In addition, if the parent is selling intermediate parts to the subsidiary, the subsidiary's cost of goods sold includes the amount of profit that is included in the transfer pricing of the intermediate parts. Clearly, this profit enhances the value of the subsidiary from the parent company shareholder's perspective.

Although the parent's perspective is ultimately what we want to value, it is often easiest to do international capital budgeting with a three-step approach. We begin with the subsidiary's viewpoint of free cash flow and then consider how the cash flows change when the parent's viewpoint is taken into account. Finally, we adjust for financial side effects and growth options. We now consider these three steps in detail.

A Three-Step Approach to Determining the Value of a Foreign Subsidiary

The first step in deriving the value of a foreign subsidiary to the parent corporation involves conducting the NPV cash flow analysis of the foreign subsidiary as if it were an independent, all-equity firm. This analysis provides the value that an independent company would place on the foreign project if it were licensed to use the technology of the parent corporation. Hence, the royalty payments, licensing fees, and other overhead management fees that the subsidiary must pay the parent are just costs of doing business.

Second, we consider the cash flow implications from the parent's perspective. Several issues are important at this point. First, the dividends that the subsidiary will pay to the parent will incur withholding taxes because foreign governments tax the repatriation of profits. These taxes essentially reduce the value of the free cash flow that accrues to the parent relative to what accrues to the subsidiary by the percentage tax rate. From the parent's perspective, though, the after-tax values of the royalty payments, licensing fees, and management fees that the subsidiary pays the parent provide profits that increase the parent's valuation of the foreign subsidiary. We must also include any profits on sales of intermediate parts from the parent to the subsidiary. Finally, we must watch for cannibalization of exports to the market served by the subsidiary, as discussed in Section 15.2.

In the third step, we must adjust the value of the project for the net present value of financing side effects and possible growth options. Often, there will be loans and subsidies that must be valued. Opportunities for additional growth in the future will also typically be present. These three steps are now demonstrated in an extensive case analysis.

15.6 The Case of International Wood Products

International Wood Products, Inc. (IWPI) is considering whether to build a Spanish manufacturing facility to serve its European market. IWPI is U.S.–based and manufactures wooden tables and chairs. The stylishly designed furniture has found its way into better European homes, and the company forecasts that European demand for its furniture is likely to increase significantly over the next 10 years. IWPI is currently exporting to Europe from its New Hampshire manufacturing plant. Because European demand for the company's products has been growing at 10% per year for the past 5 years, the New Hampshire plant is now operating at 100% of capacity. Hence, this is an appropriate time for IWPI to consider establishing a new European production facility.

Although Spain is not centrally located in Europe, the availability of skilled Spanish workers at relatively low wages makes locating in Spain desirable. In addition, the Spanish government is offering a 10-year, €30 million loan at an attractive interest rate of 3% per annum. The interest payments on the loan would be due annually at the end of the year, and the repayment of principal would be a final payment at the end of year 10.

IWPI-Spain's Free Cash Flows

Initial Investments

IWPI's managers have discovered a manufacturing facility outside of Madrid, Spain, that can be acquired for €100 million. They estimate that the total cost of equipping the plant with the necessary machines would be €73 million. An initial investment in cash and inventory would require another €5.66 million. Hence, the total initial expenditure on the project is

$$€100 \text{ million} + €73 \text{ million} + €5.66 \text{ million} = €178.66 \text{ million}$$

At the spot exchange rate of \$1.40/€, the total initial dollar investment is therefore

$$€178.66 \text{ million} \times \$1.40/€ = \$250.12 \text{ million}$$

After the acquisition, training the Spanish workforce to meet IWPI's high quality standards will take time, and IWPI forecasts that only one-half of the first year's European demand will be met by the Spanish facility.

Forecasting Total Revenue

Exhibit 15.3 presents forecasts of revenue for the next 10 years for IWPI-Spain. Line 1 indicates that growth in European demand is expected to be 10% in the first year; to increase to 12% by the third year, as new showrooms are opened throughout Europe; and then to decline to 1% by year 10, as the market becomes saturated. Line 2 translates these growth forecasts into forecasts of unit sales. Because the current European demand for IWPI's furniture is 40,000 units, 10% growth in year 1 implies expected sales of 44,000 units. One-half of this, or 22,000 units, will be produced in Spain. Thereafter, IWPI plans to satisfy the entire European demand from the Spanish plant. By the 10th year, the Spanish plant expects to produce slightly more than 76,000 units. The Madrid facility is sufficiently large that this growth can be accommodated without a major expansion of plant and equipment.

The current dollar price of a typical unit of IWPI furniture is \$3,430, and IWPI charges an analogous euro price, which at the current exchange rate is

$$\$3{,}430/(\$1.40/€) = €2{,}450$$

Sales in the parts of Europe that do not use the euro will be priced in local currencies, but the retail prices will be dictated by the euro price. This retail price is expected to increase at the euro rate of inflation. The forecasts in Line 3 of Exhibit 15.3 indicate that IWPI expects the euro rate of inflation to first increase before falling to 2% from year 4 into the indefinite future.

Line 5 of Exhibit 15.3 forecasts euro revenue by multiplying the expected euro price per unit in Line 4 by the expected number of units sold in Line 2. Revenue forecasts increase from €55.52 million in the first year to €236.04 million in 10 years.

