CHAPTER 18

International Capital Budgeting Decisions

Opening Case 18:   **External Factors Affecting Foreign Project Analysis**

Foreign-exchange rates, interest rates, and inflation are three external factors that affect multinational companies (MNCs) and their markets. Changes in these three factors stem from several sources, such as economic conditions, government policies, monetary systems, and political risks. Each factor is a significant external variable that affects areas such as policy decisions, strategic planning, profit planning, and budget control. To minimize the possible negative impact of these factors, MNCs must establish and implement policies and practices that recognize and respond to their influences.

These three factors – exchange rates, interest rates, and inflation – affect sales budgets, expense budgets, capital budgeting, and cash budgets. However, they are particularly useful when evaluating international capital budgeting alternatives. Foreign-exchange rates have the most significant effect on the capital budgeting process. A foreign investment project will be affected by exchange rate fluctuations during the life of the project, but these fluctuations are difficult to forecast. There are methods of hedging against exchange rate risks, but most hedging techniques are used to cover short-term positions.

The cost of capital is used as a cutoff point to accept or reject a proposed project. Because the cost of capital is the weighted average cost of debt and equity, interest rates play a key role in a capital expenditure analysis. Most components of project cash flows – revenues, variable costs, and fixed costs – are likely to rise in line with inflation, but local price controls may not permit internal price adjustments. A capital expenditure analysis requires price projections for the entire life of the project. In some

countries, the inflation rate may exceed 100 percent during a 3-year period, a condition known as hyperinflation. These and other factors related to inflation make the capital budgeting process extremely difficult.

Source: Paul V. Mannino and Ken Milani, "Budgeting for an International Business," *Management Accounting*, Feb. 1992, pp. 36–41.

The basic principles of analysis are the same for foreign and domestic investment projects. However, a foreign investment decision results from a complex process, which differs, in many aspects, from the domestic investment decision.

Relevant cash flows are the dividends and royalties that would be repatriated by each subsidiary to a parent firm. Because these net cash flows must be converted into the currency of a parent company, they are subject to future exchange rate changes. Moreover, foreign investment projects are subject to political risks such as exchange controls and discrimination. Normally, the cost of capital for a foreign project is higher than that for a similar domestic project. Certainly, this higher risk comes from two major sources, political risk and exchange risk.

This chapter is composed of four major sections. The first section describes the entire process of planning capital expenditures in foreign countries beyond 1 year. The second section examines how international diversification can reduce the overall riskiness of a company. The third section compares capital budgeting theory with capital budgeting practice. The fourth section covers political risk analysis.

18.1   The Foreign Investment Decision-Making Process

The foreign investment decision-making process involves the entire process of planning capital expenditures in foreign countries beyond 1 year. The 1-year time frame is arbitrary, but a 1-year boundary is rather widely accepted. There are many steps and elements in this process. Each element is a subsystem of the capital budgeting system. Thus, the foreign investment decision-making process may be viewed as an integral unit of many elements that are interrelated. Here we assume that the entire foreign investment decision-making process consists of 11 phases: (1) the decision to search for foreign investment, (2) an assessment of the political climate in the host country, (3) an examination of the company's overall strategy, (4) cash flow analysis, (5) the required rate of return, (6) economic evaluation, (7) selection, (8) risk analysis, (9) implementation, (10) expenditure control, and (11) post-audit.

18.1.1   The search for foreign investment

The availability of good investment opportunities sets the foundation for a successful investment program. Hence, a system should be established to stimulate ideas for capital expenditures abroad and to identify good investment opportunities. Moreover, good investment opportuni-

ties come from hard thinking, careful planning, and, frequently, large outlays for research and development.

The first phase in the foreign investment decision-making process is an analysis of the forces that lead some company officials to focus on the possibilities of foreign investment. If a company recognizes foreign investment as a legitimate program, its search for foreign investment opportunities will start. The economic and political forces in the host countries are largely responsible for the expansion of foreign investment. Many companies also desire foreign investment to seek new markets, raw materials, and production efficiency. Chapter 2 described these and other motives for foreign investment in detail.

It is not easy to pinpoint one motive for a decision to invest abroad in any particular case or to find out exactly who initiated a foreign project. The decision to search for foreign investment comes at the end of a series of events, and it is a combination of several motivating forces and activities of different persons. Typically, the decision to look abroad depends on the interaction of many forces. Considerations such as profit opportunities, tax policy, and diversification strategies are economic variables that may affect a decision to look overseas. In addition, environmental forces, organizational factors, and a drive by some high-ranking officials inside a company could be major forces leading a company to look abroad.

18.1.2   The political climate

Political risks may exist for the domestic investment. Price controls may be established or lifted, some regulated industries may be deregulated, or quotas and tariffs on cheap imported components may be imposed. Certainly, there are more political risks in foreign investment. For one thing, at least two national governments become involved in a foreign investment project – that of the home country of the parent company and that of the host country of the subsidiary. The goals of the two countries may differ; laws may change; rights to repatriate capital may be modified; and, in an extreme situation, assets may be seized by a host government without adequate compensation.

One major concern of MNCs is the possibility that the political climate of a host country may deteriorate. The multinational financial manager must analyze the political environment of the proposed host country and determine whether the economic environment would be receptive to the proposed project. In general, projects designed to reduce the country's need for imports and thus save foreign exchange are given the highest priority by the host government.

Political actions, such as exchange controls and discrimination, adversely affect company operations. Thus, the analyst should emphasize such factors as the host government's attitudes toward foreign investment, the desire of the host country for national rather than foreign control, and its political stability. The analyst should also determine whether adequate and prompt compensation is guaranteed if a host country nationalizes alien assets in the public interest.

18.1.3   The company's overall strategy

If the initial screening of the political climate is favorable, the MNCs can move on to the next stage of the decision-making process. The analyst then assesses the usefulness of each alternative within the company's overall strategy to determine how foreign operations may perpetuate current

strengths or offset weaknesses. This approach allows a company to reduce alternatives to a manageable number. At this stage, the company must check whether the project conflicts with company goals, policies, and resources. The analyst must also evaluate whether the company has the experience to handle the project and how the project could be integrated into existing projects.

The company's overall strategy consists of objectives, policies, and resources. In capital expenditure analysis, there are objectives to be attained and policies designed to achieve these objectives. If a particular set of policies is not consistent with the stated objectives, either the policies or the objectives should be revised. The company must also have resources necessary to carry out its policies. If resources are not available, they must be acquired, or the policies and/or the objectives must be revised.

THE COMPANY GOAL   The primary goal of the MNC is to maximize its stock price. The market price of the firm's stock reflects the market's evaluation of its prospective earnings stream over time and the riskiness of this stream. Thus, the company must attempt to accept projects whose profits are higher and whose risks are lower.

COMPANY POLICY   If the company has carefully established policies to achieve its goal, it can overcome the threat of competitors and use its oligopolistic advantages. The company should systematically evaluate individual entry strategies in foreign markets, continuously audit the effectiveness of current entry modes, and use appropriate evaluation criteria.

COMPANY RESOURCES   Resources are assets that enable the company to carry out its objectives and policies; they include marketing skills, management time and expertise, capital resources, technological capabilities, and strong brand names.

