



12: Managing Economic Exposure and Translation Exposure

As the previous chapter described, MNCs can manage the exposure of their international transactions to exchange rate movements (referred to as transaction exposure) in various ways. Nevertheless, cash flows of MNCs may still be sensitive to exchange rate movements (economic exposure) even if anticipated international transactions are hedged. Furthermore, the consolidated financial statements of MNCs may still be exposed to exchange rate movements (translation exposure). By managing economic exposure and translation exposure, financial managers may increase the value of their MNCs.

The specific objectives of this chapter are to:

- explain how an MNC's economic exposure can be hedged, and
- explain how an MNC's translation exposure can be hedged.

In general, it is more difficult to effectively hedge economic or translation exposure than to hedge transaction exposure, for reasons explained in this chapter.

Economic Exposure

From a U.S. firm's perspective, transaction exposure represents only the exchange rate risk when converting net foreign cash inflows to U.S. dollars or when purchasing foreign currencies to send payments. Economic exposure represents any impact of exchange rate fluctuations on a firm's future cash flows. Corporate cash flows can be affected by exchange rate movements in ways not directly associated with foreign transactions. Thus, firms cannot focus just on hedging their foreign currency payables or receivables but must also attempt to determine how all their cash flows will be affected by possible exchange rate movements.

EXAMPLE

Nike's economic exposure comes in various forms. First, it is subject to transaction exposure because of its numerous purchase and sale transactions in foreign currencies, and this transaction exposure is a subset of economic exposure. Second, any remitted earnings from foreign subsidiaries to the U.S. parent also reflect transaction exposure and therefore reflect economic exposure. Third, a change in exchange rates that affects the demand for shoes at other athletic shoe companies (such as Adidas) can indirectly affect the demand for Nike's athletic shoes. Nike attempts to hedge some of its transaction exposure, but it cannot eliminate transaction exposure because it cannot predict all future transactions. Moreover, even if it could eliminate its transaction exposure, it cannot perfectly hedge its remaining economic exposure; it is difficult to determine exactly how a specific exchange rate movement will affect the demand for a competitor's athletic shoes and, therefore, how it will indirectly affect the demand for Nike's shoes. ■

The following comments by PepsiCo summarize the dilemma faced by many MNCs that assess economic exposure.

HTTP://

<http://www.ibm.com/us/>
An example of an MNC's website. The websites of various MNCs make available financial statements such as annual reports that describe the use of financial derivatives to hedge interest rate risk and exchange rate risk.

The economic impact of currency exchange rates on us is complex because such changes are often linked to variability in real growth, inflation, interest rates, governmental actions, and other factors. These changes, if material, can cause us to adjust our financing and operating strategies.

—PepsiCo

Use of Projected Cash Flows to Assess Economic Exposure

An MNC must determine its economic exposure before it can manage its exposure. It can determine its exposure to each currency in terms of its cash inflows and cash outflows. Information for each subsidiary can be used to derive estimates.

E X A M P L E

Recall from Chapter 10 that Madison Co. is subject to economic exposure. Madison can assess its economic exposure to exchange rate movements by determining the sensitivity of its expenses and revenue to various possible exchange rate scenarios. Exhibit 12.1 reproduces Madison's revenue and expense information from Exhibit 10.9 of Chapter 10. Madison's sales in the United States are not sensitive to exchange rate scenarios. Canadian sales are expected to be C\$4 million, but the dollar amount received from these sales will depend on the scenario. The cost of materials purchased in the United States is assumed to be \$50 million and insensitive to exchange rate movements. The cost of materials purchased in Canada is assumed to be C\$200 million. The U.S. dollar amount of this cost varies with the exchange rate scenario.

The interest owed to U.S. banks is insensitive to the exchange rate scenario, but the projected amount of dollars needed to pay interest on existing Canadian loans varies with the exchange rate scenario.

Exhibit 12.1 Original Impact of Possible Exchange Rates on Cash Flows of Madison Co. (in Millions)

	Exchange Rate Scenario		
	C\$1 = \$.75	C\$1 = \$.80	C\$1 = .85
Sales			
(1) U.S. sales	\$320.00	\$320.00	\$320.00
(2) Canadian sales	C\$4 = <u>3.00</u>	C\$4 = <u>3.20</u>	C\$4 = <u>3.40</u>
(3) Total sales in U.S. \$	\$323.00	\$323.20	\$323.40
Cost of Materials			
(4) U.S. cost of materials	\$ 50.00	\$ 50.00	\$ 50.00
(5) Canadian cost of materials	C\$200 = <u>150.00</u>	C\$200 = <u>160.00</u>	C\$200 = <u>170.00</u>
(6) Total cost of materials in U.S. \$	\$200.00	\$210.00	\$220.00
(7) Operating expenses	\$ 60.00	\$ 60.00	\$ 60.00
Interest Expenses			
(8) U.S. interest expenses	\$ 3	\$ 3	\$ 3
(9) Canadian interest expenses	C\$10 = <u>7.5</u>	C\$10 = <u>8</u>	C\$10 = <u>8.50</u>
(10) Total interest expenses in U.S. \$	\$ 10.5	\$ 11	\$ 11.50
Cash flows in U.S. dollars before taxes	\$ 52.50	\$ 42.20	\$ 31.90

Exhibit 12.1 enables Madison to assess how its cash flows before taxes will be affected by different exchange rate movements. A stronger Canadian dollar increases Madison's dollar revenue earned from Canadian sales. However, it also increases Madison's cost of materials purchased from Canada and the dollar amount needed to pay interest on loans from Canadian banks. The higher expenses more than offset the higher revenue in this scenario. Thus, the amount of Madison's cash flows before taxes is inversely related to the strength of the Canadian dollar.

If the Canadian dollar strengthens consistently over the long run, Madison's expenses likely will rise at a higher rate than its U.S. dollar revenue. Consequently, it may wish to institute some policies to ensure that movements of the Canadian dollar will have a more balanced impact on its revenue and expenses.

Now that Madison has assessed its exposure, it recognizes that it can reduce this exposure by either increasing Canadian sales or reducing orders of Canadian materials. These actions would allow some offsetting of cash flows and therefore reduce its economic exposure, as explained next. ■

How Restructuring Can Reduce Economic Exposure

MNCs may restructure their operations to reduce their economic exposure. The restructuring involves shifting the sources of costs or revenue to other locations in order to match cash inflows and outflows in foreign currencies.

EXAMPLE

Reconsider the previous example of Madison Co., which has more cash outflows than cash inflows in Canadian dollars. Madison could create more balance by increasing Canadian sales. It believes that it can achieve Canadian sales of C\$20 million if it spends \$2 million more on advertising (which is part of Madison's operating expenses). The increased sales will also require an additional expenditure of \$10 million on materials from U.S. suppliers. In addition, it plans to reduce its reliance on Canadian suppliers and increase its reliance on U.S. suppliers. Madison anticipates that this strategy will reduce the cost of materials from Canadian suppliers by C\$100 million and increase the cost of materials from U.S. suppliers by \$80 million (not including the \$10 million increase resulting from increased sales to the Canadian market). Furthermore, it plans to borrow additional funds in the United States and retire some existing loans from Canadian banks. The result will be an additional interest expense of \$4 million to U.S. banks and a reduction of C\$5 million owed to Canadian banks. Exhibit 12.2 shows the anticipated impact of these strategies on Madison's cash flows. For each of the three exchange rate scenarios, the initial projections are in the left column, and the revised projections (as a result of the proposed strategy) are in the right column.

