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 MNC’s cost of debt affects its required rate of return when it assesses proposed projects. Features of debt such as currency of denomination, maturity, and whether the rate is fixed or floating can affect the cost of debt, and therefore affect the feasibility of projects that are supported with the debt. Thus, MNCs can enhance their value by determining specific features of debt that can reduce their cost of debt.

FINANCING TO MATCH THE INFLOW CURRENCY

Subsidiaries of MNCs commonly finance their operations with the currency in which they invoice their products. This matching strategy can reduce the subsidiary’s exposure to exchange rate movements because it allows the subsidiary to use a portion of its cash inflows to cover the cash outflows to repay its debt. In this way, the amount of the subsidiary’s funds that will ultimately be remitted to the parent (and converted into the parent’s currency) is reduced.

Many MNCs, including Honeywell and The Coca-Cola Co., issue bonds in some of the foreign currencies 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. IBM and Nike have issued bonds denominated in yen at low-interest rates and use 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.

The matching strategy described above is especially desirable when the foreign subsidiaries are based in countries where interest rates are relatively low. The MNC achieves a low financing rate and also reduces its exchange rate risk by matching its
debt outflow payments with the currency denoting its cash inflows. This can help to stabilize the firm’s cash flow.

**Using Currency Swaps to Execute the Matching Strategy**

In some cases, an MNC may not be able to borrow a currency that matches its invoice currency in order to reduce exchange rate risk. Under these conditions, the MNC may want to engage in a currency swap, which specifies the exchange of currencies at periodic intervals. A currency swap may allow the MNC to have cash outflows in the same currency in which it receives most or all of its revenue, and therefore can reduce its exposure to exchange rate movements.

**EXAMPLE**

Miller Co., a U.S. firm, has a European subsidiary that 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 cash inflows 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 18.1.

**Exhibit 18.1 Illustration of a Currency Swap**
The swap just described eliminates exchange rate risk for both Miller Co. and Beck Co. because both firms are able to match their cash outflow currency with the cash inflow currency. 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, the currency swap allows it to make dollar payments to the investors without having to be concerned about exchange rate risk.

Ford Motor Co., Johnson & Johnson, and many other MNCs use currency swaps. Many MNCs simultaneously swap interest payments and currencies. The Gillette Co. engaged in swap agreements that converted $500 million in fixed rate dollar-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.

**Using Parallel Loans to Execute the Matching Strategy**

If an MNC is not able to borrow a currency that matches its invoice currency, it might also consider financing with a parallel (or back-to-back) loan so that it can match its invoice currency. In a parallel loan, two parties provide simultaneous loans with an agreement to repay at a specified point in the future.

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. Ann Arbor Co. may be able to more easily obtain a loan in U.S. dollars where its parent is based, while the British-owned MNC has easier access to loans in British pounds where its parent is based. Two parties can engage in a parallel loan as follows. The British parent provides a loan in pounds to the British subsidiary of Ann Arbor Co., while the parent of Ann Arbor Co. provides a loan in dollars to the American subsidiary of the British-based MNC (as shown in Exhibit 18.2). At the time specified

**Exhibit 18.2 Illustration of a Parallel Loan**

1. Loans are simultaneously provided by parent of each MNC to subsidiary of the other MNC.
2. At a specified time in the future, the loans are repaid in the same currency that was borrowed.
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 loan from the parent of Ann Arbor Co. ●

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 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. Schnell’s investment in the project is 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 $.20 next year. Furthermore, Schnell will have to borrow for 1 year in order to pursue the project and will incur financing costs of 13 percent over the next year.

If Schnell pursues the project, it will incur a net outflow now of MR1,000,000 × $.25 = $250,000. Next year, it will also have to pay the financing costs of $250,000 × 13% = $32,500. If the ringgit depreciates to $.20, then Schnell will receive MR1,400,000 × $.20 = $280,000 next year. For each year, the cash flows are summarized below.

<table>
<thead>
<tr>
<th></th>
<th>YEAR 0</th>
<th>YEAR 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>-$250,000</td>
<td></td>
</tr>
<tr>
<td>Interest payment</td>
<td></td>
<td>-$32,500</td>
</tr>
<tr>
<td>Project cash flow</td>
<td>0</td>
<td>$280,000</td>
</tr>
<tr>
<td>Net</td>
<td>-$250,000</td>
<td>$247,500</td>
</tr>
</tbody>
</table>

The cash inflows to Schnell in 1 year (shown in the bottom row for Year 1) would be less than Schnell’s initial investment, even when ignoring the time value of money.

However, a parallel loan may improve the outcome for Schnell. Assume that Schnell and the Malaysian government engage in a parallel loan, in which the Malaysian government will give Schnell MR1 million in exchange for a loan in dollars at the current exchange rate. These loans will be repaid by both parties at the end of 1 year when the project is completed. Assume that 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 is shown in Exhibit 18.3.

