

# An Overview of Corporate Finance and the Financial Environment

In a beauty contest for companies, the winner is . . . General Electric.

Or at least General Electric is the most admired company in America, according to *Fortune* magazine's annual survey. The other top ten finalists are Cisco Systems, Wal-Mart Stores, Southwest Airlines, Microsoft, Home Depot, Berkshire Hathaway, Charles Schwab, Intel, and Dell Computer. What do these companies have that separates them from the rest of the pack?

According to more than 4,000 executives, directors, and security analysts, these companies have the highest average scores across eight attributes: (1) innovativeness, (2) quality of management, (3) employee talent, (4) quality of products and services, (5) long-term investment value, (6) financial soundness, (7) social responsibility, and (8) use of corporate assets.

These companies also have an incredible focus on using technology to reduce costs, to reduce inventory, and to speed up product delivery. For example, workers at Dell previously touched a computer 130 times during the assembly process but now touch it only 60 times. Using point-of-sale data, Wal-Mart is able to identify and meet surprising customer needs, such as bagels in Mexico, smoke detectors in Brazil, and house paint during the winter in Puerto Rico. Many of these companies are changing the way business works by using the Net, and that change is occurring at a break-neck pace. For example, in 1999 GE's plastics distribution business did less than \$2,000 per day of business online. A year later the division did more than \$2,000,000 per day in e-commerce.

Many companies have a difficult time attracting employees. Not so for the most admired companies, which average 26 applicants for each job opening. This is because, in addition to their acumen with technology and customers, they are also on the leading edge when it comes to training employees and providing a workplace in which people can thrive.

In a nutshell, these companies reduce costs by having innovative production processes, they create value for customers by providing high-quality products and services, and they create value for employees through training and fostering an environment that allows employees to utilize all of their skills and talents.

Do investors benefit from this focus on processes, customers, and employees? During the most recent five-year period, these ten companies posted an average annual stock return of 41.4 percent, more than double the S&P 500's average annual return of 18.3 percent. These exceptional returns are due to the ability of these companies to generate cash flow. But, as you will see throughout this book, a company can generate cash flow only if it also creates value for its customers, employees, and suppliers.



See <http://www.fortune.com> for updates on the U.S. ranking. *Fortune* also ranks the Global Most Admired.

This chapter should give you an idea of what corporate finance is all about, including an overview of the financial markets in which corporations operate. But before getting into the details of finance, it's important to look at the big picture. You're probably back in school because you want an interesting, challenging, and rewarding career. To see where finance fits in, let's start with a five-minute MBA.

## The Five-Minute MBA

Okay, we realize you can't get an MBA in five minutes. But just as an artist quickly sketches the outline of a picture before filling in the details, we can sketch the key elements of an MBA education. In a nutshell, the objective of an MBA is to provide managers with the knowledge and skills they need to run successful companies, so we start our sketch with some common characteristics of successful companies. In particular, all successful companies are able to accomplish two goals.

1. All successful companies identify, create, and deliver products or services that are highly valued by customers, so highly valued that customers choose to purchase them from the company rather than from its competitors. This happens only if the company provides more value than its competitors, either in the form of lower prices or better products.
2. All successful companies sell their products/services at prices that are high enough to cover costs and to compensate owners and creditors for their exposure to risk. In other words, it's not enough just to win market share and to show a profit. The profit must be high enough to adequately compensate investors.



Visit <http://ehrhart.swcollege.com> to see the web site accompanying this text. This ever-evolving site, for students and instructors, is a tool for teaching, learning, financial research, and job searches.

It's easy to talk about satisfying customers and investors, but it's not so easy to accomplish these goals. If it were, then all companies would be successful and you wouldn't need an MBA! Still, companies such as the ones on *Fortune's* Most Admired list are able to satisfy customers and investors. These companies all share the following three key attributes.

### The Key Attributes Required for Success

First, successful companies have skilled people at all levels inside the company, including (1) leaders who develop and articulate sound strategic visions; (2) managers who make value-adding decisions, design efficient business processes, and train and motivate work forces; and (3) a capable work force willing to implement the company's strategies and tactics.

Second, successful companies have strong relationships with groups that are outside the company. For example, successful companies develop win-win relationships with suppliers, who deliver high-quality materials on time and at a reasonable cost. A related trend is the rapid growth in relationships with third-party outsourcers, who provide high-quality services and products at a relatively low cost. This is particularly true in the areas of information technology and logistics. Successful companies also develop strong relationships with their customers, leading to repeat sales, higher profit margins, and lower customer acquisition costs.

Third, successful companies have sufficient capital to execute their plans and support their operations. For example, most growing companies must purchase land, buildings, equipment, and materials. To make these purchases, companies can reinvest a portion of their earnings, but most must also raise additional funds externally, by some combination of selling stock or borrowing from banks and other creditors.

Just as a stool needs all three legs to stand, a successful company must have all three attributes: skilled people, strong external relationships, and sufficient capital.



Consult <http://www.careers-in-finance.com> for an excellent site containing information on a variety of business career areas, listings of current jobs, and other reference materials.

## The MBA, Finance, and Your Career

To be successful, a company must meet its first goal—the identification, creation, and delivery of highly valued products and services. This requires that it possess all three of the key attributes. Therefore, it's not surprising that most of your MBA courses are directly related to these attributes. For example, courses in economics, communication, strategy, organizational behavior, and human resources should prepare you for a leadership role and enable you to effectively manage your company's work force. Other courses, such as marketing, operations management, and information technology are designed to develop your knowledge of specific disciplines, enabling you to develop the efficient business processes and strong external relationships your company needs. Portions of this corporate finance course will address raising the capital your company needs to implement its plans. In particular, the finance course will enable you to forecast your company's funding requirements and then describe strategies for acquiring the necessary capital. In short, your MBA courses will give you the skills to help a company achieve its first goal—producing goods and services that customers want.

Recall, though, that it's not enough just to have highly valued products and satisfied customers. Successful companies must also meet their second goal, which is to generate enough cash to compensate the investors who provided the necessary capital. To help your company accomplish this second goal, you must be able to evaluate any proposal, whether it relates to marketing, production, strategy, or any other area, and implement only the projects that add value for your investors. For this, you must have expertise in finance, no matter what your major is. Thus, corporate finance is a critical part of an MBA education and will help you throughout your career.

### Self-Test Questions

What are the goals of successful companies?

What are the three key attributes common to all successful companies?

How does expertise in corporate finance help a company become successful?

## How Are Companies Organized?

There are three main forms of business organization: (1) sole proprietorships, (2) partnerships, and (3) corporations. In terms of numbers, about 80 percent of businesses are operated as sole proprietorships, while most of the remainder are divided equally between partnerships and corporations. Based on dollar value of sales, however, about 80 percent of all business is conducted by corporations, about 13 percent by sole proprietorships, and about 7 percent by partnerships and hybrids. Because most business is conducted by corporations, we will concentrate on them in this book. However, it is important to understand the differences among the various forms.

### Sole Proprietorship

A **sole proprietorship** is an unincorporated business owned by one individual. Going into business as a sole proprietor is easy—one merely begins business operations. However, even the smallest business normally must be licensed by a governmental unit.

The proprietorship has three important advantages: (1) It is easily and inexpensively formed, (2) it is subject to few government regulations, and (3) the business avoids corporate income taxes.

The proprietorship also has three important limitations: (1) It is difficult for a proprietorship to obtain large sums of capital; (2) the proprietor has unlimited personal liability for the business's debts, which can result in losses that exceed the money he or she invested in the company; and (3) the life of a business organized as a proprietorship is limited to the life of the individual who created it. For these three reasons, sole proprietorships are used primarily for small-business operations. However, businesses are frequently started as proprietorships and then converted to corporations when their growth causes the disadvantages of being a proprietorship to outweigh the advantages.

### Partnership

A **partnership** exists whenever two or more persons associate to conduct a non-corporate business. Partnerships may operate under different degrees of formality, ranging from informal, oral understandings to formal agreements filed with the secretary of the state in which the partnership was formed. The major advantage of a partnership is its low cost and ease of formation. The disadvantages are similar to those associated with proprietorships: (1) unlimited liability, (2) limited life of the organization, (3) difficulty transferring ownership, and (4) difficulty raising large amounts of capital. The tax treatment of a partnership is similar to that for proprietorships, but this is often an advantage, as we demonstrate in Chapter 9.

Regarding liability, the partners can potentially lose all of their personal assets, even assets not invested in the business, because under partnership law, each partner is liable for the business's debts. Therefore, if any partner is unable to meet his or her pro rata liability in the event the partnership goes bankrupt, the remaining partners must make good on the unsatisfied claims, drawing on their personal assets to the extent necessary. Today (2002), the partners of the national accounting firm Arthur Andersen, a huge partnership facing lawsuits filed by investors who relied on faulty Enron audit statements, are learning all about the perils of doing business as a partnership. Thus, a Texas partner who audits a business that goes under can bring ruin to a millionaire New York partner who never went near the client company.

The first three disadvantages—unlimited liability, impermanence of the organization, and difficulty of transferring ownership—lead to the fourth, the difficulty partnerships have in attracting substantial amounts of capital. This is generally not a problem for a slow-growing business, but if a business's products or services really catch on, and if it needs to raise large sums of money to capitalize on its opportunities, the difficulty in attracting capital becomes a real drawback. Thus, growth companies such as Hewlett-Packard and Microsoft generally begin life as a proprietorship or partnership, but at some point their founders find it necessary to convert to a corporation.

### Corporation

A **corporation** is a legal entity created by a state, and it is separate and distinct from its owners and managers. This separateness gives the corporation three major advantages: (1) *Unlimited life*. A corporation can continue after its original owners and managers are deceased. (2) *Easy transferability of ownership interest*. Ownership interests can be divided into shares of stock, which, in turn, can be transferred far more easily than can proprietorship or partnership interests. (3) *Limited liability*. Losses are limited to the actual funds invested. To illustrate limited liability, suppose you invested \$10,000 in a partnership that then went bankrupt owing \$1 million. Because the owners are

liable for the debts of a partnership, you could be assessed for a share of the company's debt, and you could be held liable for the entire \$1 million if your partners could not pay their shares. Thus, an investor in a partnership is exposed to unlimited liability. On the other hand, if you invested \$10,000 in the stock of a corporation that then went bankrupt, your potential loss on the investment would be limited to your \$10,000 investment.<sup>1</sup> These three factors—unlimited life, easy transferability of ownership interest, and limited liability—make it much easier for corporations than for proprietorships or partnerships to raise money in the capital markets.

The corporate form offers significant advantages over proprietorships and partnerships, but it also has two disadvantages: (1) Corporate earnings may be subject to double taxation—the earnings of the corporation are taxed at the corporate level, and then any earnings paid out as dividends are taxed again as income to the stockholders. (2) Setting up a corporation, and filing the many required state and federal reports, is more complex and time-consuming than for a proprietorship or a partnership.

A proprietorship or a partnership can commence operations without much paperwork, but setting up a corporation requires that the incorporators prepare a charter and a set of bylaws. Although personal computer software that creates charters and bylaws is now available, a lawyer is required if the fledgling corporation has any nonstandard features. The **charter** includes the following information: (1) name of the proposed corporation, (2) types of activities it will pursue, (3) amount of capital stock, (4) number of directors, and (5) names and addresses of directors. The charter is filed with the secretary of the state in which the firm will be incorporated, and when it is approved, the corporation is officially in existence.<sup>2</sup> Then, after the corporation is in operation, quarterly and annual employment, financial, and tax reports must be filed with state and federal authorities.

The **bylaws** are a set of rules drawn up by the founders of the corporation. Included are such points as (1) how directors are to be elected (all elected each year, or perhaps one-third each year for three-year terms); (2) whether the existing stockholders will have the first right to buy any new shares the firm issues; and (3) procedures for changing the bylaws themselves, should conditions require it.

The value of any business other than a very small one will probably be maximized if it is organized as a corporation for these three reasons:

1. Limited liability reduces the risks borne by investors, and, other things held constant, *the lower the firm's risk, the higher its value.*
2. A firm's value depends on its *growth opportunities*, which, in turn, depend on the firm's ability to attract capital. Because corporations can attract capital more easily than unincorporated businesses, they are better able to take advantage of growth opportunities.
3. The value of an asset also depends on its *liquidity*, which means the ease of selling the asset and converting it to cash at a "fair market value." Because the stock of a corporation is much more liquid than a similar investment in a proprietorship or partnership, this too enhances the value of a corporation.

As we will see later in the chapter, most firms are managed with value maximization in mind, and this, in turn, has caused most large businesses to be organized as corporations. However, a very serious problem faces the corporation's stockholders, who are its owners. What is to prevent managers from acting in their own best interests, rather

---

<sup>1</sup>In the case of small corporations, the limited liability feature is often a fiction, because bankers and other lenders frequently require personal guarantees from the stockholders of small, weak businesses.

<sup>2</sup>Note that more than 60 percent of major U.S. corporations are chartered in Delaware, which has, over the years, provided a favorable legal environment for corporations. It is not necessary for a firm to be headquartered, or even to conduct operations, in its state of incorporation.

than in the best interests of the owners? This is called an **agency problem**, because managers are hired as agents to act on behalf of the owners. We will have much more to say about agency problems in Chapters 12 and 13.

## Hybrid Forms of Organization

Although the three basic types of organization—proprietorships, partnerships, and corporations—dominate the business scene, several hybrid forms are gaining popularity. For example, there are some specialized types of partnerships that have somewhat different characteristics than the “plain vanilla” kind. First, it is possible to limit the liabilities of some of the partners by establishing a **limited partnership**, wherein certain partners are designated **general partners** and others **limited partners**. In a limited partnership, the limited partners are liable only for the amount of their investment in the partnership, while the general partners have unlimited liability. However, the limited partners typically have no control, which rests solely with the general partners, and their returns are likewise limited. Limited partnerships are common in real estate, oil, and equipment leasing ventures. However, they are not widely used in general business situations because no one partner is usually willing to be the general partner and thus accept the majority of the business’s risk, while the would-be limited partners are unwilling to give up all control.

The **limited liability partnership (LLP)**, sometimes called a **limited liability company (LLC)**, is a relatively new type of partnership that is now permitted in many states. In both regular and limited partnerships, at least one partner is liable for the debts of the partnership. However, in an LLP, all partners enjoy limited liability with regard to the business’s liabilities, so in that regard they are similar to shareholders in a corporation. In effect, the LLP combines the limited liability advantage of a corporation with the tax advantages of a partnership. Of course, those who do business with an LLP as opposed to a regular partnership are aware of the situation, which increases the risk faced by lenders, customers, and others who deal with the LLP.

There are also several different types of corporations. One that is common among professionals such as doctors, lawyers, and accountants is the **professional corporation (PC)**, or in some states, the **professional association (PA)**. All 50 states have statutes that prescribe the requirements for such corporations, which provide most of the benefits of incorporation but do not relieve the participants of professional (malpractice) liability. Indeed, the primary motivation behind the professional corporation was to provide a way for groups of professionals to incorporate and thus avoid certain types of unlimited liability, yet still be held responsible for professional liability.

Finally, note that if certain requirements are met, particularly with regard to size and number of stockholders, one (or more) individuals can establish a corporation but elect to be taxed as if the business were a proprietorship or partnership. Such firms, which differ not in organizational form but only in how their owners are taxed, are called **S corporations**. Although S corporations are similar in many ways to limited liability partnerships, LLPs frequently offer more flexibility and benefits to their owners, and this is causing many S corporation businesses to convert to the LLP organizational form.

### Self-Test Questions

What are the key differences between sole proprietorships, partnerships, and corporations?

Explain why the value of any business other than a very small one will probably be maximized if it is organized as a corporation.

Identify the hybrid forms of organization discussed in the text, and explain the differences among them.

## The Primary Objective of the Corporation

Shareholders are the owners of a corporation, and they purchase stocks because they want to earn a good return on their investment without undue risk exposure. In most cases, shareholders elect directors, who then hire managers to run the corporation on a day-to-day basis. Because managers are supposed to be working on behalf of shareholders, it follows that they should pursue policies that enhance shareholder value. Consequently, throughout this book we operate on the assumption that management's primary objective is **stockholder wealth maximization**, which translates into *maximizing the price of the firm's common stock*. Firms do, of course, have other objectives—in particular, the managers who make the actual decisions are interested in their own personal satisfaction, in their employees' welfare, and in the good of the community and of society at large. Still, for the reasons set forth in the following sections, *stock price maximization is the most important objective for most corporations*.

### Stock Price Maximization and Social Welfare

If a firm attempts to maximize its stock price, is this good or bad for society? In general, it is good. Aside from such illegal actions as attempting to form monopolies, violating safety codes, and failing to meet pollution requirements, *the same actions that maximize stock prices also benefit society*. Here are some of the reasons:

1. **To a large extent, the owners of stock are society.** Seventy-five years ago this was not true, because most stock ownership was concentrated in the hands of a relatively small segment of society, comprised of the wealthiest individuals. Since then, there has been explosive growth in pension funds, life insurance companies, and mutual funds. These institutions now own more than 57 percent of all stock. In addition, more than 48 percent of all U.S. households now own stock directly, as compared with only 32.5 percent in 1989. Moreover, most people with a retirement plan have an indirect ownership interest in stocks. Thus, most members of society now have an important stake in the stock market, either directly or indirectly. Therefore, when a manager takes actions to maximize the stock price, this improves the quality of life for millions of ordinary citizens.
2. **Consumers benefit.** Stock price maximization requires efficient, low-cost businesses that produce high-quality goods and services at the lowest possible cost. This means that companies must develop products and services that consumers want and need, which leads to new technology and new products. Also, companies that maximize their stock price must generate growth in sales by creating value for customers in the form of efficient and courteous service, adequate stocks of merchandise, and well-located business establishments.

People sometimes argue that firms, in their efforts to raise profits and stock prices, increase product prices and gouge the public. In a reasonably competitive economy, which we have, prices are constrained by competition and consumer resistance. If a firm raises its prices beyond reasonable levels, it will simply lose its market share. Even giant firms such as General Motors lose business to Japanese and German firms, as well as to Ford and Chrysler, if they set prices above the level necessary to cover production costs plus a “normal” profit. Of course, firms *want* to earn more, and they constantly try to cut costs, develop new products, and so on, and thereby earn above-normal profits. Note, though, that if they are indeed successful and do earn above-normal profits, those very profits will attract competition, which will eventually drive prices down, so again, the main long-term beneficiary is the consumer.



The Security Industry Association's web site, <http://www.sia.com>, is a great source of information. To find data on stock ownership, go to their web page, click on Reference Materials, click on Securities Industry Fact Book, and look at the section on Investor Participation.

3. **Employees benefit.** There are cases in which a stock increases when a company announces a plan to lay off employees, but viewed over time this is the exception rather than the rule. In general, companies that successfully increase stock prices also grow and add more employees, thus benefiting society. Note too that many governments across the world, including U.S. federal and state governments, are privatizing some of their state-owned activities by selling these operations to investors. Perhaps not surprisingly, the sales and cash flows of recently privatized companies generally improve. Moreover, studies show that these newly privatized companies tend to grow and thus require more employees when they are managed with the goal of stock price maximization.