Note first that the projected total sales increase in response to Madison's plan to penetrate the Canadian market (see row 2). Second, the U.S. cost of materials is now \$90 million higher as a result of the \$10 million increase to accommodate increased Canadian sales and the \$80 million increase due to the shift from Canadian suppliers to U.S. suppliers (see row 4). The Canadian cost of materials decreases from C\$200 million to C\$100 million as a result of this shift (see row 5). The revised operating expenses of \$62 million include the \$2 million increase in advertising expenses necessary to penetrate the Canadian market (see row 7). The interest expenses are revised because of the increased loans from the U.S. banks and reduced loans from Canadian banks (see rows 8 and 9).

If Madison increases its Canadian dollar inflows and reduces its Canadian dollar outflows as proposed, its revenue and expenses will be affected by movements of the Canadian dollar in a somewhat similar manner. Thus, its performance will be less susceptible to movements in the Canadian dollar. Exhibit 12.3 illustrates the sensitivity of Madison's earnings before taxes to the three exchange rate scenarios (derived from Exhibit 12.2). The reduced sensitivity of Madison's proposed restructured operations to exchange rate movements is obvious. ■

Exhibit 12.2 Impact of Possible Exchange Rate Movements on Earnings under Two Alternative Operational Structures (in Millions)

	Exchange Rate Scenario C\$ = \$.75		Exchange Rate Scenario C\$ = \$.80		Exchange Rate Scenario C\$ = \$.85	
	Original Operational Structure	Proposed Operational Structure	Original Operational Structure	Proposed Operational Structure	Original Operational Structure	Proposed Operational Structure
Sales						
(1) U.S. sales	\$320.0	\$320.00	\$320.00	\$320	\$320.00	\$320.00
(2) Canadian sales	C\$4 = <u>3.0</u>	C\$20 = <u>15.00</u>	C\$4 = <u>3.20</u>	C\$20 = <u>16</u>	C\$4 = <u>3.40</u>	C\$20 = <u>17.00</u>
(3) Total sales in U.S. \$	\$323.0	\$335.00	\$323.20	\$336	\$323.40	\$337.00
Cost of Materials						
(4) U.S. cost of materials	\$ 50.0	\$140.00	\$ 50.00	\$140	\$ 50.00	\$140.00
(5) Canadian cost of materials	C\$200 = <u>150.0</u>	C\$100 = <u>75.00</u>	C\$200 = <u>160.00</u>	C\$100 = <u>80</u>	C\$200 = <u>170.00</u>	C\$100 = <u>85.00</u>
(6) Total cost of materials in U.S. \$	\$200.0	\$215.00	\$210.00	\$220	\$220.00	\$225.00
(7) Operating expenses	\$ 60	\$ 62	\$ 60	\$ 62	\$ 60	\$ 62
Interest Expenses						
(8) U.S. interest expenses	\$ 3.0	\$ 7.00	\$ 3.00	\$ 7	\$ 3.00	\$ 7.00
(9) Canadian interest expenses	C\$10 = <u>7.5</u>	C\$5 = <u>3.75</u>	C\$10 = <u>8.00</u>	C\$5 = <u>4</u>	C\$10 = <u>8.50</u>	C\$5 = <u>4.25</u>
(10) Total interest expenses in U.S. \$	<u>\$ 10.5</u>	<u>\$ 10.75</u>	<u>\$ 11.00</u>	<u>\$ 11</u>	<u>\$ 11.50</u>	<u>\$ 11.25</u>
(11) Cash flows in U.S. dollars before taxes	\$ 52.5	\$ 47.25	\$ 42.2	\$ 43	\$ 31.9	\$ 38.75

The way a firm restructures its operations to reduce economic exposure to exchange rate risk depends on the form of exposure. For Madison Co. future expenses are more sensitive than future revenue to the possible values of a foreign currency. Therefore, it can reduce its economic exposure by increasing the sensitivity of revenue and reducing the sensitivity of expenses to exchange rate movements. Firms that have a greater level of exchange rate-sensitive revenue than expenses, however, would reduce their economic exposure by decreasing the level of exchange rate-sensitive revenue or by increasing the level of exchange rate-sensitive expenses.

Some revenue or expenses may be more sensitive to exchange rates than others. Therefore, simply matching the level of exchange rate-sensitive revenue to the level of exchange rate-sensitive expenses may not completely insulate a firm from exchange rate risk. The firm can best evaluate a proposed restructuring of operations by forecasting various items for various possible exchange rate scenarios (as shown in Exhibit 12.2) and then assessing the sensitivity of cash flows to these different scenarios.

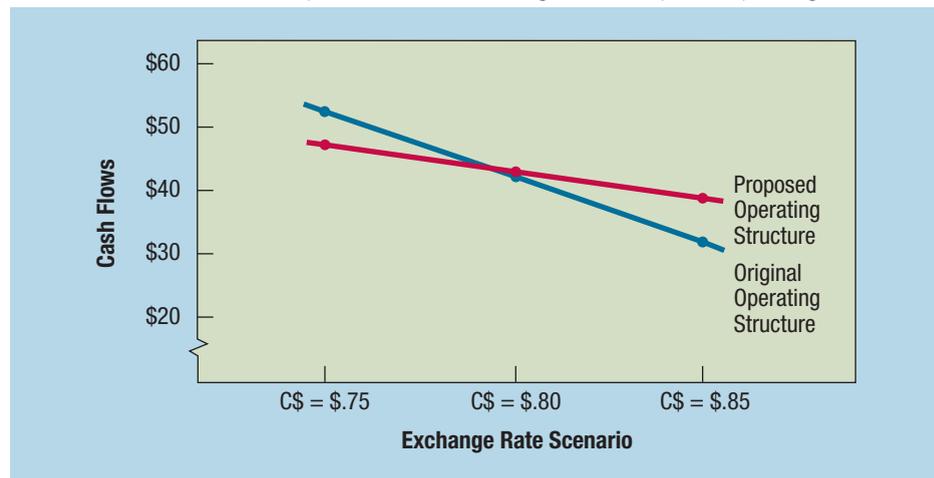
Expediting the Analysis with Computer Spreadsheets.

Determining the sensitivity of cash flows (ignoring tax effects) to alternative exchange rate scenarios can be expedited by using a computer to create a spreadsheet similar to Exhibit 12.2. By revising the input to reflect various possible restructurings, the analyst can determine how each operational structure would affect the firm's economic exposure.

EXAMPLE

Recall that Madison Co. assessed one alternative operational structure in which it increased Canadian sales by C\$16 million, reduced its purchases of Canadian materials by C\$100 million, and reduced its interest owed to Canadian banks by C\$5 million. By using a computerized spreadsheet, Madison can easily assess the impact of alternative strategies, such as increasing Canadian sales by other amounts and/or reducing the Canadian expenses by other amounts. This provides Madison with more information about its economic exposure under various operational structures and enables it to devise the operational structure that will reduce its economic exposure to the degree desired. ■

Exhibit 12.3 Economic Exposure Based on the Original and Proposed Operating Structures



Issues Involved in the Restructuring Decision

Restructuring operations to reduce economic exposure is a more complex task than hedging any single foreign currency transaction, which is why managing economic exposure is normally perceived to be more difficult than managing transaction exposure. By managing economic exposure, however, the firm is developing a long-term solution because once the restructuring is complete, it should reduce economic exposure over the long run. In contrast, the hedging of transaction exposure deals with each upcoming foreign currency transaction separately. Note, however, that it can be very costly to reverse or eliminate restructuring that was undertaken to reduce economic exposure. Therefore, MNCs must be very confident about the potential benefits before they decide to restructure their operations.

