IN THE 1990S, STARBUCKS COFFEE COMPANY IDENTIFIED JAPAN as a potentially lucrative new market for its coffee products and decided to invest as much as $10 million in fiscal year 1996 to begin operations there. Because Starbucks realized it needed specialized knowledge of the Japanese market, it established a joint venture with Sazaby, Inc., a Japanese retailer and restaurateur. This venture, called Starbucks Coffee Japan Ltd., intended to open as many as 12 stores in its initial phase. Although stores opened more slowly than expected, the venture had more than 200 stores and sales of ¥29 billion ($252 million) by 2001, and it opened its 500th store in November 2003. To finance this growth, Starbucks Coffee Japan Ltd. used the Japanese capital markets. It held an initial public offering of shares on the Osaka Stock Exchange in October 2001 with a market capitalization of ¥90.88 billion ($756 million), raising ¥18.8 billion ($156 million) in additional capital for expansion. How did Starbucks’ managers decide to undertake this investment opportunity? Why did they decide to use the Japanese domestic market to finance it rather than U.S. markets?

This chapter focuses on some of the factors a firm faces when making a foreign investment that it does not face when making a domestic investment. There are three key issues that arise when considering an investment in a foreign project like Starbucks Coffee Japan Ltd.:

- The project will most likely generate foreign currency cash flows, although the firm cares about the home currency value of the project.
- Interest rates and costs of capital will likely be different in the foreign country as a result of the macroeconomic environment.
- The firm will probably face a different tax rate in the foreign country and will be subject to both foreign and domestic tax codes.
As a first step toward evaluating foreign projects, this chapter discusses international capital markets. We begin by examining internationally integrated capital markets, which provide a useful benchmark for comparing different methods of valuing a foreign project. We next explain how to value a foreign project and address the three key issues mentioned above. We then value foreign currency cash flows using two valuation methodologies and consider the implications of foreign and domestic tax codes. Finally, we explore the implications of internationally segmented capital markets.

31.1 Internationally Integrated Capital Markets

We begin our examination of valuing foreign projects by developing a conceptual benchmark based on the integration of capital markets across currencies and borders. In this framework, capital markets are internationally integrated when the value of a foreign investment does not depend on the currency (home or foreign) we use in the analysis.

Consider a risky foreign asset that is expected to pay the cash flow, $C_{FC}$, in one period. In a normal market, the price of this asset in a foreign market is the present value of this cash flow using the cost of capital of a local investor:

$$C_{FC}/(1 + r_{FC}^*)$$  \hspace{1cm} (31.1)

A U.S. investor who wants to purchase this asset in dollars will have to pay

$$S \times \frac{C_{FC}}{(1 + r_{FC}^*)}$$  \hspace{1cm} (31.2)

where $S$ is current spot exchange rate in dollars per foreign currency. Now any U.S. investor who actually purchased this security would have to convert the future cash flow into dollars, so the payoff to such an investor is the dollar cash flow it produces. To value this cash flow, assume that the U.S. investor contracts today to convert the expected cash flow in one period at the forward rate, $F$, quoted as dollars per foreign currency. If we assume that spot exchange rates and the foreign currency cash flows of the security are uncorrelated, then this U.S. investor’s expected dollar cash flow is $F \times C_{FC}$. If $r_{FC}^*$ is the appropriate cost of capital from the standpoint of a U.S. investor, the present value of this expected cash flow is

$$\frac{F \times C_{FC}}{(1 + r_{FC}^*)}$$  \hspace{1cm} (31.3)

By the Law of One Price, this value must be equal to what the U.S. investor paid for the security:

$$S \times \frac{C_{FC}}{(1 + r_{FC}^*)} = \frac{F \times C_{FC}}{(1 + r_{FC}^*)}$$

---

1The actual cash flow in foreign currency will be $C_{FC} + \varepsilon$ where $\varepsilon$ is the uncertainty in the cash flow and has an expected value of zero. In U.S. dollars, this cash flow is $F \times C_{FC} + S_0 \times \varepsilon$ because the forward contract is only for the amount $C_{FC}$; the rest must be converted at the prevailing spot rate in one period, $S_0$. Then, because spot rates are uncorrelated with the project cash flows, $E[S_0 \times \varepsilon] = E[S_0] \times E[\varepsilon] = E[S_0] \times 0 = 0$. 
Rearranging terms gives

\[ F = \frac{(1+r_s^*)}{(1+r_{FC}^*)} S \quad (31.4) \]

This condition ought to look familiar from Chapter 30, because Eq. 31.4 is simply covered interest parity, here derived for risky rather than riskless discount rates.

