

14 Multinational Capital Budgeting

Chapter Objectives

- the capital budgeting analysis of an MNC's subsidiary versus its parent.
- how multinational capital budgeting can be applied to determine whether an international project should be implemented.
- Show how multinational capital budgeting can be adapted to account for special situations such as alternative exchange rate scenarios or when subsidiary financing is considered.
- Explain how the risk of international projects can be assessed.

Subsidiary versus Parent Perspective (1 of 2)

- Different **tax rates** may make a project feasible from a subsidiary's perspective, but not from a parent's perspective.

Restrictions on Remitted Earnings:

- Governments may place restrictions on whether earnings must remain in country.
- If the parent company charges fees to the subsidiary, then a project may appear favorable from a parent perspective, but not from a subsidiary's perspective.

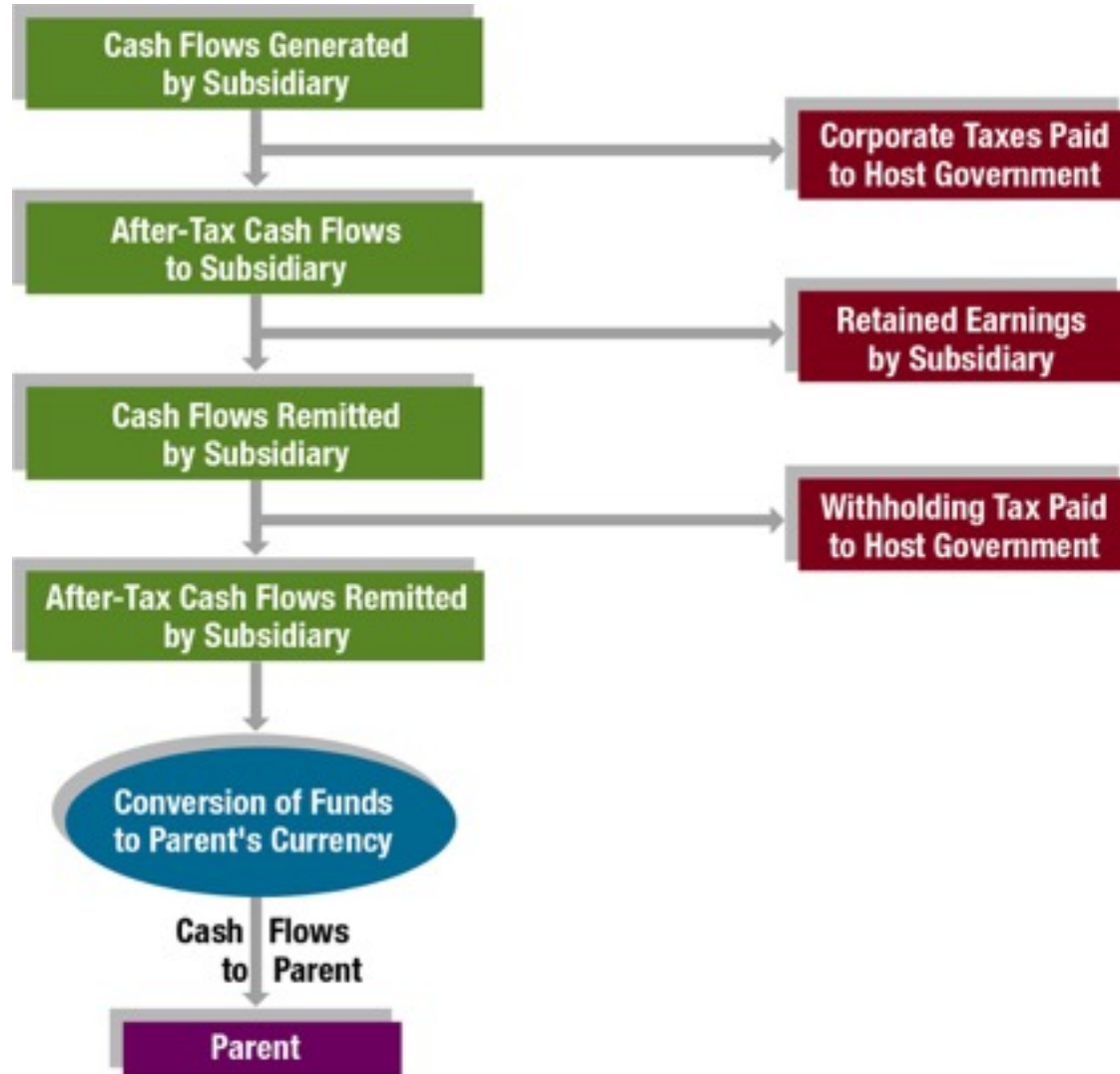
Exchange Rate Movements: Earnings converted to the currency of the parent company will be affected by exchange rate movements.