When deciding how to restructure operations to reduce economic exposure, one must address the following questions:

- Should the firm attempt to increase or reduce sales in new or existing foreign markets?
- Should the firm increase or reduce its dependency on foreign suppliers?
- Should the firm establish or eliminate production facilities in foreign markets?
- Should the firm increase or reduce its level of debt denominated in foreign currencies?

The first question relates to foreign cash inflows and the remaining ones to foreign cash outflows. Some of the more common solutions to balancing a foreign currency's inflows and outflows are summarized in Exhibit 12.4. Any restructuring of operations that can reduce the periodic difference between a foreign currency's inflows and outflows can reduce the firm's economic exposure to that currency's movements.

MNCs that have production and marketing facilities in various countries may be able to reduce any adverse impact of economic exposure by shifting the allocation of their operations.

EXAMPLE

Deland Co. produces products in the United States, Japan, and Mexico and sells these products (denominated in the currency where they are produced) to several countries. If the Japanese yen strengthens against many currencies, Deland may boost production in Mexico, expecting a decline in demand for the Japanese subsidiary's products. Deland may even transfer some machinery from Japan to Mexico and allocate more marketing funds to the Mexican subsidiary at the expense of the Japanese subsidiary. By following this strategy, however, Deland may have to forgo economies of scale that could be achieved if it concentrated production at one subsidiary while other subsidiaries focused on warehousing and distribution. ■

Exhibit 12.4 How to Restructure Operations to Balance the Impact of Currency Movements on Cash Inflows and Outflows

Type of Operation	Recommended Action When a Foreign Currency Has a Greater Impact on Cash Inflows	Recommended Action When a Foreign Currency Has a Greater Impact on Cash Outflows
Sales in foreign currency units	Reduce foreign sales	Increase foreign sales
Reliance on foreign supplies	Increase foreign supply orders	Reduce foreign supply orders
Proportion of debt structure representing foreign debt	Restructure debt to increase debt payments in foreign currency	Restructure debt to reduce debt payments in foreign currency

A Case Study in Hedging Economic Exposure

In reality, most MNCs are not able to reduce their economic exposure as easily as Madison Co. in the previous example. First, an MNC's economic exposure may not be so obvious. An analysis of the income statement for an entire MNC may not necessarily detect its economic exposure. The MNC may be composed of various business units, each of which attempts to achieve high performance for its shareholders. Each business unit may have a unique cost and revenue structure. One unit of an MNC may focus on computer consulting services in the United States and have no exposure to exchange rates. Another unit may also focus on sales of personal computers in the United States, but this unit may be adversely affected by weak foreign currencies because its U.S. customers may buy computers from foreign firms.

Although the MNC is mostly concerned with the effect of exchange rates on its performance and value overall, it can more effectively hedge its economic exposure if it can pinpoint the underlying source of the exposure. Yet, even if the MNC can pinpoint the underlying source of the exposure, there may not be a perfect hedge against that exposure. No textbook formula can provide the perfect solution, but a combination of actions may reduce the economic exposure to a tolerable level, as illustrated in the following example. This example is more difficult than the previous example of Madison Co., but it may be more realistic for many MNCs.

Savor Co.'s Dilemma

Savor Co., a U.S. firm, is primarily concerned with its exposure to the euro. It wants to pinpoint the source of its exposure so that it can determine how to hedge its exposure. Savor has three units that conduct some business in Europe. Because each unit has established a wide variety of business arrangements, it is not obvious whether all three units have a similar exposure. Each unit tends to be independent of the others, and the managers of each unit are compensated according to that unit's performance. Savor may want to hedge its economic exposure, but it must first determine whether it is exposed and the source of the exposure.

Assessment of Economic Exposure

Because the exact nature of its economic exposure to the euro is not obvious, Savor attempts to assess the relationship between the euro's movements and each unit's cash flows over the last nine quarters. A firm may want to use more data, but nine quarters are sufficient to illustrate the point. The cash flows and movements in the euro are shown in Exhibit 12.5. First, Savor applies regression analysis (as discussed in the previous chapter) to determine whether the percentage change in its total cash flow (PCF_t , shown in column 5) is related to the percentage change in the euro ($\% \Delta \text{euro}$, shown in column 6) over time:

$$PCF_t = a_0 + a_1(\% \Delta \text{euro})_t + \mu_t$$

Regression analysis derives the values of the constant, a_0 , and the slope coefficient, a_1 . The slope coefficient represents the sensitivity of PCF_t to movements in the euro. Based on this analysis, the slope coefficient is positive and statistically significant, which implies that the cash flows are positively related to the percentage changes in the euro. That is, a negative change in the euro adversely affects Savor's total cash flows. The R -squared statistic is .31, which suggests that 31 percent of the variation in Savor's cash flows can be explained by movements in the euro. The evidence presented so far strongly suggests that Savor is exposed to exchange rate movements of the euro but does not pinpoint the source of the exposure.

Exhibit 12.5 Assessment of Savor Co.'s Cash Flows and the Euro's Movements

(1) Quarter	(2) % Change in Unit A's Cash Flows	(3) % Change in Unit B's Cash Flows	(4) % Change in Unit C's Cash Flows	(5) % Change in Total Cash Flows	(6) % Change in the Value of the Euro
1	-3	2	1	0	2
2	0	1	3	4	5
3	6	-6	-1	-1	-3
4	-1	1	-1	-1	0
5	-4	0	-1	-5	-2
6	-1	-2	-2	-5	-5
7	1	-3	3	1	4
8	-3	2	1	0	2
9	4	-1	0	3	-4

Assessment of Each Unit's Exposure

To determine the source of the exposure, Savor applies the regression model separately to each individual unit's cash flows. The results are shown here (apply the regression analysis yourself as an exercise):

Unit	Slope Coefficient
A	Not significant
B	Not significant
C	Coefficient = .45, which is statistically significant (R -squared = .80)

The results suggest that the cash flows of Units A and B are not subject to economic exposure. However, Unit C is subject to economic exposure. Approximately 80 percent of Unit C's cash flows can be explained by movements in the value of the euro over time. The regression coefficient suggests that for a 1 percent decrease in the value of the euro, the unit's cash flows will decline by about .45 percent. Exhibit 12.5, which shows the euro's exchange rate movements and the cash flows for Savor's individual units, confirms the strong relationship between the euro's movements and Unit C's cash flows.

Identifying the Source of the Unit's Exposure

Now that Savor has determined that one unit is the cause of the exposure, it can pinpoint the characteristics of that unit that cause the exposure. Savor believes that the key components that affect Unit C's cash flows are income statement items such as its U.S. revenue, its cost of goods sold, and its operating expenses. This unit conducts all of its production in the United States.

Savor first determines the value of each income statement item that affected the unit's cash flows in each of the last nine quarters. It then applies regression analysis to

determine the relationship between the percentage change in the euro and each income statement item over those quarters. Assume that it finds:

- A significant positive relationship between Unit C's revenue and the euro's value.
- No relationship between the unit's cost of goods sold and the euro's value.
- No relationship between the unit's operating expenses and the euro's value.