By using the parallel loan, Schnell is able to more closely match its cash inflows and outflows in ringgit as shown here:

<table>
<thead>
<tr>
<th></th>
<th>SCHNELL DOLLAR CASH FLOWS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YEAR 0</td>
</tr>
<tr>
<td>Loan to Malaysia</td>
<td>-$250,000</td>
</tr>
<tr>
<td>Interest payment</td>
<td></td>
</tr>
<tr>
<td>Interest received on loan ($250,000 × 7%)</td>
<td></td>
</tr>
<tr>
<td>Return of loan principal</td>
<td></td>
</tr>
<tr>
<td>Net cash flow</td>
<td>-$250,000</td>
</tr>
</tbody>
</table>
Based on the forecasted spot rate of $0.20 in 1 year, the net cash flow in Year 1 of MR250,000 is expected to be $250,000 \times 0.20 = $50,000. Thus, the total dollar cash flows using the parallel loan are $235,000 + $50,000 = $285,000. Overall, Schnell’s net cash flows in Year 1 more than offset its initial cash outflow of $250,000. In addition, the parallel loan reduces the ringgit amount that Schnell must convert to dollars at project termination from MR1.4 million to MR250,000. Thus, the parallel loan reduces Schnell’s exposure to the potential depreciation of the ringgit.

**Debt Denomination Decision by Subsidiaries**

If subsidiaries of MNCs desire to match the currency they borrow with the currency they use to invoice products, their cost of debt is dependent on the local interest rate of their host country. Exhibit 18.4 illustrates how long-term risk-free bond yields can vary among countries. The cost of debt to a subsidiary in any of these countries would be
slightly higher than the risk-free rates shown here because it would contain a credit risk premium. The cost of debt financing in Japan is typically low because the risk-free bond rate there is low. Conversely, the cost of debt financing in Brazil (as shown here) and some other countries can be very high. A subsidiary in a host country where interest rates are high might consider borrowing in a different currency in order to avoid the high cost of local debt. The analysis used to determine which currency to borrow is explained in the following section.

Debt Decision in Host Countries with High Interest Rates

When an MNC’s subsidiaries are based in developing countries such as Brazil, Indonesia, Malaysia, Mexico, and Thailand, they may be subject to relatively high interest rates. Thus, while the matching strategy described earlier reduces exchange rate risk, it would force MNC subsidiaries in developing countries to incur a high cost of debt. The parent of a U.S.-based MNC may consider providing a loan in dollars to finance the subsidiary so the subsidiary can avoid the high cost of local debt. However, this will force the subsidiary to convert some of its funds to dollars in order to repay the loan. Recall that countries where interest rates are high tend to have high expected inflation (the Fisher effect, explained in Chapter 8) and that currencies of countries with relatively high inflation tend to weaken over time (as suggested by purchasing power parity, explained in Chapter 8). Thus, by attempting to avoid the high cost of debt in one currency, the subsidiary of a U.S.-based MNC becomes more highly exposed to exchange rate risk.

EXAMPLE

Boise Co. (a U.S. company) has a Mexican subsidiary that will need about 200 million Mexican pesos for 3 years to finance its Mexican operations. While the Mexican subsidiary will continue to exist even after 3 years, the focus here on a 3-year period is sufficient to illustrate a common subsidiary financing dilemma when the host country interest rate is high. Assume the peso’s spot rate is $.10; the financing represents $20 million (computed as MXP200 million × $.10). To finance its operations, Boise’s parent considers two possible financing alternatives:

1. **Peso Loan.** Boise’s parent can instruct its Mexican subsidiary to borrow Mexican pesos to finance the Mexican operations. The interest rate on a 3-year fixed rate peso-denominated loan is 12 percent.

2. **Dollar Loan.** Boise’s parent can borrow dollars and extend a loan to the Mexican subsidiary to finance the Mexican operations. Boise can obtain a 3-year fixed rate dollar-denominated loan at an interest rate 7 percent.
If the Mexican subsidiary borrows Mexican pesos, it is matching its cash outflow currency (when making interest payments) to its cash inflow currency. Thus, it can use a portion of its peso inflows to periodically make payments on the peso-denominated loan before remitting any earnings to the parent. Consequently, it has less cash available to periodically remit to the parent convertible into dollars, and it does not have any loan repayments to the parent. This situation reflects a relatively low exposure of Boise to exchange rate risk. Even if the Mexican peso depreciates substantially over time, the adverse impact is less pronounced because there is a smaller amount of pesos periodically converted into U.S. dollars over time. However, the disadvantage of borrowing pesos is that the interest rate is high.

The potential advantage of the Mexican subsidiary borrowing dollars is that it results in a lower interest rate. However, the potential disadvantage of borrowing in dollars is that there is more of a mismatch between the cash flows, as illustrated in Exhibit 18.5. If the Mexican subsidiary borrows dollars, it does not have debt in pesos, so it will periodically remit a larger amount of pesos to the parent (so that it can repay the loan from the parent), convertible into dollars. This situation reflects a high exposure of Boise to exchange rate risk. If the Mexican peso depreciates substantially over time, the subsidiary will need more pesos to repay the dollar-denominated loan over time. For this reason, it is possible that the subsidiary will need more pesos to pay off the 7 percent dollar-denominated loan than the 12 percent peso-denominated loan.

