreement**. This agreement provides participants in the private derivatives markets with the opportunity to establish the legal and credit terms between them for an ongoing business relationship. The key advantage of such an agreement is that the general legal and credit terms do not have to be renegotiated each time the parties enter into a transaction. Consequently, the ISDA Master Agreement has contributed greatly to the standardization of the derivatives market.¹

¹For more information about interest rate swaps, see the following: Robert A. Strong, *Derivatives: An Introduction*, 2e (Mason, Ohio: South-Western, 2005); and the ISDA, at <http://www.isda.org>.

SUMMARY

■ Some MNCs may consider long-term financing in foreign currencies to offset future cash inflows in those currencies and therefore reduce exposure to exchange rate risk. Other MNCs may consider long-term financing in foreign currencies to reduce financing costs. If a foreign interest rate is relatively low or the foreign currency borrowed depreciates over the financing period, long-term financing in that currency can result in low financing costs.

■ An MNC can assess the feasibility of financing in foreign currencies by applying exchange rate forecasts to the periodic coupon payments and the principal payment. In this way, it determines the amount of its home currency that is necessary per period to cover the payments. The annual cost of financing can be estimated by determining the discount rate that equates the periodic payments on the foreign financing to the initial amount borrowed (as measured in the domestic currency). The discount rate derived from this exercise represents the annual cost of financing in the foreign currency, which can be compared to the cost of

domestic financing. The cost of long-term financing in a foreign currency is dependent on the currency's exchange rate over the financing period and therefore is uncertain. Thus, the MNC will not automatically finance with a foreign currency that has a lower interest rate since its exchange rate forecasts are subject to error. For this reason, the MNC may estimate the costs of foreign financing under various exchange rate scenarios over time.

■ For bonds that have floating interest rates, the coupon payment to be paid to investors is uncertain. This creates another uncertain variable (along with exchange rates) in estimating the amount in the firm's domestic currency that is required per period to make the payments. This uncertainty can be accounted for by estimating the coupon payment amount necessary under various interest rate scenarios over time. Then, with the use of these estimates, the amount of the firm's domestic currency required to make the payments can be estimated, based on various exchange rate scenarios over time.

POINT COUNTER-POINT

Will Currency Swaps Result in Low Financing Costs?

Point Yes. Currency swaps have created greater participation by firms that need to exchange their currencies in the future. Thus, firms that finance in a low-interest-rate currency can more easily establish an agreement to obtain the currency that has the low interest rate.

Counter-Point No. Currency swaps will establish an exchange rate that is based on market forces. If a forward rate exists for a future period, the swap rate should be somewhat similar to the forward rate. If it was not as attractive as the forward rate, the partici-

pants would use the forward market instead. If a forward market does not exist for the currency, the swap rate should still reflect market forces. The exchange rate at which a low-interest currency could be purchased will be higher than the prevailing spot rate since otherwise MNCs would borrow the low-interest currency and simultaneously purchase the currency forward so that they could hedge their future interest payments.

Who Is Correct? Use the Internet to learn more about this issue. Which argument do you support? Offer your own opinion on this issue.

SELF TEST

Answers are provided in Appendix A at the back of the text.

1. Explain why a firm may issue a bond denominated in a currency different from its home currency

to finance local operations. Explain the risk involved.

2. Tulane, Inc. (based in Louisiana), is considering issuing a 20-year Swiss franc-denominated bond. The

- proceeds are to be converted to British pounds to support the firm's British operations. Tulane, Inc., has no Swiss operations but prefers to issue the bond in francs rather than pounds because the coupon rate is 2 percentage points lower. Explain the risk involved in this strategy. Do you think the risk here is greater or less than it would be if the bond proceeds were used to finance U.S. operations? Why?
3. Some large companies based in Latin American countries could borrow funds (through issuing bonds or borrowing from U.S. banks) at an interest rate that would be substantially less than the interest rates in their own countries. Assuming that they are perceived to be creditworthy in the United States, why might they still prefer to borrow in their local countries when financing local projects (even if they incur interest rates of 80 percent or more)?
 4. A respected economist recently predicted that even though Japanese inflation would not rise, Japanese interest rates would rise consistently over the next 5 years. Paxson Co., a U.S. firm with no foreign operations, has recently issued a Japanese yen-denominated bond to finance U.S. operations. It chose the yen denomination because the coupon rate was low. Its vice president stated, "I'm not concerned about the prediction because we issued fixed rate bonds and are therefore insulated from risk." Do you agree? Explain.
 5. Long-term interest rates in some Latin American countries commonly exceed 100 percent annually. Offer your opinion as to why these interest rates are so much higher than those of industrialized countries and why some projects in these countries are feasible for local firms, even though the cost of funding the projects is so high.