These results suggest that when the euro weakens, the unit's revenue from U.S. customers declines substantially. Its U.S. customers shift their demand to foreign competitors when the euro weakens and they can obtain imports at a low price. Thus, Savor's economic exposure could be due to foreign competition. A firm's economic exposure is not always obvious, however, and regression analysis may detect exposure that was not suspected by the firm or its individual units. Furthermore, regression analysis can be used to provide a more precise estimate of the degree of economic exposure, which can be useful when deciding how to manage the exposure.

Possible Strategies to Hedge Economic Exposure

Now that Savor has identified the source of its economic exposure, it can develop a strategy to reduce that exposure.

Pricing Policy. Savor recognizes that there will be periods in the future when the euro will depreciate against the dollar. Under these conditions, Unit C may attempt to be more competitive by reducing its prices. If the euro's value declines by 10 percent and this reduces the prices that U.S. customers pay for the foreign products by 10 percent, then Unit C can attempt to remain competitive by discounting its prices by 10 percent. Although this strategy can retain market share, the lower prices will result in less revenue and therefore less cash flows. Therefore, this strategy does not completely eliminate Savor's economic exposure. Nevertheless, this strategy may still be feasible, especially if the unit can charge relatively high prices in periods when the euro is strong and U.S. customers have to pay higher prices for European products. In essence, the strategy might allow the unit to generate abnormally high cash flows in a strong-euro period to offset the abnormally low cash flows in a weak-euro period. The adverse effect during a weak-euro period will still occur, however. Given the limitations of this strategy, other strategies should be considered.

Hedging with Forward Contracts. Savor's Unit C could sell euros forward for the period in which it wants to hedge against the adverse effects of the weak euro. Assume the spot and 3-month forward rates on the euro are \$1. If the euro weakens, the cash flows from normal operations will still be adversely affected. However, the unit would generate a gain on the forward contract because it will be able to purchase euros at the spot rate at the end of the period at a lower exchange rate than the rate at which it will have to sell those euros to fulfill the forward contract. The weaker the euro, the more pronounced will be the adverse effects on the unit's cash flows from normal operations, but the gains from the forward contract will also be more pronounced.

Using a forward contract has definite limitations, however. Since the economic exposure is likely to continue indefinitely, the use of a forward contract in the manner described here hedges only for the period of the contract. It does not serve as a continuous long-term hedge against economic exposure.

Purchasing Foreign Supplies. Another possibility is for the unit to purchase its materials in Europe, a strategy that would reduce its costs (and enhance its cash flows) during a weak-euro period to offset the adverse effects of the weak

euro. However, the cost of buying European materials may be higher than the cost of buying local materials, especially when transportation expenses are considered.

Financing with Foreign Funds. The unit could also reduce its economic exposure by financing a portion of its business with loans in euros. It could convert the loan proceeds to dollars and use the dollars to support its business. It will need to make periodic loan repayments in euros. If the euro weakens, the unit will need fewer dollars to cover the loan repayments. This favorable effect can partially offset the adverse effect of a weak euro on the unit's revenue. If the euro strengthens, the unit will need more dollars to cover the loan repayments, but this adverse effect will be offset by the favorable effect of the strong euro on the unit's revenue. This type of hedge is more effective than the pricing hedge because it can offset the adverse effects of a weak euro in the same period (whereas the pricing policy attempts to make up for lost cash flows once the euro strengthens).

This strategy also has some limitations. First, the strategy only makes sense if Savor needs some debt financing. It should not borrow funds just for the sake of hedging its economic exposure. Second, Savor might not desire this strategy when the euro has a very high interest rate. Though borrowing in euros can reduce its economic exposure, it may not be willing to enact the hedge at a cost of higher interest expenses than it would pay in the United States.

Third, this strategy is unlikely to create a perfect hedge against Savor's economic exposure. Even if the company needs debt financing and the interest rate charged on the foreign loan is low, Savor must attempt to determine the amount of debt financing that will hedge its economic exposure. The amount of foreign debt financing necessary to fully hedge the exposure may exceed the amount of funding that Savor needs.

Revising Operations of Other Units. Given the limitations of hedging Unit C's economic exposure by adjusting the unit's operations, Savor may consider modifying the operations of another unit in a manner that will offset the exposure of Unit C. However, this strategy may require changes in another unit that will not necessarily benefit that unit. For example, assume that Unit C could partially hedge its economic exposure by borrowing euros (as explained above) but that it does not need to borrow as much as would be necessary to fully offset its economic exposure. Savor's top management may suggest that Units A and B also obtain their financing in euros, so that the MNC's overall economic exposure is hedged. Thus, a weak euro would still adversely affect Unit C because the adverse effect on its revenue would not be fully offset by the favorable effect on its financing (debt repayments). Yet, if the other units have borrowed euros as well, the combined favorable effects on financing for Savor overall could offset the adverse effects on Unit C.

However, Units A and B will not necessarily desire to finance their operations in euros. Recall that these units are not subject to economic exposure. Also recall that the managers of each unit are compensated according to the performance of that unit. By agreeing to finance in euros, Units A and B could become exposed to movements in the euro. If the euro strengthens, their cost of financing increases. So, by helping to offset the exposure of Unit C, Units A and B could experience weaker performance, and their managers would receive less compensation.

A solution is still possible if Savor's top managers who are not affiliated with any unit can remove the hedging activity from the compensation formula for the units' managers. That is, top management could instruct Units A and B to borrow funds in euros, but could reward the managers of those units based on an assessment of the units' performance that excludes the effect of the euro on financing costs. In this way, the managers will be more willing to engage in a strategy that increases their economic exposure while reducing Savor's.

Savor's Hedging Solution

In summary, Savor's initial analysis of its units determined that only Unit C was highly subject to economic exposure. Unit C could attempt to use a pricing policy that would maintain market share when the euro weakens, but this strategy would not eliminate the economic exposure because its cash flows would still be adversely affected. Borrowing euros can be an effective strategy to hedge Unit C's exposure, but it does not need to borrow the amount of funds necessary to offset its exposure. The optimal solution for Savor Co. is to instruct its other units to do their financing in euros as well. This strategy effectively increases their exposure, but in the opposite manner of Unit C's exposure, so that the MNC's economic exposure overall is reduced. The units' managers should be willing to cooperate if their compensation is not reduced as a result of increasing the exposure of their individual units.

Limitations of Savor's Optimal Hedging Strategy

Even if Savor Co. is able to achieve the hedge described above, the hedge will still not be perfect. The impact of the euro's movements on Savor's cash outflows needed to repay the loans is known with certainty. But the impact of the euro's movements on Savor's cash inflows (revenue) is uncertain and can change over time. If the amount of foreign competition increases, the sensitivity of Unit C's cash flows to exchange rates would increase. To hedge this increased exposure, it would need to borrow a larger amount of euros. An MNC's economic exposure can change over time in response to shifts in foreign competition or other global conditions, so it must continually assess and manage its economic exposure.

Hedging Exposure to Fixed Assets

Up to this point, the focus has been on how economic exposure can affect periodic cash flows. The effects may extend beyond periodic cash flows, however. When an MNC has fixed assets (such as buildings or machinery) in a foreign country, the dollar cash flows to be received from the ultimate sale of these assets is subject to exchange rate risk.