**Combining Debt Financing with Forward Hedging** While a subsidiary is more exposed to exchange rate risk if it borrows a currency other than that of its host country, it might consider hedging that risk. Forward contracts may be available on some currencies for 5 years or longer, which may allow the subsidiary to hedge its future loan payments in a particular currency. However, this hedging strategy may not allow the

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**Exhibit 18.5** Comparison of Subsidiary Financing with Its Local Currency versus Borrowing from Parent

<table>
<thead>
<tr>
<th>Alternative 1: Mexican Subsidiary Borrows Pesos at Interest Rate of 12 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
</tr>
<tr>
<td>Mexican Subsidiary</td>
</tr>
<tr>
<td>Loans</td>
</tr>
<tr>
<td>Local Bank in Mexico</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative 2: Mexican Subsidiary Borrows Dollars at Interest Rate of 7 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
</tr>
<tr>
<td>Mexican Subsidiary</td>
</tr>
</tbody>
</table>
subsidiary to achieve a lower debt financing rate than it could achieve by borrowing its host country currency, as illustrated here.

EXAMPLE

Recall that the Mexican subsidiary of Boise Co. wants to borrow 200 million Mexican pesos for 3 years to support its operations, but the prevailing fixed interest rate on peso-denominated debt is 12 percent versus 7 percent on dollar-denominated debt. The Mexican subsidiary considers borrowing $20 million and converting them to pesos to support its operations. It would need to convert pesos to dollars to make interest payments of $2,100,000 (computed as 7% × $20,000,000) for each of the next 3 years. It is concerned that the Mexican peso could depreciate against the dollar over time, which could increase the amount of pesos needed to cover the loan payments. So it wants to hedge its loan payments with forward sales of pesos in exchange for $2,100,000 over each of the next 3 years. However, even if Boise Co. is able to find a financial institution that is willing to accommodate this request with forward contracts over the next 3 years, it will not benefit from this strategy. Recall from Chapter 7 that from a U.S. perspective, interest rate parity causes the forward rate of a foreign currency to exhibit a discount that reflects the differential between the interest rate of that currency versus the interest rate on dollars. In this example, the interest rate from borrowing pesos is much higher than the interest rate from borrowing U.S. dollars. Thus, the forward rate of the Mexican peso will contain a substantial discount, which means that the Mexican subsidiary of Boise Co. would be selling pesos forward at a substantial discount in order to obtain dollars so that it could make loan payments. Consequently, the discount would offset the interest rate advantage of borrowing dollars, so Boise Co. would not be able to reduce its financing costs with this forward hedge strategy.

Even if a subsidiary cannot effectively hedge its financing position, it might still consider financing with a currency that differs from its host country. Its final debt denomination decision will likely be based on its forecasts of exchange rates, as is illustrated in the following section.

Comparing Financing Costs between Debt Denominations  If an MNC parent considers financing subsidiary operations in a host country where interest rates are high, it must estimate the financing costs for both financing alternatives.

EXAMPLE

Recall that the Mexican subsidiary of Boise Co. could obtain a MXP200 million loan at an annualized interest rate of 12 percent over 3 years, or can borrow $20 million from its parent at an annualized interest rate of 7 percent over 3 years. Assume that all loan principal is repaid at the end of 3 years. The annualized cost of each financing alternative is shown in Exhibit 18.6. The subsidiary’s payments on the peso-denominated loan is simply based on the interest rate (12 percent) applied to the loan amount, as there is no exchange rate risk to the Mexican subsidiary if it borrows its local currency. Next, the annualized cost of financing of the dollar loan is the discount rate that equates the payments to the loan proceeds (MXP200 million) at the time the loan is created, and is estimated to be 12.00 percent (the same as the interest rate because there is no exchange rate risk). The estimated cost of financing with dollars requires forecasts of exchange rates at the intervals when loan payments are made to the U.S. parent, as shown in Exhibit 18.6. Assume that the subsidiary forecasts that the peso’s spot rate will be $.10 in 1 year, $.09 in 2 years, and $.09 in 3 years. Given the required loan repayments in dollars and the forecasted exchange rate of the peso, the

Exhibit 18.6  Comparison of Two Alternative Loans with Different Debt Denominations for the Foreign Subsidiary

<table>
<thead>
<tr>
<th></th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PESO LOAN OF MXP 200,000,000 at 12%</strong></td>
<td>MXP24,000,000</td>
<td>MXP24,000,000</td>
<td>MXP24,000,000 + loan principal repayment of MXP200,000,000</td>
</tr>
<tr>
<td><strong>U.S. DOLLAR LOAN OF $20,000,000 at 7%</strong></td>
<td>$1,400,000</td>
<td>$1,400,000</td>
<td>$1,400,000 + loan principal repayment of $20,000,000</td>
</tr>
<tr>
<td>Loan repayment in U.S. Dollars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecasted Exchange Rate of Peso</td>
<td>$.10</td>
<td>$.09</td>
<td>$.09</td>
</tr>
<tr>
<td>Pesos Needed to Repay Dollar Loan</td>
<td>MXP14,000,000</td>
<td>MXP15,555,556</td>
<td>MXP237,777,778</td>
</tr>
</tbody>
</table>
amount of pesos needed to repay the loan per year can be estimated, as shown in Exhibit 18.6. Next, the annualized cost of financing of the Mexican subsidiary with a dollar loan can be determined. It is the discount rate that equates the payments to the loan proceeds ($20 million) at the time the loan is created, and can be calculated with the use of many calculators. It is estimated to be 10.82 percent when financing with a U.S. dollar loan, versus 12 percent for the Mexican peso loan.