Exhibit 15.3 Revenue Forecasts for IWPI-Spain

	Year in the Future									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Real Growth Rates of Unit Sales	10%	11%	12%	10%	8%	6%	4%	3%	2%	1%
2. Unit Sales	22,000	48,840	54,701	60,171	64,985	68,884	71,639	73,788	75,264	76,017
3. Euro Inflation Rates	3%	4%	3%	2%	2%	2%	2%	2%	2%	2%
4. Euro Price per Unit	2,524	2,624	2,703	2,757	2,812	2,869	2,926	2,985	3,044	3,105
5. Total Euro Revenue (millions) (Line 2) × (Line 4)	55.52	128.18	147.87	165.91	182.76	197.60	209.62	220.22	229.12	236.04

Exhibit 15.4 Forecasts of Additions to Net Working Capital and Capital Expenditures for IWPI-Spain

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Total Revenue (Exhibit 15.3, Line 5)		55.52	128.18	147.87	165.91	182.76	197.60	209.62	220.22	229.12	236.04
2. Stock of NWC (year 0 given, then 10.5% of Line 1)	5.66	5.83	13.46	15.53	17.42	19.19	20.75	22.01	23.12	24.06	24.78
3. Addition to NWC (Line 2 year i − Line 2 year (i −1))		0.17	7.63	2.07	1.89	1.77	1.56	1.26	1.11	0.93	0.73
4. Capital Expenditures	173.00	10.58	11.01	11.34	11.56	11.80	12.03	12.27	12.52	12.77	13.02
5. Depreciation		10.28	10.90	11.56	12.23	12.92	13.62	14.33	15.06	15.81	16.57

Notes: All numbers are in millions of euros. Capital expenditures are the nominal spending necessary to keep the real capital stock constant.

Forecasting Net Working Capital, Capital Expenditures, and Depreciation

Exhibit 15.4 presents forecasts of investments that IWPI-Spain must make to maintain its productivity and satisfy the demand for its products. These investments are presented now because they determine accounting depreciation, which is a cost of doing business but not a cash outflow.

The first investment is net working capital, the cash and inventory that the firm needs to conduct its business. The initial stock of net working capital is €5.66 million, and we assume that net working capital is expected to be 10.5% of total revenue. Line 1 of Exhibit 15.4 presents the total revenue forecasts, and the required stocks of net working capital are in Line 2. The additions to net working capital are presented in Line 3 and represent the increases in the stocks from year to year. For example, 10.5% of the first year's total revenue is €5.83 million, which is greater than the initial €5.66 million. Hence, the first-year investment is

$$€5.83 \text{ million} - €5.66 \text{ million} = €0.17 \text{ million}$$

Line 4 of Exhibit 15.4 presents the forecasts of capital expenditures (CAPX). Annual nominal CAPX is required to offset economic depreciation, that is, the wearing out of plant and equipment. Management anticipates that economic depreciation as a percentage of the real capital stock will coincide with the percentage associated with accounting depreciation, derived below. But, as the plant and equipment wear out, the nominal euros that must be spent to keep the real capital stock constant increase with inflation.

The Spanish tax authorities require straight-line accounting depreciation with a 3% per year allowance for plant and 10% per year allowance for equipment. Because plant represents 58% (€100 million out of €173 million) of the initial CAPX and equipment represents 42% (€73 million out of €173 million), accounting depreciation in the first year is $(0.03 \times 0.58) + (0.10 \times 0.42) = 5.94\%$ of initial CAPX (€173 million), or €10.28 million. We assume that CAPX in year 1 is also 5.94% of initial CAPX, but 3% more must be spent due to inflation. Hence, CAPX in year 1 is €10.58 million. In later years, CAPX grows with the euro rate of inflation, $\pi(t+k, €)$, because purchasing the same 5.94% of the real plant and equipment gets progressively more expensive:

$$\text{CAPX}(t+k) = \text{CAPX}(t+k-1) \times (1 + \pi(t+k, €))$$

Line 5 of Exhibit 15.4 presents the forecasts of accounting depreciation, which are related to the forecasts of CAPX. Until the initial plant and equipment are fully depreciated, which

will take 33 years for plant and 10 years for equipment, depreciation in year $t+k$ is the same as last year's depreciation plus 5.94% of last year's CAPX. Hence, depreciation follows

$$\text{Depreciation}(t+k) = \text{Depreciation}(t+k-1) + 0.0594 \times \text{CAPX}(t+k-1)$$

Forecasting Total Costs

Exhibit 15.5 forecasts total costs for IWPI-Spain, which include variable costs and fixed costs. Variable cost per unit has three components. Labor costs in Line 1.a begin at €702. Materials sourced in Europe, presented in Line 1.b, are forecast to cost €665 per unit in the first year. Intermediate parts sourced from the parent company, IWPI-U.S., are presented in Line 1.c and are forecast to cost €407 per unit in the first year. Labor costs, the price of European materials, and the euro price of U.S. parts are each forecast to increase at the euro rate of inflation. For imported parts, this assumption is consistent with the dollar prices of the parts being expected to increase at the dollar rate of inflation and the $/€ exchange rate being expected to satisfy relative purchasing power parity (see Chapter 8). Total variable cost in Line 2 represents the estimated number of units sold in a particular year (Line 2 of Exhibit 15.3) multiplied by the sum of the per-unit variable labor costs and the two material costs. Total variable cost is forecast to increase from €39.03 million in the first year to €165.93 million in 10 years.

The next part of Exhibit 15.5 forecasts the costs associated with the royalty and the overhead allocation agreements between IWPI-U.S. and IWPI-Spain. The royalty fee paid by IWPI-Spain to its parent, in Line 3, is 5% of total revenue. The overhead allocation fee paid to the parent corporation for accounting and other managerial assistance, in Line 4, is 2% of total revenue. Because these fees are constant percentages of total revenue, they grow with total revenue.

Fixed costs and direct overhead expenses of IWPI-Spain are presented in Line 5 of Exhibit 15.5. These begin at €1.59 million and increase at the euro rate of inflation. Depreciation, calculated in Exhibit 15.4, is the last cost and is presented again for completeness as Line 6.

Total cost in Line 7 of Exhibit 15.5 is the sum of total variable cost in Line 2, the royalty fee in Line 3, the overhead allocation fee in Line 4, the overhead expenses in Line 5, and depreciation in Line 6. Total costs are forecast to increase from €54.78 million in the first year to €200.98 million in 10 years.