Subsidiary versus Parent Perspective (2 of 2)

Summary of Factors

- The **parent's perspective** is appropriate when evaluating a project since the parent's shareholders are the owners and any project should generate sufficient cash flows to the parent to enhance shareholder wealth.
- Exception: when the **foreign subsidiary** is not wholly owned by the parent and the foreign project is partially financed with retained earnings of the parent and of the subsidiary.

Exhibit 14.1 Process of Remitting Subsidiary Earnings to Parent



Input for Multinational Capital Budgeting (1 of 2)

An MNC will normally require forecasts of the financial characteristics that influence the initial investment or cash flows of the project.

- **Initial investment** — Funds initially invested include whatever is necessary to start the project, and additional funds, such as working capital, to support the project over time.
- **Price and consumer demand** — Future demand is usually influenced by economic conditions, which are uncertain.
- **Costs** — Variable-cost forecasts can be developed from comparative costs of the components. Fixed costs can be estimated without an estimate of consumer demand.

Input for Multinational Capital Budgeting (2 of 2)

- **Tax laws** — International tax effects must be determined on any proposed foreign projects.
- **Remitted funds** — The MNC policy for remitting funds to the parent influences estimated cash flows.
- **Exchange rates** — These movements are often very difficult to forecast.
- **Salvage (liquidation) values** — Depends on several factors, including the success of the project and the attitude of the host government toward the project.
- **Required rate of return** — The MNC should first estimate its cost of capital, and then it can derive its required rate of return on a project based on the risk of that project.

Multinational Capital Budgeting Example (1 of 5)

Background

- Spartan, Inc., is considering the development of a subsidiary in Singapore that would manufacture and sell tennis rackets locally.
- Spartan's financial managers have asked the manufacturing, marketing, and financial departments to provide them with relevant input so they can apply a capital budgeting analysis to this project.
- In addition, some Spartan executives have met with government officials in Singapore to discuss the proposed subsidiary.
- The project would end in 4 years. All relevant information follows.

Multinational Capital Budgeting Example (2 of 5)

- **Initial investment:** S\$20 million (S\$ = Singapore dollars)
- **Price and consumer demand:**
 - Year 1 and 2: 60,000 units @ S\$350/unit
 - Year 3: 100,000 units @ S\$360/unit
 - Year 4: 100,000 units @ S\$380/unit
- **Costs**
 - Variable costs: Years 1 & 2 S\$200/unit, Year 3 S\$250/unit, Year 4 S\$260/unit
 - Fixed costs: S\$2 million per year
- **Tax laws:** 20% income tax
- **Remitted funds:** 10% withholding tax on remitted funds
- **Exchange rates:** Spot exchange rate of \$0.50 for Singapore dollar
- **Salvage values:** S\$12 million
- **Required rate of return:** 15%

Multinational Capital Budgeting Example (3 of 5)

Analysis

- The capital budgeting analysis is conducted from the parent's perspective, based on the assumption that the subsidiary would be wholly owned by the parent and created to enhance the value of the parent.
- *The capital budgeting analysis to determine whether Spartan, Inc., should establish the subsidiary is provided in Exhibit 14.2.*

Exhibit 14.2 Capital Budgeting Analysis: Spartan, Inc.

		YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1.	Demand		60,000	60,000	100,000	100,000
2.	Price per unit		<u>\$350</u>	<u>\$350</u>	<u>\$360</u>	<u>\$380</u>
3.	Total revenue = (1) × (2)		\$21,000,000	\$21,000,000	\$36,000,000	\$38,000,000
4.	Variable cost per unit		\$200	\$200	\$250	\$260
5.	Total variable cost = (1) × (4)		\$12,000,000	\$12,000,000	\$25,000,000	\$26,000,000
6.	Annual lease expense		\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
7.	Other fixed annual expenses		\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
8.	Noncash expense (depreciation)		<u>\$2,000,000</u>	<u>\$2,000,000</u>	<u>\$2,000,000</u>	<u>\$2,000,000</u>
9.	Total expenses = (5) + (6) + (7) + (8)		\$16,000,000	\$16,000,000	\$29,000,000	\$30,000,000
10.	Before-tax earnings of subsidiary = (3) – (9)		\$5,000,000	\$5,000,000	\$7,000,000	\$8,000,000
11.	Host government tax (20%)		\$1,000,000	\$1,000,000	\$1,400,000	\$1,600,000
12.	After-tax earnings of subsidiary = (10) – (11)		\$4,000,000	\$4,000,000	\$5,600,000	\$6,400,000
13.	Net cash flow to subsidiary = (12) + (8)		\$6,000,000	\$6,000,000	\$7,600,000	\$8,400,000
14.	\$ remitted by subsidiary (100% of net cash flow)		\$6,000,000	\$6,000,000	\$7,600,000	\$8,400,000
15.	Withholding tax on remitted funds (10%)		<u>\$600,000</u>	<u>\$600,000</u>	<u>\$760,000</u>	<u>\$840,000</u>
16.	\$ remitted after withholding taxes = (14) – (15)		\$5,400,000	\$5,400,000	\$6,840,000	\$7,560,000
17.	Salvage value					\$12,000,000
18.	Exchange rate of \$		\$50	\$50	\$50	\$50
19.	Cash flows to parent = [(16) + (17)] × (18)		\$2,700,000	\$2,700,000	\$3,420,000	\$9,780,000
20.	PV of parent cash flows (15% discount rate)		\$2,347,826	\$2,041,588	\$2,248,706	\$5,591,747
21.	Initial investment by parent	\$10,000,000				
22.	Cumulative NPV		–\$7,652,174	–\$5,610,586	–\$3,361,880	\$2,229,867

Multinational Capital Budgeting Example (4 of 5)

Analysis

■ Calculation of Net Present Value

$$NPV = -IO + \sum_{t=1}^n \frac{CF_t}{(1+k)^t} + \frac{SV_n}{(1+k)^n}$$

Where:

IO = initial outlay (investment)

CF_t = cash flow in period t

SV_n = salvage value

k = required rate of return on the project

n = lifetime of the project (number of periods)

Multinational Capital Budgeting Example (5 of 5)

Spartan, Inc. NPV = \$2,229,867

Results

- Because the NPV is positive, Spartan, Inc., may accept this project if the discount rate of 15% has fully accounted for the project's risk.
- If the analysis has not yet accounted for risk, however, Spartan may decide to reject the project.

Other Factors to Consider (1 of 10)

Exchange rate fluctuations

Inflation

Financing arrangement

Blocked funds

Uncertain salvage value

Impact of project on prevailing cash flows

Host government incentives

Real options

Other Factors to Consider (2 of 10)

Exchange Rate Fluctuations (Exhibits 14.3 and 14.4)

- Though exchange rates are difficult to forecast, a multinational capital budgeting analysis could incorporate other scenarios for exchange rate movements, such as a pessimistic scenario and an optimistic scenario.
- **Exchange Rates Tied to Parent Currency** — Some MNCs consider projects in countries where the local currency is tied to the dollar.
- **Hedged Exchange Rates** — Some MNCs may hedge the expected cash flows of a new project, so they should evaluate the project based on hedged exchange rates. (Exhibit 14.5)

Exhibit 14.3 Analysis Using Different Exchange Rate Scenarios: Spartan, Inc.

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
SS remitted after withholding taxes (including salvage value)		SS\$5,400,000	SS\$5,400,000	SS\$6,840,000	SS\$19,560,000
Strong-SS Scenario					
18. Exchange rate of SS		\$.54	\$.57	\$.61	\$.65
19. Cash flows to parent		\$2,916,000	\$3,078,000	\$4,172,400	\$12,714,000
20. PV of cash flows (15% discount rate)		\$2,535,652	\$2,327,410	\$2,743,421	\$7,269,271
21. Initial investment by parent	\$10,000,000				
22. Cumulative NPV		−\$7,464,348	−\$5,136,938	−\$2,393,517	\$4,875,754
Weak-SS Scenario					
18. Exchange rate of SS		\$.47	\$.45	\$.40	\$.37
19. Cash flows to parent		\$2,538,000	\$2,430,000	\$2,736,000	\$7,237,200
20. PV of cash flows (15% discount rate)		\$2,206,957	\$1,837,429	\$1,798,964	\$4,137,893
21. Initial investment by parent	\$10,000,000				
22. Cumulative NPV		−\$7,793,043	−\$5,955,614	−\$4,156,650	−\$18,757

Exhibit 14.4 Sensitivity of the Project's NPV to Different Exchange Rate Scenarios: Spartan, Inc.