18.1.4 Cash flow analysis

The fourth stage of the screening process involves a standard cash flow analysis. The after-tax cash outflows and inflows directly associated with each project must be estimated to evaluate capital investment alternatives. An MNC must forecast its expected expenditures for the proposed project. Ordinarily, it obtains these forecasts from data of similar ventures. A company may also make forecasts by such techniques as the percent-of-sale method or a linear regression analysis. An important difference in the application of cash flow analysis for foreign investment is that a company must make two sets of cash flow analyses, one for the project itself and one for the parent company.

THE DEMAND FORECAST   The first step in analyzing cash flows for any investment proposal is a forecast of demand. These estimates of usage are highly correlated with historical demand, population, income, alternative sources of products, competition, the feasibility of serving nearby markets, and general economic conditions.

There are a number of reasons for emphasizing market size in the investment decision-making process. First, the expected market size can be used as an indication of profit possibilities for the proposed investment project. Second, small markets tend to have high uncertainty. If a market

is small, the MNC has little or no leeway in case of an erroneous estimate. Third, small markets are not worth the effort. Because management is one of scarce resources in a company, the proposed project should be large enough to support management time on project analysis.

DUTIES AND TAXES   Because foreign investment cuts across national boundaries, a unique set of tax laws and import duties may be applicable. An MNC must review the tax structure of the host country. In this analysis, the evaluator would include the definition of a taxable entity, statutory tax rates, tax treaties, treatment of dual taxation, and tax incentive programs. The MNC should also know whether the host government imposes customs duties on imported production equipment and materials not obtainable from local sources.

FOREIGN-EXCHANGE RATES AND RESTRICTIONS   Another important feature of foreign investment analysis is that project inflows available to the investor are subject to foreign-exchange rates and restrictions. When the host country has a stable exchange rate, no problems are presented. However, if the exchange rate is expected to change or allowed to float, cash flow analysis becomes more complicated, because the analyst must forecast the exchange rate that may be applicable to convert cash flows into hard currencies.

It is equally important to recognize that many host governments have various exchange control regulations. Under these regulations, permission may be required to buy foreign exchange with local currency for payment of loan interest, management fees, royalties, and most other billings for services provided by foreign suppliers. Processing applications for permission to purchase foreign exchange may take a long time. Moreover, the granting of permission to buy foreign exchange does not guarantee that a related foreign exchange will be available in time, because commercial banks can allocate only such amounts as are made available by a central bank.

Many factors affect the blockage of funds to nonresidents. They include an expected shortage of foreign exchange, a long-run deficiency of the foreign exchange, and certain types of domestic political pressures. If all funds are blocked in perpetuity, the value of a project is zero to the parent company. However, in actuality funds are likely to be only partially blocked, because MNCs have many ways to remove blocked funds. These methods include transfer price adjustments, loan repayments, royalty adjustments, and fee adjustments. Furthermore, most host countries limit the amount of fund transfers to nonresidents or block the transfer of funds only on a temporary basis. Nevertheless, MNCs must analyze the effect of blocked funds on project return. It is critical that an analyst determines the amount of blocked funds, their reinvestment return, and ways in which funds can be transferred under the host country's law.

PROJECT VERSUS PARENT CASH FLOWS   To determine after-tax profits from a proposed project, the MNC must develop a demand forecast, forecast its expected expenditures, and review the tax structure of the host country. The estimated sales, less estimated expenses, plus noncash outlays such as depreciation, gives the cash inflows from operations.

Typically, an MNC desires to maximize the utility of project cash flows on a worldwide basis. The MNC must value only those cash flows that can be repatriated, because only these funds can be used for investment in new ventures, for payment of dividends and debt obligations, and for reinvestment in other subsidiaries. Project cash flows would have little value if they could not be used for these alternatives.

Project cash flows and parent cash flows can be substantially different due to tax regulations and exchange controls. Moreover, some project expenses, such as management fees and royalties, are returns to the parent company. In general, incremental cash flows to the parent company are worldwide parent cash flows after investment minus worldwide parent cash flows before investment. These differences raise the question of which cash flows should be used as the relevant cash flows in project evaluation. Because the value of a project is determined by the net present value of future cash flows to an investor, a foreign investment analyst should use cash flows available for repatriation as the relevant cash flows. Hence, the MNC must analyze the impact of taxation, exchange controls, and other operational restrictions on cash flows to the parent company.

CAPITAL BUDGETING AND TRANSFER PRICING Cash flow analysis of a foreign investment project involves many unique environmental variables. They include (1) different tax systems, (2) foreign-exchange risk, (3) project versus parent cash flows, (4) restrictions on remittance of funds, and (5) political, financial, and business risks. In these five environmental variables, a transfer pricing policy is an integral part of each of the following three issues: First, MNCs should know the amount of funds they can withdraw from their foreign investment. Transfer price adjustments, dividends, royalties, and management fees are the only techniques to withdraw funds where there are restrictions on fund flow movements. Second, transfer pricing policies are regarded as one of the best ways to reduce a variety of taxes, such as income taxes, tariffs, and other taxes. Third, transfer pricing policies are one of the better means of minimizing foreign-exchange losses from currency fluctuations, because they enable MNCs to shift funds from one country to another. However, it is important to understand that use of market-based transfer prices may lead to the better investment decision, because transfer price adjustments may significantly distort the profitability of a foreign project.

18.1.5 The cost of capital

The **cost of capital** is the minimum rate of return that a project must yield in order to be accepted by a company. This minimum rate of return is sometimes called the discount rate or the required rate of return. The cost of capital is an extremely important financial concept. It acts as a major link between the firm's foreign investment decision and the wealth of the owners as determined by investors in the global marketplace. It is in effect the "magic number" used to decide whether a proposed foreign investment will increase or decrease the firm's stock price. Clearly, only those projects expected to increase stock price would be accepted. Because it plays a key role in international capital expenditure analysis, chapter 19 discusses the cost of capital for foreign investment projects in detail.

18.1.6 Economic evaluation

Once cash flows and the required rate of return have been determined, the company begins the formal process of evaluating investment projects. Many techniques have been developed for evaluating projects under conditions of certainty. They range from simple rules of thumb to sophisticated mathematical programming methods. The four most commonly used methods for an

economic evaluation of individual projects are payback, average rate of return, internal rate of return, and net present value.

The literature on capital expenditure analysis favors the net-present-value and internal-rate-of-return methods, which are sometimes called the **discounted cash flow approaches**. The two discounted cash flow approaches provide a more sophisticated basis for ranking and selecting investment projects, because the payback and average-rate-of return methods have various limitations. These two methods clearly recognize that money has a time value and that money in the near future is more valuable than money in the distant future. They also use the cash flows of a project over its entire life span. Analysts can avoid difficult problems underlying the measurement of income by using cash flows, thus eliminating such irrelevant influences as depreciation methods and inventory valuation.

The **net present value** of a project is the present value of its expected cash inflows minus the present value of its expected cash outflows. The **internal rate of return** is the discount rate that equates the present value of the net cash flows to the present value of the net cash investment, or the rate that provides a zero net present value. The decision rule tells us to (1) accept a project if its net present value is positive and (2) accept a project if its internal rate of return is greater than a firm's cost of capital.

The net-present-value and internal-rate-of-return methods lead to the same decision in many situations. These two rules lead to the same decision if the following conditions hold:

1   Investment proposals under consideration are mutually independent and they are free of capital rationing constraints.
2   All projects are equally risky, so that the acceptance or rejection of any project does not affect the cost of capital.
3   A meaningful cost of capital exists to the extent that a company has access to capital at that cost.
4   A unique internal rate of return exists; every project has just one internal rate of return.