Exhibit 15.5 Cost Forecasts for IWPI-Spain

	Year in the Future									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Variable Cost per Unit										
a. Labor	702	730	752	767	782	798	814	830	847	864
b. Materials Sourced in Europe	665	692	712	727	741	756	771	786	802	818
c. Parts Purchased from IWPI-U.S.	407	423	436	445	454	463	472	481	491	501
2. Total Variable Cost (Lines 1.a + 1.b + 1.c) × (Exhibit 15.3, Line 2)	39.03	90.11	103.95	116.63	128.48	138.91	147.36	154.81	161.07	165.93
3. Royalty Fees @ 5% of Total Revenue (0.05 × Exhibit 15.3, Line 5)	2.78	6.41	7.39	8.30	9.14	9.88	10.48	11.01	11.46	11.80
4. Overhead Allocation @ 2% of Total Revenue (0.02 × Exhibit 15.3, Line 5)	1.11	2.56	2.96	3.32	3.66	3.95	4.19	4.40	4.58	4.72
5. Overhead Expenses	1.59	1.65	1.70	1.74	1.77	1.81	1.84	1.88	1.92	1.96
6. Depreciation (Exhibit 15.4, Line 5)	10.28	10.90	11.56	12.23	12.92	13.62	14.33	15.06	15.81	16.57
7. Total Cost (Lines 2 + 3 + 4 + 5 + 6)	54.78	111.64	127.56	142.21	155.96	168.17	178.21	187.17	194.83	200.98

Note: All numbers except the per-unit values in Line 1 are in millions of euros.

Exhibit 15.6 Forecasts of After-Tax Profit for IWPI-Spain

	Year in the Future									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Total Revenue (Exhibit 15.3, Line 5)	55.52	123.18	147.87	165.91	182.76	197.60	209.62	220.22	229.12	236.04
2. Total Cost (Exhibit 15.5, Line 7)	54.78	111.64	127.56	142.21	155.96	168.17	178.21	187.17	194.33	200.98
3. Earnings Before Interest and Tax (EBIT) (Line 1 − Line 2)	0.74	16.54	20.30	23.69	26.80	29.43	31.41	33.05	34.29	35.06
4. Corporate Income Tax @ 35% (0.35 × Line 3)	0.26	5.79	7.11	8.29	9.38	10.30	10.99	11.57	12.00	12.27
5. Earnings After Tax (NOPLAT) (Line 3 − Line 4)	0.48	10.75	13.20	15.40	17.42	19.13	20.41	21.48	22.29	22.79

Note: All numbers are in millions of euros.

Forecasting Net Operating Profit Less Adjusted Taxes (NOPLAT)

Exhibit 15.6 forecasts NOPLAT. Line 1 reproduces the forecasts of total revenues from Line 5 of Exhibit 15.3. Line 2 reproduces the forecasts of total costs from Line 7 of Exhibit 15.5. The difference between total revenue and total cost is earnings before interest and taxes (EBIT), which is presented in Line 3. With a Spanish corporate income tax rate of 35%, Line 4 gives corporate taxes as 35% of EBIT. Line 5 presents after-tax earnings or NOPLAT, which start at €0.48 million in the first year and increase to €22.79 million in 10 years.

Forecasting IWPI-Spain's Free Cash Flow

Exhibit 15.7 presents the forecasts of IWPI-Spain's free cash flow. The first line presents after-tax earnings (NOPLAT), derived in Line 5 of Exhibit 15.6. To NOPLAT we add the accounting depreciation in Line 6 of Exhibit 15.5 because accounting depreciation was subtracted as a cost, but it is not a cash flow. The firm's investments, the change in its net working capital and its capital expenditures, from Lines 3 and 4 of Exhibit 15.6, are then subtracted. The results in Line 5 of Exhibit 15.7 are the forecasts of free cash flow (FCF). The initial FCF is negative and represents the initial cost of the project. Forecasts of FCF start at zero in year 1 and grow to €25.60 million in year 10.

The Net Present Value of IWPI-Spain

The forecasts of free cash flow must then be discounted to the present. The discount rate reflects a 4.5% nominal interest rate on 10-year German government bonds (the risk-free euro interest rate), a beta for the project of 1.2, and an equity risk premium of 5.5%:

$$11.1\% = 4.5\% + (1.2 \times 5.5\%)$$

Hence, the discount factor for year k in the future is $1/(1 + 0.111)^k$, and these values are given in Line 6 of Exhibit 15.7. Multiplying these discount factors by the forecasts of free cash flow in Line 5 gives the present values of the free cash flows in Line 7. The sum of these present values plus the terminal value provides the net present value of the project.

Deriving the Terminal Value

The terminal value in Line 8 of Exhibit 15.7 represents the discounted present value of all expected future free cash flows in years 11 and beyond into the indefinite future. The year 0 value of the terminal value is calculated to be €100.17 million. This terminal value is calculated in two steps. First, the terminal value of free cash flow in year 10 is taken to be a perpetuity that is growing at the long-run euro rate of inflation of 2%. The perpetuity must

Exhibit 15.7 Net Present Value of Project Free Cash Flows for IWPI-Spain

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Earnings After Tax (NOPLAT) (Exhibit 15.6, Line 5)		0.48	10.75	13.20	15.40	17.42	19.13	20.41	21.48	22.29	22.79
2. Depreciation (Exhibit 15.4, Line 5)		10.28	10.90	11.56	12.23	12.92	13.62	14.33	15.06	15.81	16.57
3. Change in NWC (Exhibit 15.4, Line 3)	5.66	0.17	7.63	2.07	1.89	1.77	1.56	1.26	1.11	0.93	0.73
4. Capital Expenditures (CAPX) (Exhibit 15.4, Line 4)	173.00	10.58	11.01	11.34	11.56	11.80	12.03	12.27	12.52	12.77	13.02
5. Free Cash Flow (FCF) (Lines 1 + 2 − 3 − 4)	−178.66	0.00	3.02	11.35	14.17	16.77	19.16	21.21	22.91	24.39	25.60
6. Discount Factors (@ 11.1% per annum)	1.00	0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
7. Present Value of FCF (Lines 5 × 6)	−178.66	0.00	2.45	8.28	9.30	9.91	10.19	10.15	9.87	9.46	8.94
8. Terminal Value	100.17										
9. NPV of the Project (sum of Line 7 + Line 8)	0.05										

Notes: All numbers except the discount factors are in millions of euros. The terminal value is the discounted value of free cash flow from years 11 to infinity, calculated as a perpetuity growing at the euro rate of inflation of 2%.

be discounted at 11.1%, and its starting value in year 11 will be 2% higher than the expected value of the free cash flow in year 10. That is, the terminal value in year 10 is

$$\frac{(€25.60 \text{ million}) \times (1 + 0.02)}{(0.111 - 0.02)} = €286.95 \text{ million}$$

Second, the terminal value in year 10 is discounted to year 0 by dividing by $(1 + 0.111)^{10}$:

$$\text{Terminal value in year 0} = \frac{€286.95 \text{ million}}{(1 + 0.111)^{10}} = €100.17 \text{ million}$$

Notice that IWPI forecasts 2% growth in free cash flow into the indefinite future, which is the expected euro rate of inflation. This reflects IWPI's assessment that the Spanish plant and equipment can only produce 76,000 units. Consequently, free cash flow cannot grow faster than inflation without additional investments.