Each year *Fortune* magazine conducts a survey of managers, analysts, and other knowledgeable people to determine the most admired companies. One of *Fortune*'s key criteria is a company's ability to attract, develop, and retain talented people. The results consistently show that there are high correlations among a company's being admired, its ability to satisfy employees, and its creation of value for shareholders. Employees find that it is both fun and financially rewarding to work for successful companies. So, successful companies get the cream of the employee crop, and skilled, motivated employees are one of the keys to corporate success.

### Managerial Actions to Maximize Shareholder Wealth

What types of actions can managers take to maximize a firm's stock price? To answer this question, we first need to ask, "What determines stock prices?" In a nutshell, it is *a company's ability to generate cash flows now and in the future*.

While we will address this issue in detail in Chapter 12, we can lay out three basic facts here: (1) Any financial asset, including a company's stock, is valuable only to the extent that it generates cash flows; (2) the timing of cash flows matters—cash received sooner is better, because it can be reinvested in the company to produce additional income or else be returned to investors; and (3) investors generally are averse to risk, so all else equal, they will pay more for a stock whose cash flows are relatively certain than for one whose cash flows are more risky. Because of these three facts, managers can enhance their firms' stock prices by increasing the size of the expected cash flows, by speeding up their receipt, and by reducing their risk.

The three primary determinants of cash flows are (1) unit sales, (2) after-tax operating margins, and (3) capital requirements. The first factor has two parts, the *current level of sales* and their *expected future growth rate*. Managers can increase sales, hence cash flows, by truly understanding their customers and then providing the goods and services that customers want. Some companies may luck into a situation that creates rapid sales growth, but the unfortunate reality is that market saturation and competition will, in the long term, cause their sales growth rate to decline to a level that is limited by population growth and inflation. Therefore, managers must constantly strive to create new products, services, and brand identities that cannot be easily replicated by competitors, and thus to extend the period of high growth for as long as possible.

The second determinant of cash flows is the amount of after-tax profit that the company can keep after it has paid its employees and suppliers. One possible way to increase operating profit is to charge higher prices. However, in a competitive economy such as ours, higher prices can be charged only for products that meet the needs of customers better than competitors' products.

Another way to increase operating profit is to reduce direct expenses such as labor and materials. However, and paradoxically, sometimes companies can create even

higher profit by spending *more* on labor and materials. For example, choosing the lowest-cost supplier might result in using poor materials that lead to costly production problems. Therefore, managers should understand *supply chain management*, which often means developing long-term relationships with suppliers. Similarly, increased employee training adds to costs, but it often pays off through increased productivity and lower turnover. Therefore, the *human resources staff* can have a huge impact on operating profits.

The third factor affecting cash flows is the amount of money a company must invest in plant and equipment. In short, it takes cash to create cash. For example, as a part of their normal operations, most companies must invest in inventory, machines, buildings, and so forth. But each dollar tied up in operating assets is a dollar that the company must “rent” from investors and pay for by paying interest or dividends. Therefore, reducing asset requirements tends to increase cash flows, which increases the stock price. For example, companies that successfully implement *just-in-time* inventory systems generally increase their cash flows, because they have less cash tied up in inventory.

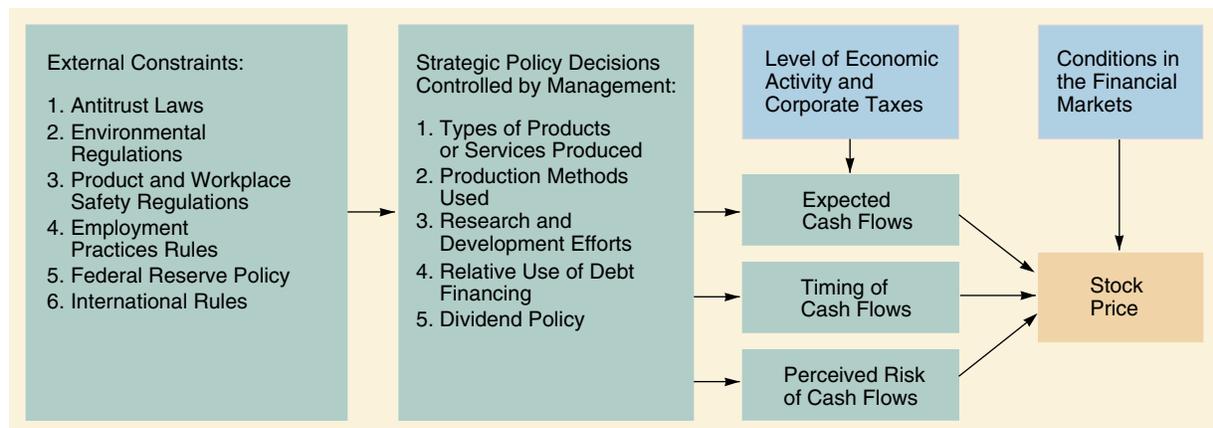
As these examples indicate, there are many ways to improve cash flows. All of them require the active participation of many departments, including marketing, engineering, and logistics. One of the financial manager’s roles is to show others how their actions will affect the company’s ability to generate cash flow.

Financial managers also must decide *how to finance the firm*: What mix of debt and equity should be used, and what specific types of debt and equity securities should be issued? Also, what percentage of current earnings should be retained and reinvested rather than paid out as dividends?

Each of these investment and financing decisions is likely to affect the level, timing, and risk of the firm’s cash flows, and, therefore, the price of its stock. Naturally, managers should make investment and financing decisions that are designed to maximize the firm’s stock price.

Although managerial actions affect stock prices, stocks are also influenced by such external factors as legal constraints, the general level of economic activity, tax laws, interest rates, and conditions in the stock market. See Figure 1-1. Working within the set of external constraints shown in the box at the extreme left, management makes a set of

**FIGURE 1-1** Summary of Major Factors Affecting Stock Prices



long-run strategic policy decisions that chart a future course for the firm. These policy decisions, along with the general level of economic activity and the level of corporate income taxes, influence expected cash flows, their timing, and their perceived risk. These factors all affect the price of the stock, but so does the overall condition of the financial markets.

### Self-Test Questions

- What is management's primary objective?
- How does stock price maximization benefit society?
- What three basic factors determine the price of a stock?
- What three factors determine cash flows?

## The Financial Markets

Businesses, individuals, and governments often need to raise capital. For example, suppose Carolina Power & Light (CP&L) forecasts an increase in the demand for electricity in North Carolina, and the company decides to build a new power plant. Because CP&L almost certainly will not have the \$1 billion or so necessary to pay for the plant, the company will have to raise this capital in the financial markets. Or suppose Mr. Fong, the proprietor of a San Francisco hardware store, decides to expand into appliances. Where will he get the money to buy the initial inventory of TV sets, washers, and freezers? Similarly, if the Johnson family wants to buy a home that costs \$100,000, but they have only \$20,000 in savings, how can they raise the additional \$80,000? If the city of New York wants to borrow \$200 million to finance a new sewer plant, or the federal government needs money to meet its needs, they too need access to the capital markets.

On the other hand, some individuals and firms have incomes that are greater than their current expenditures, so they have funds available to invest. For example, Carol Hawk has an income of \$36,000, but her expenses are only \$30,000, leaving \$6,000 to invest. Similarly, Ford Motor Company has accumulated roughly \$16 billion of cash and marketable securities, which it has available for future investments.

### Types of Markets

People and organizations who want to borrow money are brought together with those with surplus funds in the **financial markets**. Note that “markets” is plural—there are a great many different financial markets in a developed economy such as ours. Each market deals with a somewhat different type of instrument in terms of the instrument's maturity and the assets backing it. Also, different markets serve different types of customers, or operate in different parts of the country. Here are some of the major types of markets:

1. **Physical asset markets** (also called “tangible” or “real” asset markets) are those for such products as wheat, autos, real estate, computers, and machinery. **Financial asset markets**, on the other hand, deal with stocks, bonds, notes, mortgages, and other **financial instruments**. All of these instruments are simply pieces of paper with contractual provisions that entitle their owners to specific rights and claims on real assets. For example, a corporate bond issued by IBM entitles its owner to a specific claim on the cash flows produced by IBM's physical assets, while a share of IBM stock entitles its owner to a different set of claims on IBM's cash flows. Unlike these conventional financial instruments, the contractual provisions of **derivatives**

are not direct claims on either real assets or their cash flows. Instead, derivatives are claims whose values depend on what happens to the value of some other asset. Futures and options are two important types of derivatives, and their values depend on what happens to the prices of other assets, say, IBM stock, Japanese yen, or pork bellies. Therefore, the value of a derivative is *derived* from the value of an underlying real or financial asset.

2. **Spot markets** and **futures markets** are terms that refer to whether the assets are being bought or sold for “on-the-spot” delivery (literally, within a few days) or for delivery at some future date, such as six months or a year into the future.
3. **Money markets** are the markets for short-term, highly liquid debt securities. The New York and London money markets have long been the world’s largest, but Tokyo is rising rapidly. **Capital markets** are the markets for intermediate- or long-term debt and corporate stocks. The New York Stock Exchange, where the stocks of the largest U.S. corporations are traded, is a prime example of a capital market. There is no hard and fast rule on this, but when describing debt markets, “short term” generally means less than one year, “intermediate term” means one to five years, and “long term” means more than five years.
4. **Mortgage markets** deal with loans on residential, commercial, and industrial real estate, and on farmland, while **consumer credit markets** involve loans on autos and appliances, as well as loans for education, vacations, and so on.
5. **World, national, regional, and local markets** also exist. Thus, depending on an organization’s size and scope of operations, it may be able to borrow all around the world, or it may be confined to a strictly local, even neighborhood, market.
6. **Primary markets** are the markets in which corporations raise new capital. If Microsoft were to sell a new issue of common stock to raise capital, this would be a primary market transaction. The corporation selling the newly created stock receives the proceeds from the sale in a primary market transaction.
7. The **initial public offering (IPO) market** is a subset of the primary market. Here firms “go public” by offering shares to the public for the first time. Microsoft had its IPO in 1986. Previously, Bill Gates and other insiders owned all the shares. In many IPOs, the insiders sell some of their shares plus the company sells newly created shares to raise additional capital.
8. **Secondary markets** are markets in which existing, already outstanding, securities are traded among investors. Thus, if Jane Doe decided to buy 1,000 shares of AT&T stock, the purchase would occur in the secondary market. The New York Stock Exchange is a secondary market, since it deals in outstanding, as opposed to newly issued, stocks. Secondary markets also exist for bonds, mortgages, and other financial assets. The corporation whose securities are being traded is not involved in a secondary market transaction and, thus, does not receive any funds from such a sale.
9. **Private markets**, where transactions are worked out directly between two parties, are differentiated from **public markets**, where standardized contracts are traded on organized exchanges. Bank loans and private placements of debt with insurance companies are examples of private market transactions. Since these transactions are private, they may be structured in any manner that appeals to the two parties. By contrast, securities that are issued in public markets (for example, common stock and corporate bonds) are ultimately held by a large number of individuals. Public securities must have fairly standardized contractual features, both to appeal to a broad range of investors and also because public investors cannot afford the time to study unique, nonstandardized contracts. Their diverse ownership also ensures that public securities are relatively liquid. Private market securities are, therefore,

more tailor-made but less liquid, whereas public market securities are more liquid but subject to greater standardization.

Other classifications could be made, but this breakdown is sufficient to show that there are many types of financial markets. Also, note that the distinctions among markets are often blurred and unimportant, except as a general point of reference. For example, it makes little difference if a firm borrows for 11, 12, or 13 months, hence, whether we have a “money” or “capital” market transaction. You should recognize the big differences among types of markets, but don’t get hung up trying to distinguish them at the boundaries.

A healthy economy is dependent on efficient transfers of funds from people who are net savers to firms and individuals who need capital. Without efficient transfers, the economy simply could not function: Carolina Power & Light could not raise capital, so Raleigh’s citizens would have no electricity; the Johnson family would not have adequate housing; Carol Hawk would have no place to invest her savings; and so on. Obviously, the level of employment and productivity, hence our standard of living, would be much lower. Therefore, it is absolutely essential that our financial markets function efficiently—not only quickly, but also at a low cost.

Table 1-1 gives a listing of the most important instruments traded in the various financial markets. The instruments are arranged from top to bottom in ascending order of typical length of maturity. As we go through the book, we will look in much more detail at many of the instruments listed in Table 1-1. For example, we will see that there are many varieties of corporate bonds, ranging from “plain vanilla” bonds to bonds that are convertible into common stocks to bonds whose interest payments vary depending on the inflation rate. Still, the table gives an idea of the characteristics and costs of the instruments traded in the major financial markets.



You can access current and historical interest rates and economic data as well as regional economic data for the states of Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee from the Federal Reserve Economic Data (FRED) site at <http://www.stls.frb.org/fred/>.

## Recent Trends

Financial markets have experienced many changes during the last two decades. Technological advances in computers and telecommunications, along with the globalization of banking and commerce, have led to deregulation, and this has increased competition throughout the world. The result is a much more efficient, internationally linked market, but one that is far more complex than existed a few years ago. While these developments have been largely positive, they have also created problems for policy makers. At a recent conference, Federal Reserve Board Chairman Alan Greenspan stated that modern financial markets “expose national economies to shocks from new and unexpected sources, and with little if any lag.” He went on to say that central banks must develop new ways to evaluate and limit risks to the financial system. Large amounts of capital move quickly around the world in response to changes in interest and exchange rates, and these movements can disrupt local institutions and economies.

With globalization has come the need for greater cooperation among regulators at the international level. Various committees are currently working to improve coordination, but the task is not easy. Factors that complicate coordination include (1) the differing structures among nations’ banking and securities industries, (2) the trend in Europe toward financial service conglomerates, and (3) a reluctance on the part of individual countries to give up control over their national monetary policies. Still, regulators are unanimous about the need to close the gaps in the supervision of worldwide markets.

Another important trend in recent years has been the increased use of derivatives. The market for derivatives has grown faster than any other market in recent years, providing corporations with new opportunities but also exposing them to new risks.

TABLE 1-1 Summary of Major Financial Instruments

Instrument	Major Participants	Risk	Original Maturity	Interest Rates on 9/27/01 <sup>a</sup>
U.S. Treasury bills	Sold by U.S. Treasury	Default-free	91 days to 1 year	2.3%
Banker's acceptances	A firm's promise to pay, guaranteed by a bank	Low if strong bank guarantees	Up to 180 days	2.6
Commercial paper	Issued by financially secure firms to large investors	Low default risk	Up to 270 days	2.4
Negotiable certificates of deposit (CDs)	Issued by major banks to large investors	Depends on strength of issuer	Up to 1 year	2.5
Money market mutual funds	Invest in short-term debt; held by individuals and businesses	Low degree of risk	No specific maturity (instant liquidity)	3.2
Eurodollar market time deposits	Issued by banks outside U.S.	Depends on strength of issuer	Up to 1 year	2.5
Consumer credit loans	Loans by banks/credit unions/finance companies	Risk is variable	Variable	Variable
Commercial loans	Loans by banks to corporations	Depends on borrower	Up to 7 years	Tied to prime rate (6.0%) or LIBOR (2.6%) <sup>d</sup>
U.S. Treasury notes and bonds	Issued by U.S. government	No default risk, but price falls if interest rates rise	2 to 30 years	5.5
Mortgages	Loans secured by property	Risk is variable	Up to 30 years	6.8
Municipal bonds	Issued by state and local governments to individuals and institutions	Riskier than U.S. government bonds, but exempt from most taxes	Up to 30 years	5.1
Corporate bonds	Issued by corporations to individuals and institutions	Riskier than U.S. government debt; depends on strength of issuer	Up to 40 years <sup>b</sup>	7.2
Leases	Similar to debt; firms lease assets rather than borrow and then buy them	Risk similar to corporate bonds	Generally 3 to 20 years	Similar to bond yields
Preferred stocks	Issued by corporations to individuals and institutions	Riskier than corporate bonds	Unlimited	7 to 9%
Common stocks <sup>c</sup>	Issued by corporations to individuals and institutions	Riskier than preferred stocks	Unlimited	10 to 15%

<sup>a</sup>Data are from *The Wall Street Journal* (<http://interactive.wsj.com/documents/rates.htm>) or the *Federal Reserve Statistical Release*, <http://www.federalreserve.gov/releases/H15/update>. Money market rates assume a 3-month maturity. The corporate bond rate is for AAA-rated bonds.

<sup>b</sup>Just recently, a few corporations have issued 100-year bonds; however, the majority have issued bonds with maturities less than 40 years.

<sup>c</sup>Common stocks are expected to provide a "return" in the form of dividends and capital gains rather than interest. Of course, if you buy a stock, your actual return may be considerably higher or lower than your expected return. For example, Nasdaq stocks on average provided a return of about -39 percent in 2000, but that was well below the return most investors expected.

<sup>d</sup>The prime rate is the rate U.S. banks charge to good customers. LIBOR (London Interbank Offered Rate) is the rate that U.K. banks charge one another.

Derivatives can be used either to reduce risks or to speculate. As an example of a risk-reducing usage, suppose an importer's net income tends to fall whenever the dollar falls relative to the yen. That company could reduce its risk by purchasing derivatives that increase in value whenever the dollar declines. This would be called a *hedging operation*, and its purpose is to reduce risk exposure. Speculation, on the other hand, is done in the hope of high returns, but it raises risk exposure. For example, Procter &

Gamble lost \$150 million on derivative investments, and Orange County (California) went bankrupt as a result of its treasurer's speculation in derivatives.

The size and complexity of derivatives transactions concern regulators, academics, and members of Congress. Fed Chairman Greenspan noted that, in theory, derivatives should allow companies to manage risk better, but that it is not clear whether recent innovations have “increased or decreased the inherent stability of the financial system.”

Another major trend involves stock ownership patterns. The number of individuals who have a stake in the stock market is increasing, but the percentage of corporate shares owned by individuals is decreasing. How can both of these two statements be true? The answer has to do with institutional versus individual ownership of shares. Although more than 48 percent of all U.S. households now have investments in the stock market, more than 57 percent of all stock is now owned by pension funds, mutual funds, and life insurance companies. Thus, more and more individuals are investing in the market, but they are doing so indirectly, through retirement plans and mutual funds. In any event, the performance of the stock market now has a greater effect on the U.S. population than ever before. Also, the direct ownership of stocks is being concentrated in institutions, with professional portfolio managers making the investment decisions and controlling the votes. Note too that if a fund holds a high percentage of a given corporation's shares, it would probably depress the stock's price if it tried to sell out. Thus, to some extent, the larger institutions are “locked into” many of the shares they own. This has led to a phenomenon called **relationship investing**, where portfolio managers think of themselves as having an active, long-term relationship with their portfolio companies. Rather than being passive investors who “vote with their feet,” they are taking a much more active role in trying to force managers to behave in a manner that is in the best interests of shareholders.

### Self-Test Questions

Distinguish between: (1) physical asset markets and financial asset markets; (2) spot and futures markets; (3) money and capital markets; (4) primary and secondary markets; and (5) private and public markets.

What are derivatives, and how is their value related to that of an “underlying asset”?

What is relationship investing?