EXAMPLE

Wagner Co., a U.S. firm, pursued a 6-year project in Russia. It purchased a manufacturing plant from the Russian government 6 years ago for 500 million rubles. Since the ruble was worth \$.16 at the time of the investment, Wagner needed \$80 million to purchase the plant. The Russian government guaranteed that it would repurchase the plant for 500 million rubles in 6 years when the project was completed. At that time, however, the ruble was worth only \$.034, so Wagner received only \$17 million (computed as 500 million \times \$.034) from selling the plant. Even though the price of the plant in rubles at the time of the sale was the same as the price at the time of the purchase, the sales price of the plant in dollars at the time of the sale was about 79 percent less than the purchase price. ■

Some MNCs may not worry about the exchange rate effect on fixed assets because they normally expect to retain the assets for several years. Given the frequent restructuring of global operations, however, MNCs should consider hedging against the possible sale of these assets in the distant future. A sale of fixed assets can be hedged by creating a liability that matches the expected value of the assets at the point in the future when they may be sold. In essence, the sale of the fixed assets generates a foreign currency cash inflow that can be used to pay off the liability that is denominated in the same currency.

E X A M P L E

In the previous example, Wagner could have financed part of its investment in the Russian manufacturing plant by borrowing rubles from a local bank, with the loan structured to have zero interest payments and a lump-sum repayment value equal to the expected sales price set for the date when Wagner expected to sell the plant. Thus, the loan could have been structured to have a lump-sum repayment value of 500 million rubles in 6 years. ■

The limitations of hedging a sale of fixed assets are that an MNC does not necessarily know the (1) date when it will sell the assets or (2) the price in local currency at which it will sell them. Consequently, it is unable to create a liability that perfectly matches the date and amount of the sale of the fixed assets. Nevertheless, these limitations should not prevent a firm from hedging.

E X A M P L E

Even if the Russian government would not guarantee a purchase price of the plant, Wagner Co. could create a liability that reflects the earliest possible sales date and the lowest expected sales price. If the sales date turns out to be later than the earliest possible sales date, Wagner might be able to extend its loan period to match the sales date. By structuring the lump-sum loan repayment to match the minimum sales price, Wagner will not be perfectly hedged if the fixed assets turn out to be worth more than the minimum expected amount. Nevertheless, Wagner would at least have reduced its exposure by offsetting a portion of the fixed assets with a liability in the same currency. ■

Long-term forward contracts may also be a possible way to hedge the distant sale of fixed assets in foreign countries, but they may not be available for many emerging market currencies.

Managing Translation Exposure

Translation exposure occurs when an MNC translates each subsidiary's financial data to its home currency for consolidated financial statements. Even if translation exposure does not affect cash flows, it is a concern of many MNCs because it can reduce an MNC's consolidated earnings and thereby cause a decline in its stock price. Thus, some MNCs may consider hedging their translation exposure.

E X A M P L E

Columbus Co. is a U.S.-based MNC with a subsidiary in the United Kingdom. The subsidiary typically accounts for about half of the total revenue and earnings generated by Columbus. In the last three quarters, the value of the British pound declined, and the reported dollar level of earnings attributable to the British subsidiary was weak simply because of the relatively low rate at which the British earnings were translated into U.S. dollars. During this period, some stock analysts who follow Columbus reduced their rating of Columbus stock. This downgrade in the rating resulted in a lower stock price because many investors rely on ratings when deciding what stocks to buy or sell. The high-level managers and the board were criticized in the media for poor performance, even though the only reason for the poor performance was the translation effect on earnings. The compensation levels are tied to consolidated earnings and therefore were low this year because of the translation effect. Consequently, Columbus decided that it would attempt to hedge translation exposure in the future. ■

Use of Forward Contracts to Hedge Translation Exposure

MNCs can use forward contracts or futures contracts to hedge translation exposure. Specifically, they can sell the currency forward that their foreign subsidiaries receive as earnings. In this way, they create a cash outflow in the currency to offset the earnings received in that currency.

E X A M P L E

Recall that Columbus Co. has one subsidiary based in the United Kingdom. While there is no foreseeable transaction exposure in the near future from the future earnings (since the pounds will remain in the United Kingdom), Columbus is exposed to translation exposure.

The subsidiary forecasts that its earnings next year will be £20 million. To hedge its translation exposure, Columbus can implement a forward hedge on the expected earnings by selling £20 million one year forward. Assume the forward rate at that time is \$1.60, the same as the spot rate. At the end of the year, Columbus can buy £20 million at the spot rate and fulfill its forward contract obligation to sell £20 million. If the pound depreciates during the fiscal year, then Columbus will be able to purchase pounds at the end of the fiscal year to fulfill the forward contract at a cheaper rate than it can sell them (\$1.60 per pound). Thus, it will have generated income that can offset the translation loss.

If the pound depreciates over the year such that the average weighted exchange rate is \$1.50 over the year, the subsidiary's earnings will be translated as follows:

$$\begin{aligned}\text{Translated earnings} &= \text{Subsidiary earnings} \times \text{Weighted average exchange rate} \\ &= 20 \text{ million pounds} \times \$1.50 \\ &= \$30 \text{ million}\end{aligned}$$

If the exchange rate had not declined over the year, the translated amount of earnings would have been \$32 million (computed as 20 million pounds \times \$1.60), so the exchange rate movements caused the reported earnings to be reduced by \$2 million.

However, there is a gain from the forward contract because the spot rate declined over the year. If we assume that the spot rate is worth \$1.50 at the end of the year, then the gain on the forward contract would be:

$$\begin{aligned}\text{Gain on forward contract} &= (\text{Amount received from forward sale}) - (\text{Amount paid to fulfill forward contract obligation}) \\ &= (20 \text{ million pounds} \times \$1.60) - \\ &\quad (20 \text{ million pounds} \times \$1.50) \\ &= \$32 \text{ million} - \$30 \text{ million} \\ &= \$2 \text{ million}\end{aligned}$$

In the preceding example, the dollar amount of the gain on the forward contract exactly offsets the reduction in reported earnings due to the translation effect. That is because we assumed that the spot rate at the end of the year was the same as the weighted average exchange rate over the year. In reality, a perfect offsetting effect is unlikely. However, when there is a relatively large reduction in the weighted average exchange rate, there will likely be a large reduction in the spot rate over that same period. Consequently, the larger the adverse translation effect, the larger the gain on the forward contract. Thus, the forward contract is normally effective in hedging a portion of the translation exposure.

Limitations of Hedging Translation Exposure

There are four limitations in hedging translation exposure.

Inaccurate Earnings Forecasts. A subsidiary's forecasted earnings for the end of the year are not guaranteed. In the previous example involving Columbus, Inc., British earnings were projected to be £20 million. If the actual earnings turned out to be much higher, and if the pound weakens during the year, the translation loss would likely exceed the gain generated from the forward contract strategy.

Inadequate Forward Contracts for Some Currencies. A second limitation is that forward contracts are not available for all currencies. Thus, an

MNC with subsidiaries in some smaller countries may not be able to obtain forward contracts for the currencies of concern.

Accounting Distortions. A third limitation is that the forward rate gain or loss reflects the difference between the forward rate and the future spot rate, whereas the translation gain or loss is caused by the change in the average exchange rate over the period in which the earnings are generated. In addition, the translation losses are not tax deductible, whereas gains on forward contracts used to hedge translation exposure are taxed.

Increased Transaction Exposure. The fourth and most critical limitation with a hedging strategy such as using a forward contract on translation exposure is that the MNC may be increasing its transaction exposure. For example, consider a situation in which the subsidiary's currency appreciates during the fiscal year, resulting in a translation gain. If the MNC enacts a hedge strategy at the start of the fiscal year, this strategy will generate a transaction loss that will somewhat offset the translation gain.