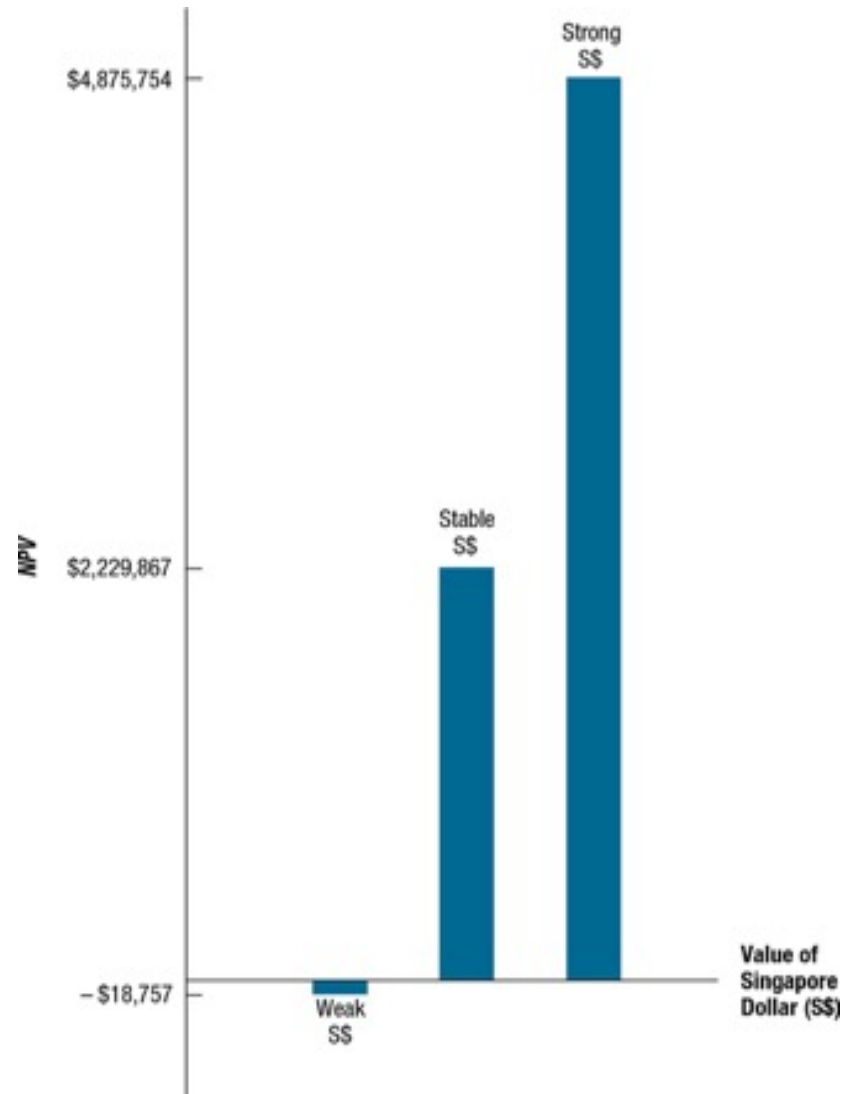


Exhibit 14.5 Analysis When a Portion of the Expected Cash Flows Are Hedged: Spartan Inc.

		YEAR 1	YEAR 2	YEAR 3	YEAR 4
16.	Total S\$ cash flows remitted after withholding taxes	S\$5,400,000	S\$5,400,000	S\$6,840,000	S\$7,560,000
16a.	Hedged S\$ cash flows remitted after withholding taxes	S\$4,000,000	S\$4,000,000	S\$4,000,000	S\$4,000,000
16b.	Unhedged S\$ cash flows = (16) – (16a)	S\$1,400,000	S\$1,400,000	S\$2,840,000	S\$3,560,000
17.	Salvage value				S\$12,000,000
18a.	Forward rate of S\$	\$.48	\$.48	\$.48	\$.48
18b.	Expected future spot rate of S\$	\$.50	\$.50	\$.50	\$.50
19a.	Hedged cash flows to parent = (16a) × (18a)	\$1,920,000	\$1,920,000	\$1,920,000	\$1,920,000
19b.	Unhedged cash flows to parent = [(16b) + (17)] × (18b)	\$700,000	\$700,000	\$1,420,000	\$7,780,000
19c.	Total cash flows to parent = (19a) + (19b)	\$2,620,000	\$2,620,000	\$3,340,000	\$9,700,000
20.	PV of parent cash flows (based on 15% discount rate)	\$2,278,261	\$1,981,096	\$2,196,104	\$5,546,006
21.	Initial investment by parent	\$10,000,000			
22.	Cumulative NPV	–\$7,721,739	–\$5,740,643	–\$3,544,539	\$2,001,467

Other Factors to Consider (3 of 10)

Inflation

- Should affect both costs and revenues.
- Exchange rates of highly inflated countries tend to weaken over time.
- The joint impact of inflation and exchange rate fluctuations may be partially offsetting effect from the viewpoint of the parent.