## Financial Institutions

Transfers of capital between savers and those who need capital take place in the three different ways diagrammed in Figure 1-2:

1. *Direct transfers* of money and securities, as shown in the top section, occur when a business sells its stocks or bonds directly to savers, without going through any type of financial institution. The business delivers its securities to savers, who in turn give the firm the money it needs.
2. As shown in the middle section, transfers may also go through an *investment banking house* such as Merrill Lynch, which *underwrites* the issue. An underwriter serves as a middleman and facilitates the issuance of securities. The company sells its stocks or bonds to the investment bank, which in turn sells these same securities to savers. The businesses' securities and the savers' money merely “pass through” the investment banking house. However, the investment bank does buy and hold the

securities for a period of time, so it is taking a risk—it may not be able to resell them to savers for as much as it paid. Because new securities are involved and the corporation receives the proceeds of the sale, this is a primary market transaction.

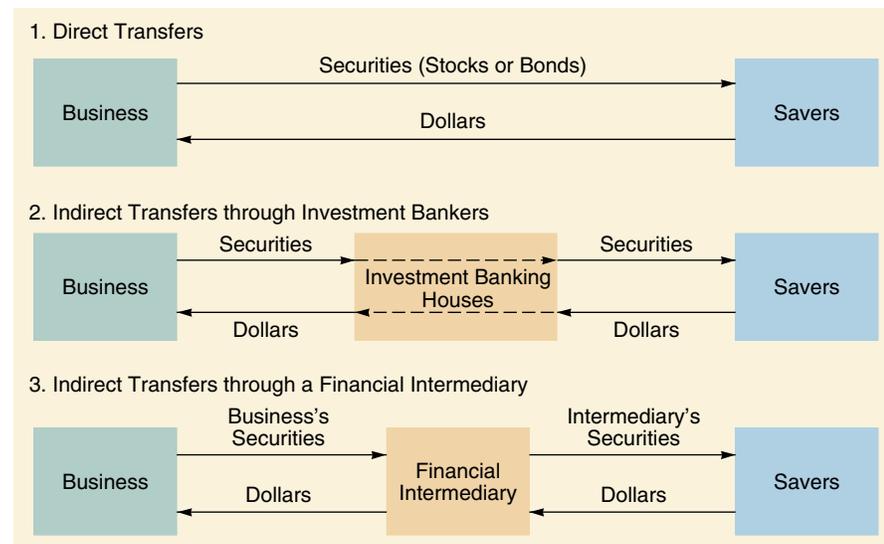
- Transfers can also be made through a *financial intermediary* such as a bank or mutual fund. Here the intermediary obtains funds from savers in exchange for its own securities. The intermediary then uses this money to purchase and then hold businesses' securities. For example, a saver might give dollars to a bank, receiving from it a certificate of deposit, and then the bank might lend the money to a small business in the form of a mortgage loan. Thus, intermediaries literally create new forms of capital—in this case, certificates of deposit, which are both safer and more liquid than mortgages and thus are better securities for most savers to hold. The existence of intermediaries greatly increases the efficiency of money and capital markets.

In our example, we assume that the entity needing capital is a business, and specifically a corporation, but it is easy to visualize the demander of capital as a home purchaser, a government unit, and so on.

Direct transfers of funds from savers to businesses are possible and do occur on occasion, but it is generally more efficient for a business to enlist the services of an **investment banking house** such as Merrill Lynch, Salomon Smith Barney, Morgan Stanley, or Goldman Sachs. Such organizations (1) help corporations design securities with features that are currently attractive to investors, (2) then buy these securities from the corporation, and (3) resell them to savers. Although the securities are sold twice, this process is really one primary market transaction, with the investment banker acting as a facilitator to help transfer capital from savers to businesses.

The **financial intermediaries** shown in the third section of Figure 1-2 do more than simply transfer money and securities between firms and savers—they literally create new financial products. Since the intermediaries are generally large, they gain economies of scale in analyzing the creditworthiness of potential borrowers, in

**FIGURE 1-2** Diagram of the Capital Formation Process



processing and collecting loans, and in pooling risks and thus helping individual savers diversify, that is, “not putting all their financial eggs in one basket.” Further, a system of specialized intermediaries can enable savings to do more than just draw interest. For example, individuals can put money into banks and get both interest income and a convenient way of making payments (checking), or put money into life insurance companies and get both interest income and protection for their beneficiaries.

In the United States and other developed nations, a set of specialized, highly efficient financial intermediaries has evolved. The situation is changing rapidly, however, and different types of institutions are performing services that were formerly reserved for others, causing institutional distinctions to become blurred. Still, there is a degree of institutional identity, and here are the major classes of intermediaries:

1. **Commercial banks**, the traditional “department stores of finance,” serve a wide variety of savers and borrowers. Historically, commercial banks were the major institutions that handled checking accounts and through which the Federal Reserve System expanded or contracted the money supply. Today, however, several other institutions also provide checking services and significantly influence the money supply. Conversely, commercial banks are providing an ever-widening range of services, including stock brokerage services and insurance.

Note that commercial banks are quite different from investment banks. Commercial banks lend money, whereas investment banks help companies raise capital from other parties. Prior to 1933, commercial banks offered investment banking services, but the Glass-Steagall Act, which was passed in 1933, prohibited commercial banks from engaging in investment banking. Thus, the Morgan Bank was broken up into two separate organizations, one of which became the Morgan Guaranty Trust Company, a commercial bank, while the other became Morgan Stanley, a major investment banking house. Note also that Japanese and European banks can offer both commercial and investment banking services. This hindered U.S. banks in global competition, so in 1999 Congress basically repealed the Glass-Steagall Act. Then, U.S. commercial and investment banks began merging with one another, creating such giants as Citigroup and J.P. Morgan Chase.

2. **Savings and loan associations (S&Ls)**, which have traditionally served individual savers and residential and commercial mortgage borrowers, take the funds of many small savers and then lend this money to home buyers and other types of borrowers. Because the savers obtain a degree of liquidity that would be absent if they made the mortgage loans directly, perhaps the most significant economic function of the S&Ls is to “create liquidity” which would otherwise be lacking. Also, the S&Ls have more expertise in analyzing credit, setting up loans, and making collections than individual savers, so S&Ls can reduce the costs of processing loans, thereby increasing the availability of real estate loans. Finally, the S&Ls hold large, diversified portfolios of loans and other assets and thus spread risks in a manner that would be impossible if small savers were making mortgage loans directly. Because of these factors, savers benefit by being able to invest in more liquid, better managed, and less risky assets, whereas borrowers benefit by being able to obtain more capital, and at a lower cost, than would otherwise be possible.

In the 1980s, the S&L industry experienced severe problems when (1) short-term interest rates paid on savings accounts rose well above the returns being earned on the existing mortgages held by S&Ls and (2) commercial real estate suffered a severe slump, resulting in high mortgage default rates. Together, these events forced many S&Ls to either merge with stronger institutions or close their doors.

3. **Mutual savings banks**, which are similar to S&Ls, operate primarily in the north-eastern states, accept savings primarily from individuals, and lend mainly on a long-term basis to home buyers and consumers.
4. **Credit unions** are cooperative associations whose members are supposed to have a common bond, such as being employees of the same firm. Members' savings are loaned only to other members, generally for auto purchases, home improvement loans, and home mortgages. Credit unions are often the cheapest source of funds available to individual borrowers.
5. **Life insurance companies** take savings in the form of premiums; invest these funds in stocks, bonds, real estate, and mortgages; and finally make payments to the beneficiaries of the insured parties. In recent years, life insurance companies have also offered a variety of tax-deferred savings plans designed to provide benefits to the participants when they retire.
6. **Mutual funds** are corporations that accept money from savers and then use these funds to buy stocks, long-term bonds, or short-term debt instruments issued by businesses or government units. These organizations pool funds and thus reduce risks by diversification. They also achieve economies of scale in analyzing securities, managing portfolios, and buying and selling securities. Different funds are designed to meet the objectives of different types of savers. Hence, there are bond funds for those who desire safety, stock funds for savers who are willing to accept significant risks in the hope of higher returns, and still other funds that are used as interest-bearing checking accounts (the **money market funds**). There are literally thousands of different mutual funds with dozens of different goals and purposes.
7. **Pension funds** are retirement plans funded by corporations or government agencies for their workers and administered generally by the trust departments of commercial banks or by life insurance companies. Pension funds invest primarily in bonds, stocks, mortgages, and real estate.

Changes in the structure of pension plans over the last decade have had a profound effect on both individuals and financial markets. Historically, most large corporations and governmental units used **defined benefit** plans to provide for their employees' retirement. In a defined benefit plan, the employer guarantees the level of benefits the employee will receive when he or she retires, and it is the employer's responsibility to invest funds to ensure that it can meet its obligations when its employees retire. Under a defined benefit plan, employees have little or no say about how the money in the pension plan is invested—this decision is made by the corporate employer. Note that employers, not employees, bear the risk that investments held by a defined benefit plan will not perform well.

In recent years many companies (including virtually all new companies, especially those in the rapidly growing high-tech sector) have begun to use **defined contribution** plans, under which employers make specified, or defined, payments into the plan. Then, when the employee retires, his or her pension benefits are determined by the amount of assets in the plan. Therefore, in a defined contribution plan the employee has the responsibility for making investment decisions and bears the risks inherent in investments.

The most common type of defined contribution plan is the **401(k)** plan, named after the section in the federal act that established the legal basis for the plan. Governmental units, including universities, can use **403(b)** plans, which operate essentially like 401(k) plans. In all of these plans, employees must choose from a set of investment alternatives. Typically, the employer agrees to make some "defined contribution" to the plan, and the employee can also make a supplemental payment. Then, the employer contracts with an insurance company plus one or more mutual fund companies, and then employees choose among investments

## Mutual Fund Mania

Americans love mutual funds. Just over ten years ago, Americans had invested about \$810 billion in mutual funds, which is not exactly chicken feed. Today, however, they have more than \$5 trillion in mutual funds!

Not only has the amount of money invested in mutual funds skyrocketed, but the variety of funds is astounding. Thirty years ago there were just a few types of mutual funds. You could buy a growth fund (composed of stocks that paid low dividends but that had been growing rapidly), income funds (primarily composed of stocks that paid high dividends), or a bond fund. Now you can buy funds that specialize in virtually any type of asset. There are funds that own stocks only from a particular industry, a particular continent, or a particular country, and money market funds that invest only in Treasury bills and other short-term securities. There are funds that have municipal bonds from only one state. You can buy socially conscious funds that refuse to own stocks of companies that pollute, sell tobacco products, or have work forces that are not culturally diverse. You can buy

“market neutral funds,” which sell some stocks short, invest in other stocks, and promise to do well no matter which way the market goes. There is the Undiscovered Managers Behavioral fund that picks stocks by psychoanalyzing Wall Street analysts. And then there is the Tombstone fund that owns stocks only from the funeral industry.

How many funds are there? One urban myth is that there are more funds than stocks. But that includes bond funds, money market funds, and funds that invest in non-U.S. stocks. It also includes “flavors” of the same fund. For example, some funds allow you to buy different “share classes” of a single fund, with each share class having different fee structures. So even though there are at least 10,000 different funds of all types, there are only about 2,000 U.S. equity mutual funds. Still, that’s a lot of funds, since there are only about 8,000 regularly traded U.S. stocks.

**Sources:** “The Many New Faces of Mutual Funds,” *Fortune*, July 6, 1998, 217–218; “Street Myths,” *Fortune*, May 24, 1999, 320.

ranging from “guaranteed investment contracts” to government bond funds to domestic corporate bond and stock funds to international stock and bond funds. Under most plans, the employees can, within certain limits, shift their investments from category to category. Thus, if someone thinks the stock market is currently overvalued, he or she can tell the mutual fund to move the money from a stock fund to a money market fund. Similarly, employees may choose to gradually shift from 100 percent stock to a mix of stocks and bonds as they grow older.

These changes in the structure of pension plans have had two extremely important effects. First, individuals must now make the primary investment decisions for their pension plans. Because such decisions can mean the difference between a comfortable retirement and living on the street, it is important that people covered by defined contribution plans understand the fundamentals of investing. Second, whereas defined benefit plan managers typically invest in individual stocks and bonds, most individuals invest 401(k) money through mutual funds. Since 401(k) defined contribution plans are growing rapidly, the result is rapid growth in the mutual fund industry. This, in turn, has implications for the security markets, and for businesses that need to attract capital.

Financial institutions have historically been heavily regulated, with the primary purpose of this regulation being to ensure the safety of the institutions and thus to protect investors. However, these regulations—which have taken the form of prohibitions on nationwide branch banking, restrictions on the types of assets the institutions can buy, ceilings on the interest rates they can pay, and limitations on the types of services they can provide—tended to impede the free flow of capital and thus hurt the

**TABLE 1-2** Ten Largest U.S. Bank Holding Companies and World Banking Companies, and Top Ten Leading Underwriters

<b>PANEL A</b>	<b>PANEL B</b>	<b>PANEL C</b>
<b><u>U.S. Bank Holding Companies<sup>a</sup></u></b>	<b><u>World Banking Companies<sup>b</sup></u></b>	<b><u>Leading Underwriters<sup>c</sup></u></b>
Citigroup Inc.	Deutsche Bank, Frankfurt	Merrill Lynch & Co.
J.P. Morgan Chase	Citigroup, New York	Salomon Smith Barney <sup>d</sup>
Bank of America	BNP Paribas, Paris	Morgan Stanley
Wells Fargo & Co.	Bank of Tokyo-Mitsubishi, Tokyo	Credit Suisse First Boston
Bank One	Bank of America, Charlotte, N.C.	J.P. Morgan
Metlife Inc	UBS, Zurich	Goldman Sachs
First Union	HSBC Holdings, London	Deutsche Bank
FleetBoston Financial	Fuji Bank, Tokyo	Lehman Brothers
U.S. Bancorp	Sumitomo Bank, Osaka	UBS Warburg
SunTrust Banks Inc.	Bayerische Hypo Vereinsbank, Munich	Bank of America Securities

Notes:  
<sup>a</sup>Ranked by total assets as of December 31, 2000; see <http://www.americanbanker.com>.  
<sup>b</sup>Ranked by total assets as of December 31, 1999; see [http://www.financialservicefacts.org/inter\\_fr.html](http://www.financialservicefacts.org/inter_fr.html).  
<sup>c</sup>Ranked by dollar amount raised through new issues in 2000; see *The Wall Street Journal*, January 2, 2001, R19.  
<sup>d</sup>Owned by Citigroup.

efficiency of our capital markets. Recognizing this fact, Congress has authorized some major changes, and more are on the horizon.

The result of the ongoing regulatory changes has been a blurring of the distinctions between the different types of institutions. Indeed, the trend in the United States today is toward huge **financial service corporations**, which own banks, S&Ls, investment banking houses, insurance companies, pension plan operations, and mutual funds, and which have branches across the country and around the world. Examples of financial service corporations, most of which started in one area but have now diversified to cover most of the financial spectrum, include Merrill Lynch, American Express, Citigroup, Fidelity, and Prudential.

Panel a of Table 1-2 lists the ten largest U.S. bank holding companies, and Panel b shows the leading world banking companies. Among the world's ten largest, only two (Citigroup and Bank of America) are from the United States. While U.S. banks have grown dramatically as a result of recent mergers, they are still small by global standards. Panel c of the table lists the ten leading underwriters in terms of dollar volume of new issues. Six of the top underwriters are also major commercial banks or are part of bank holding companies, which confirms the continued blurring of distinctions among different types of financial institutions.

### Self-Test Questions

Identify three ways capital is transferred between savers and borrowers.

What is the difference between a commercial bank and an investment bank?

Distinguish between investment banking houses and financial intermediaries.

List the major types of intermediaries and briefly describe the primary function of each.

## Online Trading Systems

The forces that led to online trading have also promoted online trading systems that bypass the traditional exchanges. These systems, known as electronic communications networks (ECNs), use technology to bring buyers and sellers together electronically. Bob Mazarella, president of Fidelity Brokerage Services Inc., estimates that ECNs have already captured 20 to 35 percent of Nasdaq's trading volume. Instinet, the first and largest ECN, has a stake with Goldman Sachs, J. P. Morgan, and E\*Trade in another network, Archipelago, which recently announced plans to form its own exchange. Likewise, Charles Schwab recently announced plans to join with Fidelity Investments, Donaldson, Lufkin & Jenrette, and Spear, Leeds & Kellogg to develop another ECN.

ECNs are accelerating the move toward 24-hour trading. Large clients who want to trade after the other markets have closed may utilize an ECN, bypassing the NYSE and Nasdaq.

In fact, Eurex, a Swiss-German ECN for trading futures contracts, has virtually eliminated futures activity on the

trading floors of Paris, London, and Frankfurt. Moreover, it recently passed the Chicago Board of Trade (CBOT) to become the world's leader in futures trading volume. The threat of a similar ECN in the United States has undoubtedly contributed to the recent 50 percent decline in the price of a seat on the CBOT.

The move toward faster, cheaper, 24-hour trading obviously benefits investors, but it also presents regulators, who try to ensure that all investors have access to a "level playing field," with a number of headaches.

Because of the threat from ECNs and the need to raise capital and increase flexibility, both the NYSE and Nasdaq plan to convert from privately held, member-owned businesses to stockholder-owned, for-profit corporations. This suggests that the financial landscape will continue to undergo dramatic changes in the upcoming years.

**Sources:** Katrina Brooker, "Online Investing: It's Not Just for Geeks Anymore," *Fortune*, December 21, 1998, 89-98; "Fidelity, Schwab Part of Deal to Create Nasdaq Challenger," *The Milwaukee Journal Sentinel*, July 22, 1999, 1.

## Secondary Markets

Financial institutions play a key role in matching primary market players who need money with those who have extra funds, but the vast majority of trading actually occurs in the **secondary markets**. Although there are many secondary markets for a wide variety of securities, we can classify their trading procedures along two dimensions. First, the secondary market can be either a **physical location exchange** or a **computer/telephone network**. For example, the New York Stock Exchange, the American Stock Exchange (AMEX), the Chicago Board of Trade (the CBOT trades futures and options), and the Tokyo Stock Exchange are all physical location exchanges. In other words, the traders actually meet and trade in a specific part of a specific building. In contrast, Nasdaq, which trades U.S. stocks, is a network of linked computers. Other examples are the markets for U.S. Treasury bonds and foreign exchange, which are conducted via telephone and/or computer networks. In these electronic markets, the traders never see one another.

The second dimension is the way orders from sellers and buyers are matched. This can occur through an open outcry **auction** system, through dealers, or by automated order matching. An example of an outcry auction is the CBOT, where traders actually meet in a pit and sellers and buyers communicate with one another through shouts and hand signals.

In a **dealer market**, there are "market makers" who keep an inventory of the stock (or other financial instrument) in much the same way that any merchant keeps an inventory. These dealers list bid and ask quotes, which are the prices at which they are

willing to buy or sell. Computerized quotation systems keep track of all bid and ask prices, but they don't actually match buyers and sellers. Instead, traders must contact a specific dealer to complete the transaction. Nasdaq (U.S. stocks) is one such market, as are the London SEAQ (U.K. stocks) and the Neuer Market (stocks of small German companies).