QUESTIONS AND APPLICATIONS

1. **Floating Rate Bonds.**
 - a. What factors should be considered by a U.S. firm that plans to issue a floating rate bond denominated in a foreign currency?
 - b. Is the risk of issuing a floating rate bond higher or lower than the risk of issuing a fixed rate bond? Explain.
 - c. How would an investing firm differ from a borrowing firm in the features (i.e., interest rate and currency's future exchange rates) it would prefer a floating rate foreign currency-denominated bond to exhibit?
2. **Risk from Issuing Foreign Currency-Denominated Bonds.** What is the advantage of using simulation to assess the bond financing position?
3. **Exchange Rate Effects.**
 - a. Explain the difference in the cost of financing with foreign currencies during a strong-dollar period versus a weak-dollar period for a U.S. firm.
 - b. Explain how a U.S.-based MNC issuing bonds denominated in euros may be able to offset a portion of its exchange rate risk.
4. **Bond Offering Decision.** Columbia Corp. is a U.S. company with no foreign currency cash flows. It plans to issue either a bond denominated in euros with a fixed interest rate or a bond denominated in U.S. dollars with a floating interest rate. It estimates its periodic dollar cash flows for each bond. Which bond do you think would have greater uncertainty surrounding these future dollar cash flows? Explain.
5. **Currency Diversification.** Why would a U.S. firm consider issuing bonds denominated in multiple currencies?
6. **Financing That Reduces Exchange Rate Risk.** Kerr, Inc., a major U.S. exporter of products to Japan, denominates its exports in dollars and has no other international business. It can borrow dollars at 9 percent to finance its operations or borrow yen at 3 percent. If it borrows yen, it will be exposed to exchange rate risk. How can Kerr borrow yen and possibly reduce its economic exposure to exchange rate risk?
7. **Exchange Rate Effects.** Katina, Inc., is a U.S. firm that plans to finance with bonds denominated in euros to obtain a lower interest rate than is available on dollar-denominated bonds. What is the most critical point in time when the exchange rate will have the greatest impact?
8. **Financing Decision.** Quanto Corp. is a U.S. drug company that has attempted to capitalize on new opportunities to expand in Eastern Europe. The production costs in most Eastern European countries are very low, often less than one-fourth of the cost in Germany or Switzerland. Furthermore, there is a strong demand for drugs in Eastern Europe. Quanto penetrated Eastern Europe by purchasing a 60 percent stake in Galena AS, a Czech firm that produces drugs.

- a. Should Cuanto finance its investment in the Czech firm by borrowing dollars from a U.S. bank that would then be converted into koruna (the Czech currency) or by borrowing koruna from a local Czech bank? What information do you need to know to answer this question?
- b. How can borrowing koruna locally from a Czech bank reduce the exposure of Cuanto to exchange rate risk?
- c. How can borrowing koruna locally from a Czech bank reduce the exposure of Cuanto to political risk caused by government regulations?