In the absence of these assumptions, the two discounted cash flow approaches may lead to different decisions, thus making the capital budgeting decision much more complex.

When the net-present-value and internal-rate-of-return methods produce different answers, net present value is better for a number of reasons:

1   The net present value is easier to compute than the internal rate of return.
2   If the primary goal of a firm is to maximize the value of the firm, the net-present-value method leads to the correct decision, while the internal-rate-of-return method may lead to an incorrect decision.
3   A single project may have more than one internal rate of return under certain conditions, whereas the same project has just one net present value at a particular discount rate.
4   Once computed, the internal rate of return remains constant over the entire life of the project. This assumption about static conditions is hardly realistic during a period of rising interest rates and inflation. Uneven discount rates present no problems when the net-present-value method is used.
5   In the net-present-value method, the implied reinvestment rate approximates the opportunity cost for reinvestment. However, with the internal-rate-of-return method, the implied reinvestment assumption does not approximate the opportunity cost for reinvestment at all.

Although the net-present-value method is theoretically superior, the internal-rate-of-return method has certain advantages. First, internal rate of return is easier to visualize and interpret, because it is identical with the yield to the maturity of bonds or other securities. Second, we do not need to specify a required rate of return in the computation. In other words, it does not require the prior computation of the cost of capital. Third, business executives are more comfortable with internal rate of return, because it is directly comparable to the firm's cost of capital.

18.1.7 Selection

Each of the capital budgeting techniques described in the previous section measures the rate of return on a uniform basis for all projects under consideration. A project or a set of projects will be chosen at this stage if the following three assumptions hold: first, the company has a definite cutoff point that all projects must meet; second, all cash outflows and inflows from each project are known with absolute certainty; and, third, the company's investment programs are not constrained by any lack of funds. The final selection of projects depends on three kinds of capital budgeting decisions: the accept–reject decision, the mutually exclusive choice decision, and the capital rationing decision.

The selected project must successfully pass the accept–reject decision. If projects under consideration are mutually independent and not subject to capital rationing constraints, the company must accept all projects whose expected rate of return exceeds its hurdle rate in order to maximize stockholder wealth. The **hurdle rate** may be based on the cost of capital, the opportunity cost, or some other arbitrary standard. However, it is important to recognize the possibility that (1) certain projects may compete with each other and (2) available projects may exceed available funds. Mutual exclusiveness and capital rationing constraints are two cases in which otherwise profitable projects are rejected. Investment proposals are said to be mutually exclusive if the acceptance of one project means the rejection of all the other projects. Capital rationing refers to an upper ceiling on the size of capital expenditures during a given period of time.

18.1.8 Risk analysis

Up to this point, we have assumed that the dollar cash flows will certainly occur. In reality, all foreign investment projects are subject to various risks – business and financial risks, inflation and currency risks, and political risks. A change in some of these risks may have a decisive impact on the financial consequences of a particular project. Furthermore, the risks vary widely from country to country.

Only a few of the financial variables are normally known with a fair degree of accuracy in advance. Investors are basically risk averters. If investors do not know in advance exactly which future events will occur, they will have to determine the risk–return trade-off in order to choose attractive projects.

Many MNCs use the risk-adjusted discount rate and the certainty equivalent approach to adjust for project estimates. The **risk-adjusted discount rate** is a rate that consists of the riskless rate of return plus a risk premium. Assume that the cost of capital for a firm is 10 percent

when the riskless rate of return is 7 percent. This 3 percent difference between the cost of capital and the riskless rate of return reflects the degree of risk for the company. The company may increase its discount rate by 2 percent to a total of 12 percent for a mildly risky project, by 5 percent to a total of 15 percent for a more risky project, and so on. Hence, the risk-adjusted discount rate accounts for the time value of money and the relative risk of the project in terms of a risk premium.

The **certainty equivalent approach** is a method used to adjust for project risk in the numerator of the net-present-value formula. In other words, while the risk-adjusted discount rate adjusts for risk in the denominator of the net-present-value formula, the certainty equivalent approach adjusts for risk in the numerator of the same equation.

When an analyst uses the certainty equivalent approach, the annual cash flows are multiplied by a certainty equivalent coefficient, which is a certain cash flow divided by an uncertain cash flow. If the analyst is indifferent between a certain $140 and an uncertain $200, its coefficient is 0.70 ($140/$200). The coefficient assumes a value of between 0 and 1. It varies inversely with risk. If a firm perceives greater risk, it uses a lower coefficient that would deflate the dollar return value. Once all the risky cash flows are adjusted downward to reflect uncertainty through the use of the coefficient, the analyst then discounts these certain cash flows at the risk-free rate of interest to determine the certain net present value.

18.1.9   Implementation, control, and post-audits

The last three steps of the capital budgeting system consist of implementation, expenditure control, and post-audits.

IMPLEMENTATION   Authorization to expend funds for the accepted projects may be obtained by submission of individual capital expenditure requests in accordance with formal procedures set forth by the budget director. These procedures typically cover the use of standard forms, the channels for submission and review, and the authority requirements and limits for approval.

CONTROL   There is a specific phase of the capital budgeting process during which the practical cost control of a foreign project becomes important. This is the time between the approval of the project and its completion. The expenditure control of a foreign project in process is designed to increase the probability that it is completed within the established guidelines. This phase is particularly important for foreign investment projects, because operations are typically supervised from a distance.

POST-AUDIT   Because multinational capital budgeting decisions are made on the basis of assumptions in foreign countries, estimates and actual results may differ. Thus, when a foreign project is completed, the firm should perform a post-audit on the entire project to determine its success or failure. The results of post-audits enable the firm to compare the actual performance of a foreign project with established standards. If the capital budgeting process used by an MNC has been successful, the system is likely to be reinforced. If the system has been unsatisfactory, it is likely to be revised or replaced for future foreign projects.

Example 18.1

In September 2004, the government of Jordan requested that the International TV Corporation establish a plant in Jordan to assemble television sets. The company wishes to invest 1,500 Jordanian dinars in the proposed plant in return for an increase in tariffs against other companies in the industry. The JD1,500 will be financed with only common stock, all of which will be owned by the parent company. The plant is to be depreciated over a 5-year period on a straight-line basis for tax purposes. It is expected to have a salvage value of JD750 at the end of 5 years. The company will pay income taxes at 20 percent on net income earned in Jordan and no withholding taxes on dividends repatriated. In this case, the United States also has a 50 percent tax rate with direct credit for Jordanian taxes. This means that net income earned in Jordan by US companies will be subject to a total of 50 percent tax. Expected revenues, operating costs, and applicable exchange rates are given in tables 18.1–18.3. There is no restriction on dividend repatriation, but depreciation cash flows may not be repatriated until the company is liquidated. These cash flows can be reinvested in Jordanian government bonds to earn tax-exempt interest at the rate of 8 percent. The company's cost of capital is 15 percent.

Table 18.1 shows the projected cash flows for the proposed plant. It is important to recognize that for the first year a total tax of 50 percent (JD225) will be levied: 20 percent in Jordanian tax (JD90) and 30 percent in US tax (JD135).