Some MNCs may not be comfortable with this offsetting effect. The translation gain is simply a paper gain; that is, the reported dollar value of earnings is higher due to the subsidiary currency's appreciation. If the subsidiary reinvests the earnings, however, the parent does not receive any more income due to this appreciation. The MNC parent's net cash flow is not affected. Conversely, the loss resulting from a hedge strategy is a *real* loss; that is, the net cash flow to the parent will be reduced due to this loss. Thus, in this situation, the MNC reduces its translation exposure at the expense of increasing its transaction exposure.

GOVERNANCE

Governing the Hedge of Translation Exposure

Many managers of an MNC are granted stock options as part of their compensation. They recognize that the MNC's stock price may change in response to a change in consolidated earnings. They can partially hedge against adverse effects of exchange rate movements on consolidated earnings. To the extent that managers are concerned that any adverse translation effect on consolidated earnings would result in a lower stock price, their own compensation is affected. They may hedge translation exposure to hedge their own exposure to their compensation. In this case, their decisions for the MNC are based on their own situation. An MNC can impose controls to prevent this type of agency problem. For example, it could specify the conditions that are necessary for managers to hedge translation exposure or require board approval. ■

SUMMARY

■ Economic exposure can be managed by balancing the sensitivity of revenue and expenses to exchange rate fluctuations. To accomplish this, however, the firm must first recognize how its revenue and expenses are affected by exchange rate fluctuations. For some firms, revenue is more susceptible. These firms are most concerned that their home currency will appreciate against foreign currencies since the unfavorable effects on revenue will more than offset the

favorable effects on expenses. Conversely, firms whose expenses are more sensitive to exchange rates than their revenue are most concerned that their home currency will depreciate against foreign currencies. When firms reduce their economic exposure, they reduce not only these unfavorable effects but also the favorable effects if the home currency value moves in the opposite direction.

Translation exposure can be reduced by selling forward the foreign currency used to measure a subsidiary's income. If the foreign currency depreciates against the home currency, the adverse impact on the consolidated income statement can be offset by the gain on the forward sale in that currency. If

the foreign currency appreciates over the time period of concern, there will be a loss on the forward sale that is offset by a favorable effect on the reported consolidated earnings. However, many MNCs would not be satisfied with a "paper gain" that offsets a "cash loss."

POINT COUNTER-POINT

Can an MNC Reduce the Impact of Translation Exposure by Communicating?

Point Yes. Investors commonly use earnings to derive an MNC's expected future cash flows. Investors do not necessarily recognize how an MNC's translation exposure could distort their estimates of the MNC's future cash flows. Therefore, the MNC could clearly communicate in its annual report and elsewhere how the earnings were affected by translation gains and losses in any period. If investors have this information, they will not overreact to earnings changes that are primarily attributed to translation exposure.

Counter-Point No. Investors focus on the bottom line and should ignore any communication regarding the translation exposure. Moreover, they may believe that translation exposure should be accounted for anyway. If foreign earnings are reduced because of a weak currency, the earnings may continue to be weak if the currency remains weak.

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.

- Salem Exporting Co. purchases chemicals from U.S. sources and uses them to make pharmaceutical products that are exported to Canadian hospitals. Salem prices its products in Canadian dollars and is concerned about the possibility of the long-term depreciation of the Canadian dollar against the U.S. dollar. It periodically hedges its exposure with short-term forward contracts, but this does not insulate against the possible trend of continuing Canadian dollar depreciation. How could Salem offset some of its exposure resulting from its export business?
- Using the information in question 1, give a possible disadvantage of offsetting exchange rate exposure from the export business.
- Coastal Corp. is a U.S. firm with a subsidiary in the United Kingdom. It expects that the pound will depreciate this year. Explain Coastal's translation exposure. How could Coastal hedge its translation exposure?
- Arlington Co. has substantial translation exposure in European subsidiaries. The treasurer of Arlington Co. suggests that the translation effects are not relevant because the earnings generated by the European subsidiaries are not being remitted to the U.S. parent, but are simply being reinvested in Europe. Nevertheless, the vice president of finance of Arlington Co. is concerned about translation exposure because the stock price is highly dependent on the consolidated earnings, which are dependent on the exchange rates at which the earnings are translated. Who is correct?
- Lincolnshire Co. exports 80 percent of its total production of goods in New Mexico to Latin American countries. Kalafa Co. sells all the goods it produces in the United States, but it has a subsidiary in Spain that usually generates about 20 percent of its total earnings. Compare the translation exposure of these two U.S. firms.

QUESTIONS AND APPLICATIONS

1. **Reducing Economic Exposure.** Baltimore, Inc., is a U.S.-based MNC that obtains 10 percent of its supplies from European manufacturers. Sixty percent of its revenues are due to exports to Europe, where its product is invoiced in euros. Explain how Baltimore can attempt to reduce its economic exposure to exchange rate fluctuations in the euro.
2. **Reducing Economic Exposure.** UVA Co. is a U.S.-based MNC that obtains 40 percent of its foreign supplies from Thailand. It also borrows Thailand's currency (the baht) from Thai banks and converts the baht to dollars to support U.S. operations. It currently receives about 10 percent of its revenue from Thai customers. Its sales to Thai customers are denominated in baht. Explain how UVA Co. can reduce its economic exposure to exchange rate fluctuations.
3. **Reducing Economic Exposure.** Albany Corp. is a U.S.-based MNC that has a large government contract with Australia. The contract will continue for several years and generate more than half of Albany's total sales volume. The Australian government pays Albany in Australian dollars. About 10 percent of Albany's operating expenses are in Australian dollars; all other expenses are in U.S. dollars. Explain how Albany Corp. can reduce its economic exposure to exchange rate fluctuations.
4. **Tradeoffs When Reducing Economic Exposure.** When an MNC restructures its operations to reduce its economic exposure, it may sometimes forgo economies of scale. Explain.
5. **Exchange Rate Effects on Earnings.** Explain how a U.S.-based MNC's consolidated earnings are affected when foreign currencies depreciate.
6. **Hedging Translation Exposure.** Explain how a firm can hedge its translation exposure.
7. **Limitations of Hedging Translation Exposure.** Bartunek Co. is a U.S.-based MNC that has European subsidiaries and wants to hedge its translation exposure to fluctuations in the euro's value. Explain some limitations when it hedges translation exposure.
8. **Effective Hedging of Translation Exposure.** Would a more established MNC or a less established MNC be better able to effectively hedge its given level of translation exposure? Why?
9. **Comparing Degrees of Economic Exposure.** Carlton Co. and Palmer, Inc., are U.S.-based MNCs with subsidiaries in Mexico that distribute medical

supplies (produced in the United States) to customers throughout Latin America. Both subsidiaries purchase the products at cost and sell the products at 90 percent markup. The other operating costs of the subsidiaries are very low. Carlton Co. has a research and development center in the United States that focuses on improving its medical technology. Palmer, Inc., has a similar center based in Mexico. The parent of each firm subsidizes its respective research and development center on an annual basis. Which firm is subject to a higher degree of economic exposure? Explain.

10. **Comparing Degrees of Translation Exposure.** Nelson Co. is a U.S. firm with annual export sales to Singapore of about S\$800 million. Its main competitor is Mez Co., also based in the United States, with a subsidiary in Singapore that generates about S\$800 million in annual sales. Any earnings generated by the subsidiary are reinvested to support its operations. Based on the information provided, which firm is subject to a higher degree of translation exposure? Explain.