While the annualized cost of financing is slightly lower when financing the Mexican subsidiary with dollars, the cost is subject to exchange rate forecasts, and therefore is uncertain. Conversely, the cost of financing with the peso-denominated loan is certain for the Mexican subsidiary. Thus, Boise Co. will only decide to finance the Mexican subsidiary with dollar-denominated debt if it is confident that the peso will not weaken any more than its prevailing forecasts over the next 3 years.

**Accounting for Uncertainty of Financing Costs** The estimated cost of debt financing by the subsidiary when it borrows a different currency than that of its host country is highly sensitive to the forecasted exchange rates. If the subsidiary uses inaccurate exchange rate forecasts, it could make the wrong decision regarding the currency to denominate its debt. It can at least account for the uncertainty surrounding its point estimate exchange rate forecasts by using sensitivity analysis, in which it can develop alternative forecasts for the exchange rate for each period in which a loan payment will be provided. It might initially use its best guess for each period to estimate the cost of financing. Then, it can repeat the process based on unfavorable conditions. Finally, it can repeat the process under more favorable conditions. For each set of exchange rate forecasts, the MNC can estimate the cost of financing. This process results in a different estimate of the cost of financing for each of the three sets of forecasts that it used.

Alternatively, an MNC can apply simulation, in which it develops a probability distribution for the exchange rate for each period in which an outflow payment will be provided. 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 as many times as desired, perhaps 100 times or so.

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 subsidiary borrows its local currency. Through this comparison, the MNC can determine the probability that borrowing a currency other than its local currency (of its host country) will achieve a lower annualized cost of financing than if it borrows its local currency.

**Debt Denomination to Finance a Project**

When an MNC considers a new project, it must consider what currency to borrow when financing the project. This decision is related to the previous section in which an MNC’s subsidiary decides how to finance its operations. However, it is more specific in that it is focused on financing a specific project, as illustrated in the example below.
**Input Necessary to Conduct an Analysis**  Consider the case of Lexon Co. (a U.S. firm), which considers a new project that would require an investment of 80 million Argentine pesos (AP). Because the spot rate of the Argentine peso is presently $.50, the project’s initial outlay requires the equivalent of $40 million. If Lexon implements this project, it will use equity to finance half of the investment, or $20 million. It will use debt to finance the remainder. For its debt financing, Lexon will either borrow $20 million (and convert those funds into pesos), or it will borrow AP40 million. Thus, the focus of this problem is on the currency to borrow to support the project. Lexon will pay an annualized interest rate of 9 percent if it borrows U.S. dollars or 15 percent if it borrows Argentine pesos. The project will be terminated in 1 year. At that time, the debt will be repaid, and any earnings generated by the project will be remitted to Lexon in the United States. The project is expected to generate revenue of AP200 million at the end of 1 year, and operating expenses in Argentina will be AP10 million payable at the end of 1 year. Lexon expects that the Argentine peso will be valued at $.40 in 1 year. This project will not generate any revenue in the United States, but Lexon does expect to incur operating expenses of $10 million in the United States. Lexon’s cost of equity is 18 percent.

**Analysis of Financing Alternatives for the Project**  By applying capital budgeting analysis to each possible financing mix, Lexon can determine which financing mix will result in a higher net present value. As explained in Chapter 14, an MNC can account for exchange rate effects due to debt financing by directly estimating the debt payment cash flows along with all other cash flows in the capital budgeting process. Because the debt payments are completely accounted for within the cash flow estimates, the initial outlay represents the parent’s equity investment, and the capital budgeting analysis determines the net present value of the parent’s equity investment. If neither alternative has a positive NPV, the proposed project will not be undertaken. If both alternatives have positive NPVs, the project will be financed with the financing mix that is expected to generate a higher NPV.

The analysis of the two financing alternatives is provided in Exhibit 18.7. Rows 1 and 2 show the expected revenue and operating expenses in Argentina, and are the same for both alternatives. Row 3 shows that borrowing dollars results in zero Argentine interest expenses, while the alternative of borrowing pesos results in interest expenses of AP6 million pesos (15% × 40 million pesos). Row 4 shows Argentine earnings before taxes, which is computed as row 1 minus rows 2 and 3. The tax rate is applied to the Argentine earnings before taxes (row 4) in order to derive the taxes paid in Argentina (row 5) and Argentine earnings after taxes (row 6).

Row 7 accounts for the repayment of Argentine debt. This is a key difference between the two financing alternatives, and is why the amount of pesos remitted to Lexon in row 8 is so much larger if dollar-denominated debt is used instead of peso-denominated debt. The expected exchange rate of the peso in row 9 is applied to the amount of pesos to be remitted in row 8 in order to determine the amount of dollars received in row 10. The U.S. operating expenses are shown in row 11. The U.S. interest expenses are shown in row 12 and computed as 9% × $20 million = $1.8 million if dollar-denominated debt is used. Row 13 accounts for tax savings to Lexon from incurring expenses in the United States due to the project, which are estimated as the 30 percent U.S. tax rate multiplied by the U.S. expenses shown in rows 11 and 12. The principal payment of U.S. dollar-denominated debt is shown in row 14.