Table 18.1   Projected earnings after taxes for the proposed project

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	JD1,500	JD1,650	JD1,800	JD1,950	JD2,100
Operating costs	900	900	1,050	1,050	1,200
Depreciation	150	150	150	150	150
Taxable income	JD 450	JD 600	JD 600	JD 750	JD 750
Total tax at 50%	225	300	300	375	375
Earnings after tax	JD 225	JD 300	JD 300	JD 375	JD 375

Table 18.2 shows the depreciation cash flows and interest-compounded depreciation cash flows at the termination of the project at the end of 5 years. Thus, a total of JD880 will be repatriated to the USA along with the plant's fifth-year earnings of JD375 at the end of 5 years.

The last two steps in the analysis are: (1) to convert the cash flows from dinars to dollars and (2) to determine the net present value of the plant. Table 18.3 shows these two computation steps. It should be noted that the fifth-year cash flow of JD2,005 consists of dividends (JD375), the estimated salvage value of the plant (JD750), and the interest-accumulated depreciation cash flows (JD880).

The current exchange rate of five dinars to the dollar is expected to hold during the first year. However, the dinar is expected to depreciate at a rate of 5 percent per year after the

Table 18.2   Depreciation cash flows

Year	Depreciation	Interest factor at 8%	Terminal value, year 5
1	JD150	1.360	JD204
2	150	1.260	189
3	150	1.166	175
4	150	1.080	162
5	150	1.000	150
			JD880

Table 18.3   The parent's net present value

Year	Cash flows	Exchange rate	Cash flows	Present value at 15%	Cum. net pres. value
0	−JD1,500	5.00	−$300	−$300	−$300
1	225	5.00	45	39	−261
2	300	5.25	57	43	−218
3	300	5.51	54	36	−182
4	375	5.79	65	37	−145
5	2,005	6.08	330	164	19

first year. The expected cash flows in dollars are obtained by dividing the cash flows in dinars by the exchange rates. The dollar cash flows are then discounted at the firm's cost of capital (15 percent) to arrive at a present value figure for each year. Cumulative net present values are the final amounts given in table 18.3. We see that, from the parent's point of view, the plant would break even on a discounted cash flow basis during the fifth year. Because the net present value of the project is positive ($19), the International TV Corporation should accept the proposed plant in order to maximize the market value of the company. The project's internal rate of return is approximately 17 percent. Because the internal rate of return (17 percent) is greater than the cost of capital (15 percent), the internal-rate-of-return criterion also indicates acceptance.

18.1.10   Real option analysis

The literature on capital investment analysis pays insufficient attention to the possibility of future options over an investment project. Ordinarily, an investment project is evaluated as though a company were committed to the project over its entire economic life. However, it may be more profitable to expand or retire an investment project before the end of its estimated economic life rather than continue its operation. When investment proposals are originally considered, key financial variables are identified and assumptions are made in order to arrive at a choice. As time

passes, some unforeseen problems can occur and they could affect these key variables. Initial assumptions may turn out to be incorrect, or perhaps some additional investment opportunities may arise.

Real option analysis is the application of option pricing models to the evaluation of investment options in real projects. Option pricing models work best for simple options on financial assets, such as stocks, interest rates, currencies or commodities, but they are also useful for foreign investment analysis, because a key variable faced by every foreign project is uncertainty. Currency, political, and cultural risks are the most prominent additional risks in foreign investment. Additionally, business risk on foreign projects is higher than that of domestic projects. When uncertainty is high, an MNC's investment opportunities can be viewed as real options (Butler 2004). Real options include (1) options to expand or contract, (2) options to accelerate or delay, and (3) options to continue or retire.

18.2   Portfolio Theory

In the real world, practically no company or individual invests everything in a single project. Thus, it is useful to consider the risk and return of a particular project in conjunction with its counterparts in existing assets or new investment opportunities. **Portfolio theory** deals with the selection of investment projects that would minimize risk for a given rate of return, or that would maximize the rate of return for a given degree of risk. Such a portfolio is sometimes called the optimum portfolio.

Markowitz and Sharpe developed a powerful technique for a simultaneous risk–return analysis of multiple projects. Although the technique was applied first for the selection of portfolios of common stocks, it is also applicable to the evaluation of capital investment projects. This approach employs two basic measures: an index of expected value and an index of risk. The expected value for a portfolio of investments is simply the sum of the individual present values for the projects that make up the portfolio. The standard deviation as a measure of risk for the portfolio, however, is not so easily measured. There are many business situations in which the risks of individual projects tend to offset each other. Thus, successful diversification makes it possible for the company to have the risk of a portfolio less than the sum of the risks of the individual projects.

Example 18.2

A company has two proposed projects in an isolated Caribbean island whose major industry is tourism: (A) build a suntan lotion factory and (B) build a disposable umbrella factory. Project A's sales, earnings, and cash flows are highest in sunny years. Contrary to project A, project B's sales, earnings, and cash flows are highest in rainy years. Project A has a cost of $800, while project B has a cost of $1,000. These two projects are mutually independent and their possible net cash flows at the end of 1 year are given in table 18.4. Assume that the cost of capital is 5 percent.

Table 18.4 Net cash flows under different weather conditions

		Net cash flows	
Weather conditions	*Probability*	*Project A*	*Project B*
Sunny year	0.50	$2,000	$ 0
Rainy year	0.50	0	2,000

Because the expected net cash flow for each project is $1,000 ($2,000 × 0.5 + $0 × 0.5), their net present values (NPV) are computed as follows:

$$NPV_A = \frac{\$1,000}{(1.05)^1} - \$800 = \$152$$

$$NPV_B = \frac{\$1,000}{(1.05)^1} - \$1,000 = -\$48$$

The standard deviation of a project (σ) is computed as follows:

$$\sigma = \sqrt{\sum_{i=1}^{n}(R_i - R)^2 P_i} \tag{18.1}$$

where R_i is the net cash flow associated with the *i*th event (i.e., a particular weather condition such as a sunny summer or a rainy summer), R is the expected net cash flow, and P_i is the probability of the *i*th event. Thus, the standard deviations of projects A and B can be obtained as follows:

$$\sigma_A = \sqrt{(\$2,000 - \$1,000)^2(0.50) + (\$0 - \$1,000)^2(0.50)} = \$1,000$$
$$\sigma_B = \sqrt{(\$0 - \$1,000)^2(0.50) + (\$2,000 - \$1,000)^2(0.50)} = \$1,000$$

Project A has a net present value of $152 and project B has a net present value of –$48. Both projects have an equal standard deviation of $1,000. Project B would have no chance of being accepted, because its expected net present value is negative. Project A has a positive net present value of $152, but most investors are likely to reject the project because its risk is too high.

We can completely eliminate unsystematic risk by combining these two projects, because the unsystematic risks of individual projects tend to offset each other. Whether you have a sunny year or a rainy year, the expected net cash flow of this combination is $2,000 and their combined net present value is $104 ($152 – $48). The standard deviation of this two-project portfolio is zero (0) because the portfolio always produces a net present value of $104. When we consider projects A and B separately, both projects are clearly undesirable. However, when we treat them as a portfolio, we find the portfolio acceptable.

Total risk elimination is possible in example 18.2 because there is a perfect negative relation between the returns on projects A and B. In practice, such a perfect relation is rare. The returns on most domestic projects are highly interrelated with each other, because they depend on the same state of economy. However, the returns on foreign projects and domestic projects are less interrelated with each other, because they depend on different states of economy. As a result, international diversification is more effective than domestic diversification.