At this point, it is worth taking a step back and considering the assumptions specific to the international context that we needed to derive Eq. 31.4. Recall from Chapter 3 that in a normal market, prices are competitive. In this context, this concept means, among other things, that any investor can exchange either currency in any amount at the spot rate or forward rates, and is free to purchase or sell any security in any amount in either country at their current market prices. Under these conditions, which we term \textbf{internationally integrated capital markets}, the value of an investment does not depend on the currency we use in the analysis.

\begin{example}

\textbf{Present Values and Internationally Integrated Capital Markets}

\textbf{Problem}

You are an American who is trying to calculate the present value of a ¥10 million cash flow that will occur one year in the future. You know that the spot exchange rate is \( S = ¥110/¥ \) and the one-year forward rate is \( F = ¥105.80/¥ \). You also know that the appropriate dollar cost of capital for this cash flow is \( r_s^* = 5\% \) and that the appropriate yen cost of capital for this cash flow is \( r_{FC}^* = 1\% \). What is the present value of the ¥10 million cash flow from the standpoint of a Japanese investor, and what is the dollar equivalent of this amount? What is the present value of the ¥10 million cash flow from the standpoint of a U.S. investor who first converts the ¥10 million into dollars, and then applies the dollar discount rate?

\textbf{Solution}

The present value of the yen cash flow is \( ¥10,000,000/(1.01) = ¥9,900,990 \), and the dollar equivalent is \( ¥9,900,990/110 = 90,009 \). (Note that we adjusted the formula in Eq. 31.2 because the exchange rate is expressed as yen per dollar rather than dollars per yen.) The present value from the standpoint of a U.S. investor who first converts the ¥10 million into dollars using the forward rate and then applies the dollar cost of capital is \( ¥10,000,000/(105.80/¥)/1.05 = 90,009 \). (Again, we have adjusted the formula in Eq. 31.3 because the exchange rate is expressed as yen per dollar.) Because the U.S. and Japanese capital markets are internationally integrated, both methods produce the same result.

\end{example}

\textbf{CONCEPT CHECK}

1. What assumptions are necessary for internationally integrated capital markets?
2. What implication do internationally integrated capital markets have for the value of the same asset in different countries?

\begin{section}

\textbf{31.2 Valuation of Foreign Currency Cash Flows}

The most obvious difference between a domestic project and a foreign project is that the foreign project will most likely generate cash flows in a foreign currency. If the foreign project is owned by a domestic corporation, managers and shareholders need to determine the home currency value of the foreign currency cash flows.

In an internationally integrated capital market, two equivalent methods are available for calculating the NPV of a foreign project: Either we can calculate the NPV in the foreign
country and convert it to the local currency at the spot rate, or we can convert the cash flows of the foreign project into the local currency and then calculate the NPV of these cash flows. The first method is essentially what we have done throughout this book (calculating the NPV of a project in a single currency) with the added step at the end of converting the NPV into the local currency using spot rates. Because this method should be familiar to you at this stage, we will concentrate on the second method.

**WACC Valuation Method in Domestic Currency**

The second valuation method requires converting the expected dollar value of the foreign currency cash flows and then proceeding to value the project as if it were a domestic project.

**Application: Ityesi, Inc.** Ityesi, Inc., a manufacturer of custom packaging products headquartered in the United States, wants to apply the weighted average cost of capital (WACC) technique to value a project in the United Kingdom. Ityesi is considering introducing a new line of packaging in the United Kingdom that will be its first foreign project. The project will be completely self-contained within the United Kingdom, such that all revenues are generated and all costs are incurred there.

Engineers expect the technology used in the new products to be obsolete after four years. The marketing group expects annual sales of £37.5 million per year for this product line. Manufacturing costs and operating expenses are expected to total £15.625 million and £5.625 million per year, respectively. Developing the product will require an upfront investment of £15 million in capital equipment that will be obsolete in four years, and an initial marketing expense of £4.167 million. Ityesi pays a corporate tax rate of 40% regardless of where it manufactures its products. The expected pound free cash flows of the proposed project are projected in the spreadsheet in Table 31.1.