Advanced Questions

9. **Bond Financing Analysis.** Sambuka, Inc., can issue bonds in either U.S. dollars or in Swiss francs. Dollar-denominated bonds would have a coupon rate of 15 percent; Swiss franc-denominated bonds would have a coupon rate of 12 percent. Assuming that Sambuka can issue bonds worth \$10 million in either currency, that the current exchange rate of the Swiss franc is \$.70, and that the forecasted exchange rate of the franc in each of the next 3 years is \$.75, what is the annual cost of financing for the franc-denominated bonds? Which type of bond should Sambuka issue?
10. **Bond Financing Analysis.** Hawaii Co. just agreed to a long-term deal in which it will export products to Japan. It needs funds to finance the production of the products that it will export. The products will be denominated in dollars. The prevailing U.S. long-term interest rate is 9 percent versus 3 percent in Japan. Assume that interest rate parity exists and that Hawaii Co. believes that the international Fisher effect holds.
 - a. Should Hawaii Co. finance its production with yen and leave itself open to exchange rate risk? Explain.
 - b. Should Hawaii Co. finance its production with yen and simultaneously engage in forward contracts to hedge its exposure to exchange rate risk?
 - c. How could Hawaii Co. achieve low-cost financing while eliminating its exposure to exchange rate risk?
11. **Cost of Financing.** Assume that Seminole, Inc., considers issuing a Singapore dollar-denominated bond at its present coupon rate of 7 percent, even though it has no incoming cash flows to cover the bond payments. It is attracted to the low financing rate, since U.S. dollar-denominated bonds issued in the United States would have a coupon rate of 12 percent. Assume that either type of bond would have a 4-year maturity and could be issued at par value. Seminole needs to borrow \$10 million. Therefore, it will issue either U.S. dollar-denominated bonds with a par value of \$10 million or bonds denominated in Singapore dollars with a par value of S\$20 million. The spot rate of the Singapore dollar is \$.50. Seminole has forecasted the Singapore dollar's value at the end of each of the next 4 years, when coupon payments are to be paid:

| End of Year | Exchange Rate of Singapore Dollar |
|-------------|-----------------------------------|
| 1 | \$.52 |
| 2 | .56 |
| 3 | .58 |
| 4 | .53 |

 Determine the expected annual cost of financing with Singapore dollars. Should Seminole, Inc., issue bonds denominated in U.S. dollars or Singapore dollars? Explain.
12. **Interaction between Financing and Invoicing Policies.** Assume that Hurricane, Inc., is a U.S. company that exports products to the United Kingdom, invoiced in dollars. It also exports products to Denmark, invoiced in dollars. It currently has no cash outflows in foreign currencies, and it plans to issue bonds in the near future. Hurricane could likely issue bonds at par value in (1) dollars with a coupon rate of 12 percent, (2) Danish kroner with a coupon rate of 9 percent, or (3) pounds with a coupon rate of 15 percent. It expects the kroner and pound to strengthen over time. How could Hurricane revise its invoicing policy and make its bond denomination decision to achieve low financing costs without excessive exposure to exchange rate fluctuations?
13. **Swap Agreement.** Grant, Inc., is a well-known U.S. firm that needs to borrow 10 million British pounds to support a new business in the United Kingdom. However, it cannot obtain financing from British banks because it is not yet established within the United Kingdom. It decides to issue dollar-denominated debt (at par value) in the United States, for which it will pay an annual coupon rate of 10 percent. It then will convert the dollar proceeds from the debt issue into British pounds at the prevailing spot rate (the prevailing spot rate is one pound = \$1.70). Over each of the next 3 years, it plans to use the revenue in pounds from the new business in the United Kingdom to make its annual debt payment. Grant, Inc., engages in a currency swap in which it will convert pounds to dollars at an exchange rate of \$1.70 per pound at the end of each of the next 3 years. How many

dollars must be borrowed initially to support the new business in the United Kingdom? How many pounds should Grant, Inc., specify in the swap agreement that it will swap over each of the next 3 years in exchange for dollars so that it can make its annual coupon payments to the U.S. creditors?

- 14. Interest Rate Swap.** Janutis Co. has just issued fixed rate debt at 10 percent. Yet, it prefers to convert its financing to incur a floating rate on its debt. It engages in an interest rate swap in which it swaps variable rate payments of LIBOR plus 1 percent in exchange for payments of 10 percent. The interest rates are applied to an amount that represents the principal from its recent debt issue in order to determine the interest payments due at the end of each year for the next 3 years. Janutis Co. expects that the LIBOR will be 9 percent at the end of the first year, 8.5 percent at the end of the second year, and 7 percent at the end of the third year. Determine the financing rate that Janutis Co. expects to pay on its debt after considering the effect of the interest rate swap.
- 15. Financing and the Currency Swap Decision.** Bradenton Co. is considering a project in which it will export special contact lenses to Mexico. It expects that it will receive 1 million pesos after taxes at the end of each year for the next 4 years, and after that time its business in Mexico will end as its special patent will be terminated. The peso's spot rate is presently \$.20. The U.S. annual risk-free interest rate is 6 percent, while Mexico's annual risk-free interest rate is 11 percent. Interest rate parity exists.