18.3   Capital Budgeting Theory and Practice

18.3.1   Project evaluation techniques

Over 35 years have passed since Stonehill and Nathanson (1968) surveyed 110 US and non-US MNCs to determine their foreign capital budgeting practices. Since then, research on the subject has not only refined its theoretical base but also expanded the knowledge of actual practices used by MNCs. The literature on foreign capital investment theory reveals that business firms should use discounted cash flow techniques for ranking and selecting overseas projects, because these methods recognize the time value of money and employ cash flows of a project over its life span.

Table 18.6 (see Case Problem 18) illustrates the extent to which discounted cash flow methods were used by MNCs that participated in various surveys from 1980 to 1994. These empirical studies revealed two important points: first, discounted cash flow approaches are more popular than rules of thumb; and, second, internal rate of return is more popular than net present value. Thus, most MNCs use discounted cash flow approaches for ranking and selecting overseas projects. The five studies cited in table 18.6 show that at least half of the respondents used discounted cash flow approaches, ranging from 50 percent according to Kelly's study to 81 percent in Stanley's study.

18.3.2   Company goals

Most leading finance textbooks now agree with Anthony (1960) and Donaldson (1963) that a firm should, first of all, maximize the wealth of stockholders. The best measure of stockholder wealth is the market value of a firm's stock, because the market value reflects the effects of all financial decisions. The financial decisions made by the managers of a firm determine the level of its stock price by affecting the riskiness and size of its earnings. In other words, the maximization of stockholder wealth depends on the trade-off between risk and return. These relationships are diagramed in figure 18.1. Although practically all financial decisions involve such risk–return trade-offs, this model is particularly important for capital budgeting decisions because capital investments are profitable, but they are subject to a variety of risks.

Investment decisions – usually requiring very large sums of money – are made in expectation of benefits over an extended period. Once capital budgeting decisions have been made, they are extremely costly to reverse. Most used plant and equipment have a limited market. In certain areas, production methods are rapidly outmoded by increasingly higher levels of technology. Moreover, most financial variables used in the analysis of capital expenditures are not accurately known in advance. Because investors and business executives are risk averters, efficient management of capital expenditures has become essential for healthy company growth.

Figure 18.1 The risk–return trade-off and company goals

In other words, more sophisticated capital budgeting techniques may be economically justified only if they increase the total value of a firm. Academic writers favor "sophisticated" capital budgeting techniques (e.g., the net-present-value method) over rules of thumb (e.g., the payback method). They argue that use of sophisticated methods will lead to higher earnings and less risk, thereby increasing the market price of the common stock. Thus it seems reasonable to suspect that a significant relationship exists between stock prices and capital budgeting practices. The hypothesis may be stated in the following way: firms using a more sophisticated capital budgeting system enjoy higher stock prices than do firms using a less sophisticated capital budgeting system.

Risk and performance measures based on the firm's common stock market values are better than risk and performance measures based on any other criterion. However, most writers on capital budgeting reject this view on the grounds that shareholders know little about corporate capital budgeting practices. Therefore, previous research studies have determined firm risk and performance measures from accounting data. To investigate the changes and effects of capital budgeting practices on risk and return, we can examine the results of capital budgeting studies to test the following two hypotheses:

1 Firms using a more sophisticated capital budgeting system have greater profitability than firms using a less sophisticated system.
2 Firm using a more sophisticated capital budgeting system are less risky than firms using a less sophisticated system.

Our literature review indicated that only a handful of empirical studies had tested these two hypotheses. Some tested these two hypotheses for domestic investment projects, but these studies found no significant relationship between budgeting practices and risk or return. We found only one such study for foreign investment projects. The study of 121 respondents by Stanley and Block (1984) revealed a strong interest in stockholder wealth maximization as the primary goal of the firm. In explaining why firms in their study might choose one capital budgeting method over another, the factors of firm size, corporate goals, beta coefficients (systematic risk), and foreign sales as percent of total sales were used to test for significant relationships. However, their study failed to establish any significant relationship between capital budgeting practices and earnings performance (stockholder wealth maximization) or risk (beta coefficients). Stanley and

Block, like other researchers, narrowly defined capital budgeting practices as the use or nonuse of specific capital budgeting methods, such as payback or internal rate of return.

18.4   Political Risk Management

Foreign investment decisions must be made today on the basis of the likely political climate for many years to come. **Political risk** is an assessment of economic opportunity against political odds. Thus, political risk assessment requires that MNCs evaluate both economic and political indicators. Political risk management refers to steps taken by companies to protect against economic losses from unexpected political events.

When the goals of MNCs and their host countries conflict, MNCs face a variety of political risks. The primary goal of an MNC is to maximize the wealth of its stockholders. On the other hand, most host countries desire to develop their economies through greater utilization of local factors of production, in order to maintain more control over key industries through less reliance on foreign capital and know-how, and to strengthen their international position through fewer imports and more exports.

Multinational investors should understand the forces at work when political uncertainty occurs, so that they can forecast future business climates, establish appropriate objectives, and take precautionary measures when necessary. In this section, we discuss the nature of political risks, types of political risks, political risk forecasting, and responses to political risks.

18.4.1   The nature of political risks

Traditionally, conflicts between MNCs and host countries have occurred over such issues as conversion of an economy to the style of a specific political system, joint ventures, control of key industries, contribution to balance of payments, national sovereignty, and economic development. Such conflicts are not limited to developing countries. More subtle, yet very real, conflicts exist between MNCs and developed countries.

It is frequently difficult to separate political and economic risks. While government decisions are political by definition, underlying forces behind the decisions may be purely economic. For example, funds to nonresidents may be blocked because of an unexpected shortage of foreign exchange or a long-run deficiency of the foreign exchange, instead of certain types of domestic political pressures. Some government decisions are partly political and partly economic. The United Nations imposed economic sanctions against Iraq in the fall of 1990 because of Iraq's invasion of Kuwait. The Organization of American States imposed economic sanctions against Haiti in 1994 because of Haiti's human rights violations. Finally, the USA and several other Western countries have imposed a variety of economic sanctions against Afghanistan, Cuba, Iran, Libya, and North Korea for many years.

Countrywide political risks depend on three broad groups of variables: political climate, economic climate, and foreign relations. The political climate may be measured by tendencies toward subversion, rebellion, or political turmoil. Multinational investors should consider such factors as levels of political violence, the existence of extreme tendencies among political parties, and recurring governmental crises.

Investment analysts should make an overall assessment of the economic climate to protect foreign investment from political risks. Relevant economic factors include the likelihood of government intervention in the economy, levels of interest and inflation rates, persistent balance-of-payments deficits, levels of foreign debts, and worsening monetary reserves.

Finally, multinational investors should determine the extent to which host countries manifest hostility toward other countries. Important factors here are incidence of conflict with their neighbors, evidence of an arms race, and sizes of defense budgets.

18.4.2 Types of political risk

Empirical studies have revealed some interesting findings about the attitudes of US and British MNCs toward political risk. Kelly and Philippatos (1982) surveyed 67 US companies to obtain the perceived importance of five variables in political risk. Goddard (1991) surveyed 51 British companies to determine the importance of six variables in political risk. Ranked in descending order of importance, their findings appear in table 18.5. Although there are several different types of political risk, these risks can be divided into two broad categories for all practical purposes: actions that restrict the freedom of a foreign company to operate in a given host environment, and actions that result in the takeover of alien assets.