Advanced Questions

11. **Managing Economic Exposure.** St. Paul Co. does business in the United States and New Zealand. In attempting to assess its economic exposure, it compiled the following information.
 - a. St. Paul's U.S. sales are somewhat affected by the value of the New Zealand dollar (NZ\$), because it faces competition from New Zealand exporters. It forecasts the U.S. sales based on the following three exchange rate scenarios:

Exchange Rate of NZ\$	Revenue from U.S. Business (in millions)
NZ\$ = \$.48	\$100
NZ\$ = .50	105
NZ\$ = .54	110

- b. Its New Zealand dollar revenues on sales to New Zealand invoiced in New Zealand dollars are expected to be NZ\$600 million.
- c. Its anticipated cost of materials is estimated at \$200 million from the purchase of U.S. materials and NZ\$100 million from the purchase of New Zealand materials.

- d. Fixed operating expenses are estimated at \$30 million.
- e. Variable operating expenses are estimated at 20 percent of total sales (after including New Zealand sales, translated to a dollar amount).
- f. Interest expense is estimated at \$20 million on existing U.S. loans, and the company has no existing New Zealand loans.

Forecast net cash flows for St. Paul Co. under each of the three exchange rate scenarios. Explain how St. Paul's net cash flows are affected by possible exchange rate movements. Explain how it can restructure its operations to reduce the sensitivity of its net cash flows to exchange rate movements without reducing its volume of business in New Zealand.

12. **Assessing Economic Exposure.** Alaska, Inc., plans to create and finance a subsidiary in Mexico that produces computer components at a low cost and exports them to other countries. It has no other international business. The subsidiary will produce computers and export them to Caribbean islands and will invoice the products in U.S. dollars. The values of the currencies in the islands are expected to remain very stable against the dollar. The subsidiary will pay wages, rent, and other operating costs in Mexican pesos. The subsidiary will remit earnings monthly to the parent.
- a. Would Alaska's cash flows be favorably or unfavorably affected if the Mexican peso depreciates over time?
 - b. Assume that Alaska considers partial financing of this subsidiary with peso loans from Mexican banks instead of providing all the financing with its own funds. Would this alternative form of financing increase, decrease, or have no effect on the degree to which Alaska is exposed to exchange rate movements of the peso?
13. **Hedging Continual Exposure.** Clearlake, Inc., produces its products in its factory in Texas and exports most of the products to Mexico each month. The exports are denominated in pesos. Clearlake recognizes that hedging on a monthly basis does not really protect against long-term movements in exchange rates. It also recognizes that it could eliminate its transaction exposure by denominating the exports in dollars, but that it still would have economic exposure (because Mexican consumers would reduce demand if the peso weakened). Clearlake does not know how many pesos it will receive in the future, so it would have difficulty even if a long-term hedging method was available. How can Clearlake realistically deal with this dilemma

and reduce its exposure over the long term? (There is no perfect solution, but in the real world, there rarely are perfect solutions.)

14. **Sources of Supplies and Exposure to Exchange Rate Risk.** Laguna Co. (a U.S. firm) will be receiving 4 million British pounds in one year. It will need to make a payment of 3 million Polish zloty in one year. It has no other exchange rate risk at this time. However, it needs to buy supplies and can purchase them from Switzerland, Hong Kong, Canada, or Ecuador. Another alternative is that it could also purchase one-fourth of the supplies from each of the four countries mentioned in the previous sentence. The supplies will be invoiced in the currency of the country from which they are imported. Laguna Co. believes that none of the sources of the imports would provide a clear cost advantage. As of today, the dollar cost of these supplies would be about \$6 million regardless of the source that will provide the supplies.

The spot rates today are as follows:

British pound = \$1.80

Swiss franc = \$.60

Polish zloty = \$.30

Hong Kong dollar = \$.14

Canadian dollar = \$.60

The movements of the pound and the Swiss franc and the Polish zloty against the dollar are highly correlated. The Hong Kong dollar is tied to the U.S. dollar, and you expect that it will continue to be tied to the dollar. The movements in the value of the Canadian dollar against the U.S. dollar are not correlated with the movements of the other currencies. Ecuador uses the U.S. dollar as its local currency.

Which alternative should Laguna Co. select in order to minimize its overall 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 Xtra! website at <http://maduraxtra.swlearning.com>.

BLADES, INC. CASE

Assessment of Economic Exposure

Blades, Inc., has been exporting to Thailand since its decision to supplement its declining U.S. sales by exporting there. Furthermore, Blades has recently begun exporting to a retailer in the United Kingdom. The suppliers of the components needed by Blades for roller blade production (such as rubber and plastic) are located in the United States and Thailand. Blades decided to use Thai suppliers for rubber and plastic components needed to manufacture roller blades because of cost and quality considerations. All of Blades' exports and imports are denominated in the respective foreign currency; for example, Blades pays for the Thai imports in baht.

The decision to export to Thailand was supported by the fact that Thailand had been one of the world's fastest growing economies in recent years. Furthermore, Blades found an importer in Thailand that was willing to commit itself to the annual purchase of 180,000 pairs of Blades' "Speedos," which are among the highest quality roller blades in the world. The commitment began last year and will last another 2 years, at which time it may be renewed by the two parties. Due to this commitment, Blades is selling its roller blades for 4,594 baht per pair (approximately \$100 at current exchange rates) instead of the usual \$120 per pair. Although this price represents a substantial discount from the regular price for a pair of Speedo blades, it still constitutes a considerable markup above cost. Because importers in other Asian countries were not willing to make this type of commitment, this was a decisive factor in the choice of Thailand for exporting purposes. Although Ben Holt, Blades' chief financial officer (CFO), believes the sports product market in Asia has very high future growth potential, Blades has recently begun exporting to Jogs, Ltd., a British retailer. Jogs has committed itself to purchase 200,000 pairs of Speedos annually for a fixed price of £80 per pair.

For the coming year, Blades expects to import rubber and plastic components from Thailand sufficient to manufacture 80,000 pairs of Speedos, at a cost of approximately 3,000 baht per pair of Speedos.

You, as Blades' financial analyst, have pointed out to Ben Holt that recent events in Asia have fundamentally affected the economic condition of Asian countries, including Thailand. For example, you have pointed out that the high level of consumer spending on leisure products such as roller blades has declined considerably. Thus, the Thai retailer may not renew its

commitment with Blades in 2 years. Furthermore, you are worried that the current economic conditions in Thailand may lead to a substantial depreciation of the Thai baht, which would affect Blades negatively.

Despite recent developments, however, Ben Holt remains optimistic; he is convinced that Southeast Asia will exhibit high potential for growth when the impact of recent events in Asia subsides. Consequently, Holt has no doubt that the Thai customer will renew its commitment for another 3 years when the current agreement terminates. In your opinion, Holt is not considering all of the factors that might directly or indirectly affect Blades. Moreover, you are worried that he is ignoring Blades' future in Thailand even if the Thai importer renews its commitment for another 3 years. In fact, you believe that a renewal of the existing agreement with the Thai customer may affect Blades negatively due to the high level of inflation in Thailand.