Dollar cash flows resulting from the project in row 15 can be estimated as the amount of dollars received from Argentina (row 10) minus the U.S. expenses (rows 11 and 12) plus tax benefits due to U.S. expenses (row 13) minus the principal payment on U.S. debt (row 14). The present value of the dollar cash flows resulting from the project (shown in
row 16) is determined by discounting the cash flows in row 15 at Lexon’s cost of equity, which is 18 percent. The initial equity outlay of $20 million (in row 17) is subtracted from the present value of cash flows in row 16 to derive the \( \text{NPV} \) in row 18. The results show that if Lexon uses dollar-denominated debt to partially finance the project, the \( \text{NPV} \) is $1.135 million, whereas if it uses Argentine peso-denominated debt to partially finance the project, the \( \text{NPV} \) is $4.17 million.

While the use of peso-denominated debt has a higher interest rate than the dollar-denominated debt, Lexon can substantially reduce adverse effects of the weak peso by using peso-denominated debt. Consequently, Lexon should finance this project with peso-denominated debt. The results here do not imply that foreign debt should always be used to finance a foreign project. The advantage of using foreign debt to offset foreign revenue (reduce exchange rate risk) must be weighed against the cost of that debt.

**Adjusting the Analysis for Other Conditions** The Lexon example was intentionally simplified to illustrate the process of analyzing two financing alternatives for a particular project. However, the analysis can easily be adjusted to account for more complicated conditions. The analysis shown for a single year in Exhibit 18.7 could be applied to multiple years. For each year, the revenue and expenses would be recorded, along with any other cash flows. Then the present value of the cash flows can be compared to the initial equity outlay to determine whether the equity investment is feasible.
DEBT MATURITY DECISION

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. Normally, an MNC may use a long-term maturity for financing subsidiary operations that will continue for a long-term period. But it might consider a maturity that is shorter than the time period in which it will need funds, especially when it notices that annualized interest rates on debt are relatively low for particular maturities.

Assessment of Yield Curve

Before making the debt maturity decision, MNCs assess the yield curve of the country in which they need funds.

The shape of the yield curve (relationship between annualized yield and debt maturity) can vary among countries. Some countries tend to have an upward-sloping yield curve, which means that the annualized yields are lower for short-term debt maturities than for long-term debt maturities. 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 (tying up their funds for a longer period of time). Put another way, an upward-sloping yield curve suggests that more creditors prefer to loan funds for shorter loan maturities, and therefore charge a lower annualized interest rate for these maturities.

Financing Costs of Loans with Different Maturities

When there is an upward-sloping yield curve, the MNC may be tempted to finance the project with debt over a shorter maturity in order to achieve a lower cost of debt financing, even if means that it will need funding beyond the life of the loan. However, the MNC may incur higher financing costs when it attempts to obtain additional funding after the existing loan matures if market interest rates are higher at that time. It must decide whether to obtain a loan with a maturity that perfectly fits its needs, or one with a shorter maturity if it has a more favorable interest rate and then additional financing when this loan matures.

EXAMPLE

Scottsdale Co. (a U.S. firm) has a Swiss subsidiary that needs debt financing in Swiss francs for 5 years. It plans to borrow SF40 million. A Swiss bank offers a loan that would require annual interest payments of 8 percent for a 5-year period, which results in interest expenses of SF3,200,000 per year (computed as SF40,000,000 × .08). Assume that the subsidiary could achieve an annualized cost of debt of only 6 percent if it borrows for a period of 3 years instead of 5 years. In this case, its interest expenses would be SF2,400,000 per year (computed as SF40,000,000 × .06) over the first 3 years. Thus, it can reduce its interest expenses by SF80,000 per year over the first 3 years if it pursues the 3-year loan. If Scottsdale accepts a 3-year loan, it would be able to extend its loan in 3 years for 2 additional years, but the loan rate for those remaining years would be based on the prevailing market interest rate of Swiss francs at the time. Scottsdale believes that the interest rate on Swiss francs in years 4 and 5 will be 9 percent. In this case, it would pay SF3,600,000 in annual interest expenses in Years 4 and 5.

The payments of the two financing alternatives are shown in Exhibit 18.8 Row 1 shows the payments that would be required for the 5-year loan, while row 2 shows the payments for the 3-year loan plus the estimated payments for the loan extension (in years 4 and 5). The annualized cost of financing for the two alternative loans can be measured as the discount rate that equates the payments to the loan proceeds of SF40 million. This discount rate is 8.00 percent for the 5-year loan versus 7.08 percent for the 3-year loan plus the loan extension. Since the annualized cost of financing is expected to be lower for the 3-year loan plus loan extension, Scottsdale prefers that loan.
When Scottsdale Co. assesses the annualized cost of financing for the 3-year loan plus the loan extension, there is uncertainty surrounding the interest rate to be paid during the loan extension (in years 4 and 5). It could have considered alternative possible interest rates that may exist over that period, and estimated the annualized cost of financing based on those scenarios. In this way, it could develop a probability distribution for the annualized cost of financing and compare that to the known annualized cost of financing if it pursues the fixed rate 5-year loan.