Other Factors to Consider (4 of 10)

Financing Arrangement

■ Subsidiary financing

- Assume, subsidiary borrows S\$10 million to purchase the previously leased offices. Subsidiary will make interest payments on this loan (of S\$1 million) annually and will pay the principal (S\$10 million) at the end of Year 4, at termination. Singapore government permits a maximum of S\$2 million per year in depreciation for this project, the subsidiary's depreciation rate will remain unchanged. Assume the offices are expected to be sold for S\$10 million after taxes at the end of Year 4.
 - The annual cash outflows for the subsidiary are still the same.
 - The subsidiary must pay the S\$10 million in loan principal at the end of 4 years. However, since it receives S\$10 million from the sale of the offices, it can use the proceeds of the sale to pay the loan principal.

Other Factors to Consider (5 of 10)

Financing Arrangement

■ Parent financing

- Instead of the subsidiary leasing or purchasing with borrowed funds, the parent uses its own funds to purchase the offices. Thus, its initial investment is \$15 million, composed of the original \$10 million investment, plus an additional \$5 million to obtain an extra S\$10 million to purchase the offices.
 - The subsidiary will not have any loan or lease payments.
 - The parent's initial investment is \$15 million instead of \$10 million.
 - The salvage value to be received by the parent is S\$22 million instead of S\$12 million because the offices are assumed to be sold for S\$10 million after taxes at the end of Year 4.

Other Factors to Consider (6 of 10)

Financing Arrangement (cont.)

- **Comparison of parent and subsidiary financing**
 - This revised example shows that the increased investment by the parent increases its exchange rate exposure for the following reasons.
 - First, since the parent provides the entire investment, no foreign financing is required. Consequently, the subsidiary makes no interest payments and therefore remits larger cash flows to the parent.
 - Second, the salvage value to be remitted to the parent is larger. Given the larger payments to the parent, the cash flows ultimately received by the parent are more susceptible

Exhibit 14.6 Analysis with an Alternative Financing Arrangement: Spartan, Inc.

		YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1.	Demand		60,000	60,000	100,000	100,000
2.	Price per unit		<u>S\$350</u>	<u>S\$350</u>	<u>S\$360</u>	<u>S\$380</u>
3.	Total revenue = (1) × (2)		S\$21,000,000	S\$21,000,000	S\$36,000,000	S\$38,000,000
4.	Variable cost per unit		S\$200	S\$200	S\$250	S\$260
5.	Total variable cost = (1) × (4)		S\$12,000,000	S\$12,000,000	S\$25,000,000	S\$26,000,000
6.	Annual lease expense		[S\$0]	[S\$0]	[S\$0]	[S\$0]
7.	Other fixed annual expenses		S\$1,000,000	S\$1,000,000	S\$1,000,000	S\$1,000,000
8.	Noncash expense (depreciation)		<u>S\$2,000,000</u>	<u>S\$2,000,000</u>	<u>S\$2,000,000</u>	<u>S\$2,000,000</u>
9.	Total expenses = (5) + (6) + (7) + (8)		S\$15,000,000	S\$15,000,000	S\$28,000,000	S\$29,000,000
10.	Before-tax earnings of subsidiary = (3) – (9)		S\$6,000,000	S\$6,000,000	S\$8,000,000	S\$9,000,000
11.	Host government tax (20%)		S\$1,200,000	S\$1,200,000	S\$1,600,000	S\$1,800,000
12.	After-tax earnings of subsidiary = (10) – (11)		S\$4,800,000	S\$4,800,000	S\$6,400,000	S\$7,200,000
13.	Net cash flow to subsidiary = (12) + (8)		S\$6,800,000	S\$6,800,000	S\$8,400,000	S\$9,200,000
14.	S\$ remitted by subsidiary (100% of S\$)		S\$6,800,000	S\$6,800,000	S\$8,400,000	S\$9,200,000
15.	Withholding tax on remitted funds (10%)		S\$680,000	S\$680,000	S\$840,000	S\$920,000
16.	S\$ remitted after withholding taxes = (14) – (15)		S\$6,120,000	S\$6,120,000	S\$7,560,000	S\$8,280,000
17.	Salvage value					[S\$22,000,000]
18.	Exchange rate of S\$		\$.50	\$.50	\$.50	\$.50
19.	Cash flows to parent = [(16) + (17)] × (18)		\$3,060,000	\$3,060,000	\$3,780,000	\$15,140,000
20.	PV of parent cash flows (15% discount rate)		\$2,660,870	\$2,313,800	\$2,485,411	\$8,656,344
21.	Initial investment by parent	[S\$15,000,000]				
22.	Cumulative NPV		–\$12,339,130	–\$10,025,330	–\$7,539,919	\$1,116,425