The last line of Exhibit 15.7 adds the present values of the free cash flows in Line 7 and the terminal value in Line 8 to obtain an initial net present value of the project of €0.05 million. This is the value that an independent all-equity Spanish company that was licensed by IWPI would place on the cash flows coming from IWPI-Spain. Such a company would have a zero net present value project. The projected value of the free cash flows in years 1 to infinity would just be worth what the company would pay in the initial year.

The Parent Company's Perspective

This section considers how the value of a project changes when we take the perspective of the U.S. parent corporation. We first adjust for differences in taxes because the U.S. parent owes U.S. taxes on the dividends it receives, but it also receives some tax credits. More importantly, many items that were costs to the subsidiary provide profit to the parent. This

additional profit substantially enhances the parent's value of the project. Throughout this section, we continue to present the analysis in euros, although we note that U.S. taxes must be paid in dollars.

Forecasting the Dividends Received by IWPI-U.S.

We assume that the dividends IWPI-Spain pays to its parent company, IWPI-U.S., will equal its annual free cash flow. The amount that IWPI-U.S. receives depends on both Spanish and U.S. tax laws. Exhibit 15.8 demonstrates that IWPI-U.S. initially receives 10% less than IWPI-Spain pays because the Spanish government imposes a 10% withholding tax on dividends paid by subsidiaries to their parent corporations.

Calculating the U.S. Foreign Tax Credit

Under U.S. tax law, IWPI-U.S. can claim a foreign tax credit for the withholding tax that is paid on the international dividends it receives. IWPI-U.S. also receives a tax credit for a portion of the Spanish income tax paid by IWPI-Spain. The portion of the Spanish tax that becomes a U.S. tax credit is determined by the deemed paid credit, which is discussed shortly. These tax credits help to offset the IWPI-U.S. income tax liability in the United States on the dividend income it receives from its Spanish subsidiary. Exhibit 15.9 presents the U.S. foreign tax credit, and Exhibit 15.10 derives the potential U.S. tax liability.

Exhibit 15.8 Dividends Received by IWPI-U.S.

	Year in the Future									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Dividend Paid to IWPI-U.S. (Exhibit 15.7, Line 5)	0.00	3.02	11.35	14.17	16.77	19.16	21.21	22.91	24.39	25.60
2. Spanish Withholding Taxes @ 10% (0.10 × Line 1)	0.00	0.30	1.14	1.42	1.68	1.92	2.12	2.29	2.44	2.56
3. After-Tax Dividend Rec'd by IWPI-U.S. (Line 1 − Line 2)	0.00	2.72	10.22	12.76	15.09	17.24	19.09	20.62	21.95	23.04

Note: All numbers are in millions of euros.

Exhibit 15.9 Calculation of Foreign Tax Credit for IWPI-U.S.

	Year in the Future									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Net Income to IWPI-Spain (Exhibit 15.6, Line 5)	0.48	10.75	13.20	15.40	17.42	19.13	20.41	21.48	22.29	22.79
2. Dividend Paid by IWPI-Spain (Exhibit 15.8, Line 1)	0.00	3.02	11.35	14.17	16.77	19.16	21.21	22.91	24.39	25.60
3. Income Tax Paid by IWPI-Spain (Exhibit 15.6, Line 4)	0.26	5.79	7.11	8.29	9.38	10.30	10.99	11.57	12.00	12.27
4. Deemed Paid Credit to IWPI-U.S. for Income Taxes Paid by IWPI-Spain [(Line 2/ Line 1) × Line 3] if Line 2 < Line 1; Line 3, otherwise	0.00	1.63	6.11	7.63	9.03	10.30	10.99	11.57	12.00	12.27
5. Withholding Tax Paid (Exhibit 15.8, Line 2)	0.00	0.30	1.14	1.42	1.68	1.92	2.12	2.29	2.44	2.56
6. Total Foreign Tax Credit (Line 4 + Line 5)	0.00	1.93	7.25	9.05	10.71	12.22	13.11	13.86	14.44	14.83

Note: All numbers are in millions of euros.

Exhibit 15.10 Calculation of U.S. Tax Liability of IWPI-U.S.

	Year in the Future									
	1	2	3	4	5	6	7	8	9	10
1. Grossed-up Foreign Dividend Received (Exhibit 15.8, Line 3 + Exhibit 15.9, Line 6)	0.00	4.64	17.46	21.81	25.80	29.46	32.21	34.48	36.39	37.88
2. Tentative U.S. Tax Liability @ 34% (0.34 × Line 1)	0.00	1.58	5.94	7.41	8.77	10.02	10.95	11.72	12.37	12.88
3. Available Foreign Tax Credit (Exhibit 15.9, Line 6)	0.00	1.93	7.25	9.05	10.71	12.22	13.11	13.86	14.44	14.83
4. Net U.S. Tax Owed (Line 2 − Line 3, if Line 2 > Line 3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Excess Foreign Tax Credit (Line 3 − Line 2, if Line 2 < Line 3)	0.00	0.35	1.31	1.64	1.94	2.20	2.16	2.13	2.07	1.95

Note: All numbers are in millions of euros.