**Fixed versus Floating Rate Debt Decision**

MNCs that wish to use a long-term maturity but wish to avoid paying the prevailing fixed rate on long-term bonds may consider floating rate bonds or loans. In this case, the coupon rate on bonds (or interest rate on loans) will fluctuate over time in accordance with market interest rates. For example, the coupon rate on a floating rate bond 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.

**Financing Costs of Fixed versus Floating Rate Loans**

If an MNC considers financing with floating-rate loans whose rate is tied to the LIBOR, it can first forecast the LIBOR for each year, and that would determine the expected interest rate it would pay per year. This would allow it to derive forecasted interest payments for all years of the loan. Then, it could estimate the annualized cost of financing based on the anticipated loan interest payments and repayment of loan principal.

Reconsider the case of Scottsdale Co., which plans to borrow SF40 million at a fixed rate of 3 years, and obtain a loan extension for two additional years. It is now considering one alternative financing arrangement in which it obtains a floating-rate loan from a bank at an interest rate set at LIBOR + 3 percent. Its analysis of this loan is provided in Exhibit 18.9 To forecast the interest payments paid on the floating rate loan, Scottsdale must first forecast the LIBOR for each year. Assume the forecasts as shown in the first row. The interest rate applied to its loan each year is LIBOR + 3 percent, as shown in row 2. Row 3 discloses the results when the loan amount of SF40,000,000 is multiplied by this interest rate in order to estimate the interest expenses each year, and the repayment of principal is also included in Year 5. The annualized cost of financing is determined as the discount rate that equates the payments to the loan proceeds of SF40,000,000. For the floating-rate loan, the annualized cost of financing is 7.48 percent. While this cost is lower than the 8 percent annualized cost of the 5-year fixed rate loan in the previous example, it is higher than the 7.08 percent annualized cost of the 3-year fixed rate loan and loan extension in the previous example. Based on this comparison, Scottsdale decides to obtain the 3-year fixed rate loan with the loan extension.
Hedging Interest Payments with Interest Rate Swaps

In some cases, MNCs may finance with floating rather than fixed rate debt because the prevailing floating rate debt terms offered at the time of the debt offering were more favorable. However, if the MNCs are concerned that interest rates will rise over time, they may complement their floating rate debt with interest rate swaps to hedge the risk of rising interest rates. The interest rate swaps allow them to reconfigure their future cash flows in a manner that offsets their outflow payments to creditors (lenders or bondholders). In this way, MNCs can reduce their exposure to interest rate movements. Many MNCs commonly use interest rate swaps, including Ashland, Inc., Campbell Soup Co., Intel Corp., Johnson Controls, and Union Carbide.

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.

In a “plain vanilla” interest rate swap, one participating firm makes fixed rate payments periodically (every 6 months or year) in exchange for floating rate payments. The fixed rate payments remain fixed over the life of the contract. The floating interest rate payment per period is based on a prevailing interest rate such as LIBOR at that time. The payments in an interest rate swap are typically determined using some notional value agreed upon by the parties to the swap in order to determine the swap payments.

The fixed rate payer is typically concerned that interest rates may rise in the future. Perhaps it recently issued a floating rate bond and is worried that its coupon payments will rise in the future if interest rates increase. Thus, it can benefit from swapping fixed interest payments in exchange for floating rate payments if its expectations are correct, and the gains from the interest rate swap can offset its higher expenses from having to pay higher coupon payments on the bonds it issued. Conversely, the floating rate payer expects that interest rates may decline over time, and it can benefit from swapping floating interest payments in exchange for fixed interest payments if its expectations are correct.

Two firms plan to issue bonds:

- **Quality Co.** is a highly rated firm that prefers to borrow at a variable (floating) interest rate, because it expects that interest rates will decline over time.
- **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 rate or fixed rate bonds are as follows:

<table>
<thead>
<tr>
<th>Quality Co.</th>
<th>9%</th>
<th>LIBOR + 0.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky Co.</td>
<td>10.5%</td>
<td>LIBOR + 1.0%</td>
</tr>
</tbody>
</table>

**EXAMPLE**

![Exhibit 18.9 Alternative Financing Arrangement Using a Floating-Rate Loan](image-url)

**WEB**

[www.bloomberg.com](http://www.bloomberg.com)

Information about international financing, including the issuance of debt in international markets.
Based on the information given, Quality Co. has an advantage when issuing either fixed rate or floating rate bonds but more of an advantage with fixed rate bonds. Yet Quality Co. wanted to issue floating rate bonds because it anticipates that interest rates will decline over time. Quality Co. could issue fixed rate bonds while Risky Co. issues floating rate bonds. Then, Quality could provide floating 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 + 0.5 percent in exchange for fixed rate payments of 9.5 percent. The interest rate swap arrangement is shown in Exhibit 18.10. Quality Co. benefits because the fixed rate payments of 9.5 percent it receives on the swap exceed the payments it owes (9.0%) to bondholders by 0.5 percent. Its floating rate payments (LIBOR + 0.5%) to Risky Co. are the same as what it would have paid if it had issued floating rate bonds.