Bradenton Co. uses the one-year forward rate as a predictor of the exchange rate in one year. Bradenton Co. also presumes that the exchange rates in each of the years 2 through 4 will also change by the same percentage as it predicts for year 1. Bradenton searches for a firm with which it can swap pesos for dollars over each of the next 4 years. Briggs Co. is an importer of Mexican products. It is willing to take the 1 million pesos per year from Bradenton Co. and will provide Bradenton Co. with dollars at an exchange rate of \$.17 per peso. Ignore tax effects.

Bradenton Co. has a capital structure of 60 percent debt and 40 percent equity. Its corporate tax rate is 30 percent. It borrows funds from a bank and pays 10 percent interest on its debt. It expects that the U.S. annual stock market return will be 18 percent per year. Its beta is .9. Bradenton would use its cost of capital as the required return for this project.

- Determine the *NPV* of this project if Bradenton engages in the currency swap.
- Determine the *NPV* of this project if Bradenton does not hedge the future cash flows.

Discussion in the Boardroom

This exercise can be found in Appendix E at the back of this textbook.

Running Your Own MNC

This exercise can be found on the Xtra! website at <http://maduraxtra.swlearning.com>.

BLADES, INC. CASE

Use of Long-Term Financing

Recall that Blades, Inc., is considering the establishment of a subsidiary in Thailand to manufacture "Speedos," Blades' primary roller blade product. Alternatively, Blades could acquire an existing manufacturer of roller blades in Thailand, Skates'n'Stuff. At the most recent meeting of the board of directors of Blades, Inc., the directors voted to establish a subsidiary in Thailand because of the relatively high level of control it would afford Blades.

The Thai subsidiary is expected to begin production by early next year, and the construction of the plant in Thailand and the purchase of necessary equipment to manufacture Speedos are to commence immediately. Initial estimates of the plant and equipment required to establish the subsidiary in Bangkok

indicate costs of approximately 550 million Thai baht. Since the current exchange rate of the baht is \$0.023, this translates to a dollar cost of \$12.65 million. Blades currently has \$2.65 million available in cash to cover a portion of the costs. The remaining \$10 million (434,782,609 baht), however, will have to be obtained from other sources.

The board of directors has asked Ben Holt, Blades' chief financial officer (CFO), to line up the necessary financing to cover the remaining construction costs and purchase of equipment. Holt realizes that Blades is a relatively small company whose stock is not widely held. Furthermore, he believes that Blades' stock is currently undervalued because the company's expansion into Thailand has not been widely publicized at this

point. Because of these considerations, Holt would prefer debt to equity financing to raise the funds necessary to complete construction of the Thai plant.

Ben Holt has identified two alternatives for debt financing: issue the equivalent of \$10 million yen-denominated notes or issue the equivalent of approximately \$10 million baht-denominated notes. Both types of notes would have a maturity of 5 years. In the fifth year, the face value of the notes will be repaid together with the last annual interest payment. Notes denominated in yen (¥) are available in increments of ¥125,000, while baht-denominated notes are issued in increments of 50,000 baht. Since the baht-denominated notes are issued in increments of 50,000 baht (THB), Blades needs to issue $\text{THB}434,782,609/50,000 = 8,696$ baht-denominated notes. Furthermore, since the current exchange rate of the yen in baht is $\text{THB}0.347826/\text{¥}$, Blades needs to obtain $\text{THB}434,782,609/\text{THB}0.347826 = \text{¥}1,250,000,313$. Since yen-denominated notes would be issued in increments of 125,000 yen, Blades would have to issue $\text{¥}1,250,000,313/\text{¥}125,000 = 10,000$ yen-denominated notes.