The most important part of Exhibit 15.9 is the calculation of the **deemed-paid credit** in Line 4. If the ratio of the dividend paid by IWPI-Spain to its after-tax income is less than 1, only that corresponding fraction of the income tax paid by IWPI-Spain is allowed as a credit against U.S. taxes owed by IWPI-U.S. For example, Line 1 of Exhibit 15.9 shows that the year 2 forecast of after-tax income (NOPLAT) of IWPI-Spain is €10.75 million. Because of its investments in CAPX and the change in net working capital that must be made in that year, IWPI-Spain will not pay its full after-tax income as a dividend. In Line 2 of Exhibit 15.9, we see that the year 2 forecast of IWPI-Spain's free cash flow is €3.02 million, and this amount will be paid to the parent as a dividend. Consequently, even though IWPI-Spain expects to pay €5.79 million in Spanish income taxes, only €1.63 million is allowed as a U.S. foreign tax credit because this is the same proportion of the income tax as the income paid by IWPI-Spain to its parent as a dividend:

$$\frac{\text{Dividend of €3.02 million}}{\text{Net income of €10.75 million}} \times \text{Spanish tax of €5.79 million} = \text{Credit of €1.63 million}$$

The reason that only €1.63 million of the Spanish income tax of €5.79 million is allowed as a foreign tax credit is that the U.S. government recognizes that only that fraction of the income of the foreign subsidiary was paid to the parent. After year 5, the dividend paid is forecast to be larger than the subsidiary's net income because of increases in depreciation relative to CAPX, so the full Spanish tax is credited. The sum of the deemed-paid credit (Line 4) and the dividend withholding tax (Line 5) gives the foreign tax credit in Line 6 of Exhibit 15.9.

Calculating the U.S. Income Tax Liability for IWPI-U.S.

Exhibit 15.10 calculates whether IWPI-U.S. will owe additional U.S. income tax on the dividends it receives from IWPI-Spain or whether there will be excess foreign tax credits that can be used to offset the U.S. income tax IWPI-U.S. owes on other foreign income. Line 1 presents the **grossed-up dividend**, which is the sum of the actual dividend received (Exhibit 15.8, Line 3) plus the foreign tax credit (Exhibit 15.9, Line 6).

In year 2, the dividend received after paying the Spanish withholding tax is €2.72 million. The foreign tax credit in year 2 is €1.93 million. Hence, for U.S. tax purposes, the grossed-up dividend is €2.72 million + €1.93 million = €4.65 million. Because the U.S. corporate income tax rate is 34%, the U.S. corporate income tax on this amount would be

$$0.34 \times €4.65 \text{ million} = €1.58 \text{ million}$$

If the tentative U.S. tax liability is less than the available foreign tax credit, calculated in Exhibit 15.9 and presented in Line 3 of Exhibit 15.10, then no additional U.S. tax is owed. This analysis is evaluated in Line 4. Line 5 of Exhibit 15.10 subtracts the U.S. tax liability from the available foreign tax credit to calculate the excess foreign tax credit. These excess foreign tax credits can be used by IWPI-U.S. to offset U.S. income taxes owed on other foreign income.

Calculating the Net Present Value of After-Tax Dividends Received by IWPI-U.S.

Now, we can calculate the after-tax value of the dividends received by IWPI-U.S. In Exhibit 15.11 the present value of after-tax dividends received by IWPI-U.S. is €160.84 million. This present value includes a terminal value, calculated as a perpetuity, growing at 2% and discounted at 11.1%:

$$€90.15 \text{ million} = \frac{€23.04 \text{ million} \times 1.02}{(0.111 - 0.02) \times (1.111)^{10}}$$

Because the present value of the dividends is less than the €178.66 million total cost of the project, if dividends were the only source of value, the NPV of the project would be negative, and it would not be undertaken. But, there are additional sources of value. IWPI-U.S. receives royalties and overhead allocation fees that add value to the project.

Forecasting the Royalty and Overhead Allocation Fees

The royalty fee in Line 1 of Exhibit 15.12 is forecast to be 5% of total revenue, which was calculated in Exhibit 15.3. The Spanish government extracts a 10% withholding tax on royalty payments, in Line 2, in recognition of the fact that the royalty payment is income to the parent, exactly like a dividend. The overhead allocation fee in Line 3 of Exhibit 15.12 is also a cost to the subsidiary and a profit to the parent. It is forecast to be 2% of total revenue, and the Spanish government extracts a 14% withholding tax on such payments, as is calculated in Line 4. Line 5 of Exhibit 15.12 sums the after-withholding-tax values of the royalty and overhead fees, which provide forecasts of income to IWPI-U.S. The tentative U.S. corporate tax liability of 34% is calculated in Line 6, based on the gross of foreign tax royalties and fees received, because the U.S. government gives a tax credit for the Spanish withholding taxes. Line 7 presents the excess foreign tax credit that is available from Exhibit 15.10. The net U.S. tax owed is calculated in Line 8. IWPI receives a tax credit for the two withholding taxes and can use the excess foreign tax credit from its dividends.

Exhibit 15.11 Net Present Value of After-Tax Dividends for IWPI-U.S.

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. After Tax Value of Dividends to IWPI-U.S. (Exhibit 15.8, Line 3 − Exhibit 15.10, Line 4)		0.00	2.72	10.22	12.76	15.09	17.24	19.09	20.62	21.95	23.04
2. Discount Factors (@ 11.1% per annum)	1.00	0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
3. Present Value of After-Tax Dividends (Line 1 × Line 2)		0.00	2.20	7.45	8.37	8.92	9.17	9.14	8.88	8.51	8.04
4. Terminal Value of Dividends	90.15										
5. NPV of After-Tax Dividends (sum of Line 3 + Line 4)	160.84										

Notes: All numbers except the discount factors are in millions of euros. The terminal value is the discounted value of dividends from years 11 to infinity, calculated as a perpetuity growing at the euro rate of inflation of 2%.

Exhibit 15.12 Net Present Value of After-Tax Royalty and Overhead Allocation Fees Received by IWPI-U.S.