OPERATIONAL RESTRICTIONS   Actions that restrict the freedom of a foreign company include operational restrictions such as employment policies; locally shared ownership; loss of transfer freedom; exchange controls; financial, personal, or ownership rights; breaches or unilateral revisions in contracts and agreements; discrimination through taxes or compulsory joint ventures; and damage to property or personnel from riots, revolutions, and wars.

Funds are usually blocked in the host country when operational restrictions are imposed. There are a number of ways to remove blocked funds. The most obvious way is to arrange swaps between corporations. Here, each corporation lends to the other in the country where its own funds are restricted. Other methods include transfer price adjustments and other adjustments

Table 18.5 Types of political risk and their importance

USA		UK	
Rank	*Variable*	*Rank*	*Variable*
1	Restrictions on remittances	1	Expropriation or nationalization
2	Operational restrictions on ownership, employment, and market shares	2	Political stability within the country
3	Expropriation or nationalization of dividends	3	Restrictions on remittances and royalties
4	Discrimination	4	Currency stability
5	Breaches in agreements	5	Tax changes
6	Others	6	Exchange controls

Source: Goddard, "Political Risk in International Capital Budgeting," in R. K. Kolb, ed., *The International Financial Reader*, Miami, FL: Kolb Publishing, 1991, p. 360.

such as fees, royalties, and loan repayments. Of course, most of these methods raise some serious ethical and legal questions. Moreover, black market operations may not be available for relatively large transfers of money and highly visible transactions, such as an attempt to terminate company operations in a small, developing country.

EXPROPRIATION   Sales of business assets to local shareholders, compulsory sales of business assets to local and federal government units, and confiscation of business assets with or without compensation all come under the heading of **expropriation**.

Ball and McCulloch (1999) say that many governments nationalize both foreign and domestic companies, and may do so for a number of reasons:

1   The government believes that it could run the business more efficiently.
2   The government believes that the company is concealing its profits.
3   Left-wing governments, oftentimes after being elected, nationalize business firms.
4   Politicians wish to win popular support as they save jobs by putting dying industries on a life support system.
5   The government can control a company or industry by pumping money into the company or industry.

Business operations in foreign countries are subject to the power of host countries. It is customary to seize foreign assets for a public purpose without discrimination and with adequate compensation. Although these three rules are in accordance with traditional principles of international law, they have often been ignored by some developing countries.

Kennedy (1993) analyzed 79 countries in terms of political regimes and their expropriation policies. This study revealed that during the 1960–87 period, these 79 developing countries nationalized l,118 foreign companies in 599 separate actions. The overwhelming majority of expropriations were politically motivated acts that had been undertaken by only a few governments. In fact, only 28 governments out of more than the 300 total accounted for two-thirds of all acts of expropriation.

Figure 18.2 shows expropriation trends from 1960 to 1987. We could divide relations between MNCs and host governments into three eras: MNC domination (1945 to early 1960s), MNC–host government confrontation (mid-1960s to 1980), and MNC–host government realignment (1980s). The history of expropriation activity by less developed countries tracks these three periods quite well. By the mid-1960s, the number of expropriation acts had risen significantly, but the forced divestment of foreign direct investment was most pronounced in the 1970–9 period. In the 1980s, the number of expropriation acts dropped dramatically.

According to Kennedy (1993), there were six primary reasons why a significant upsurge in expropriation would not return in the 1990s and beyond. First, the international demonstration effect today discourages expropriation, because market-oriented systems and privatization are being adopted even in the most socialist of countries. Second, unlike the expectations of traditional dependency theorists, the history of mass expropriation has demonstrated that the economic consequences of such a policy are generally negative. Third, adverse economic consequences would be further aggravated today by the lack of foreign aid from socialist countries, which helped cushion this negative impact in the past. Fourth, if the move toward a market-oriented system and privatization creates significant real growth and prosperity for most people,
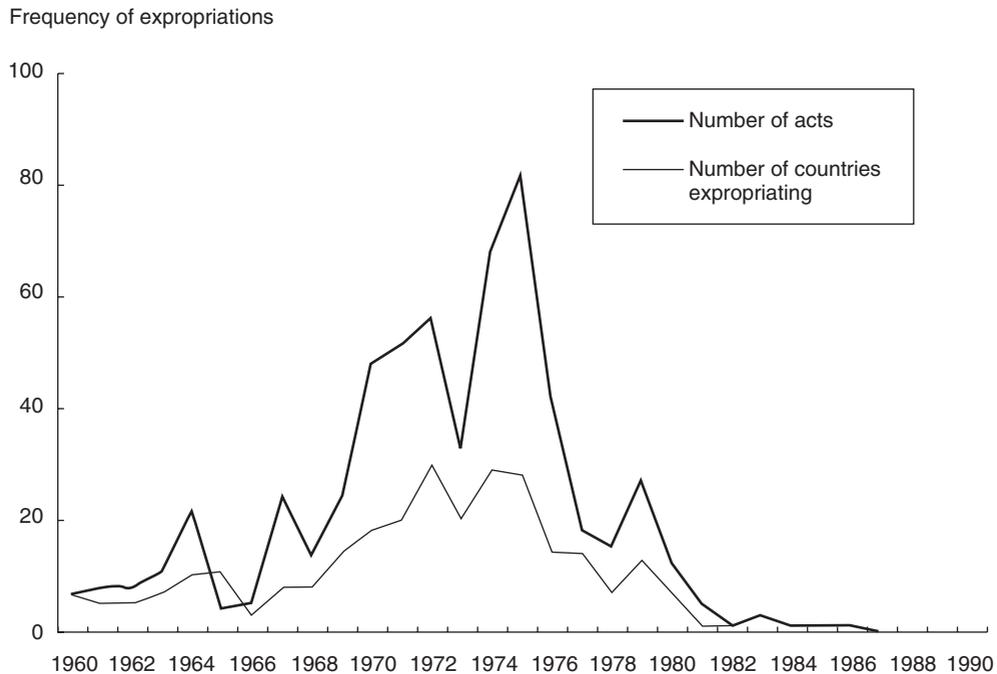
Frequency of expropriations

Figure 18.2 Expropriation acts, by year

Source: C. R. Kennedy, "Multinational Corporations and Expropriation Risk", *Multinational Business Review*, Spring 1993, p. 45.

then the loss of sovereignty over key sectors may be politically accepted. Fifth, the enhanced capabilities of developing countries have reduced their sense of dependency on external factors and have increased their policy options in managing multinational companies. Sixth, the current political impact of colonial or neocolonial experiences on foreign direct investment policy has receded.

18.4.3   Forecasting political risks

Once a manager has examined political risks and their implications, the manager shifts her attention to forecasting these risks in foreign countries where her company has business interests. As MNCs have become more experienced and more diversified, they have maintained political forecasting staffs on the same level as economic forecasting staffs.

In political risk analysis, a manager gives special attention to the "nationalism" of a host country. Nationalism represents loyalty to one's country and pride in it, based on shared common features such as race, language, religion, or ideology. In other words, it is an emotion that can hinder or prevent rational dealings with foreigners. Some effects of nationalism on MNCs are: (1) requirements for minimum local ownership; (2) reservation of certain industries for local

companies; (3) preference of local suppliers for government contracts; (4) limitations on number and type of foreign employees; (5) protectionism based on quotas and tariffs; and (6) expropriation or confiscation of assets.