Due to recent unfavorable economic events in Thailand, expansion into Thailand is viewed as relatively risky; Holt's research indicates that Blades would have to offer a coupon rate of approximately 10 percent on the yen-denominated notes to induce investors to purchase these notes. Conversely, Blades could issue baht-denominated notes at a coupon rate of 15 percent. Whether Blades decides to issue baht- or yen-denominated notes, it would use the cash flows generated by the Thai subsidiary to pay the interest on the notes and to repay the principal in 5 years. For example, if Blades decides to issue yen-denominated notes, it would convert baht into yen to pay the interest on these notes and to repay the principal in 5 years.

Although Blades can finance with a lower coupon rate by issuing yen-denominated notes, Ben Holt suspects that the effective financing rate for the yen-denominated notes may actually be higher than for the baht-denominated notes. This is because forecasts for the future value of the yen indicate an appreciation of the yen (versus the baht) in the future. Although the

precise future value of the yen is uncertain, Holt has compiled the following probability distribution for the annual percentage change of the yen versus the baht:

| Annual % Change in Yen (against the baht) | Probability |
|---|-------------|
| 0% | 20% |
| 2 | 50 |
| 3 | 30 |

Holt suspects that the effective financing cost of the yen-denominated notes may actually be higher than for the baht-denominated notes once the expected appreciation of the yen (against the baht) is taken into consideration.

Holt has asked you, a financial analyst at Blades, Inc., to answer the following questions for him:

1. Given that Blades expects to use the cash flows generated by the Thai subsidiary to pay the interest and principal of the notes, would the effective financing cost of the baht-denominated notes be affected by exchange rate movements? Would the effective financing cost of the yen-denominated notes be affected by exchange rate movements? How?
2. Construct a spreadsheet to determine the annual effective financing percentage cost of the yen-denominated notes issued in each of the three scenarios for the future value of the yen. What is the probability that the financing cost of issuing yen-denominated notes is higher than the cost of issuing baht-denominated notes?
3. Using a spreadsheet, determine the expected annual effective financing percentage cost of issuing yen-denominated notes. How does this expected financing cost compare with the expected financing cost of the baht-denominated notes?
4. Based on your answers to the previous questions, do you think Blades should issue yen- or baht-denominated notes?
5. What is the tradeoff involved?

SMALL BUSINESS DILEMMA

Long-Term Financing Decision by the Sports Exports Company

The Sports Exports Company continues to focus on producing footballs in the United States and exporting them to the United Kingdom. The exports are denominated in pounds, which has continually exposed the

firm to exchange rate risk. It is now considering a new form of expansion where it would sell specialty sporting goods in the United States. If it pursues this U.S. project, it will need to borrow long-term funds. The dollar-

denominated debt has an interest rate that is slightly lower than the pound-denominated debt.

1. Jim Logan, owner of the Sports Exports Company, needs to determine whether dollar-denominated debt or pound-denominated debt would be most appropriate for financing this expansion, if he does expand. He is leaning toward financing the U.S. project with dollar-denominated debt since his goal

is to avoid exchange rate risk. Is there any reason why he should consider using pound-denominated debt to reduce exchange rate risk?

2. Assume that Jim decides to finance his proposed U.S. business with dollar-denominated debt, if he does implement the U.S. business idea. How could he use a currency swap along with the debt to reduce the firm's exposure to exchange rate risk?

INTERNET/EXCEL EXERCISES

1. The Bloomberg website provides interest rate data for many countries and various maturities. Its address is <http://www.bloomberg.com>. Go to the Markets section of the website and then to Bonds and Rates and then click on Australia. Consider a subsidiary of a U.S.-based MNC that is located in Australia. Assume that when it borrows in Australian dollars, it would pay 1 percent more than the risk-free (government) rates shown on the website. What rate would the subsidiary pay for 1-year debt? For 5-year debt? For 10-year debt? Assuming that it needs funds for 10 years, do you think it should use 1-year debt, 5-year debt, or 10-year debt? Explain your answer.
2. Assume that you conduct business in Argentina, Brazil, and Canada. You consider expanding your business overseas. You want to estimate the annual cost of equity in these countries in case you

decide to obtain equity funding there. Go to <http://finance.yahoo.com/intlindices?e=americas> and click on index MERV (which represents the Argentina stock market index). Click on 1y just below the chart provided. Then scroll down and click on Historical Prices. Obtain the stock market index value 8 years ago, 7 years ago, . . . , 1 year ago, and as of today. Insert the data on an electronic spreadsheet. Use the mean annual return (percentage change in value) over the last 8 years as a rough estimate of your cost of equity in each of these countries.