Risky Co. is receiving LIBOR + 0.5 percent on the swap, which is 0.5 percent less than what it must pay (LIBOR + 1 percent) on its floating rate bonds. Yet, it is making fixed rate payments of 9.5 percent, which is 1 percent less than what it would have paid if it had issued fixed rate bonds. Overall, Risky Co. saves 0.5 percent per year of financing costs.

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 + 0.5 percent annually, based on a notional value of $50 million. From Risky Co.’s viewpoint, the swap arrangement involves a fixed payment of 9.5 percent annually based on a notional value of $50 million. The following table illustrates the payments based on LIBOR over time.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>LIBOR</th>
<th>QUALITY CO.’S PAYMENT</th>
<th>RISKY CO.’S PAYMENT</th>
<th>NET PAYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.0%</td>
<td>8.5% × $50 million = $4.25 million</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>Risky pays Quality $0.5 million.</td>
</tr>
<tr>
<td>2</td>
<td>7.0%</td>
<td>7.5% × $50 million = $3.75 million</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>Risky pays Quality $1 million.</td>
</tr>
<tr>
<td>3</td>
<td>5.5%</td>
<td>6.0% × $50 million = $3 million</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>Risky pays Quality $1.75 million.</td>
</tr>
<tr>
<td>4</td>
<td>9.0%</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>No payment is made.</td>
</tr>
<tr>
<td>5</td>
<td>10.0%</td>
<td>10.5% × $50 million = $5.25 million</td>
<td>9.5% × $50 million = $4.75 million</td>
<td>Quality pays Risky $0.5 million.</td>
</tr>
</tbody>
</table>

**Limitations of Interest Rate Swaps** 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 counter participant could default on payments.

**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.

Putable swap. A putable 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, such as interest rate, currency, commodity, credit, and equity swaps, as well as related products.

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

**Summary**

- An MNC’s subsidiary may prefer to use debt financing in a currency that matches the currency it receives from cash inflows. The cash inflows can be used to cover its interest payments on its existing loans. When MNCs issue debt in a foreign currency that differs from the currency they receive from sales, they may use currency swaps or parallel loans to hedge the exchange rate risk resulting from the debt financing.
- An MNC’s subsidiary may consider long-term financing in a foreign currency different from its local (host country) currency in order to reduce financing costs. It can forecast the exchange rates for the periods in which it will make loan payments, and then can estimate the annualized cost of financing in that currency.

When determining the debt denomination to finance a specific project, an MNC can conduct the capital budgeting by deriving the NPV based on the equity investment, and the cash flows from the debt can be directly accounted for within the estimated cash flows. This allows for explicit consideration of the exchange rate effects on all cash flows after considering debt payments. By applying this method (which was developed in Chapter 14), an MNC can assess the feasibility of a particular project based on various debt financing alternatives.

- An MNC’s subsidiary can select among various available debt maturities when financing its operations. It can estimate the annualized cost of financing for alternative maturities, and determine which maturity will result in the lowest expected annualized cost of financing.
- For debt that has floating interest rates, the interest (or coupon) payment to be paid to investors is dependent on the future LIBOR, and is therefore uncertain. An MNC can forecast LIBOR so it can derive expected interest rates it would be charged on the loan in future periods. It can apply these expected interest rates to estimate expected loan payments, and can then derive the expected annualized cost of financing of the floating rate loan. Finally, it can compare the expected cost of financing on a floating rate loan to the known cost of financing on a fixed rate loan. In some cases, an MNC may engage in a floating rate loan, and use interest rate swaps to hedge the interest rate risk.

**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 participants 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.

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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 www.isda.org.
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 tend to be much higher than those of industrialized countries. Why do you think 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. Borrowing Combined with Forward Hedging Cedar Falls Co. has a subsidiary in Brazil, where local interest rates are high. It considers borrowing dollars and hedging the exchange rate risk by selling the Brazilian real forward in exchange for dollars for the periods in which it would need to make loan payments in dollars. Assume that forward contracts on the real are available. What is the limitation of this strategy?

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** Cuanto 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. Cuanto penetrated Eastern Europe by purchasing a 60 percent stake in Galena, 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 because 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. Determine the expected annual cost of financing with Singapore dollars. Should Seminole, Inc., issue bonds denominated in U.S. dollars or Singapore dollars? Explain.

<table>
<thead>
<tr>
<th>END OF YEAR</th>
<th>EXCHANGE RATE OF SINGAPORE DOLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$.52</td>
</tr>
<tr>
<td>2</td>
<td>$.56</td>
</tr>
<tr>
<td>3</td>
<td>$.58</td>
</tr>
<tr>
<td>4</td>
<td>$.53</td>
</tr>
</tbody>
</table>

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 krone with a coupon rate of 9 percent, or (3) pounds with a coupon rate of 15 percent. It expects the krone 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 1-year forward rate as a predictor of the exchange rate in 1 year. Bradenton Co. also presumes the exchange rates in each of 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.

a. Determine the NPV of this project if Bradenton engages in the currency swap.

b. Determine the NPV of this project if Bradenton does not hedge the future cash flows.