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Royalty Fee @ 5% of Total Revenue (Exhibit 15.5, Line 3)		2.78	6.41	7.39	8.30	9.14	9.88	10.48	11.01	11.46	11.80
2. Spanish Withholding Tax @ 10% (0.10 × Line 1)		0.28	0.64	0.74	0.83	0.91	0.99	1.05	1.10	1.15	1.18
3. Overhead Fee @ 2% of Total Revenue (Exhibit 15.5, Line 4)		1.11	2.56	2.96	3.32	3.66	3.95	4.19	4.40	4.58	4.72
4. Spanish Withholding Taxes @ 14% (0.14 × Line 3)		0.16	0.36	0.41	0.46	0.51	0.55	0.59	0.62	0.64	0.66
5. After-Tax Fees Received by IWPI-U.S. (Line 1 − Line 2 + Line 3 − Line 4)		3.45	7.97	9.20	10.32	11.37	12.29	13.04	13.70	14.25	14.68
6. Tentative U.S. Tax Liability @ 34% (0.34 × (Line 1 + Line 3)		1.32	3.05	3.52	3.95	4.35	4.70	4.99	5.24	5.45	5.62
7. Excess Foreign Tax Credit from Dividends (Exhibit 15.10, Line 5)		0.00	0.35	1.31	1.64	1.94	2.20	2.16	2.13	2.07	1.95
8. Net U.S. Tax Owed (Line 6 − Line 2 − Line 4 − Line 7)		0.89	1.70	1.06	1.02	0.99	0.96	1.19	1.39	1.60	1.82
9. After-Tax Value of Fees to IWPI-U.S. (Line 5 − Line 8)		2.57	6.27	8.14	9.30	10.38	11.33	11.85	12.31	12.65	12.86
10. Discount Factors (@ 11.1% per annum)		0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
11. Present Value of After-Tax Fees (Line 8 × Line 9)		2.31	5.08	5.94	6.10	6.13	6.02	5.67	5.30	4.91	4.49
12. Terminal Value of Fees	50.31										
13. NPV of After-Tax Fees (Sum of Line 11 + Line 12)	102.26										

Notes: All numbers except the discount factors are in millions of euros. The terminal value is the discounted value of fees from years 11 to infinity, calculated as a perpetuity growing at the euro rate of inflation of 2%.

For example, in year 2, IWPI-U.S. receives €7.97 million of after-withholding-tax fees, based on €8.97 million of gross income. This gross income generates a tentative U.S. tax liability of €3.05 million. But IWPI-U.S. paid withholding taxes of €0.64 million on the royalty and €0.36 million on the overhead, for which it receives foreign tax credits. IWPI-U.S. can also use the €0.35 million of excess foreign tax credits associated with the income tax on its dividends, calculated in Exhibit 15.10, to offset U.S. tax owed. The net result is a tax liability of

$$€3.05 \text{ million} - €0.64 \text{ million} - €0.36 \text{ million} - €0.35 \text{ million} = €1.70 \text{ million}$$

Subtracting the actual U.S. tax liability in Line 8 of Exhibit 15.12 from the after-tax fees received in Line 5 gives the after-tax value of the fees to IWPI-U.S. shown in Line 9. These profits are also discounted at 11.1% per annum, and the discount factors are again presented in Line 10. Multiplying the expected values in Line 9 by the discount factors in Line 10 gives the present values of the fees in Line 11. The terminal value of the fees for years 11 to the indefinite future discounted to year 0 is €50.31 million, and it is calculated just like the terminal value of dividends. The net present value of the fees, which is the sum of the discounted values in Line 11 and the terminal value in Line 12, is €102.26 million.

Forecasting the Profits Earned from Intermediate Goods

Because IWPI-U.S. sells intermediate parts to IWPI-Spain, additional profit accrues to IWPI-U.S. Exhibit 15.13 calculates the net present value of these export profits. Export revenue is

Exhibit 15.13 Net Present Value of After-Tax Profit on Intermediate Goods Sold by IWPI-U.S. to IWPI-Spain

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Unit Sales (Exhibit 15.3, Line 2)		22,000	48,840	54,701	60,171	64,985	68,884	71,639	73,788	75,264	76,017
2. Per-Unit Price of Exported Parts (Exhibit 15.5, Line 1.c)		407	423	436	445	454	463	472	481	491	501
3. Export Revenue of IWPI-U.S. (Line 1 × Line 2)		8.95	20.67	23.85	26.76	29.48	31.87	33.81	35.52	36.95	38.07
4. Before-Tax Profit @ 16% Margin (0.16 × Line 3)		1.43	3.31	3.82	4.28	4.72	5.10	5.41	5.68	5.91	6.09
5. U.S. Corporate Tax @ 34% (0.34 × Line 4)		0.49	1.12	1.30	1.46	1.60	1.73	1.84	1.93	2.01	2.07
6. After-Tax Profit (Line 4 − Line 5)		0.95	2.18	2.52	2.83	3.11	3.37	3.57	3.75	3.90	4.02
7. Discount Factors (@ 11.1% per annum)		0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
8. Present Value of After-Tax Profits (Line 6 × Line 7)		0.85	1.77	1.84	1.85	1.84	1.79	1.71	1.62	1.51	1.40
9. Terminal Value of Profits	15.73										
10. NPV of After-Tax Profits (sum of Line 8 + Line 9)	31.91										

Notes: All numbers except Lines 1 and 2 and the discount factors are in millions of euros. The terminal value is the discounted value of profits from years 11 to infinity, calculated as a perpetuity growing at the euro rate of inflation of 2%.

calculated in Line 3 as the product of the euro price of exported parts per unit in Line 2 multiplied by the unit sales forecast in Line 1.

The profit margin on these export sales is known to be 16%, and this is calculated in Line 4. U.S. corporate income tax on this profit is 34% in Line 5, and the after-tax profits are presented in Line 6. The present value of these expected profits on export sales is €31.91 million.

Valuing the Financial Side Effects

IWPI-U.S. also gets value from the financial side effects associated with the project. The Spanish government is offering a subsidized loan, and the interest payments provide valuable interest tax shields. When the Spanish government loan is repaid, IWPI-U.S. also plans to issue perpetual debt. Let's begin with the valuation of the interest tax shields in Exhibit 15.14.