The third method of matching orders is through an **electronic communications network (ECN)**. Participants in an ECN post their orders to buy and sell, and the ECN automatically matches orders. For example, someone might place an order to buy 1,000 shares of IBM stock (this is called a "market order" since it is to buy the stock at the current market price). Suppose another participant had placed an order to sell 1,000 shares of IBM at a price of \$91 per share, and this was the lowest price of any "sell" order. The ECN would automatically match these two orders, execute the trade, and notify both participants that the trade has occurred. Participants can also post "limit orders," which might state that the participant is willing to buy 1,000 shares of IBM at \$90 per share if the price falls that low during the next two hours. In other words, there are limits on the price and/or the duration of the order. The ECN will execute the limit order if the conditions are met, that is, if someone offers to sell IBM at a price of \$90 or less during the next two hours. The two largest ECNs for trading U.S. stocks are Instinet (owned by Reuters) and Island. Other large ECNs include Eurex, a Swiss-German ECN that trades futures contracts, and SETS, a U.K. ECN that trades stocks.

### Self-Test Questions

What are the major differences between physical location exchanges and computer/telephone networks?

What are the differences among open outcry auctions, dealer markets, and ECNs?

## The Stock Market

Because the primary objective of financial management is to maximize the firm's stock price, a knowledge of the stock market is important to anyone involved in managing a business. The two leading stock markets today are the New York Stock Exchange and the Nasdaq stock market.

### The New York Stock Exchange

The New York Stock Exchange (NYSE) is a physical location exchange. It occupies its own building, has a limited number of members, and has an elected governing body—its board of governors. Members are said to have "seats" on the exchange, although everybody stands up. These seats, which are bought and sold, give the holder the right to trade on the exchange. There are currently 1,366 seats on the NYSE, and in August 1999, a seat sold for \$2.65 million. This is up from a price of \$35,000 in 1977. The current (2002) asking price for a seat is about \$2 million.

Most of the larger investment banking houses operate *brokerage departments*, and they own seats on the NYSE and designate one or more of their officers as members. The NYSE is open on all normal working days, with the members meeting in a large room equipped with electronic equipment that enables each member to communicate with his or her firm's offices throughout the country. For example, Merrill Lynch (the largest brokerage firm) might receive an order in its Atlanta office from



You can access the home pages of the major U.S. stock markets by typing <http://www.nyse.com> or <http://www.nasdaq.com>. These sites provide background information as well as the opportunity to obtain individual stock quotes.

a customer who wants to buy shares of AT&T stock. Simultaneously, Morgan Stanley's Denver office might receive an order from a customer wishing to sell shares of AT&T. Each broker communicates electronically with the firm's representative on the NYSE. Other brokers throughout the country are also communicating with their own exchange members. The exchange members with *sell orders* offer the shares for sale, and they are bid for by the members with *buy orders*. Thus, the NYSE operates as an *auction market*.<sup>3</sup>

## The Nasdaq Stock Market

The *National Association of Securities Dealers (NASD)* is a self-regulatory body that licenses brokers and oversees trading practices. The computerized network used by the NASD is known as the NASD Automated Quotation System, or Nasdaq. Nasdaq started as just a quotation system, but it has grown to become an organized securities market with its own listing requirements. Nasdaq lists about 5,000 stocks, although not all trade through the same Nasdaq system. For example, the Nasdaq National Market lists the larger Nasdaq stocks, such as Microsoft and Intel, while the Nasdaq SmallCap Market lists smaller companies with the potential for high growth. Nasdaq also operates the Nasdaq OTC Bulletin Board, which lists quotes for stock that is registered with the Securities Exchange Commission (SEC) but that is not listed on any exchange, usually because the company is too small or too unprofitable.<sup>4</sup> Finally, Nasdaq operates the Pink Sheets, which provide quotes on companies that are not registered with the SEC.

“Liquidity” is the ability to trade quickly at a net price (i.e. after any commissions) that is very close to the security's recent market value. In a dealer market, such as Nasdaq, a stock's liquidity depends on the number and quality of the dealers who make a

<sup>3</sup>The NYSE is actually a modified auction market, wherein people (through their brokers) bid for stocks. Originally—about 200 years ago—brokers would literally shout, “I have 100 shares of Erie for sale; how much am I offered?” and then sell to the highest bidder. If a broker had a buy order, he or she would shout, “I want to buy 100 shares of Erie; who'll sell at the best price?” The same general situation still exists, although the exchanges now have members known as *specialists* who facilitate the trading process by keeping an inventory of shares of the stocks in which they specialize. If a buy order comes in at a time when no sell order arrives, the specialist will sell off some inventory. Similarly, if a sell order comes in, the specialist will buy and add to inventory. The specialist sets a *bid price* (the price the specialist will pay for the stock) and an *asked price* (the price at which shares will be sold out of inventory). The bid and asked prices are set at levels designed to keep the inventory in balance. If many buy orders start coming in because of favorable developments or sell orders come in because of unfavorable events, the specialist will raise or lower prices to keep supply and demand in balance. Bid prices are somewhat lower than asked prices, with the difference, or *spread*, representing the specialist's profit margin.

Special facilities are available to help institutional investors such as mutual funds or pension funds sell large blocks of stock without depressing their prices. In essence, brokerage houses that cater to institutional clients will purchase blocks (defined as 10,000 or more shares) and then resell the stock to other institutions or individuals. Also, when a firm has a major announcement that is likely to cause its stock price to change sharply, it will ask the exchanges to halt trading in its stock until the announcement has been made and digested by investors. Thus, when Texaco announced that it planned to acquire Getty Oil, trading was halted for one day in both Texaco and Getty stocks.

<sup>4</sup>OTC stands for over-the-counter. Before Nasdaq, the quickest way to trade a stock that was not listed at a physical location exchange was to find a brokerage firm that kept shares of that stock in inventory. The stock certificates were actually kept in a safe and were literally passed over the counter when bought or sold. Nowadays the certificates for almost all listed stocks and bonds in the United States are stored in a vault beneath Manhattan, operated by the Depository Trust and Clearing Corporation (DTCC). Most brokerage firms have an account with the DTCC, and most investors leave their stocks with their brokers. Thus, when stocks are sold, the DTCC simply adjusts the accounts of the brokerage firms that are involved, and no stock certificates are actually moved.

## Measuring the Market

A *stock index* is designed to show the performance of the stock market. The problem is that there are many stock indexes, and it is difficult to determine which index best reflects market actions. Some are designed to represent the whole equity market, some to track the returns of certain industry sectors, and others to track the returns of small-cap, mid-cap, or large-cap stocks. “Cap” is short for capitalization, which means the total market value of a firm’s stock. We discuss below four of the leading indexes.

### Dow Jones Industrial Average

Unveiled in 1896 by Charles H. Dow, the Dow Jones Industrial Average (DJIA) provided a benchmark for comparing individual stocks with the overall market and for comparing the market with other economic indicators. The industrial average began with just 10 stocks, was expanded in 1916 to 20 stocks, and then to 30 in 1928. Also, in 1928 *The Wall Street Journal* editors began adjusting it for stock splits, and making substitutions. Today, the DJIA still includes 30 companies. They represent almost a fifth of the market value of all U.S. stocks, and all are both leading companies in their industries and widely held by individual and institutional investors.

### Wilshire 5000 Total Market Index

The Wilshire 5000, created in 1974, measures the performance of all U.S. headquartered equity securities with readily available prices. It was originally composed of roughly 5,000 stocks, but as of August 1999, it included more than 7,000 publicly traded securities with a combined market capitalization in excess of \$14 trillion. The Wilshire 5000 is unique because it seeks to reflect returns on the entire U.S. equity market.

### S&P 500 Index

Created in 1926, the S&P 500 Index is widely regarded as the standard for measuring large-cap U.S. stock market per-

formance. The stocks in the S&P 500 are selected by the Standard & Poor’s Index Committee for being the leading companies in the leading industries, and for accurately reflecting the U.S. stock market. It is value weighted, so the largest companies (in terms of value) have the greatest influence. The S&P 500 Index is used as a comparison benchmark by 97 percent of all U.S. money managers and pension plan sponsors, and approximately \$700 billion is managed so as to obtain the same performance as this index (that is, in indexed funds).

### Nasdaq Composite Index

The Nasdaq Composite Index measures the performance of all common stocks listed on the Nasdaq stock market. Currently, it includes more than 5,000 companies, and because many of the technology-sector companies are traded on the computer-based Nasdaq exchange, this index is generally regarded as an economic indicator of the high-tech industry. Microsoft, Intel, and Cisco Systems are the three largest Nasdaq companies, and they comprise a high percentage of the index’s value-weighted market capitalization. For this reason, substantial movements in the same direction by these three companies can move the entire index.

### Recent Performance

Go to the web site <http://finance.yahoo.com/>. Enter the symbol for any of the indices (^DJI for the Dow Jones, ^WIL5 for the Wilshire 5000, ^SPC for the S&P 500, and ^IXIC for the Nasdaq) and click the Get Quotes button. This will bring up the current value of the index, shown in a table. Click Chart (under the table heading “More Info”), and it will bring up a chart showing the historical performance of the index. Immediately below the chart is a series of buttons that allows you to choose the number of years and to plot the relative performance of several indices on the same chart. You can even download the historical data in spreadsheet form.

market in the stock. Nasdaq has more than 400 dealers, most making markets in a large number of stocks. The typical stock has about 10 market makers, but some stocks have more than 50 market makers. Obviously, there are more market makers, and liquidity, for the Nasdaq National Market than for the SmallCap Market. There is very little liquidity for stocks on the OTC Bulletin Board or the Pink Sheets.

Over the past decade the competition between the NYSE and Nasdaq has been fierce. In an effort to become more competitive with the NYSE and with international markets, the NASD and the AMEX merged in 1998 to form what might best be referred to as an *organized investment network*. This investment network is often referred

to as Nasdaq, but stocks continue to be traded and reported separately on the two markets. Increased competition among global stock markets assuredly will result in similar alliances among other exchanges and markets in the future.

Since most of the largest companies trade on the NYSE, the market capitalization of NYSE-traded stocks is much higher than for stocks traded on Nasdaq (about \$11.6 trillion compared with \$2.7 trillion in late 2001). However, reported volume (number of shares traded) is often larger on Nasdaq, and more companies are listed on Nasdaq.<sup>5</sup>

Interestingly, many high-tech companies such as Microsoft and Intel have remained on Nasdaq even though they easily meet the listing requirements of the NYSE. At the same time, however, other high-tech companies such as Gateway 2000, America Online, and Iomega have left Nasdaq for the NYSE. Despite these defections, Nasdaq's growth over the past decade has been impressive. In the years ahead, the competition will no doubt remain fierce.

### Self-Test Question

What are some major differences between the NYSE and the Nasdaq stock market?

## The Cost of Money

Capital in a free economy is allocated through the price system. *The interest rate is the price paid to borrow debt capital. With equity capital, investors expect to receive dividends and capital gains, whose sum is the cost of equity money.* The factors that affect supply and demand for investment capital, hence the cost of money, are discussed in this section.

The four most fundamental factors affecting the cost of money are (1) **production opportunities**, (2) **time preferences for consumption**, (3) **risk**, and (4) **inflation**. To see how these factors operate, visualize an isolated island community where the people live on fish. They have a stock of fishing gear that permits them to survive reasonably well, but they would like to have more fish. Now suppose Mr. Crusoe has a bright idea for a new type of fishnet that would enable him to double his daily catch. However, it would take him a year to perfect his design, to build his net, and to learn how to use it efficiently, and Mr. Crusoe would probably starve before he could put his new net into operation. Therefore, he might suggest to Ms. Robinson, Mr. Friday, and several others that if they would give him one fish each day for a year, he would return two fish a day during all of the next year. If someone accepted the offer, then the fish that Ms. Robinson or one of the others gave to Mr. Crusoe would constitute *savings*; these savings would be *invested* in the fishnet; and the extra fish the net produced would constitute a *return on the investment*.

Obviously, the more productive Mr. Crusoe thought the new fishnet would be, the more he could afford to offer potential investors for their savings. In this example, we assume that Mr. Crusoe thought he would be able to pay, and thus he offered, a 100 percent rate of return—he offered to give back two fish for every one he received. He might have tried to attract savings for less—for example, he might have decided to offer only 1.5 fish next year for every one he received this year, which would represent a 50 percent rate of return to potential savers.

How attractive Mr. Crusoe's offer appeared to a potential saver would depend in large part on the saver's *time preference for consumption*. For example, Ms. Robinson might be thinking of retirement, and she might be willing to trade fish today for fish

<sup>5</sup>One transaction on Nasdaq generally shows up as two separate trades (the buy and the sell). This "double counting" makes it difficult to compare the volume between stock markets.

in the future on a one-for-one basis. On the other hand, Mr. Friday might have a wife and several young children and need his current fish, so he might be unwilling to “lend” a fish today for anything less than three fish next year. Mr. Friday would be said to have a high time preference for current consumption and Ms. Robinson a low time preference. Note also that if the entire population were living right at the subsistence level, time preferences for current consumption would necessarily be high, aggregate savings would be low, interest rates would be high, and capital formation would be difficult.

The *risk* inherent in the fishnet project, and thus in Mr. Crusoe’s ability to repay the loan, would also affect the return investors would require: the higher the perceived risk, the higher the required rate of return. Also, in a more complex society there are many businesses like Mr. Crusoe’s, many goods other than fish, and many savers like Ms. Robinson and Mr. Friday. Therefore, people use money as a medium of exchange rather than barter with fish. When money is used, its value in the future, which is affected by *inflation*, comes into play: the higher the expected rate of inflation, the larger the required return. We discuss this point in detail later in the chapter.

*Thus, we see that the interest rate paid to savers depends in a basic way (1) on the rate of return producers expect to earn on invested capital, (2) on savers’ time preferences for current versus future consumption, (3) on the riskiness of the loan, and (4) on the expected future rate of inflation.* Producers’ expected returns on their business investments set an upper limit on how much they can pay for savings, while consumers’ time preferences for consumption establish how much consumption they are willing to defer, hence how much they will save at different rates of interest offered by producers.<sup>6</sup> Higher risk and higher inflation also lead to higher interest rates.

### Self-Test Questions

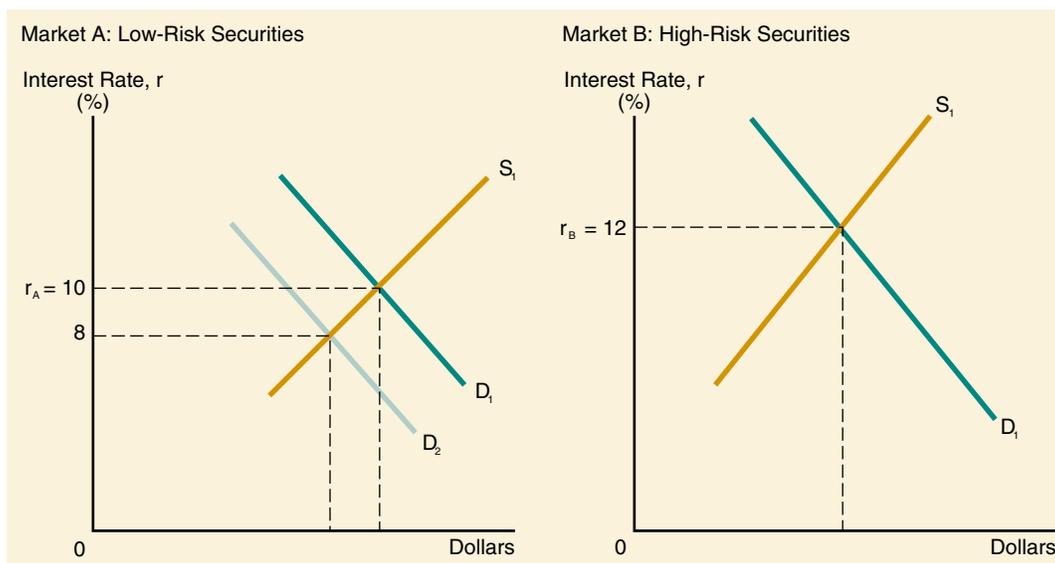
- What is the price paid to borrow money called?
- What are the two items whose sum is the “price” of equity capital?
- What four fundamental factors affect the cost of money?

## Interest Rate Levels

Capital is allocated among borrowers by interest rates: Firms with the most profitable investment opportunities are willing and able to pay the most for capital, so they tend to attract it away from inefficient firms or from those whose products are not in demand. Of course, our economy is not completely free in the sense of being influenced only by market forces. Thus, the federal government has agencies that help designated individuals or groups obtain credit on favorable terms. Among those eligible for this kind of assistance are small businesses, certain minorities, and firms willing to build plants in areas with high unemployment. Still, most capital in the U.S. economy is allocated through the price system.

Figure 1-3 shows how supply and demand interact to determine interest rates in two capital markets. Markets A and B represent two of the many capital markets in existence. The going interest rate, which can be designated as either  $r$  or  $i$ , but for purposes of our discussion is designated as  $r$ , is initially 10 percent for the low-risk

<sup>6</sup>The term “producers” is really too narrow. A better word might be “borrowers,” which would include corporations, home purchasers, people borrowing to go to college, or even people borrowing to buy autos or to pay for vacations. Also, the wealth of a society and its demographics influence its people’s ability to save and thus their time preferences for current versus future consumption.

**FIGURE 1-3** Interest Rates as a Function of Supply and Demand for Funds

securities in Market A.<sup>7</sup> Borrowers whose credit is strong enough to borrow in this market can obtain funds at a cost of 10 percent, and investors who want to put their money to work without much risk can obtain a 10 percent return. Riskier borrowers must obtain higher-cost funds in Market B. Investors who are more willing to take risks invest in Market B, expecting to earn a 12 percent return but also realizing that they might actually receive much less.

If the demand for funds declines, as it typically does during business recessions, the demand curves will shift to the left, as shown in Curve  $D_2$  in Market A. The market-clearing, or equilibrium, interest rate in this example declines to 8 percent. Similarly, you should be able to visualize what would happen if the Federal Reserve tightened credit: The supply curve,  $S_1$ , would shift to the left, and this would raise interest rates and lower the level of borrowing in the economy.

Capital markets are interdependent. For example, if Markets A and B were in equilibrium before the demand shift to  $D_2$  in Market A, then investors were willing to accept the higher risk in Market B in exchange for a *risk premium* of  $12\% - 10\% = 2\%$ . After the shift to  $D_2$ , the risk premium would initially increase to  $12\% - 8\% = 4\%$ . Immediately, though, this much larger premium would induce some of the lenders in Market A to shift to Market B, which would, in turn, cause the supply curve in Market A to shift to the left (or up) and that in Market B to shift to the right. The transfer of capital between markets would raise the interest rate in Market A and lower it in Market B, thus bringing the risk premium back closer to the original 2 percent.

There are many capital markets in the United States. U.S. firms also invest and raise capital throughout the world, and foreigners both borrow and lend in the United

<sup>7</sup>The letter “ $r$ ” is the symbol we use for interest rates and the cost of equity, but “ $i$ ” is used frequently today because this term corresponds to the interest rate key on financial calculators, as described in Chapter 2. Note also that “ $k$ ” was used in the past, but “ $r$ ” is the preferred term today.