Ityesi’s managers have determined that there is no correlation between the uncertainty in these cash flows and the uncertainty in the spot dollar-pound exchange rate. As we explained in the last section, under this condition, the expected value of the future cash flows in dollars is the expected value in pounds multiplied by the forward exchange rate.
Obtaining forward rate quotes for as long as four years in the future is difficult, so Ityesi’s managers have decided to use the covered interest rate parity formula (Eq. 30.3 in Chapter 30) to compute the forward rates.

**Forward Exchange Rates.** The current spot exchange rate, $S$, is $1.60/£$. Suppose that the yield curve in both countries is flat: The risk-free rate on dollars, $r_s$, is 4%, and the risk-free interest rate on pounds, $r_E$, is 7%. Using the covered interest parity condition for a multi-year forward exchange rate (Eq. 30.3):

\[
F_t = S \times \frac{(1 + r_s)^t}{(1 + r_E)^t} = \frac{($1.60/£)^t}{(1.07)^t} = $1.5551/£
\]

\[
F_2 = S \times \frac{(1 + r_s)^2}{(1 + r_E)^2} = \frac{($1.60/£)^2}{(1.07)^2} = $1.5115/£
\]

\[
F_3 = S \times \frac{(1 + r_s)^3}{(1 + r_E)^3} = \frac{($1.60/£)^3}{(1.07)^3} = $1.4692/£
\]

\[
F_4 = S \times \frac{(1 + r_s)^4}{(1 + r_E)^4} = \frac{($1.60/£)^4}{(1.07)^4} = $1.4280/£
\]

**Free Cash Flow Conversion.** Using these forward exchange rates, we can now calculate the expected free cash flows in dollars by multiplying the expected cash flows in pounds by the forward exchange rate, as shown in the spreadsheet in Table 31.2.

<table>
<thead>
<tr>
<th>TABLE 31.2</th>
<th>Expected Dollar Free Cash Flows from Ityesi’s U.K. Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dollar Free Cash Flow ($ millions)</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>1 Pound FCF (£ millions)</td>
<td>17.500</td>
</tr>
<tr>
<td>2 Forward Exchange Rate ($/£)</td>
<td>1.600</td>
</tr>
<tr>
<td>3 Dollar Value of Pound FCF (1 x 2)</td>
<td>28.000</td>
</tr>
</tbody>
</table>

**The Value of Ityesi’s Foreign Project with WACC.** With the cash flows of the U.K. project now expressed in dollars, we can value the foreign project as if it were a domestic U.S. project. We proceed, as we did in Chapter 18, under the assumption that the market risk of the U.K. project is similar to that of the company as a whole. As a consequence, we can use Ityesi’s costs of equity and debt in the United States to calculate the WACC.\(^2\)

Ityesi has built up $20 million in cash for investment needs and has debt of $320 million, so its net debt is $D = 320 - 20 = 300 million. This amount is equal to the market value of its equity, implying a (net) debt-equity ratio of 1. Ityesi intends to maintain a

\(^2\)The risk of the foreign project is unlikely to be exactly the same as the risk of domestic projects (or the firm as a whole), because it may be exposed to foreign economic and exchange rate risk factors. Ityesi’s managers have assessed these additional risks to be small, and so for practical purposes have chosen to ignore it. Alternatively, one could estimate a domestic cost of capital for the project based on return data for a foreign firm in the same industry with stock that is traded on the U.S. market.
TABLE 31.3  
Ityesi’s Current Market Value Balance Sheet ($ millions) 
and Cost of Capital Without the U.K. Project

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>20</td>
<td>Debt</td>
</tr>
<tr>
<td>Existing Assets</td>
<td>600</td>
<td>Equity</td>
</tr>
<tr>
<td></td>
<td>620</td>
<td></td>
</tr>
</tbody>
</table>

similar (net) debt-equity ratio for the foreseeable future. The WACC thus assigns equal weights to equity and debt (Table 31.3).