Interest Tax Shields

The interest rate on the Spanish government loan is 3% per annum, the principal on the loan is €30 million, and the maturity of the loan is 10 years. Hence, for the next 10 years, IWPI-Spain will make annual interest payments of

$$0.03 \times €30 \text{ million} = €0.9 \text{ million}$$

These interest payments are valuable because they are tax deductible. Consequently, they increase the value of the project each year by the Spanish tax rate multiplied by the interest payment:

$$0.35 \times €0.9 \text{ million} = €0.315 \text{ million}$$

Exhibit 15.14 Net Present Value of Interest Tax Shields

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Tax Rate × Interest Paid		0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315
2. Discount Factors (@ 6.00% per annum)		0.94	0.89	0.84	0.79	0.75	0.70	0.67	0.63	0.59	0.56
3. Present Value of Interest Tax Shields (Line 1 × Line 2)		0.30	0.28	0.26	0.25	0.24	0.22	0.21	0.20	0.19	0.18
4. Terminal Value of Tax Shields	8.97										
5. NPV of Interest Tax Shields (sum of Line 3 + Line 4)	11.29										

Note: All numbers except the discount factors are in millions of euros.

If IWPI-Spain were certain that it would make these interest payments, the tax shields should be discounted at the euro risk-free interest rate. In a more likely scenario, though, the interest payments would not be risk free because there would be a probability of IWPI-Spain failing and being forced into bankruptcy. If there is a bankruptcy probability, the firm's debt will not be risk free, and the firm will not expect to make the full value of the interest payments.

Suppose that IWPI-U.S. knows from its investment bankers that if it were to issue 10-year bonds, it would borrow euros at an interest rate that is 150 basis points above the euro risk-free rate of 4.5%. Thus, IWPI-Spain's euro-denominated market interest rate is 4.5% + 1.5% = 6%. The increase in the required interest rate above the risk-free rate reflects the market's assessment of possible default by IWPI.

If the risk of default on the Spanish government loan is the same as the risk of default on a market loan, then 6.0% is the appropriate rate to discount the interest tax shields. The present value of these interest tax shields is the sum of the numbers in Line 3, or €2.32 million.

If IWPI-U.S. issues €30 million of debt in year 11 at its market interest rate of 6%, and if this debt is expected to grow each year at the euro rate of inflation of 2%, the terminal value of the interest tax shields would be

$$\text{Terminal value of interest tax shield} = \frac{0.35 \times 0.06 \times €30 \text{ million} \times (1.02)}{(0.06 - 0.02) \times (1.06^{10})}$$

$$= €8.97 \text{ million}$$

The full value of the interest tax shield is therefore €2.32 million + €8.97 million = €11.29 million. This calculation no doubt overstates the value of debt to the corporation because it ignores the costs of financial distress.

Interest Subsidies

IWPI-U.S. also obtains value from the interest subsidy provided by the Spanish government. If IWPI had to borrow €30 million at its market interest rate of 6.0% per annum, its annual interest payment would be

$$0.06 \times €30 \text{ million} = €1.8 \text{ million}$$

Because the Spanish government only charges 3% per annum, IWPI's actual interest payment is €0.9 million. Therefore, the annual interest savings is

$$€1.8 \text{ million} - €0.9 \text{ million} = €0.9 \text{ million}$$

Exhibit 15.15 Net Present Value of Interest Subsidy

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Interest Subsidy		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
2. Discount Factors (@ 6.00% per annum)		0.94	0.89	0.84	0.79	0.75	0.70	0.67	0.63	0.59	0.56
3. Present Value of Interest Subsidy (Line 1 × Line 2)		0.85	0.80	0.76	0.71	0.67	0.63	0.60	0.56	0.53	0.50
4. NPV of Interest Subsidy (sum of Line 3)	6.62										

Note: All numbers except the discount factors are in millions of euros.

Exhibit 15.15 values this subsidy using the firm's market interest rate of 6.0%. The net present value of the interest subsidy is €6.62 million.

The Full ANPV of IWPI-Spain

The initial cost of the IWPI-Spain project is €178.66 million. This is the sum of the initial capital expenditures for plant and equipment and the initial investment in cash and inventory. Exhibit 15.11 calculates that the net present value of the after-tax dividends that will be returned to IWPI-U.S. from IWPI-Spain is €160.84 million. Line 13 of Exhibit 15.12 calculates the net present value of after-tax royalty and overhead fees as €102.26 million. Line 10 of Exhibit 15.13 calculates the net present value of after-tax profits on the sale of intermediate export goods as €31.91 million. The value of the interest tax shield on the loan from the Spanish government is €11.29 million, and the value of the interest subsidy is €6.62 million. Upon adding together all the costs and benefits of the project, we find

$$\begin{aligned}\text{ANPV of IWPI-Spain} = &-€178.66 \text{ million in initial costs}\\ &+€160.84 \text{ million from dividends}\\ &+€102.26 \text{ million from royalties and fees}\\ &+€31.91 \text{ million from exports}\\ &+€11.29 \text{ million from the interest tax shield}\\ &+€6.62 \text{ million from the interest subsidy}\\ = &\ €134.26 \text{ million}\end{aligned}$$

At the current exchange rate of \$1.40/€, the dollar value to IWPI-U.S. of setting up a Spanish subsidiary is

$$(\$1.40/€) \times €134.26 \text{ million} = \$187.97 \text{ million}$$

The initial cost of the project is

$$(\$1.40/€) \times €178.66 \text{ million} = \$250.12 \text{ million}$$

Thus, by investing \$250.12 million, IWPI-U.S. is purchasing a series of uncertain, risky cash flows worth

$$\$250.12 \text{ million} + \$187.97 \text{ million} = \$438.09 \text{ million}$$

The \$438.09 million is the enterprise value of the project, which is the sum of the value of debt and equity. Because IWPI is able to borrow €30 million = \$42 million from the Spanish

government, the equity value of the project is $396.09 million. Shareholders also only need to invest €148.66 million. So, by investing $208.12 million = $1.40/€ × €148.66 million of shareholders' wealth, the shareholders are able to almost double their wealth. This is clearly a good managerial decision unless the opportunity cost of lost export sales is too large.

Cannibalization of Export Sales

The final part of the valuation of IWPI-Spain involves the possibility that IWPI-U.S. may not have another market for the 40,000 units it is currently exporting to Europe. If it does not have another market, the lost profit on these exports is a cost of creating the Spanish subsidiary.