States. There are markets for home loans; farm loans; business loans; federal, state, and local government loans; and consumer loans. Within each category, there are regional markets as well as different types of submarkets. For example, in real estate there are separate markets for first and second mortgages and for loans on single-family homes, apartments, office buildings, shopping centers, vacant land, and so on. Within the business sector there are dozens of types of debt and also several different markets for common stocks.

There is a price for each type of capital, and these prices change over time as shifts occur in supply and demand conditions. Figure 1-4 shows how long- and short-term interest rates to business borrowers have varied since the early 1960s. Notice that short-term interest rates are especially prone to rise during booms and then fall during recessions. (The shaded areas of the chart indicate recessions.) When the economy is expanding, firms need capital, and this demand for capital pushes rates up. Also, inflationary pressures are strongest during business booms, and that also exerts upward pressure on rates. Conditions are reversed during recessions such as the one in 2001. Slack business reduces the demand for credit, the rate of inflation falls, and the result is a drop in interest rates. Furthermore, the Federal Reserve deliberately lowers rates during recessions to help stimulate the economy and tightens during booms.

These tendencies do not hold exactly—the period after 1984 is a case in point. The price of oil fell dramatically in 1985 and 1986, reducing inflationary pressures

**FIGURE 1-4** Long- and Short-Term Interest Rates, 1962–2001



Notes:

a. The shaded areas designate business recessions.

b. Short-term rates are measured by three- to six-month loans to very large, strong corporations, and long-term rates are measured by AAA corporate bonds.

**Sources:** Interest rates are from the *Federal Reserve Bulletin*; see <http://www.federalreserve.gov/releases>. The recession dates are from the National Bureau of Economic Research; see <http://www.nber.org/cycles>. As we write this (winter 2002), the economy is in yet another recession.

on other prices and easing fears of serious long-term inflation. Earlier, those fears had pushed interest rates to record levels. The economy from 1984 to 1987 was strong, but the declining fears of inflation more than offset the normal tendency of interest rates to rise during good economic times, and the net result was lower interest rates.<sup>8</sup>

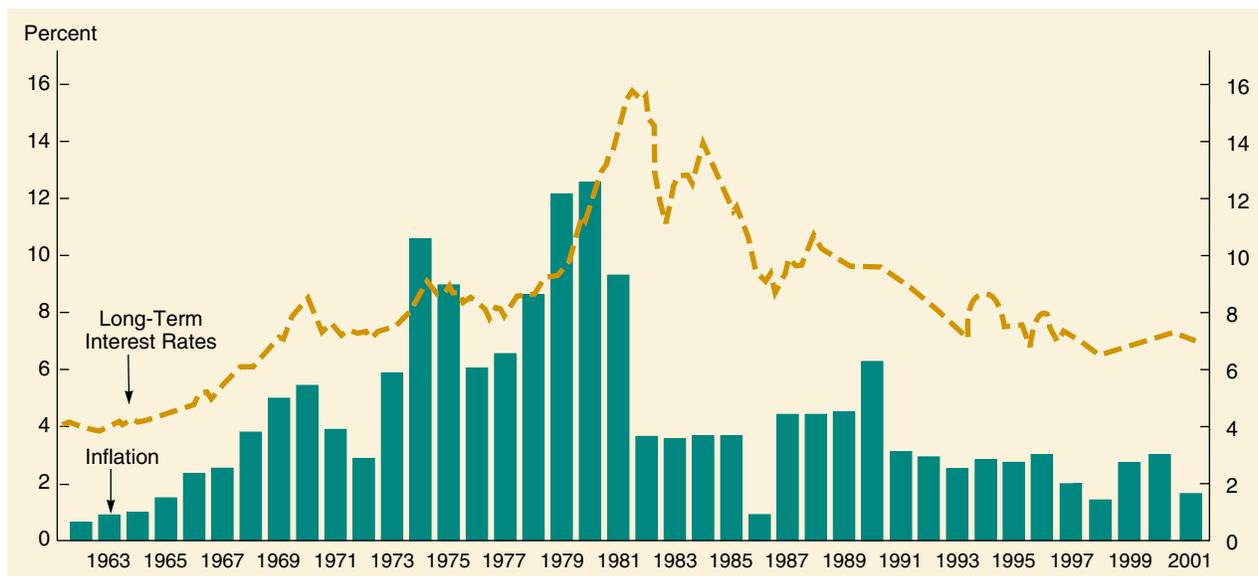
The effect of inflation on long-term interest rates is highlighted in Figure 1-5, which plots rates of inflation along with long-term interest rates. In the early 1960s, inflation averaged 1 percent per year, and interest rates on high-quality, long-term bonds averaged 4 percent. Then the Vietnam War heated up, leading to an increase in inflation, and interest rates began an upward climb. When the war ended in the early 1970s, inflation dipped a bit, but then the 1973 Arab oil embargo led to rising oil prices, much higher inflation, and sharply higher interest rates.

Inflation peaked at about 13 percent in 1980, but interest rates continued to increase into 1981 and 1982, and they remained quite high until 1985, because people were afraid inflation would start to climb again. Thus, the “inflationary psychology” created during the 1970s persisted to the mid-1980s.

Gradually, though, people began to realize that the Federal Reserve was serious about keeping inflation down, that global competition was keeping U.S. auto

<sup>8</sup>Short-term rates are responsive to current economic conditions, whereas long-term rates primarily reflect long-run expectations for inflation. As a result, short-term rates are sometimes above and sometimes below long-term rates. The relationship between long-term and short-term rates is called the *term structure of interest rates*, and it is discussed later in the chapter.

**FIGURE 1-5** Relationship between Annual Inflation Rates and Long-Term Interest Rates, 1962–2001



Notes:

- Interest rates are those on AAA long-term corporate bonds.
- Inflation is measured as the annual rate of change in the Consumer Price Index (CPI).

**Sources:** Interest rates are from the *Federal Reserve Bulletin*; see <http://www.federalreserve.gov/releases>. The CPI data are from <http://www.stls.frb.org/fred/data/cpi.htm>.

producers and other corporations from raising prices as they had in the past, and that constraints on corporate price increases were diminishing labor unions' ability to push through cost-increasing wage hikes. As these realizations set in, interest rates declined. The gap between the current interest rate and the current inflation rate is defined as the "current real rate of interest." It is called the "real rate" because it shows how much investors really earned after taking out the effects of inflation. The real rate was extremely high during the mid-1980s, but it averaged about 4 percent during the 1990s.

In recent years, inflation has been running at about 3 percent a year. However, long-term interest rates have been volatile, because investors are not sure if inflation is truly under control or is getting ready to jump back to the higher levels of the 1980s. In the years ahead, we can be sure that the level of interest rates will vary (1) with changes in the current rate of inflation and (2) with changes in expectations about future inflation.

### Self-Test Questions

How are interest rates used to allocate capital among firms?

What happens to market-clearing, or equilibrium, interest rates in a capital market when the demand for funds declines? What happens when inflation increases or decreases?

Why does the price of capital change during booms and recessions?

How does risk affect interest rates?

## The Determinants of Market Interest Rates



The textbook's web site contains an *Excel* file that will guide you through the chapter's calculations. The file for this chapter is **Ch 01 Tool Kit.xls**, and we encourage you to open the file and follow along as you read the chapter.

In general, the quoted (or nominal) interest rate on a debt security,  $r$ , is composed of a real risk-free rate of interest,  $r^*$ , plus several premiums that reflect inflation, the riskiness of the security, and the security's marketability (or liquidity). This relationship can be expressed as follows:

$$\text{Quoted interest rate} = r = r^* + \text{IP} + \text{DRP} + \text{LP} + \text{MRP} \quad (1-1)$$

Here

$r$  = the quoted, or nominal, rate of interest on a given security.<sup>9</sup> There are many different securities, hence many different quoted interest rates.

$r^*$  = the real risk-free rate of interest.  $r^*$  is pronounced "r-star," and it is the rate that would exist on a riskless security if zero inflation were expected.

$r_{\text{RF}} = r^* + \text{IP}$ , and it is the quoted risk-free rate of interest on a security such as a U.S. Treasury bill, which is very liquid and also free of most risks. Note that  $r_{\text{RF}}$  includes the premium for expected inflation, because  $r_{\text{RF}} = r^* + \text{IP}$ .

$\text{IP}$  = inflation premium.  $\text{IP}$  is equal to the average expected inflation rate over the life of the security. The expected future inflation rate is not necessarily equal to the current inflation rate, so  $\text{IP}$  is not necessarily equal to current inflation as reported in Figure 1-5.

<sup>9</sup>The term *nominal* as it is used here means the *stated* rate as opposed to the *real* rate, which is adjusted to remove inflation effects. If you bought a 10-year Treasury bond in October 2001, the quoted, or nominal, rate would be about 4.6 percent, but if inflation averages 2.5 percent over the next 10 years, the real rate would be about  $4.6\% - 2.5\% = 2.1\%$ . To be technically correct, we should find the real rate by solving for  $r^*$  in the following equation:  $(1 + r^*)(1 + 0.025) = (1 + 0.046)$ . If we solved the equation, we would find  $r^* = 2.05\%$ . Since this is very close to the 2.1 percent calculated above, we will continue to approximate the real rate by subtracting inflation from the nominal rate.

DRP = default risk premium. This premium reflects the possibility that the issuer will not pay interest or principal at the stated time and in the stated amount. DRP is zero for U.S. Treasury securities, but it rises as the riskiness of issuers increases.

LP = liquidity, or marketability, premium. This is a premium charged by lenders to reflect the fact that some securities cannot be converted to cash on short notice at a “reasonable” price. LP is very low for Treasury securities and for securities issued by large, strong firms, but it is relatively high on securities issued by very small firms.

MRP = maturity risk premium. As we will explain later, longer-term bonds, even Treasury bonds, are exposed to a significant risk of price declines, and a maturity risk premium is charged by lenders to reflect this risk.

As noted above, since  $r_{RF} = r^* + IP$ , we can rewrite Equation 1-1 as follows:

$$\text{Nominal, or quoted, rate} = r = r_{RF} + \text{DRP} + \text{LP} + \text{MRP}$$

We discuss the components whose sum makes up the quoted, or nominal, rate on a given security in the following sections.

### The Real Risk-Free Rate of Interest, $r^*$

The **real risk-free rate of interest,  $r^*$** , is defined as the interest rate that would exist on a riskless security if no inflation were expected, and it may be thought of as the rate of interest on *short-term* U.S. Treasury securities in an inflation-free world. The real risk-free rate is not static—it changes over time depending on economic conditions, especially (1) on the rate of return corporations and other borrowers expect to earn on productive assets and (2) on people’s time preferences for current versus future consumption. Borrowers’ expected returns on real asset investments set an upper limit on how much they can afford to pay for borrowed funds, while savers’ time preferences for consumption establish how much consumption they are willing to defer, hence the amount of funds they will lend at different interest rates. It is difficult to measure the real risk-free rate precisely, but most experts think that  $r^*$  has fluctuated in the range of 1 to 5 percent in recent years.<sup>10</sup>

In addition to its regular bond offerings, in 1997 the U.S. Treasury began issuing **indexed bonds**, with payments linked to inflation. To date, the Treasury has issued ten of these indexed bonds, with maturities ranging (at time of issue) from 5 to 31 years. Yields on these bonds in November 2001 ranged from 0.94 to 3.13 percent, with the higher yields on the longer maturities because they have a maturity risk premium due to the fact that the risk premium itself can change, leading to changes in the bonds’ prices. The yield on the shortest-term bond provides a good estimate for  $r^*$ , because it has essentially no risk.



See <http://www.bloomberg.com> and select MARKETS and then U.S. Treasuries for a partial listing of indexed Treasury bonds. The reported yield on each bond is the real risk-free rate expected over its life.

<sup>10</sup>The real rate of interest as discussed here is different from the *current* real rate as discussed in connection with Figure 1-5. The current real rate is the current interest rate minus the current (or latest past) inflation rate, while the real rate, without the word “current,” is the current interest rate minus the *expected future* inflation rate over the life of the security. For example, suppose the current quoted rate for a one-year Treasury bill is 5 percent, inflation during the latest year was 2 percent, and inflation expected for the coming year is 4 percent. Then the *current* real rate would be  $5\% - 2\% = 3\%$ , but the *expected* real rate would be  $5\% - 4\% = 1\%$ . The rate on a 10-year bond would be related to the expected inflation rate over the next 10 years, and so on. In the press, the term “real rate” generally means the current real rate, but in economics and finance, hence in this book unless otherwise noted, the real rate means the one based on *expected* inflation rates.

## The Nominal, or Quoted, Risk-Free Rate of Interest, $r_{RF}$

The **nominal, or quoted, risk-free rate,  $r_{RF}$** , is the real risk-free rate plus a premium for expected inflation:  $r_{RF} = r^* + IP$ . To be strictly correct, the risk-free rate should mean the interest rate on a totally risk-free security—one that has no risk of default, no maturity risk, no liquidity risk, no risk of loss if inflation increases, and no risk of any other type. There is no such security, hence there is no observable truly risk-free rate. However, there is one security that is free of most risks—an indexed U.S. Treasury security. These securities are free of default risk, liquidity risk, and risk due to changes in inflation.<sup>11</sup>

If the term “risk-free rate” is used without either the modifier “real” or the modifier “nominal,” people generally mean the quoted (nominal) rate, and we will follow that convention in this book. Therefore, when we use the term risk-free rate,  $r_{RF}$ , we mean the nominal risk-free rate, which includes an inflation premium equal to the average expected inflation rate over the life of the security. In general, we use the T-bill rate to approximate the short-term risk-free rate, and the T-bond rate to approximate the long-term risk-free rate. So, whenever you see the term “risk-free rate,” assume that we are referring either to the quoted U.S. T-bill rate or to the quoted T-bond rate.

## Inflation Premium (IP)

Inflation has a major impact on interest rates because it erodes the purchasing power of the dollar and lowers the real rate of return on investments. To illustrate, suppose you saved \$1,000 and invested it in a Treasury bill that matures in one year and pays a 5 percent interest rate. At the end of the year, you will receive \$1,050—your original \$1,000 plus \$50 of interest. Now suppose the inflation rate during the year is 10 percent, and it affects all items equally. If gas had cost \$1 per gallon at the beginning of the year, it would cost \$1.10 at the end of the year. Therefore, your \$1,000 would have bought  $\$1,000/\$1 = 1,000$  gallons at the beginning of the year, but only  $\$1,050/\$1.10 = 955$  gallons at the end. In *real terms*, you would be worse off—you would receive \$50 of interest, but it would not be sufficient to offset inflation. You would thus be better off buying 1,000 gallons of gas (or some other storable asset such as land, timber, apartment buildings, wheat, or gold) than buying the Treasury bill.

Investors are well aware of all this, so when they lend money, they build in an **inflation premium (IP)** equal to the average expected inflation rate over the life of the security. As discussed previously, for a short-term, default-free U.S. Treasury bill, the actual interest rate charged,  $r_{T\text{-bill}}$ , would be the real risk-free rate,  $r^*$ , plus the inflation premium (IP):

$$r_{T\text{-bill}} = r_{RF} = r^* + IP.$$

Therefore, if the real short-term risk-free rate of interest were  $r^* = 1.25\%$ , and if inflation were expected to be 1.18 percent (and hence  $IP = 1.18\%$ ) during the next year, then the quoted rate of interest on one-year T-bills would be  $1.25\% + 1.18\% = 2.43\%$ . Indeed, in October 2001, the expected one-year inflation rate was about 1.18

<sup>11</sup>Indexed Treasury securities are the closest thing we have to a riskless security, but even they are not totally riskless, because  $r^*$  itself can change and cause a decline in the prices of these securities. For example, between October 1998 and January 2000, the price of one indexed Treasury security declined from 98 to 89, or by almost 10 percent. The cause was an increase in the real rate. By November 2001, however, the real rate had declined, and the bond's price was back up to 109.

percent, and the yield on one-year T-bills was about 2.43 percent, so the real risk-free rate on short-term securities at that time was 1.25 percent.<sup>12</sup>

It is important to note that the inflation rate built into interest rates is the *inflation rate expected in the future*, not the rate experienced in the past. Thus, the latest reported figures might show an annual inflation rate of 2 percent, but that is for the *past* year. If people on average expect a 6 percent inflation rate in the future, then 6 percent would be built into the current interest rate. Note also that the inflation rate reflected in the quoted interest rate on any security is the *average rate of inflation expected over the security's life*. Thus, the inflation rate built into a one-year bond is the expected inflation rate for the next year, but the inflation rate built into a 30-year bond is the average rate of inflation expected over the next 30 years.<sup>13</sup>

Expectations for future inflation are closely, but not perfectly, correlated with rates experienced in the recent past. Therefore, if the inflation rate reported for last month increased, people would tend to raise their expectations for future inflation, and this change in expectations would cause an increase in interest rates.

Note that Germany, Japan, and Switzerland have over the past several years had lower inflation rates than the United States, hence their interest rates have generally been lower than ours. South Africa and most South American countries have experienced high inflation, and that is reflected in their interest rates.

## Default Risk Premium (DRP)

The risk that a borrower will *default* on a loan, which means not pay the interest or the principal, also affects the market interest rate on the security: the greater the default risk, the higher the interest rate. Treasury securities have no default risk, hence they carry the lowest interest rates on taxable securities in the United States. For corporate bonds, the higher the bond's rating, the lower its default risk, and, consequently, the lower its interest rate.<sup>14</sup> Here are some representative interest rates on long-term bonds during October 2001:

---

<sup>12</sup>There are several sources for the estimated inflation premium. The Congressional Budget Office regularly updates the estimates of inflation that it uses in its forecasted budgets; see <http://www.cbo.gov/reports.html>, select Economic and Budget Projections, and select the most recent Budget and Economic Outlook. An appendix to this document will show the 10-year projection, including the expected CPI inflation rate for each year. A second source is the University of Michigan's Institute for Social Research, which regularly polls consumers regarding their expectations for price increases during the next year; see <http://www.isr.umich.edu/src/projects.html>, select the Surveys of Consumers, and then select the table for Expected Change in Prices. Third, you can find the yield on an indexed Treasury bond, as described in the margin of page 32, and compare it with the yield on a nonindexed Treasury bond of the same maturity. This is the method we prefer, since it provides a direct estimate of the inflation risk premium.

<sup>13</sup>To be theoretically precise, we should use a *geometric average*. Also, because millions of investors are active in the market, it is impossible to determine exactly the consensus expected inflation rate. Survey data are available, however, that give us a reasonably good idea of what investors expect over the next few years. For example, in 1980 the University of Michigan's Survey Research Center reported that people expected inflation during the next year to be 11.9 percent and that the average rate of inflation expected over the next 5 to 10 years was 10.5 percent. Those expectations led to record-high interest rates. However, the economy cooled in 1981 and 1982, and, as Figure 1-5 showed, actual inflation dropped sharply after 1980. This led to gradual reductions in the *expected future* inflation rate. In winter 2002, as we write this, the expected inflation rate for the next year is about 1.2 percent, and the expected long-term inflation rate is about 2.5 percent. As inflationary expectations change, so do quoted market interest rates.

<sup>14</sup>Bond ratings, and bonds' riskiness in general, are discussed in detail in Chapter 4. For now, merely note that bonds rated AAA are judged to have less default risk than bonds rated AA, while AA bonds are less risky than A bonds, and so on. Ratings are designated AAA or Aaa, AA or Aa, and so forth, depending on the rating agency. In this book, the designations are used interchangeably.