With Ityesi’s cost of equity at 10% and its cost of debt at 6%, we calculate Ityesi’s WACC as follows:

$$r_{wacc} = \frac{E}{E+D}r_E + \frac{D}{E+D}r_D(1-\tau_C)$$

$$= (0.5)(10.0\%)+(0.5)(6.0\%)(1-40\%) = 6.8\%$$

We can now determine the value of the foreign project, including the tax shield from debt, by calculating the present value of the future free cash flows using the WACC:

$$\frac{17.495}{1.068} + \frac{17.004}{1.068^2} + \frac{16.528}{1.068^3} + \frac{16.065}{1.068^4} = 57.20 \text{ million}$$

Because the up-front cost of launching the product line in dollars is only $28 million, the net present value is $57.20 - 28 = $29.20 million. Thus, Ityesi should undertake the U.K. project.

Using the Law of One Price as a Robustness Check

To arrive at the NPV of Ityesi’s project requires making a number of assumptions—for example, that international markets are integrated, and that the exchange rate and the cash flows of the project are uncorrelated. The managers of Ityesi will naturally worry about whether these assumptions are justified. Luckily, there is a way to check the analysis.

Recall that there are two ways to compute the NPV of the foreign project. Ityesi could just have easily computed the foreign NPV by discounting the foreign cash flows at the foreign cost of capital and converting this result to a domestic NPV using the spot rate. Except for the last step, this method requires doing the same calculation we have performed throughout this book—that is, calculate the NPV of a (domestic) project. Determining the NPV requires knowing the cost of capital—in this case, the cost of capital for an investment in the United Kingdom. Recall that to estimate this cost of capital we use return data for publicly traded single-product companies—in this case, U.K. firms. For this method to provide the same answer as the alternative method, the estimate for the foreign cost of capital, \(r^*_E\), must satisfy the Law of One Price, which from Eq. 31.4 implies:

$$1+r^*_E = \frac{S}{F}(1+r^*_E)$$  \hspace{1cm} (31.5)

If it does not, then Ityesi’s managers should be concerned that the simplifying assumptions in their analysis are not valid: Either there are market frictions that prevent integration, or there is a significant correlation between the project’s cash flows and the exchange rate.
We can further interpret Eq. 31.5 by using the covered interest rate parity relation derived in Chapter 30 (Eq. 30.3):

$$\frac{S}{F} = \frac{1 + r_k}{1 + r_s}$$  \hspace{1cm} (31.6)

where \( r_k \) and \( r_s \) are the foreign and domestic risk-free interest rates, respectively. Combining Eq. 31.5 and Eq. 31.6 and rearranging terms gives the foreign cost of capital in terms of the domestic cost of capital and interest rates:

**The Foreign-Denominated Cost of Capital**

$$r_k^* = \frac{1 + r_k}{1 + r_s} (1 + r_s^*) - 1$$

$$= r_k + (r_s^* - r_s)$$  \hspace{1cm} (31.7)

In other words, the foreign risk premium should be approximately equal to the domestic risk premium. If the simplifying assumptions Iyesi made in calculating the NPV of its U.K. project are valid, then the cost of capital estimate calculated using Eq. 31.7 will be close to the cost of capital estimate calculated directly using comparable single-product companies in the United Kingdom.

**Example 31.2**

**Internationalizing the Cost of Capital**

**Problem**

Use the Law of One Price to infer the pound WACC from Iyesi’s dollar WACC. Verify that the NPV of Iyesi’s project is the same when its pound free cash flows are discounted at this WACC and converted at the spot rate.

**Solution**

Using Eq. 31.7 to compute the pound WACC gives

$$r_k^* = \frac{1 + r_k}{1 + r_s} (1 + r_s^*) - 1 = \left(\frac{1.07}{1.04}\right)\left(1.068\right) - 1 = 0.0988$$

The pound WACC is 9.88%.

We can now use Iyesi’s pound WACC to calculate the present value of the pound free cash flows in Table 31.3:

$$\frac{11.25}{1.0988} + \frac{11.25}{1.0988^2} + \frac{11.25}{1.0988^3} + \frac{11.25}{1.0988^4} = £35.75 \text{ million}$$

The NPV in pounds of the investment opportunity is £35.75 - 17.5 = £18.25 million. Converting this amount to dollars at the spot rate gives £18.25 million × 1.6$/£ = $29.20 million, which is exactly the NPV we calculated before.

**Concept Check**

1. Explain two methods we use to calculate the NPV of a foreign project.
2. When do these two methods give the same NPV of the foreign project?

**31.3 Valuation and International Taxation**

In this chapter, we assume that Iyesi pays a corporate tax rate of 40% no matter where its earnings are generated. In practice, determining the corporate tax rate on foreign income