A number of political-risk assessment techniques are available to MNCs. Some popular techniques include the following:

- The **delphi technique** combines the views of independent experts in order to obtain the degree of political risk on a given foreign project or a particular foreign country. The opinions of these experts about political risk are collected and averaged. One advantage of this method is that political-risk assessment is made easily and quickly. However, its major disadvantage is that it is completely based on opinions rather than facts and analyses.
- The **grand tour** relies on the opinions of company executives visiting the country where investment is being considered. Their visit usually involves a series of meetings with government officials, local businesspeople, and potential customers. This method places responsibility for political-risk assessment in the hands of those who must carry out the proposed investment project. But the results of such a visit can be very superficial and may produce only selected pieces of information.
- The **old hand** depends upon the advice of an outside consultant. Typically, such consultants are college professors, diplomats, local politicians, or businesspeople. The knowledge and experience of the advisor determine the quality of the political-risk assessment.
- Some companies use **quantitative analysis** – statistical techniques – to assess political risk. The basic purpose of these statistical methods is to supplement personal judgment and increase forecasting accuracy. The list of factors to be considered in quantitative methods varies from forecaster to forecaster. But all of these methods combine three major factors: external economic indicators, internal economic indicators, and political indicators.

MULTIPLE METHODS   Any of the techniques described here may be used to assess political risk. Some companies may utilize a number of methods in an attempt to obtain a good picture of the situation. If these methods should all produce about the same results, more confidence may be placed in the findings. If they give widely divergent results, a more careful investigation is needed. Because political-risk assessment is extremely important for success or failure of a project, the multiple-method approach appears to be a sound policy.

18.4.4   Responses to political risks

Forecasting political risk is critical to an MNC in deciding on a particular project. The MNC can protect itself against political risks with government insurance policies and guarantee programs. Chapters 13 and 14 have described these in some detail.

DEFENSIVE MEASURES BEFORE INVESTMENT   There are three types of defensive measures before investment: concession agreements, planned divestment, and adaptation to host-country goals.

Many host countries have recently increased their surveillance of foreign operations within their borders. An MNC ought to negotiate concession agreements to minimize subsequent polit-

ical risks. The concession agreement spells out contractual obligations of the foreign investor and the host government. Careful negotiations may result in contracts that address such critical issues as provision for arbitration of disputes, funds remittances, transfer prices, local equity participation, method of taxation, price controls, the right to exports, and limitations on nationality of personnel.

Planned divestment has been frequently suggested as one of the most important preinvestment strategies in order to avoid subsequent operational restrictions and expropriations. **Planned divestment** provides for the sale of majority ownership in foreign affiliates to local nationals during a previously agreed-upon period of time. Planned divestment is often a necessary condition for entry into foreign markets, or it may be imposed on already existing companies.

The concession agreement specifies the rights and responsibilities of both the foreign company and the host country, but it is often revised to adapt to changing host-country priorities. When the foreign company sticks to the legal interpretation of its concession agreement, the host-country government uses pressures in areas not covered by the agreement. If these pressures do not work, the host-country government reinterprets the agreement to obtain changes from the foreign company. Thus, it is advisable for MNCs to voluntarily adapt to changing host-country priorities whenever possible.

DEFENSIVE MEASURES AFTER INVESTMENT   Once managers have decided to invest and take preinvestment defensive measures, they can use several operating strategies to cope with political risks. We have grouped them for convenience into two categories: strategies that are necessary to be a good citizen of the host country and strategies to alleviate political risks. In addition, joint ventures can be used to diffuse political risks.

Many foreign affiliates attempt to harmonize their policies with their host-country priorities and goals. They may hire an increasing number of local persons for positions initially held by representatives of the parent-company management. They may share ownership with host-country private or public companies. They may develop and use local sources of supply for their raw materials and component requirements. They may try to export their products to bolster host-country reserves of foreign exchange.

Many operational policies and organizational approaches can be used to alleviate political risks. MNCs may maintain technological superiority over local companies and other competing foreign firms. The challenge here is to introduce technological improvements into the host country on a continuing basis. An MNC may integrate individual subsidiaries into a worldwide production and logistical system through highly interrelated international operations. Under such an integration, a subsidiary alone cannot operate or compete successfully, as is the case in the petroleum industry. Control of key patents and processes, joint-venture arrangements, capitalization with a thin equity base and a large local debt proportion, and control of key export markets for a subsidiary's products are examples of policy actions that can alleviate political risks.

Joint ventures with local partners have been frequently suggested as one answer to national demands for an ownership share in certain industries. A joint venture can improve the public image of a subsidiary, provide more capital, and deter operational restrictions. Joint ventures with investors from a number of different countries, such as the USA, Italy, and the UK, can make operational restrictions extremely costly, because they could distress private investors in all three countries and thus impair good economic relations with these national groups of business executives.

SUMMARY

This chapter has focused on the capital investment decision-making process. Although we have broken down the entire decision-making process for foreign investment projects into components and relationships for a detailed inspection, these stages should not be used mechanically. Some steps may be combined, some may be subdivided, and others may be skipped altogether without jeopardizing the quality of the capital budgeting system. It is likely, however, that several of these steps will be in progress simultaneously for any project under consideration. For example, if expenditure controls and post-audits are not planned until the economic evaluation of a project is completed, the capital budgeting process will hardly be realistic. Decisions for expenditure controls and post-audits affect plans, just as planning decisions affect controlling decisions. Thus, the capital budgeting process consists of several related activities that overlap continuously rather than following an ideally prescribed order. Because all steps in the capital investment decision-making process are interwoven, their relationships should not permanently place any one stage first or last in a sequence.

Foreign investment projects involve many complex variables, which do not exist in domestic projects. Two major risks for foreign investment projects are political risk and foreign-exchange risk. In chapters 9 and 10, we considered the nature of foreign-exchange risk and some methods to reduce it. In the last part of this chapter, we described the nature of political risk and some techniques to minimize it. A company may incur losses from political risks because of governmental action, which interferes with the completion of contractual obligations between the foreign company and its host government. Political risks cannot be predicted in the same way as credit losses and thus cannot be offset precisely in measurable ways. Thus, MNCs must understand the types of political risks that they can expect to encounter, assess the likelihood of the encounter, and take various protective measures to minimize the risks.

Project cash inflows and outflows are analyzed after first identifying foreign investment alternatives. Parent cash flows are then obtained by dividing the project cash flows by the exchange rates. Within this context, the net present value of parent cash flows must be positive for a foreign project to be acceptably profitable. In conjunction with the earlier stages of analysis, some adjustments should be made to facilitate risk.

Questions

1   List the 11 phases of the entire decision-making process for a foreign investment project. Should the decision-maker consider these stages one at a time or analyze several of them simultaneously?
2   Given the added political and economic risks that exist overseas, are multinational companies more or less risky than purely domestic companies in the same industry? Are purely domestic companies insulated from effects of international events?
3   Why should subsidiary projects be analyzed from the parent's perspective?

4   List additional factors that deserve consideration in a foreign project analysis but are not relevant for a purely domestic project.

5   Why are transfer pricing policies important in cash flow analysis of a foreign investment project?

6   Most academicians argue that net present value is better than internal rate of return. However, most practitioners say that internal rate of return is better than net present value. Present the arguments for each side.

7   List popular risk-assessment and risk-adjustment techniques. What is the major difference between these two types of risk analysis?