To see current estimates of DRP, go to <http://www.bondsonline.com>; under the section on Corporate Bonds, select Industrial Spreads.

	Rate	DRP
U.S. Treasury	5.5%	—
AAA	6.5	1.0%
AA	6.8	1.3
A	7.3	1.8
BBB	7.9	2.4
BB+	10.5	5.0

The difference between the quoted interest rate on a T-bond and that on a corporate bond with similar maturity, liquidity, and other features is the **default risk premium (DRP)**. Therefore, if the bonds listed above were otherwise similar, the default risk premium would be  $DRP = 6.5\% - 5.5\% = 1.0$  percentage point for AAA corporate bonds,  $6.8\% - 5.5\% = 1.3$  percentage points for AA, and so forth. Default risk premiums vary somewhat over time, but the October 2001 figures are representative of levels in recent years.

### Liquidity Premium (LP)

A “liquid” asset can be converted to cash quickly and at a “fair market value.” Financial assets are generally more liquid than real assets. Because liquidity is important, investors include **liquidity premiums (LPs)** when market rates of securities are established. Although it is difficult to accurately measure liquidity premiums, a differential of at least two and probably four or five percentage points exists between the least liquid and the most liquid financial assets of similar default risk and maturity.

### Maturity Risk Premium (MRP)

U.S. Treasury securities are free of default risk in the sense that one can be virtually certain that the federal government will meet the scheduled interest and principal payments on its bonds. Therefore, the default risk premium on Treasury securities is essentially zero. Further, active markets exist for Treasury securities, so their liquidity premiums are also close to zero. Thus, as a first approximation, the rate of interest on a Treasury bond should be the risk-free rate,  $r_{RF}$ , which is equal to the real risk-free rate,  $r^*$ , plus an inflation premium, IP. However, an adjustment is needed for long-term Treasury bonds. The prices of long-term bonds decline sharply whenever interest rates rise, and since interest rates can and do occasionally rise, all long-term bonds, even Treasury bonds, have an element of risk called **interest rate risk**. As a general rule, the bonds of any organization, from the U.S. government to Enron Corporation, have more interest rate risk the longer the maturity of the bond.<sup>15</sup> Therefore, a **maturity risk premium (MRP)**, which is higher the longer the years to maturity, must be included in the required interest rate.

The effect of maturity risk premiums is to raise interest rates on long-term bonds relative to those on short-term bonds. This premium, like the others, is difficult to

<sup>15</sup>For example, if someone had bought a 30-year Treasury bond for \$1,000 in 1998, when the long-term interest rate was 5.25 percent, and held it until 2000, when long-term T-bond rates were about 6.6 percent, the value of the bond would have declined to about \$830. That would represent a loss of 17 percent, and it demonstrates that long-term bonds, even U.S. Treasury bonds, are not riskless. However, had the investor purchased short-term T-bills in 1998 and subsequently reinvested the principal each time the bills matured, he or she would still have had \$1,000. This point will be discussed in detail in Chapter 4.

measure, but (1) it varies somewhat over time, rising when interest rates are more volatile and uncertain, then falling when interest rates are more stable, and (2) in recent years, the maturity risk premium on 30-year T-bonds appears to have generally been in the range of one to three percentage points.

We should mention that although long-term bonds are heavily exposed to interest rate risk, short-term bills are heavily exposed to **reinvestment rate risk**. When short-term bills mature and the funds are reinvested, or “rolled over,” a decline in interest rates would necessitate reinvestment at a lower rate, and this would result in a decline in interest income. To illustrate, suppose you had \$100,000 invested in one-year T-bills, and you lived on the income. In 1981, short-term rates were about 15 percent, so your income would have been about \$15,000. However, your income would have declined to about \$9,000 by 1983, and to just \$5,700 by 2001. Had you invested your money in long-term T-bonds, your income (but not the value of the principal) would have been stable.<sup>16</sup> Thus, although “investing short” preserves one’s principal, the interest income provided by short-term T-bills is less stable than the interest income on long-term bonds.

### Self-Test Questions

Write out an equation for the nominal interest rate on any debt security.

Distinguish between the *real* risk-free rate of interest,  $r^*$ , and the *nominal*, or *quoted*, risk-free rate of interest,  $r_{RF}$ .

How is inflation dealt with when interest rates are determined by investors in the financial markets?

Does the interest rate on a T-bond include a default risk premium? Explain.

Distinguish between liquid and illiquid assets, and identify some assets that are liquid and some that are illiquid.

Briefly explain the following statement: “Although long-term bonds are heavily exposed to interest rate risk, short-term bills are heavily exposed to reinvestment rate risk. The maturity risk premium reflects the net effects of these two opposing forces.”

## The Term Structure of Interest Rates



You can find current U.S. Treasury yield curve graphs and other global and domestic interest rate information at Bloomberg markets’ site at <http://www.bloomberg.com/markets/index.html>.

The **term structure of interest rates** describes the relationship between long- and short-term rates. The term structure is important to corporate treasurers who must decide whether to borrow by issuing long- or short-term debt and to investors who must decide whether to buy long- or short-term bonds. Thus, it is important to understand (1) how long- and short-term rates relate to each other and (2) what causes shifts in their relative positions.

Interest rates for bonds with different maturities can be found in a variety of publications, including *The Wall Street Journal* and the *Federal Reserve Bulletin*, and on a

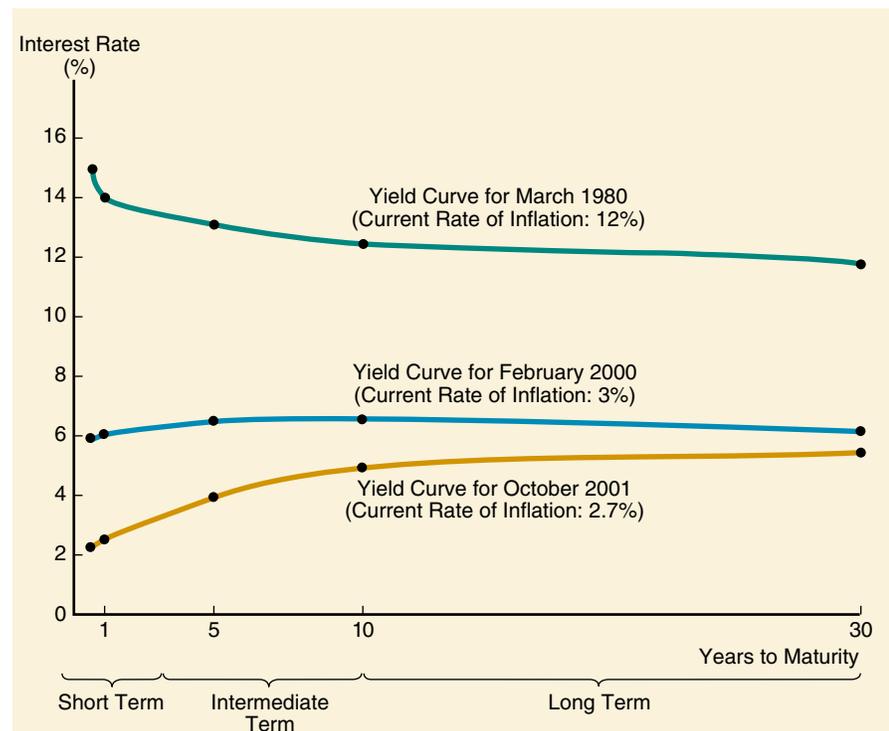
<sup>16</sup>Long-term bonds also have some reinvestment rate risk. If one is saving and investing for some future purpose, say, to buy a house or for retirement, then to actually earn the quoted rate on a long-term bond, the interest payments must be reinvested at the quoted rate. However, if interest rates fall, the interest payments must be reinvested at a lower rate; thus, the realized return would be less than the quoted rate. Note, though, that reinvestment rate risk is lower on a long-term bond than on a short-term bond because only the interest payments (rather than interest plus principal) on the long-term bond are exposed to reinvestment rate risk. Zero coupon bonds, which are discussed in Chapter 4, are completely free of reinvestment rate risk during their life.

number of web sites, including Bloomberg, Yahoo, and CNN Financial. From interest rate data obtained from these sources, we can construct the term structure at a given point in time. For example, the tabular section below Figure 1-6 presents interest rates for different maturities on three different dates. The set of data for a given date, when plotted on a graph such as that in Figure 1-6, is called the **yield curve** for that date.

The yield curve changes both in position and in slope over time. In March 1980, all rates were relatively high, and since short-term rates were higher than long-term rates, the yield curve was *downward sloping*. In October 2001, all rates had fallen, and because short-term rates were lower than long-term rates, the yield curve was *upward sloping*. In February 2000, the yield curve was *bumped*—medium-term rates were higher than both short- and long-term rates.

Figure 1-6 shows yield curves for U.S. Treasury securities, but we could have constructed curves for corporate bonds issued by Exxon Mobil, IBM, Delta Air Lines, or any other company that borrows money over a range of maturities. Had we

**FIGURE 1-6** U.S. Treasury Bond Interest Rates on Different Dates



Term to Maturity	Interest Rate		
	March 1980	February 2000	October 2001
6 months	15.0%	6.0%	2.3%
1 year	14.0	6.2	2.4
5 years	13.5	6.7	3.9
10 years	12.8	6.7	4.6
30 years	12.3	6.3	5.5

constructed corporate curves and plotted them on Figure 1-6, they would have been above those for Treasury securities because corporate yields include default risk premiums. However, the corporate yield curves would have had the same general shape as the Treasury curves. Also, the riskier the corporation, the higher its yield curve, so Delta Airlines, which has a lower bond rating than either Exxon Mobil or IBM, would have a higher yield curve than those of Exxon Mobil and IBM.

Historically, in most years long-term rates have been above short-term rates, so the yield curve usually slopes upward. For this reason, people often call an upward-sloping yield curve a **“normal” yield curve** and a yield curve that slopes downward an **inverted**, or **“abnormal,” curve**. Thus, in Figure 1-6 the yield curve for March 1980 was inverted and the one for October 2001 was normal. However, the February 2000 curve is **humped**, which means that interest rates on medium-term maturities are higher than rates on both short- and long-term maturities. We explain in detail in the next section why an upward slope is the normal situation, but briefly, the reason is that short-term securities have less interest rate risk than longer-term securities, hence smaller MRPs. Therefore, short-term rates are normally lower than long-term rates.

### Self-Test Questions

What is a yield curve, and what information would you need to draw this curve? Explain the shapes of a “normal” yield curve, an “abnormal” curve, and a “humped” curve.

## What Determines the Shape of the Yield Curve?

Since maturity risk premiums are positive, then if other things were held constant, long-term bonds would have higher interest rates than short-term bonds. However, market interest rates also depend on expected inflation, default risk, and liquidity, and each of these factors can vary with maturity.

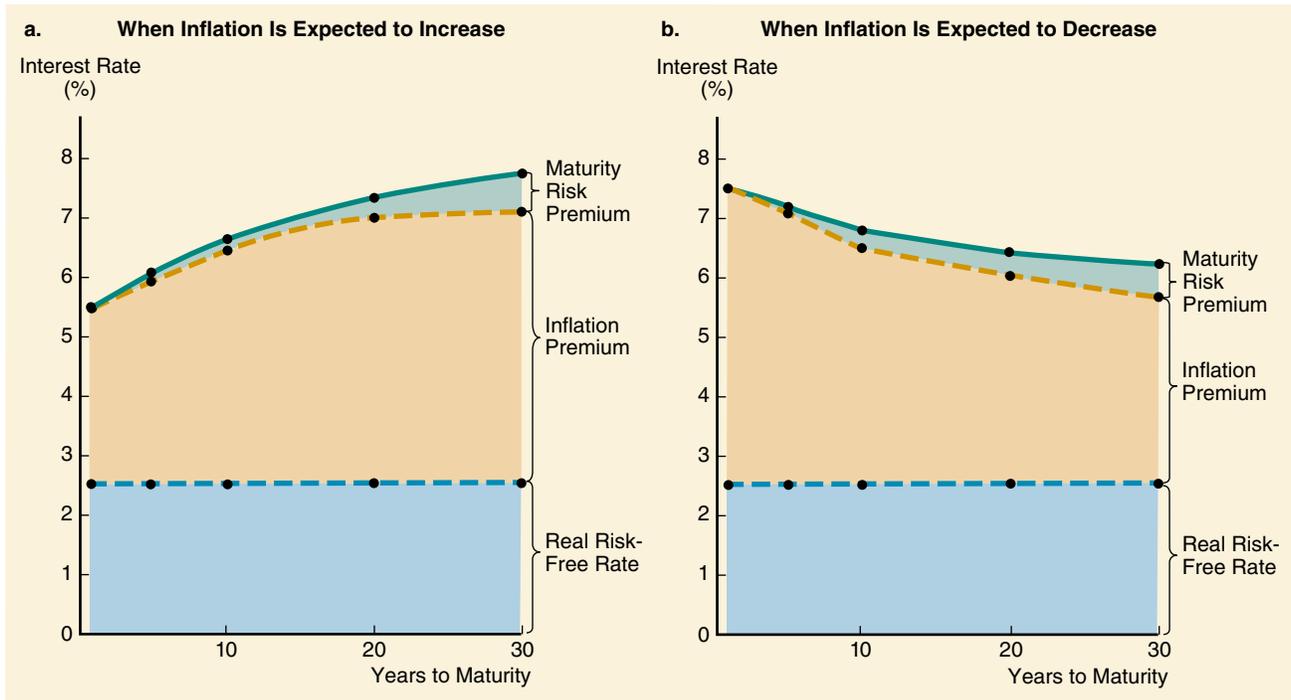
Expected inflation has an especially important effect on the yield curve’s shape. To see why, consider U.S. Treasury securities. Because Treasuries have essentially no default or liquidity risk, the yield on a Treasury bond that matures in  $t$  years can be found using the following equation:

$$r_t = r^* + IP_t + MRP_t.$$

While the real risk-free rate,  $r^*$ , may vary somewhat over time because of changes in the economy and demographics, these changes are random rather than predictable, so it is reasonable to assume that  $r^*$  will remain constant. However, the inflation premium,  $IP$ , does vary significantly over time, and in a somewhat predictable manner. Recall that the inflation premium is simply the average level of expected inflation over the life of the bond. For example, during a recession inflation is usually abnormally low. Investors will expect higher future inflation, leading to higher inflation premiums for long-term bonds. On the other hand, if the market expects inflation to decline in the future, long-term bonds will have a smaller inflation premium than short-term bonds. Finally, if investors consider long-term bonds to be riskier than short-term bonds, the maturity risk premium will increase with maturity.

Panel a of Figure 1-7 shows the yield curve when inflation is expected to increase. Here long-term bonds have higher yields for two reasons: (1) Inflation is expected to be higher in the future, and (2) there is a positive maturity risk premium. Panel b of Figure 1-7 shows the yield curve when inflation is expected to decline, causing the yield curve to be downward sloping. Downward sloping yield curves often foreshadow

**FIGURE 1-7** Illustrative Treasury Yield Curves



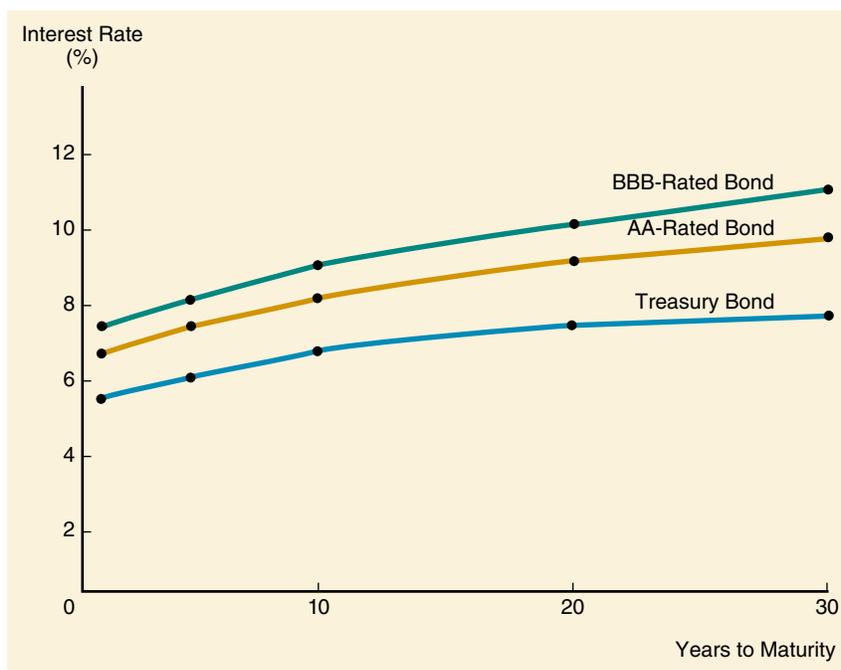
Maturity	With Increasing Expected Inflation				With Decreasing Expected Inflation				
	r*	IP	MRP	Yield	Maturity	r*	IP	MRP	Yield
1 year	2.50%	3.00%	0.00%	5.50%	1 year	2.50%	5.00%	0.00%	7.50%
5 years	2.50	3.40	0.18	6.08	5 years	2.50	4.60	0.18	7.28
10 years	2.50	4.00	0.28	6.78	10 years	2.50	4.00	0.28	6.78
20 years	2.50	4.50	0.42	7.42	20 years	2.50	3.50	0.42	6.42
30 years	2.50	4.67	0.53	7.70	30 years	2.50	3.33	0.53	6.36

economic downturns, because weaker economic conditions tend to be correlated with declining inflation, which in turn leads to lower long-term rates.

Now let's consider the yield curve for corporate bonds. Recall that corporate bonds include a default-risk premium (DRP) and a liquidity premium (LP). Therefore, the yield on a corporate bond that matures in  $t$  years can be expressed as follows:

$$r_{Ct} = r^* + IP_t + MRP_t + DRP_t + LP_t.$$

A corporate bond's default and liquidity risks are affected by its maturity. For example, the default risk on Coca-Cola's short-term debt is very small, since there is almost no chance that Coca-Cola will go bankrupt over the next few years. However, Coke has some 100-year bonds, and while the odds of Coke defaulting on these bonds still might not be high, the default risk on these bonds is considerably higher than that on its short-term debt.

**FIGURE 1-8** Corporate and Treasury Yield Curves

Term to Maturity	Interest Rate					
	Treasury Bond	AA-Rated Bond	AA Spread over T-Bond	BBB-Rated Bond	BBB Spread over T-Bond	AA Spread over BBB
1 year	5.5%	6.7%	1.2%	7.4%	1.9%	0.7%
5 years	6.1	7.4	1.3	8.1	2.0	0.7
10 years	6.8	8.2	1.4	9.1	2.3	0.9
20 years	7.4	9.2	1.8	10.2	2.8	1.0
30 years	7.7	9.8	2.1	11.1	3.4	1.3

Longer-term corporate bonds are also less liquid than shorter-term debt, hence the liquidity premium rises as maturity lengthens. The primary reason for this is that, for the reasons discussed earlier, short-term debt has less default and interest rate risk, so a buyer can buy short-term debt without having to do as much credit checking as would be necessary for long-term debt. Thus, people can move into and out of short-term corporate debt much more rapidly than long-term debt. The end result is that short-term corporate debt is more liquid, hence has a smaller liquidity premium than the same company's long-term debt.