Exhibit 15.16 presents the net present value of the after-tax profit on sales of 40,000 units between the current year and the indefinite future. Units exported are held constant in Line 1, except in year 1, because IWPI-U.S. is currently exporting its maximum capacity from the New Hampshire manufacturing facility. Lost sales in the first year are 18,000 units because the Spanish facility will produce 22,000 units, and total European demand is 44,000. Hence, IWPI-U.S. can export 22,000 units to Europe and will only lose profit on 40,000 − 22,000 = 18,000 units.

Prices per unit are given in Line 2 and correspond to the euro prices forecast in Exhibit 15.3, Line 4. Export revenue is given in Line 3 as the euro price per unit multiplied by the number of units exported. Line 4 presents the profit on these export sales, assuming a profit margin of 16%, the same profit margin as on the intermediate part exports. Line 5 calculates the IWPI-U.S. corporate income tax liability as 34% of the profits in Line 4. After-tax profits are reported in Line 6. Because these are forecasts of risky euro cash flows, it is again appropriate to discount them at 11.1% per annum. The discount factors are presented in Line 7.

Multiplying the discount factor by the after-tax profit provides the present values of each of the cash flows in Line 8. Line 9 presents the year 0 value of the terminal value, which is calculated as a perpetuity growing at the euro rate of inflation of 2% and discounted at 11.1%.

Exhibit 15.16 Net Present Value of After-Tax Profit on Lost Export Sales by IWPI-U.S.

	Year in the Future										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Unit Export Sales		18,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
2. Price per Unit (Exhibit 15.3, Line 4)		2,524	2,624	2,703	2,757	2,812	2,869	2,926	2,985	3,044	3,105
3. Export Revenue (Line 1 × Line 2)		45.42	104.98	108.13	110.29	112.50	114.75	117.04	119.38	121.77	124.20
4. Before-Tax Profit @ 18% Margin (0.16 × Line 3)		7.27	16.80	17.30	17.65	18.00	18.36	18.73	19.10	19.48	19.87
5. U.S. Corporate Tax @ 34% (0.34 × Line 4)		2.47	5.71	5.88	6.00	6.12	6.24	6.37	6.49	6.62	6.76
6. After-Tax Profit (Line 4 − Line 5)		4.80	11.09	11.42	11.65	11.88	12.12	12.36	12.61	12.86	13.12
7. Discount Factors (@ 11.1% per annum)		0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
8. Present Value of After-Tax Profits (Line 6 × Line 7)		4.32	8.98	8.33	7.64	7.02	6.44	5.92	5.43	4.99	4.58
9. Terminal Value of Profits	51.31										
10. NPV of After-Tax Profits (sum of Line 8 + Line 9)	114.95										

Notes: All numbers except Lines 1 and 2 and the discount factors are in millions of euros. The Terminal Value is the discounted value of profits from years 11 to infinity calculated as a perpetuity growing at the euro rate of inflation of 2%.

The sum of the cash flows in Line 8 and the terminal value of lost profits from year 11 to the indefinite future in Line 9 is the net present value of the after-tax profits from lost export sales. In Line 10, the year 0 value of the after-tax profits on all lost sales is €114.95 million.

Because the ANPV of the project without lost export sales was €134.26 million, even if IWPI-U.S. does not have another market for its current exports, it should still establish IWPI-Spain, although the increase in the enterprise value of the firm is now substantially smaller

$$(€134.26 \text{ million} - €114.95 \text{ million}) = €19.31 \text{ million}$$

15.7 Summary

In this chapter, we develop the adjusted net present value (ANPV) approach to capital budgeting, and we apply the ANPV approach to value a foreign subsidiary. The important points in the chapter are the following:

1. Corporations use capital budgeting to decide how to allocate funds for investment projects, and they should accept all projects with a positive ANPV.
2. The first part of an ANPV calculates the net present value (NPV) of the project's free cash flows assuming the project is financed entirely with equity. Any benefits or costs associated with issuing debt are valued later. The discount rate should reflect the riskiness of the project's free cash flows.
3. The second part of an ANPV analysis adds the net present value of financial side effects (NPVF) associated with the project, which arise from the direct costs of issuing securities, from taxes or tax deductions because of the type of financing instrument used, from the costs of financial distress, and from subsidized financing provided by governments.
4. The third part of an ANPV analysis adds the present value of any real options that arise from doing the project.
5. Free cash flow is the profit available for distribution to a firm's shareholders and is defined as the after-tax operating earnings of the corporation, plus any non-cash accounting charges, minus the investments of the firm. These investments involve increases in the firm's net working capital and capital expenditures on property, plant, and equipment.
6. The pretax operating income that a firm would have if it had no debt is EBIT (operating earnings before interest and taxes):

$$\begin{aligned}\text{EBIT} = \text{Revenue} &- \text{Costs of goods sold} \\ &- \text{Selling and general administrative expense} \\ &- \text{Depreciation}\end{aligned}$$

7. Net operating profit less adjusted taxes (NOPLAT) equals EBIT minus taxes on EBIT.
8. The terminal value of a project represents the present value of all expected future free cash flows in the years extending into the indefinite future beyond the explicit forecast horizon of the project and can be calculated using perpetuity formulas.
9. If a corporation does not have enough free cash flow to finance a project, it must turn to outside investors for additional resources. The costs of raising funds must be subtracted from the value of the project.
10. When a firm issues debt, the interest payments on the debt are tax deductible because the government views interest as a cost of doing business. Thus, debt financing reduces a corporation's income taxes and increases the value of the corporation. The value of the ability to deduct interest payments for tax purposes is called an interest tax shield.
11. The costs of financial distress refer to the loss of firm value that occurs because the firm may experience bankruptcy. These costs include direct costs due to bankruptcy and indirect costs due to the following: loss of customers who choose not to purchase the firm's products, problems with suppliers who have no long-term interest in the firm, inability of the firm to hire and retain high-quality managers and skilled workers, and poor investment decisions managers may make when the firm faces possible bankruptcy in the future.
12. The value of a subsidized loan is the difference between the interest payments on a loan of the same size at market interest rates and the interest payments on the subsidized loan discounted to the present by the market's required rate of return on the debt.
13. If, when a firm undertakes a project, it obtains an option to do another project in future, the option value of the second project adds value to the first project. In international finance, an important example of