Other Factors to Consider (7 of 10)

Blocked Funds (Exhibit 14.7)

- In some cases, the host country may block funds that the subsidiary attempts to send to the parent.
- Some countries require that earnings generated by the subsidiary be reinvested locally for at least 3 years before they can be remitted.

Exhibit 14.7 Capital Budgeting with Blocked Funds: Spartan, Inc.

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
14. S\$ to be remitted by subsidiary		S\$6,000,000	S\$6,000,000	S\$7,600,000	S\$8,400,000
					S\$7,980,000
14a. S\$ accumulated by reinvesting funds to be remitted					S\$6,615,000
					S\$6,945,750
					<u>S\$29,940,750</u>
15. Withholding tax (10%)					<u>S\$2,994,075</u>
16. S\$ remitted after withholding taxes = (14a) – (15)					S\$26,946,675
17. Salvage value					S\$12,000,000
18. Exchange rate					<u>\$.50</u>
19. Cash flows to parent = [(16) + (17)] × (18)					\$17,473,338
20. PV of parent cash flows (15% discount rate)					\$11,133,944
21. Initial investment by parent	\$10,000,000				
22. Cumulative NPV		–\$10,000,000	–\$10,000,000	–\$10,000,000	\$1,133,944

Other Factors to Consider (8 of 10)

Uncertain Salvage Value

- The salvage value of an MNC's project typically has a significant impact on the project's NPV.
 - Consider scenario analysis to estimate NPV at various salvage values.
 - Consider estimating break-even salvage value at zero NPV.

Breakeven Salvage Value:

$$SV_n = \left[IO - \sum \frac{CF_t}{(1+k)^t} \right] (1+k)^n$$

Other Factors to Consider (9 of 10)

Impact of Project on Prevailing Cash Flows (Exhibit 14.8)

- Impact can be favorable if sales volume of parent increases following establishment of project.
- Impact can be unfavorable if existing cash flows decline following establishment of project.

Host Government Incentives may include:

- Low-rate host government loans
- Reduced tax rates for subsidiary
- Government subsidies of initial investment

Exhibit 14.8 Capital Budgeting When Prevailing Cash Flows Are Affected: Spartan, Inc.

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
19. Cash flows to parent, ignoring impact on existing cash flows		\$2,700,000	\$2,700,000	\$3,420,000	\$9,780,000
19a. Impact of project on existing cash flows		<u>−\$1,000,000</u>	<u>−\$1,000,000</u>	<u>−\$1,000,000</u>	<u>−\$1,000,000</u>
19b. Cash flows to parent, incorporating impact on existing cash flows = (19) − (19a)		\$1,700,000	\$1,700,000	\$2,420,000	\$8,780,000
20. PV of cash flows to parent (15% discount rate)		\$1,478,261	\$1,285,444	\$1,591,189	\$5,019,994
21. Initial investment	\$10,000,000				
22. Cumulative NPV		−\$8,521,739	−\$7,236,295	−\$5,645,106	−\$625,112

Other Factors to Consider (10 of 10)

Real Options

- Opportunity to obtain or eliminate real assets
- Value is influenced by:
 - Probability that real option will be exercised
 - NPV that will result from exercising the real option

Adjusting Project Assessment for Risk

Risk-adjusted discount rate — The greater the uncertainty about a project's forecasted cash flows, the larger should be the discount rate applied to cash flows.

Sensitivity analysis — Can be more useful than simple point estimates because it reassesses the project based on various circumstances that may occur.

Simulation — Can be used for a variety of tasks, including the generation of a probability distribution for NPV based on a range of possible values for one or more input variables. Simulation is typically performed with the aid of a computer package. (Exhibit 14.9).