Figure 1-8 shows yield curves for an AA-rated corporate bond with minimal default risk and a BBB-rated bond with more default risk, along with the yield curve for Treasury securities as taken from Panel a of Figure 1-7. Here we assume that inflation is expected to increase, so the Treasury yield curve is upward sloping. Because of their additional default and liquidity risk, corporate bonds always trade at a higher yield than Treasury bonds with the same maturity, and BBB-rated bonds trade at higher yields than AA-rated bonds. Finally, note that the yield spread between

corporate bonds and Treasury bonds is larger the longer the maturity. This occurs because longer-term corporate bonds have more default and liquidity risk than shorter-term bonds, and both of these premiums are absent in Treasury bonds.

### Self-Test Questions

How do maturity risk premiums affect the yield curve?

If the rate of inflation is expected to increase, would this increase or decrease the slope of the yield curve?

If the rate of inflation is expected to remain constant in the future, would the yield curve slope up, down, or be horizontal?

Explain why corporate bonds' default and liquidity premiums are likely to increase with maturity.

Explain why corporate bonds always trade at higher yields than Treasury bonds and why BBB-rated bonds always trade at higher yields than otherwise similar AA-rated bonds.

## Using the Yield Curve to Estimate Future Interest Rates<sup>17</sup>

In the last section we saw that the shape of the yield curve depends primarily on two factors: (1) expectations about future inflation and (2) the relative riskiness of securities with different maturities. We also saw how to calculate the yield curve, given inflation and maturity-related risks. In practice, this process often works in reverse: Investors and analysts plot the yield curve and then use information embedded in it to estimate the market's expectations regarding future inflation and risk.

This process of using the yield curve to estimate future expected interest rates is straightforward, provided (1) we focus on Treasury securities, and (2) we assume that all Treasury securities have the same risk; that is, there is no maturity risk premium. Some academics and practitioners contend that this second assumption is reasonable, at least as an approximation. They argue that the market is dominated by large bond traders who buy and sell securities of different maturities each day, that these traders focus only on short-term returns, and that they are not concerned with risk. According to this view, a bond trader is just as willing to buy a 30-year bond to pick up a short-term profit as he would be to buy a three-month security. Strict proponents of this view argue that the shape of the yield curve is therefore determined only by market expectations about future interest rates, and this position has been called the *pure expectations theory* of the term structure of interest rates.

The **pure expectations theory** (which is sometimes called the “expectations theory”) assumes that investors establish bond prices and interest rates strictly on the basis of expectations for interest rates. This means that they are indifferent with respect to maturity in the sense that they do not view long-term bonds as being riskier than short-term bonds. If this were true, then the maturity risk premium (MRP) would be zero, and long-term interest rates would simply be a weighted average of current and expected future short-term interest rates. For example, if 1-year Treasury bills currently yield 7 percent, but 1-year bills were expected to yield 7.5 percent a

<sup>17</sup>This section is relatively technical, but instructors can omit it without loss of continuity.

year from now, investors would expect to earn an average of 7.25 percent over the next two years:<sup>18</sup>

$$\frac{7\% + 7.5\%}{2} = 7.25\%.$$

According to the expectations theory, this implies that a 2-year Treasury note purchased today should yield 7.25 percent. Similarly, if 10-year bonds yield 9 percent today, and if 5-year bonds are expected to yield 7.5 percent 10 years from now, then investors should expect to earn 9 percent for 10 years and 7.5 percent for 5 years, for an average return of 8.5 percent over the next 15 years:

$$\frac{9\% + 9\% + \dots + 9\% + 7.5\% + \dots + 7.5\%}{15} = \frac{10(9\%) + 5(7.5\%)}{15} = 8.5\%.$$

Consequently, a 15-year bond should yield this same return, 8.5 percent.

To understand the logic behind this averaging process, ask yourself what would happen if long-term yields were *not* an average of expected short-term yields. For example, suppose 2-year bonds yielded only 7 percent, not the 7.25 percent calculated above. Bond traders would be able to earn a profit by adopting the following trading strategy:

1. Borrow money for two years at a cost of 7 percent.
2. Invest the money in a series of 1-year bonds. The expected return over the 2-year period would be  $(7.0 + 7.5)/2 = 7.25\%$ .

In this case, bond traders would rush to borrow money (demand funds) in the 2-year market and invest (or supply funds) in the 1-year market. Recall from Figure 1-3 that an increase in the demand for funds raises interest rates, whereas an increase in the supply of funds reduces interest rates. Therefore, bond traders' actions would push up the 2-year yield but reduce the yield on 1-year bonds. The net effect would be to bring about a market equilibrium in which 2-year rates were a weighted average of expected future 1-year rates.

Under these assumptions, we can use the yield curve to “back out” the bond market's best guess about future interest rates. If, for example, you observe that Treasury securities with 1- and 2-year maturities yield 7 percent and 8 percent, respectively, this information can be used to calculate the market's forecast of what 1-year rates will yield one year from now. If the pure expectations theory is correct, the rate on 2-year bonds is the average of the current 1-year rate and the 1-year rate expected a year from now. Since the current 1-year rate is 7 percent, this implies that the 1-year rate one year from now is expected to be 9 percent:

$$2\text{-year yield} = 8\% = \frac{7\% + X\%}{2}$$

$$X = 16\% - 7\% = 9\% = 1\text{-year yield expected next year.}$$

<sup>18</sup>Technically, we should be using geometric averages rather than arithmetic averages, but the differences are not material in this example. In this example, we would set up the following equation:  $(1 + 0.07)(1.075) = (1 + X)^2$ . The left side is the amount we would have if we invested \$1 at 7 percent for one year and then reinvested the original \$1 and the \$0.07 interest for an additional year at the rate of 7.5 percent. The right side is the total amount we would have if instead we had invested \$1 at the rate X percent for two years. Solving for X, we find that the true two-year yield is 7.2497 percent. Since this is virtually identical to the arithmetic average of 7.25 percent, we simply use arithmetic averages. For a discussion of this point, see Robert C. Radcliffe, *Investment: Concepts, Analysis, and Strategy*, 5th ed. (Reading, MA: Addison-Wesley, 1997), Chapter 5.

The preceding analysis was based on the assumption that the maturity risk premium is zero. However, most evidence suggests that there is a positive maturity risk premium, so the MRP should be taken into account.

For example, assume once again that 1- and 2-year maturities yield 7 percent and 8 percent, respectively, but now assume that the maturity risk premium on the 2-year bond is 0.5 percent. This maturity risk premium implies that the expected return on 2-year bonds (8 percent) is 0.5 percent higher than the expected returns from buying a series of 1-year bonds (7.5 percent). With this background, we can use the following two-step procedure to back out X, the expected 1-year rate one year from now:

$$\text{Step 1: } 2\text{-year yield} - \text{MRP on 2-year bond} = 8.0\% - 0.5\% = 7.5\%.$$

$$\text{Step 2: } 7.5\% = (7.0\% + X\%)/2$$

$$X = 15.0\% - 7.0\% = 8.0\%.$$

Therefore, the yield next year on a 1-year T-bond should be 8 percent, up from 7 percent this year.

### Self-Test Questions

What key assumption underlies the pure expectations theory?

Assuming that the pure expectations theory is correct, how are long-term interest rates calculated?

According to the pure expectations theory, what would happen if long-term rates were *not* an average of expected short-term rates?

## Investing Overseas



*Euromoney* magazine publishes ranking, based on country risk. Students can access the home page of *Euromoney* magazine by typing <http://www.euromoney.com>. Although the site requires users to register, the site is free to use (although some data sets and articles are available only to subscribers.) Yahoo also provides country risk evaluations at <http://biz.yahoo.com/ifc/>.

Investors should consider additional risk factors before investing overseas. First there is **country risk**, which refers to the risk that arises from investing or doing business in a particular country. This risk depends on the country's economic, political, and social environment. Countries with stable economic, social, political, and regulatory systems provide a safer climate for investment, and therefore have less country risk, than less stable nations. Examples of country risk include the risk associated with changes in tax rates, regulations, currency conversion, and exchange rates. Country risk also includes the risk that property will be expropriated without adequate compensation, as well as new host country stipulations about local production, sourcing or hiring practices, and damage or destruction of facilities due to internal strife.

A second thing to keep in mind when investing overseas is that more often than not the security will be denominated in a currency other than the dollar, which means that the value of your investment will depend on what happens to exchange rates. This is known as **exchange rate risk**. For example, if a U.S. investor purchases a Japanese bond, interest will probably be paid in Japanese yen, which must then be converted into dollars if the investor wants to spend his or her money in the United States. If the yen weakens relative to the dollar, then it will buy fewer dollars, hence the investor will receive fewer dollars when it comes time to convert. Alternatively, if the yen strengthens relative to the dollar, the investor will earn higher dollar returns. It therefore follows that the effective rate of return on a foreign investment will depend on both the performance of the foreign security and on what happens to exchange rates over the life of the investment.

### Self-Test Questions

What is country risk?

What is exchange rate risk?

## Other Factors That Influence Interest Rate Levels

In addition to inflationary expectations, other factors also influence both the general level of interest rates and the shape of the yield curve. The four most important factors are (1) Federal Reserve policy; (2) the federal budget deficit or surplus; (3) international factors, including the foreign trade balance and interest rates in other countries; and (4) the level of business activity.



The home page for the Board of Governors of the Federal Reserve System can be found at <http://www.federalreserve.gov>. You can access general information about the Federal Reserve, including press releases, speeches, and monetary policy.

### Federal Reserve Policy

As you probably learned in your economics courses, (1) the money supply has a major effect on both the level of economic activity and the inflation rate, and (2) in the United States, the Federal Reserve Board controls the money supply. If the Fed wants to stimulate the economy, it increases growth in the money supply. The initial effect would be to cause interest rates to decline. However, a larger money supply may also lead to an increase in expected inflation, which would push interest rates up. The reverse holds if the Fed tightens the money supply.

To illustrate, in 1981 inflation was quite high, so the Fed tightened up the money supply. The Fed deals primarily in the short end of the market, so this tightening had the direct effect of pushing short-term rates up sharply. At the same time, the very fact that the Fed was taking strong action to reduce inflation led to a decline in expectations for long-run inflation, which led to a decline in long-term bond yields.

In 2000 and 2001, the situation was reversed. To stimulate the economy, the Fed took steps to reduce interest rates. Short-term rates fell, and long-term rates also dropped, but not as sharply. These lower rates benefitted heavily indebted businesses and individual borrowers, and home mortgage refinancings put additional billions of dollars into consumers' pockets. Savers, of course, lost out, but lower interest rates encouraged businesses to borrow for investment, stimulated the housing market, and brought down the value of the dollar relative to other currencies, which helped U.S. exporters and thus lowered the trade deficit.

During periods when the Fed is actively intervening in the markets, the yield curve may be temporarily distorted. Short-term rates will be temporarily "too low" if the Fed is easing credit, and "too high" if it is tightening credit. Long-term rates are not affected as much by Fed intervention. For example, the fear of a recession led the Federal Reserve to cut short-term interest rates eight times between May 2000 and October 2001. While short-term rates fell by 3.5 percentage point, long-term rates went down only 0.7 percentage points.

### Budget Deficits or Surpluses

If the federal government spends more than it takes in from tax revenues, it runs a deficit, and that deficit must be covered either by borrowing or by printing money (increasing the money supply). If the government borrows, this added demand for funds pushes up interest rates. If it prints money, this increases expectations for future inflation, which also drives up interest rates. Thus, the larger the federal deficit, other things held constant, the higher the level of interest rates. Whether long- or short-term rates are more affected depends on how the deficit is financed, so we cannot state, in general, how deficits will affect the slope of the yield curve.

Over the past several decades, the federal government routinely ran large budget deficits. However, in 1999, for the first time in recent memory, the government had a

budget surplus. As a result, the government paid back existing debt faster than it issued new debt. The net result was a decrease in the national debt. If these surpluses had continued, the government would be a net supplier of funds rather than a net borrower. However, the events of 9/11, when combined with the current recession and the Bush administration's tax cuts, have caused a current budget deficit.

### International Factors

Businesses and individuals in the United States buy from and sell to people and firms in other countries. If we buy more than we sell (that is, if we import more than we export), we are said to be running a *foreign trade deficit*. When trade deficits occur, they must be financed, and the main source of financing is debt. In other words, if we import \$200 billion of goods but export only \$100 billion, we run a trade deficit of \$100 billion, and we would probably borrow the \$100 billion.<sup>19</sup> Therefore, the larger our trade deficit, the more we must borrow, and as we increase our borrowing, this drives up interest rates. Also, foreigners are willing to hold U.S. debt if and only if the rate paid on this debt is competitive with interest rates in other countries. Therefore, if the Federal Reserve attempts to lower interest rates in the United States, causing our rates to fall below rates abroad, then foreigners will sell U.S. bonds, those sales will depress bond prices, and that in turn will result in higher U.S. rates. Thus, if the trade deficit is large relative to the size of the overall economy, it will hinder the Fed's ability to combat a recession by lowering interest rates.

The United States has been running annual trade deficits since the mid-1970s, and the cumulative effect of these deficits is that the United States has become the largest debtor nation of all time. As a result, our interest rates are very much influenced by interest rates in other countries around the world—higher rates abroad lead to higher U.S. rates, and vice versa. Because of all this, U.S. corporate treasurers—and anyone else who is affected by interest rates—must keep up with developments in the world economy.

### Business Activity

Figure 1-4, presented earlier, can be examined to see how business conditions influence interest rates. Here are the key points revealed by the graph:

1. Because inflation increased from 1961 to 1981, the general tendency during that period was toward higher interest rates. However, since the 1981 peak, the trend has generally been downward.
2. Until 1966, short-term rates were almost always below long-term rates. Thus, in those years the yield curve was almost always “normal” in the sense that it was upward sloping.
3. The shaded areas in the graph represent recessions, during which (a) both the demand for money and the rate of inflation tend to fall and (b) the Federal Reserve tends to increase the money supply in an effort to stimulate the economy. As a result, there is a tendency for interest rates to decline during recessions. For example, on three different occasions in 1998 the Fed lowered rates by 25 basis points to

---

<sup>19</sup>The deficit could also be financed by selling assets, including gold, corporate stocks, entire companies, and real estate. The United States has financed its massive trade deficits by all of these means in recent years, but the primary method has been by borrowing from foreigners.

combat the deepening global economic and financial crisis. When the economy is growing rapidly and inflation threatens, the Fed raises interest rates, as it did six times in 1999 and early 2000. The Fed gave four reasons for the rate hikes: healthy financial markets, a persistent strength in domestic demand, firmer foreign economies, and a tight labor market. Currently, in early 2002, we are in a period of recession, and the Fed has cut rates eleven times since mid-2000.

4. During recessions, short-term rates decline more sharply than long-term rates. This occurs because (a) the Fed operates mainly in the short-term sector, so its intervention has the strongest effect there, and (b) long-term rates reflect the average expected inflation rate over the next 20 to 30 years, and this expectation generally does not change much, even when the current inflation rate is low because of a recession or high because of a boom. So, short-term rates are more volatile than long-term rates.

### Self-Test Questions

Other than inflationary expectations, name some additional factors that influence interest rates, and explain the effects of each.

How does the Fed stimulate the economy? How does the Fed affect interest rates? Does the Fed have complete control over U.S. interest rates; that is, can it set rates at any level it chooses?

## Organization of the Book

The primary goal of a manager should be to maximize the value of his or her firm. To achieve this goal, managers must have a general understanding of how businesses are organized, how financial markets operate, how interest rates are determined, how the tax system operates, and how accounting data are used to evaluate a business's performance. In addition, managers must have a good understanding of such fundamental concepts as the time value of money, risk measurement, asset valuation, and techniques for evaluating specific investment opportunities. This background information is essential for anyone involved with the kinds of decisions that affect the value of a firm's securities.

The book's organization reflects these considerations. Part One contains the basic building blocks of finance, beginning here in Chapter 1 with an overview of corporate finance and the financial markets. Then, in Chapters 2 and 3, we cover two of the most important concepts in finance—the time value of money and the relationship between risk and return.

Part Two covers the valuation of securities and projects. Chapter 4 focuses on bonds, and Chapter 5 considers stocks. Both chapters describe the relevant institutional details, then explain how risk and time value jointly determine stock and bond prices. Then, in Chapter 6, we explain how to measure the cost of capital, which is the rate of return that investors require on capital used to fund a company's projects. Chapter 7 goes on to show how we determine whether a potential project will add value to the firm, while Chapter 8 shows how to estimate the size and risk of the cash flows that a project will produce.

Part Three addresses the issue of corporate valuation. Chapter 9 describes the key financial statements, discusses what these statements are designed to do, and then explains how our tax system affects earnings, cash flows, stock prices, and managerial decisions. Chapter 10 shows how to use financial statements to identify a firm's strengths and weaknesses, and Chapter 11 develops techniques for forecasting future financial

statements. Finally, Chapter 12 shows how to use its cost of capital and projected financial statements to determine a corporation's value. The corporate valuation model is useful to investors, and it also allows managers to estimate the impact that proposed changes in operating strategies will have on the value of the corporation. Chapter 12 concludes with a discussion of corporate governance, which has a direct impact on how much value companies create for their shareholders.

Part Four discusses corporate financing decisions, which means how money should be raised. Chapter 13 examines capital structure theory, or the issue of how much debt versus equity the firm should use. Then, Chapter 14 considers the firm's distribution policy; that is, how much of the net income should be retained for reinvestment versus being paid out, either as a dividend or as a share repurchase?

Finally, in Part Five, we address several special topics that draw upon the earlier chapters, including multinational financial management, working capital management, option pricing, and real options.

It is worth noting that instructors may cover the chapters in a different sequence from the order in the book. The chapters are written in a modular, self-contained manner, so such reordering should present no major difficulties.

## e-Resources

*Corporate Finance's* web site at <http://ehrhartd.swcollege.com> contains several types of files:

1. It contains *Excel* files, called Tool Kits, that provide well documented models for almost all of the text's calculations. Not only will these Tool Kits help you with this finance course, but they will serve as tool kits for you in other courses and in your career.
2. There are problems at the end of the chapters that require spreadsheets, and the web site contains the models you will need to begin work on these problems.
3. The web site also contains *PowerPoint* and *Excel* files that correspond to the Mini Cases at the end of each chapter.

When we think it might be helpful for you to look at one of the web site's files, we'll show an icon in the margin like the one that is shown here.



Other resources are also on the web page, including *Web Safaris*, which are links to useful web data and descriptions for navigating the sites to access the data.

## Summary

In this chapter, we provided an overview of corporate finance and of the financial environment. We discussed the nature of financial markets, the types of institutions that operate in these markets, and how interest rates are determined. In later chapters we will use this information to help value different investments, and to better understand corporate financing and investing decisions. The key concepts covered are listed below:

- The three main forms of business organization are the **sole proprietorship**, the **partnership**, and the **corporation**.