Then start over and repeat the process for Brazil (click on the index BVSP). Then start over and repeat the process for Canada (click on the index GSPTSE). Which country has the lowest estimated cost of equity? Which country has the highest estimated cost of equity?

PART 4 INTEGRATIVE PROBLEM

Long-Term Asset and Liability Management

Gandor Co. is a U.S. firm that is considering a joint venture with a Chinese firm to produce and sell videocassettes. Gandor will invest \$12 million in this project, which will help to finance the Chinese firm's production. For each of the first 3 years, 50 percent of the total profits will be distributed to the Chinese firm, while the remaining 50 percent will be converted to dollars to be sent to the United States. The Chinese government intends to impose a 20 percent income tax on the profits distributed to Gandor. The Chinese government has guaranteed that the after-tax profits (denominated in yuan, the Chinese currency) can be converted to U.S. dollars at an exchange rate of \$.20 per yuan and sent to Gandor Co. each year. At the current time, no withholding tax is imposed on profits sent to the United States as a result of joint ventures in China. Assume that after considering the taxes paid in China, an additional 10 percent tax is imposed by the U.S. government on profits received by Gandor Co. After the first 3 years, all profits earned are allocated to the Chinese firm.

The expected total profits resulting from the joint venture per year are as follows:

| Year | Total Profits from Joint Venture (in yuan) |
|------|--|
| 1 | 60 million |
| 2 | 80 million |
| 3 | 100 million |

Gandor's average cost of debt is 13.8 percent before taxes. Its average cost of equity is 18 percent. Assume that the corporate income tax rate imposed on Gandor is normally 30 percent. Gandor uses a capital structure composed of 60 percent debt and 40 percent equity. Gandor automatically adds 4 percentage points to its cost of capital when deriving its required rate of return on international joint ventures. Though this project has particular forms of country risk that are unique, Gandor plans to account for these forms of risk within its estimation of cash flows.

Gandor is concerned about two forms of country risk. First, there is the risk that the Chinese government will increase the corporate income tax rate from 20 to 40 percent (20 percent probability). If this occurs, additional tax credits will be allowed, resulting in no U.S. taxes on the profits from this joint venture. Second, there is the risk that the Chinese government will impose a withholding tax of 10 percent on the profits that are sent to the United States (20 percent probability). In this case, additional tax credits will not be allowed, and Gandor will still be subject to a 10 percent U.S. tax on profits received from China. Assume that the two types of country risk are mutually exclusive. That is, the Chinese government will adjust only one of its taxes (the income tax or the withholding tax), if any.

Questions

- 1** Determine Gandor's cost of capital. Also, determine Gandor's required rate of return for the joint venture in China.
- 2** Determine the probability distribution of Gandor's net present values for the joint venture. Capital budgeting analyses should be conducted for these three scenarios:
 - *Scenario 1.* Based on original assumptions.
 - *Scenario 2.* Based on an increase in the corporate income tax by the Chinese government.
 - *Scenario 3.* Based on the imposition of a withholding tax by the Chinese government.
- 3** Would you recommend that Gandor participate in the joint venture? Explain.
- 4** What do you think would be the key underlying factor that would have the most influence on the profits earned in China as a result of the joint venture?
- 5** Is there any reason for Gandor to revise the composition of its capital (debt and equity) obtained from the United States when financing joint ventures like this?
- 6** When Gandor was assessing this proposed joint venture, some of its managers recommended that Gandor borrow the Chinese currency rather than dollars to obtain some of the necessary capital for its initial investment. They suggested that such a strategy could reduce Gandor's exchange rate risk. Do you agree? Explain.