8   Have researchers established a significant relationship between capital budgeting practices and the market price of the common stock? What is the major reason for their finding on this topic?

9   Discuss the nature of political risk.

10   List two major forms of political risk.

11   List some forms of defensive measures against political risks before investment.

12   Why did the number of expropriations decline in the 1980s?

Problems

1   Assume that the American Electrical Corporation (AEC) is considering the establishment of a freezer manufacturing plant in Spain. AEC wants to invest a total of 10,000 Spanish pesetas in the proposed plant. The Pts10,000 will be financed with only common stock, all of which will be owned by the parent company. The plant is to be depreciated over a 5-year period on a straight-line basis for tax purposes. It is expected to have a salvage value of Pts5,000 at the end of 5 years. Spain has 35 percent corporate income tax and no withholding taxes on dividends paid. The USA has 50 percent corporate income tax with direct credit for Spanish taxes. Spain does not impose any restrictions on dividend repatriation, but it does not allow the parent company to repatriate depreciation cash flows until the plant is liquidated. These depreciation cash flows may be reinvested in Spanish government bonds to earn 8 percent tax-exempt interest. The cost of capital used to analyze the project is 15 percent. The current exchange rate of Pts5.00 per US dollar is expected to hold during year 1, but the Spanish peseta is expected to depreciate thereafter at a rate of 5 percent a year. Assume the following revenues and operating costs in terms of Spanish pesetas:

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	10,000	11,000	12,000	13,000	14,000
Operating costs	6,000	6,000	7,000	7,000	8,000

(a) Determine the projected earnings after taxes for the proposed plant.

(b) Determine the interest-compounded depreciation cash flows at the end of 5 years.

(c) Determine the net present value of the plant, the profitability index, and the internal rate of return for the plant in terms of the US dollar.

2 The Wayne Company currently exports 500 calculators per month to Jordan at a price of $60 and the variable cost per calculator is $40. In May 1990, the company is approached by the government of Jordan with a request that it establish a small manufacturing plant in Jordan. After a careful analysis, the company decides to make an equity investment of $1 million, half of which will represent working capital and the other half-fixed assets. The company will sell the plant to a local investor for the sum of $1 at the end of 5 years and the central bank of Jordan will repay the company for the working capital of $500,000. In return for an increase in tariffs against other companies, the Wayne Company is willing to sell its calculators in Jordan for $50 per unit. In addition, the company will have to buy certain raw materials from local suppliers and will have to use local managers. The total costs of the local managers and materials will be $15 per calculator. Other materials will be purchased from the parent at $10 per unit and the parent will receive a direct contribution to overhead after variable costs of $5 per unit sold. Under this arrangement, the company expects that it will sell 1,000 calculators per month. The fixed assets are to be depreciated on a straight-line basis over a 5-year period. The company will have to pay income taxes at 50 percent on profits earned in Jordan. The USA also has a 50 percent tax rate with direct credit for Jordanian taxes. The current exchange rate is 10 Jordanian dinars per dollar and it is expected to stay the same for the next 5 years. There is no restriction on cash flow repatriation.

(a) Determine the net present value of the project at 10 percent.

(b) The Wayne Company has been informed that, if it decides to reject the project, it would lose its entire export sales. How does this affect the decision by the Wayne Company?

3 Problems 1 and 2 highlight the complexities involved in foreign investment decisions. Identify these problems.

4 A project with an initial cost of $15,000 is expected to produce net cash flows of $8,000, $9,000, $10,000, and $11,000 for each of the next 4 years. The firm's cost of capital is 12 percent, but the financial manager perceives the risk of this particular project to be much higher than 12 percent. The financial manager feels that a 20 percent discount rate would be appropriate for the project.

(a) Compute the net present value of the project at the firm's cost of capital.

(b) Compute the risk-adjusted net present value of the project.

5 A project has a cost of $1,400. Its net cash flows are expected to be $900, $1,000, and $1,400 for each of the next 3 years. The respective certainty equivalent coefficients are estimated to be 0.75, 0.55, and 0.35. With a 6 percent risk-free discount rate, determine the certain net present value.

6 Project F has a cost of $3,000 and project G has a cost of $4,000. These two projects are mutually independent and their possible net cash flows are given below. Assume that the cost of capital is 10 percent.

		Net cash flows	
Economic condition	Probability	Project F	Project G
Boom	0.50	$8,000	$ 0
Recession	0.50	0	8,000

(a) Determine the net present value of projects F and G.

(b) Determine the standard deviation of projects F and G.

(c) Determine the portfolio net present value and the portfolio standard deviation.

(d) Discuss the significance of the portfolio effect in terms of international context.

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Case Problem 18: Multinational Capital Budgeting Practices

The literature on foreign capital investment theory reveals that business firms should use discounted cash flow techniques for ranking and selecting overseas projects because these methods recognize the time value of money and employ cash flows of a project over its life span. Table 18.6 illustrates the extent to which discounted cash flow methods were used by companies that were surveyed from 1980 to 1994. These empirical studies revealed two important points: first, discounted cash flow approaches are more popular than rules of thumb; second, internal rate of return is more popular than net present value.

Table 18.6 The use of primary project evaluation techniques

Evaluation method	Oblak (1980)	Kelly (1982)	Stanley (1984)	Kim (1984)	Shao (1994)
Payback	10%	18%	5%	12%	25%
ARR	14%	27%	11%	14%	14%
IRR	60%	36%	65%	62%	40%
NPV	10%	14%	16%	9%	17%
Others	6%	5%	3%	3%	4%
Total	100%	100%	100%	100%	100%

Thus, most MNCs use discounted cash flow approaches for ranking and selecting overseas projects. The five studies cited in table 18.6 show that at least half of the respondents used discounted cash flow approaches, ranging from 50 percent according to Kelly's study to 81 percent in Stanley's study. Although the findings vary in these surveys, their overriding implication suggests that discounted cash flow approaches are unmistakably more popular than rules of thumb. In fact, the use of those techniques favored by academicians has become so commonplace in recent years that we do not need more empirical studies to confirm the adoption of discounted cash flow techniques by most MNCs.

The results are not strictly comparable, because terms such as "exclusive," "most important," and "primary" used by these surveys are not synonymous. On the other hand, the key characteristics for most of these surveys are so similar that our inferences are valid. The firms surveyed were drawn mostly from large industrial categories; sample sizes were relatively large; respondents and sample groups were surveyed by mail; and research methods were carefully adhered to. The respondents revealed that most companies use discounted cash flow approaches for foreign investment projects. With this fact established, it is reasonable to expect that firms using such sophisticated techniques as internal rate of return should make better investment decisions and thus perform better than firms using such unsophisticated techniques as payback.

Case Questions

1   What are the disadvantages of the payback method and the average-rate-of-return method?
2   What are the conditions under which the net-present-value and internal-rate-of-return methods will lead to the same capital-budgeting decision?
3   Why is the net-present-value method theoretically better than the internal-rate-of-return method?
4   Why is internal rate of return more popular than net present value in practice?
5   The website of the Bank for International Settlements, www.bis.org/cbanks.htm, and the website of the US State Department, www.state.gov, give economic information on most countries around the world. Access these websites to obtain economic information that can be used to assess the feasibility of projects in a developing country.

Source: Kim, S. H. and G. Ulferts, "A Summary of Multinational Capital Budgeting Practices," *Managerial Finance*, Spring 1996, pp. 75–85.