- Although each form of organization offers advantages and disadvantages, **corporations conduct most business in the United States because this organizational form maximizes larger firms' values.**
- The primary objective of management should be to **maximize stockholders' wealth**, and this means **maximizing the stock price**. Legal actions that maximize stock prices usually increase social welfare.
- Firms increase cash flows by creating value for **customers, suppliers, and employees.**
- Three factors determine cash flows: (1) **sales**, (2) **after-tax operating profit margins**, and (3) **capital requirements.**
- The **price of a firm's stock** depends on the **size of the firm's cash flows**, the **timing of those flows**, and **their risk**. The size and risk of the cash flows are affected by the **financial environment** as well as the **investment, financing, and dividend policy decisions** made by financial managers.
- There are many different types of **financial markets**. Each market serves a different region or deals with a different type of security.
- **Physical asset markets**, also called tangible or real asset markets, are those for such products as wheat, autos, and real estate.
- **Financial asset markets** deal with stocks, bonds, notes, mortgages, and other claims on real assets.
- **Spot markets** and **futures markets** are terms that refer to whether the assets are bought or sold for “on-the-spot” delivery or for delivery at some future date.
- **Money markets** are the markets for debt securities with maturities of less than one year.
- **Capital markets** are the markets for long-term debt and corporate stocks.
- **Primary markets** are the markets in which corporations raise new capital.
- **Secondary markets** are markets in which existing, already outstanding, securities are traded among investors.
- A **derivative** is a security whose value is derived from the price of some other “underlying” asset.
- Transfers of capital between borrowers and savers take place (1) by **direct transfers** of money and securities; (2) by transfers through **investment banking houses**, which act as middlemen; and (3) by transfers through **financial intermediaries**, which create new securities.
- The major intermediaries include **commercial banks, savings and loan associations, mutual savings banks, credit unions, pension funds, life insurance companies, and mutual funds.**
- One result of ongoing regulatory changes has been a blurring of the distinctions between the different financial institutions. The trend in the United States has been toward **financial service corporations** that offer a wide range of financial services, including investment banking, brokerage operations, insurance, and commercial banking.
- The **stock market** is an especially important market because this is where stock prices (which are used to “grade” managers' performances) are established.
- There are two basic types of stock markets—the **physical location exchanges** (such as NYSE) and **computer/telephone networks** (such as Nasdaq).
- Orders from buyers and sellers can be matched in one of three ways: (1) in an open outcry **auction**; (2) through **dealers**; and (3) automatically through an **electronic communications network (ECN).**
- Capital is allocated through the price system—a price must be paid to “rent” money. Lenders charge **interest** on funds they lend, while equity investors receive **dividends and capital gains** in return for letting firms use their money.

- Four fundamental factors affect the cost of money: (1) **production opportunities**, (2) **time preferences for consumption**, (3) **risk**, and (4) **inflation**.
- The **risk-free rate of interest**,  $r_{RF}$ , is defined as the real risk-free rate,  $r^*$ , plus an inflation premium, IP, hence  $r_{RF} = r^* + IP$ .
- The **nominal (or quoted) interest rate** on a debt security,  $r$ , is composed of the real risk-free rate,  $r^*$ , plus premiums that reflect inflation (IP), default risk (DRP), liquidity (LP), and maturity risk (MRP):

$$r = r^* + IP + DRP + LP + MRP.$$

- If the **real risk-free rate of interest and the various premiums were constant over time**, interest rates would be stable. However, both the real rate and the premiums—especially the premium for expected inflation—**do change over time, causing market interest rates to change**. Also, Federal Reserve intervention to increase or decrease the money supply, as well as international currency flows, lead to fluctuations in interest rates.
- The relationship between the yields on securities and the securities' maturities is known as the **term structure of interest rates**, and the **yield curve** is a graph of this relationship.
- The shape of the yield curve depends on two key factors: (1) **expectations about future inflation** and (2) **perceptions about the relative riskiness of securities with different maturities**.
- The yield curve is normally **upward sloping**—this is called a **normal yield curve**. However, the curve can slope downward (an **inverted yield curve**) if the inflation rate is expected to decline. The yield curve can be **humped**, which means that interest rates on medium-term maturities are higher than rates on both short- and long-term maturities.

## Questions

- 1-1 Define each of the following terms:
- Sole proprietorship; partnership; corporation
  - Limited partnership; limited liability partnership; professional corporation
  - Stockholder wealth maximization
  - Money market; capital market; primary market; secondary market
  - Private markets; public markets; derivatives
  - Investment banker; financial service corporation; financial intermediary
  - Mutual fund; money market fund
  - Physical location exchanges; computer/telephone network
  - Open outcry auction; dealer market; electronic communications network (ECN)
  - Production opportunities; time preferences for consumption
  - Real risk-free rate of interest,  $r^*$ ; nominal risk-free rate of interest,  $r_{RF}$
  - Inflation premium (IP); default risk premium (DRP); liquidity; liquidity premium (LP)
  - Interest rate risk; maturity risk premium (MRP); reinvestment rate risk
  - Term structure of interest rates; yield curve
  - “Normal” yield curve; inverted (“abnormal”) yield curve
  - Expectations theory
  - Foreign trade deficit
- 1-2 What are the three principal forms of business organization? What are the advantages and disadvantages of each?
- 1-3 What are the three primary determinants of a firm's cash flow?
- 1-4 What are financial intermediaries, and what economic functions do they perform?

- 1-5 Which fluctuate more, long-term or short-term interest rates? Why?
- 1-6 Suppose the population of Area Y is relatively young while that of Area O is relatively old, but everything else about the two areas is equal.
- Would interest rates likely be the same or different in the two areas? Explain.
  - Would a trend toward nationwide branching by banks and savings and loans, and the development of nationwide diversified financial corporations, affect your answer to part a?
- 1-7 Suppose a new and much more liberal Congress and administration were elected, and their first order of business was to take away the independence of the Federal Reserve System, and to force the Fed to greatly expand the money supply. What effect would this have
- On the level and slope of the yield curve immediately after the announcement?
  - On the level and slope of the yield curve that would exist two or three years in the future?
- 1-8 It is a fact that the federal government (1) encouraged the development of the savings and loan industry; (2) virtually forced the industry to make long-term, fixed-interest-rate mortgages; and (3) forced the savings and loans to obtain most of their capital as deposits that were withdrawable on demand.
- Would the savings and loans have higher profits in a world with a “normal” or an inverted yield curve?
  - Would the savings and loan industry be better off if the individual institutions sold their mortgages to federal agencies and then collected servicing fees or if the institutions held the mortgages that they originated?

### Self-Test Problem (Solution Appears in Appendix A)

- ST-1** INFLATION RATES Assume that it is now January 1. The rate of inflation is expected to be 4 percent throughout the year. However, increased government deficits and renewed vigor in the economy are then expected to push inflation rates higher. Investors expect the inflation rate to be 5 percent in Year 2, 6 percent in Year 3, and 7 percent in Year 4. The real risk-free rate,  $r^*$ , is expected to remain at 2 percent over the next 5 years. Assume that no maturity risk premiums are required on bonds with 5 years or less to maturity. The current interest rate on 5-year T-bonds is 8 percent.
- What is the average expected inflation rate over the next 4 years?
  - What should be the prevailing interest rate on 4-year T-bonds?
  - What is the implied expected inflation rate in Year 5, given that Treasury bonds which mature at the end of that year yield 8 percent?

### Problems

- 1-1** EXPECTED RATE OF INTEREST The real risk-free rate of interest is 3 percent. Inflation is expected to be 2 percent this year and 4 percent during the next 2 years. Assume that the maturity risk premium is zero. What is the yield on 2-year Treasury securities? What is the yield on 3-year Treasury securities?
- 1-2** DEFAULT RISK PREMIUM A Treasury bond that matures in 10 years has a yield of 6 percent. A 10-year corporate bond has a yield of 8 percent. Assume that the liquidity premium on the corporate bond is 0.5 percent. What is the default risk premium on the corporate bond?
- 1-3** EXPECTED RATE OF INTEREST One-year Treasury securities yield 5 percent. The market anticipates that 1 year from now, 1-year Treasury securities will yield 6 percent. If the pure expectations hypothesis is correct, what should be the yield today for 2-year Treasury securities?
- 1-4** MATURITY RISK PREMIUM The real risk-free rate is 3 percent, and inflation is expected to be 3 percent for the next 2 years. A 2-year Treasury security yields 6.2 percent. What is the maturity risk premium for the 2-year security?
- 1-5** EXPECTED RATE OF INTEREST Interest rates on 1-year Treasury securities are currently 5.6 percent, while 2-year Treasury securities are yielding 6 percent. If the pure expectations theory is correct, what does the market believe will be the yield on 1-year securities 1 year from now?

- 1-6** *EXPECTED RATE OF INTEREST* Interest rates on 4-year Treasury securities are currently 7 percent, while interest rates on 6-year Treasury securities are currently 7.5 percent. If the pure expectations theory is correct, what does the market believe that 2-year securities will be yielding 4 years from now?
- 1-7** *EXPECTED RATE OF INTEREST* The real risk-free rate is 3 percent. Inflation is expected to be 3 percent this year, 4 percent next year, and then 3.5 percent thereafter. The maturity risk premium is estimated to be  $0.0005 \times (t - 1)$ , where  $t$  = number of years to maturity. What is the nominal interest rate on a 7-year Treasury security?
- 1-8** *EXPECTED RATE OF INTEREST* Suppose the annual yield on a 2-year Treasury security is 4.5 percent, while that on a 1-year security is 3 percent.  $r^*$  is 1 percent, and the maturity risk premium is zero.
- Using the expectations theory, forecast the interest rate on a 1-year security during the second year. (Hint: Under the expectations theory, the yield on a 2-year security is equal to the average yield on 1-year securities in Years 1 and 2.)
  - What is the expected inflation rate in Year 1? Year 2?
- 1-9** *EXPECTED RATE OF INTEREST* Assume that the real risk-free rate is 2 percent and that the maturity risk premium is zero. If the nominal rate of interest on 1-year bonds is 5 percent and that on comparable-risk 2-year bonds is 7 percent, what is the 1-year interest rate that is expected for Year 2? What inflation rate is expected during Year 2? Comment on why the average interest rate during the 2-year period differs from the 1-year interest rate expected for Year 2.
- 1-10** *MATURITY RISK PREMIUM* Assume that the real risk-free rate,  $r^*$ , is 3 percent and that inflation is expected to be 8 percent in Year 1, 5 percent in Year 2, and 4 percent thereafter. Assume also that all Treasury securities are highly liquid and free of default risk. If 2-year and 5-year Treasury notes both yield 10 percent, what is the difference in the maturity risk premiums (MRPs) on the two notes; that is, what is  $MRP_5$  minus  $MRP_2$ ?
- 1-11** *INTEREST RATES* Due to a recession, the inflation rate expected for the coming year is only 3 percent. However, the inflation rate in Year 2 and thereafter is expected to be constant at some level above 3 percent. Assume that the real risk-free rate is  $r^* = 2\%$  for all maturities and that the expectations theory fully explains the yield curve, so there are no maturity premiums. If 3-year Treasury notes yield 2 percentage points more than 1-year notes, what inflation rate is expected after Year 1?
- 1-12** *YIELD CURVES* Suppose you and most other investors expect the inflation rate to be 7 percent next year, to fall to 5 percent during the following year, and then to remain at a rate of 3 percent thereafter. Assume that the real risk-free rate,  $r^*$ , will remain at 2 percent and that maturity risk premiums on Treasury securities rise from zero on very short-term securities (those that mature in a few days) to a level of 0.2 percentage point for 1-year securities. Furthermore, maturity risk premiums increase 0.2 percentage point for each year to maturity, up to a limit of 1.0 percentage point on 5-year or longer-term T-notes and T-bonds.
- Calculate the interest rate on 1-, 2-, 3-, 4-, 5-, 10-, and 20-year Treasury securities, and plot the yield curve.
  - Now suppose Exxon Mobil, an AAA-rated company, had bonds with the same maturities as the Treasury bonds. As an approximation, plot an Exxon Mobil yield curve on the same graph with the Treasury bond yield curve. (Hint: Think about the default risk premium on Exxon Mobil's long-term versus its short-term bonds.)
  - Now plot the approximate yield curve of Long Island Lighting Company, a risky nuclear utility.

## Spreadsheet Problem

**1-13**  
BUILD A MODEL:  
ANALYZING INTEREST RATES



- Start with the partial model in the file *Cb 01 P13 Build a Model.xls* from the textbook's web site. Suppose you are considering two possible investment opportunities: a 12-year Treasury bond and a 7-year, A-rated corporate bond. The current real risk-free rate is 4 percent, and inflation is expected to be 2 percent for the next two years, 3 percent for the following four years, and 4 percent thereafter. The maturity risk premium is estimated by this formula:  $MRP = 0.1\%$

- (t - 1). The liquidity premium for the corporate bond is estimated to be 0.7 percent. Finally, you may determine the default risk premium, given the company's bond rating, from the default risk premium table in the text. What yield would you predict for each of these two investments?
- b. Given the following Treasury bond yield information from the September 28, 2001, *Federal Reserve Statistical Release*, construct a graph of the yield curve as of that date.

Maturity	Yield
3 months	2.38%
6 months	2.31
1 year	2.43
2 years	2.78
3 years	3.15
5 years	3.87
10 years	4.58
20 years	5.46
30 years	5.45

- c. Based on the information about the corporate bond that was given in part a, calculate yields and then construct a new yield curve graph that shows both the Treasury and the corporate bonds.
- d. Using the Treasury yield information above, calculate the following forward rates:
- (1) The 1-year rate, one year from now.
  - (2) The 5-year rate, five years from now.
  - (3) The 10-year rate, ten years from now.
  - (4) The 10-year rate, twenty years from now.

## Mini Case



See *Ch 01 Show.ppt* and  
*Ch 01 Mini Case.xls*.

Assume that you recently graduated with a degree in finance and have just reported to work as an investment advisor at the brokerage firm of Balik and Kiefer Inc. One of the firm's clients is Michelle DellaTorre, a professional tennis player who has just come to the United States from Chile. DellaTorre is a highly ranked tennis player who would like to start a company to produce and market apparel that she designs. She also expects to invest substantial amounts of money through Balik and Kiefer. DellaTorre is very bright, and, therefore, she would like to understand in general terms what will happen to her money. Your boss has developed the following set of questions which you must ask and answer to explain the U.S. financial system to DellaTorre.

- a. Why is corporate finance important to all managers?
- b. (1) What are the alternative forms of business organization?  
(2) What are their advantages and disadvantages?
- c. What should be the primary objective of managers?  
(1) Do firms have any responsibilities to society at large?  
(2) Is stock price maximization good or bad for society?  
(3) Should firms behave ethically?
- d. What factors affect stock prices?
- e. What factors determine cash flows?
- f. What factors affect the level and risk of cash flows?
- g. What are financial assets? Describe some financial instruments.
- h. Who are the providers (savers) and users (borrowers) of capital? How is capital transferred between savers and borrowers?
- i. List some financial intermediaries.
- j. What are some different types of markets?
- k. How are secondary markets organized?  
(1) List some physical location markets and some computer/telephone networks.  
(2) Explain the differences between open outcry auctions, dealer markets, and electronic communications networks (ECNs).

- l. What do we call the price that a borrower must pay for debt capital? What is the price of equity capital? What are the four most fundamental factors that affect the cost of money, or the general level of interest rates, in the economy?
- m. What is the real risk-free rate of interest ( $r^*$ ) and the nominal risk-free rate ( $r_{RF}$ )? How are these two rates measured?
- n. Define the terms inflation premium (IP), default risk premium (DRP), liquidity premium (LP), and maturity risk premium (MRP). Which of these premiums is included when determining the interest rate on (1) short-term U.S. Treasury securities, (2) long-term U.S. Treasury securities, (3) short-term corporate securities, and (4) long-term corporate securities? Explain how the premiums would vary over time and among the different securities listed above.
- o. What is the term structure of interest rates? What is a yield curve?
- p. Suppose most investors expect the inflation rate to be 5 percent next year, 6 percent the following year, and 8 percent thereafter. The real risk-free rate is 3 percent. The maturity risk premium is zero for securities that mature in 1 year or less, 0.1 percent for 2-year securities, and then the MRP increases by 0.1 percent per year thereafter for 20 years, after which it is stable. What is the interest rate on 1-year, 10-year, and 20-year Treasury securities? Draw a yield curve with these data. What factors can explain why this constructed yield curve is upward sloping?
- q. At any given time, how would the yield curve facing an AAA-rated company compare with the yield curve for U.S. Treasury securities? At any given time, how would the yield curve facing a BB-rated company compare with the yield curve for U.S. Treasury securities? Draw a graph to illustrate your answer.
- r. What is the pure expectations theory? What does the pure expectations theory imply about the term structure of interest rates?
- s. Suppose that you observe the following term structure for Treasury securities:

Maturity	Yield
1 year	6.0%
2 years	6.2
3 years	6.4
4 years	6.5
5 years	6.5

Assume that the pure expectations theory of the term structure is correct. (This implies that you can use the yield curve given above to “back out” the market’s expectations about future interest rates.) What does the market expect will be the interest rate on 1-year securities one year from now? What does the market expect will be the interest rate on 3-year securities two years from now?

- t. Finally, DellaTorre is also interested in investing in countries other than the United States. Describe the various types of risks that arise when investing overseas.

## Selected Additional References

*For alternative views on firms’ goals and objectives, see the following articles:*

- Cornell, Bradford, and Alan C. Shapiro, “Corporate Stakeholders and Corporate Finance,” *Financial Management*, Spring 1987, 5–14.
- Seitz, Neil, “Shareholder Goals, Firm Goals and Firm Financing Decisions,” *Financial Management*, Autumn 1982, 20–26.

*For a general review of academic finance, together with an extensive bibliography of key research articles, see*

- Brennan, Michael J., “Corporate Finance Over the Past 25 Years,” *Financial Management*, Summer 1995, 9–22.
- Cooley, Philip L., and J. Louis Heck, “Significant Contributions to Finance Literature,” *Financial Management*, Tenth Anniversary Issue 1981, 23–33.

*Textbooks that focus on interest rates and financial markets include*

Fabozzi, Frank J., *Bond Markets: Analysis and Strategies* (Englewood Cliffs, NJ: Prentice-Hall, 1992).

Johnson, Hazel J., *Financial Institutions and Markets: A Global Perspective* (New York: McGraw-Hill, 1993).

Kidwell, David S., Richard Peterson, and David Blackwell, *Financial Institutions, Markets, and Money* (Fort Worth, TX: The Dryden Press, 1993).

Kohn, Mier, *Money, Banking, and Financial Markets* (Fort Worth, TX: The Dryden Press, 1993).

Livingston, Miles, *Money and Capital Markets* (Cambridge, MA: Blackwell, 1996).

Smith, Stephen D., and Raymond E. Spudeck, *Interest Rates: Theory and Application* (Fort Worth, TX: The Dryden Press, 1993).

*For additional information on financial institutions, see*

Greenbaum, Stuart I., and Anjan V. Thakor, *Contemporary Financial Intermediation* (Fort Worth, TX: The Dryden Press, 1995).

Kaufman, George G., *The U.S. Financial System* (Englewood Cliffs, NJ: Prentice-Hall, 1995).