Since Holt is interested in your opinion and wants to assess Blades' economic exposure in Thailand, he has asked you to conduct an analysis of the impact of the value of the baht on next year's earnings to assess Blades' economic exposure. You have gathered the following information:

- Blades has forecasted sales in the United States of 520,000 pairs of Speedos at regular prices; exports to Thailand of 180,000 pairs of Speedos for 4,594 baht a pair; and exports to the United Kingdom of 200,000 pairs of Speedos for £80 per pair.
- Cost of goods sold for 80,000 pairs of Speedos are incurred in Thailand; the remainder is incurred in the United States, where the cost of goods sold per pair of Speedos runs approximately \$70.
- Fixed costs are \$2 million, and variable operating expenses other than costs of goods sold represent approximately 11 percent of U.S. sales. All fixed and variable operating expenses other than cost of goods sold are incurred in the United States.
- Recent events in Asia have increased the uncertainty regarding certain Asian currencies considerably, making it extremely difficult to forecast the value of the baht at which the Thai revenues will be converted. The current spot rate of the baht is \$.022, and the current spot rate of the pound is \$1.50. You have created three scenarios

and derived an expected value on average for the upcoming year based on each scenario:

Scenario	Effect on the Average Value of Baht	Average Value of Baht	Average Value of Pound
1	No change	\$.0220	\$1.530
2	Depreciate by 5%	.0209	1.485
3	Depreciate by 10%	.0198	1.500

- Blades currently has no debt in its capital structure. However, it may borrow funds in Thailand if it establishes a subsidiary in the country.

Ben Holt has asked you to answer the following questions:

1. How will Blades be negatively affected by the high level of inflation in Thailand if the Thai customer renews its commitment for another 3 years?
2. Holt believes that the Thai importer will renew its commitment in 2 years. Do you think his assessment is correct? Why or why not? Also, assume that the Thai economy returns to the high growth level that existed prior to the recent unfavorable economic events. Under this assumption, how likely is it that the Thai importer will renew its commitment in 2 years?
3. For each of the three possible values of the Thai baht and the British pound, use a spreadsheet to estimate cash flows for the next year. Briefly comment on the level of Blades' economic exposure. Ignore possible tax effects.
4. Now repeat your analysis in question 3 but assume that the British pound and the Thai baht are perfectly correlated. For example, if the baht depreciates by 5 percent, the pound will also depreciate by 5 percent. Under this assumption, is Blades subject to a greater degree of economic exposure? Why or why not?
5. Based on your answers to the previous three questions, what actions could Blades take to reduce its level of economic exposure to Thailand?

SMALL BUSINESS DILEMMA

Hedging the Sports Exports Company's Economic Exposure to Exchange Rate Risk

Jim Logan, owner of the Sports Exports Company, remains concerned about his exposure to exchange rate risk. Even if Jim hedges his transactions from one month to another, he recognizes that a long-term trend of depreciation in the British pound could have a severe impact on his firm. He believes that he must continue to focus on the British market for selling his footballs. However, he plans to consider various ways in which he can reduce his economic exposure. At the current time, he obtains material from a local manufacturer and uses a machine to produce the footballs, which are then ex-

ported. He still uses his garage as a place of production and would like to continue using his garage to maintain low operating expenses.

1. How could Jim adjust his operations to reduce his economic exposure? What is a possible disadvantage of such an adjustment?
2. Offer another solution to hedging the economic exposure in the long run as Jim's business grows. What are the disadvantages of this solution?

INTERNET/EXCEL EXERCISES

1. Review an annual report of an MNC of your choice. Many MNCs provide their annual report on their websites. Look for any comments that relate to the MNC's economic or translation exposure. Does it appear that the MNC hedges its economic exposure or translation exposure? If so, what methods does it use to hedge its exposure?
2. Go to <http://finance.yahoo.com> and insert the ticker symbol IBM (or use a different MNC if you wish) in the stock quotations box. Click on 1y just

below the chart provided. Then scroll down and click on Historical Prices. Set the date range so that you can access data for least the last 20 quarters. Obtain the stock price of IBM at the beginning of the last 20 quarters and insert the data on your electronic spreadsheet. Compute the percentage change in the stock price of IBM from one quarter to the next. Then go to <http://www.oanda.com/convert/fxhistory> and obtain direct exchange rates of the Canadian dollar and the euro that match up with the stock price data. Run a regression analysis with the quarterly percentage change in IBM's stock price as the dependent variable and the quarterly change in the Canadian dollar's value as the independent variable. (Appendix C explains how Excel can be used to run regression analysis.) Does it appear that IBM's stock price is affected

- by changes in the value of the Canadian dollar? If so, what is the direction of the relationship? Is the relationship strong? (Check the *R*-squared statistic.) Based on this relationship, do you think IBM should attempt to hedge its economic exposure to movements in the Canadian dollar?
3. Repeat the process using the euro in place of the Canadian dollar. Does it appear that IBM's stock price is affected by changes in the value of the euro? If so, what is the direction of the relationship? Is the relationship strong? (Check the *R*-squared statistic.) Based on this relationship, do you think IBM should attempt to hedge its economic exposure to movements in the euro?

PART 3 INTEGRATIVE PROBLEM

Exchange Rate Risk Management

Vogl Co. is a U.S. firm conducting a financial plan for the next year. It has no foreign subsidiaries, but more than half of its sales are from exports. Its foreign cash inflows to be received from exporting and cash outflows to be paid for imported supplies over the next year are shown in the following table:

Currency	Total Inflow	Total Outflow
Canadian dollar (C\$)	C\$32,000,000	C\$2,000,000
New Zealand dollar (NZ\$)	NZ\$5,000,000	NZ\$1,000,000
Mexican peso (MXP)	MXP11,000,000	MXP10,000,000
Singapore dollar (S\$)	S\$4,000,000	S\$8,000,000

The spot rates and one-year forward rates as of today are shown below:

Currency	Spot Rate	One-Year Forward Rate
C\$	\$.90	\$.93
NZ\$.60	.59
MXP	.18	.15
S\$.65	.64

Questions

- 1 Based on the information provided, determine Vogl's net exposure to each foreign currency in dollars.
- 2 Assume that today's spot rate is used as a forecast of the future spot rate one year from now. The New Zealand dollar, Mexican peso, and Singapore dollar are expected to move in tandem against the U.S. dollar over the next year. The Canadian dollar's movements are expected to be unrelated to movements of the other currencies. Since exchange rates are difficult to predict, the forecasted net dollar cash flows per currency may be inaccurate. Do you anticipate any offsetting exchange rate effects from whatever exchange movements do occur? Explain.
- 3 Given the forecast of the Canadian dollar along with the forward rate of the Canadian dollar, what is the expected increase or decrease in dollar cash flows that would result from hedging the net cash flows in Canadian dollars? Would you hedge the Canadian dollar position?

- 4 Assume that the Canadian dollar net inflows may range from C\$20 million to C\$40 million over the next year. Explain the risk of hedging C\$30 million in net inflows. How can Vogl Co. avoid such a risk? Is there any tradeoff resulting from your strategy to avoid that risk?
- 5 Vogl Co. recognizes that its year-to-year hedging strategy hedges the risk only over a given year and does not insulate it from long-term trends in the Canadian dollar's value. It has considered establishing a subsidiary in Canada. The goods would be sent from the United States to the Canadian subsidiary and distributed by the subsidiary. The proceeds received would be reinvested by the Canadian subsidiary in Canada. In this way, Vogl Co. would not have to convert Canadian dollars to U.S. dollars each year. Has Vogl eliminated its exposure to exchange rate risk by using this strategy? Explain.