16. Financing and Exchange Rate Risk The parent of Nester Co. (a U.S. firm) has no international business but plans to invest $20 million in a business in Switzerland. Because the operating costs of this business are very low, Nester Co. expects this business to generate large cash flows in Swiss francs that will be remitted to the parent each year. Nester will finance half of this project with debt. It has these choices for financing the project:

- obtain half of the funds needed from parent equity and the other half by borrowing dollars,
- obtain half of the funds needed from parent equity and the other half by borrowing Swiss francs, or
- obtain half of the funds that are needed from parent equity and obtain the remainder by borrowing an equal amount of dollars and Swiss francs.

The interest rate on dollars is the same as the interest rate on Swiss francs.

a. Which choice will result in the most exchange rate exposure?

b. Which choice will result in the least exchange rate exposure?

c. If the Swiss franc were expected to appreciate over time, which financing choice would result in the highest expected net present value?

17. Financing and Exchange Rate Risk Vix Co. (a U.S. firm) presently serves as a distributor of...
products by purchasing them from other U.S. firms and selling them in Europe. It wants to purchase a manufacturer in Thailand that could produce similar products at a low cost (due to low labor costs in Thailand) and export the products to Europe. The operating expenses would be denominated in Thai currency (the baht). The products would be invoiced in euros. If Vix Co. can acquire a manufacturer, it will discontinue its existing distributor business. If Vix Co. purchases a company in Thailand, it expects that its revenue might not be sufficient to cover its operating expenses during the first 8 years. It will need to borrow funds for an 8-year term to ensure that it has enough funds to pay all of its operating expenses in Thailand. It can borrow funds denominated in U.S. dollars, in Thai baht, or in euros. Assuming that its financing decision will be primarily intended to minimize its exposure to exchange rate risk, which currency should it borrow? Briefly explain.

18. Financing and Exchange Rate Risk
Compton Co. has a subsidiary in Thailand that produces computer components. The subsidiary sells the components to manufacturers in the United States. The components are invoiced in U.S. dollars. Compton pays employees of the subsidiary in Thai baht and makes a large monthly lease payment in Thai baht. Compton financed the investment in the Thai subsidiary by borrowing dollars borrowed from a U.S. bank. Compton has no other international business.

a. Given the conditions, is Compton affected favorably, unfavorably, or not at all by depreciation of the Thai baht? Briefly explain.

b. Assume that interest rates in Thailand declined recently, so the Compton subsidiary considers obtaining a new loan in Thai baht. Compton would use the proceeds to pay off its existing loan from a U.S. bank. Will this form of financing increase, reduce, or not impact its economic exposure to exchange rate movements? Briefly explain.

19. Selecting a Loan Maturity
Omaha Co. has a subsidiary in Chile that wants to borrow from a local bank at a fixed rate over the next 10 years.

a. Explain why Chile’s term structure of interest rates (as reflected in its yield curve) might cause the subsidiary to borrow for a different term to maturity.

b. If Omaha is offered a more favorable interest rate for a term of 6 years, explain the potential disadvantage compared to a 10-year loan.

c. Explain how the subsidiary can determine whether to select the 6-year loan or the 10-year loan.

20. Project Financing
Dryden Co. is a U.S. firm that plans a foreign project in which it needs $8,000,000 as an initial investment. The project is expected to generate cash flows of 10 million euros in 1 year after the complete repayment of the loan (including the loan interest and principal). The project has zero salvage value and is terminated at the end of 1 year. Dryden considers financing this project with:

- all U.S. equity,
- all U.S. debt (loans) denominated in dollars provided by U.S. banks,
- all debt (loans) denominated in euros provided by European banks, or
- half of funds obtained from loans denominated in euros, and half obtained from loans denominated in dollars.

Which form of financing will cause the project’s NPV to be the least sensitive to exchange rate risk?

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 International Financial Management text companion website. Go to www.cengagebrain.com (students) or login.cengage.com (instructors) and search using ISBN 9781133435174.

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.

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 THB434,782,609/50,000 = 8,696 baht-denominated notes. Furthermore, since the current exchange rate of the yen in baht is THB0.347826/¥, Blades needs to obtain THB434,782,609/THB0.347826 = ¥1,250,000,313. Since yen-denominated notes would be issued in increments of 125,000 yen, Blades would have to issue ¥1,250,000,313/¥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, 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:

<table>
<thead>
<tr>
<th>ANNUAL % CHANGE IN YEN (AGAINST THE BAHT)</th>
<th>PROBABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
</tr>
</tbody>
</table>

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? 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?
2. 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?

3. Based on your answers to the previous questions, do you think Blades should issue yen- or baht-denominated notes?

4. 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 Logan 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 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 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?

**Online Articles with Real World Examples**

Find a recent article available that describes an actual international finance application or a real world example about a specific MNC’s actions that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary there and provide the web link of the article so that other students can access it. If your class is live, your professor may
ask you to summarize your application in class. Your professor may assign specific students to complete this assignment for this chapter, or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real world examples applied to this chapter, consider using the following search terms and include the current year as a search term to ensure that the online articles are recent:

1. Company AND foreign debt
2. Inc. AND foreign debt
3. [name of an MNC] AND debt
4. international AND debt
5. international AND financing
6. Company AND foreign financing
7. Inc. AND foreign financing
8. subsidiary AND debt
9. subsidiary AND financing
10. subsidiary AND leverage