

## CHAPTER

# 7

# STOCK VALUATION

## LEARNING GOALS

LG1

Differentiate between debt and equity capital.

LG2

Discuss the rights, characteristics, and features of both common and preferred stock.

LG3

Describe the process of issuing common stock, including in your discussion venture capital, going public, the investment banker's role, and stock quotations.

LG4

Understand the concept of market efficiency and basic common stock valuation under each of three cases: zero growth, constant growth, and variable growth.

LG5

Discuss the free cash flow valuation model and the use of book value, liquidation value, and price/earnings (P/E) multiples to estimate common stock values.

LG6

Explain the relationships among financial decisions, return, risk, and the firm's value.

## *Across the Disciplines* WHY THIS CHAPTER MATTERS TO YOU

**Accounting:** You need to understand the difference between debt and equity in terms of tax treatment; the ownership claims of capital providers, including venture capitalists and stockholders; and why book value per share is not a sophisticated basis for common stock valuation.

**Information systems:** You need to understand the procedures used to issue common stock; the sources and types of information that impact stock value; and how such information can be used in stock valuation models to link proposed actions to share price.

**Management:** You need to understand the difference between debt and equity capital; the rights and claims of stockholders; the process of raising funds from venture capi-

talists and through initial public offerings; and how the market will use various stock valuation models to value the firm's common stock.

**Marketing:** You need to understand that the firm's ideas for products and services will greatly affect the willingness of venture capitalists and stockholders to contribute capital to the firm and also that a perceived increase in risk as a result of new projects may negatively affect the firm's stock value.

**Operations:** You need to understand that the amount of capital the firm has to invest in plant assets and inventory will depend on the evaluations of venture capitalists and would-be investors; the better the prospects look for growth, the more money the firm will have for operations.

# OAKLEY

## OAKLEY SEES ITS WAY TO HIGHER VALUE

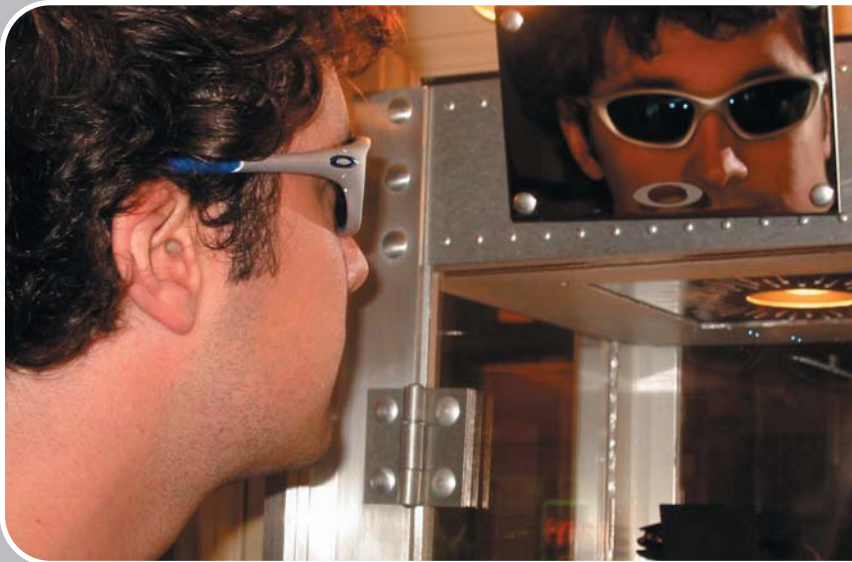
People who wanted to buy a pair of high-fashion **Oakley** sunglasses in fall 2001 were out of luck if they looked for them at **Sunglass Hut**. In August 2001, Oakley's biggest distributor announced it would no longer carry the brand. The loss of about 25 percent of its sales revenue immediately sent Oakley's share price down 33 percent to about \$12 a share, less than half its 52-week high of \$26.56.

Interestingly, however, some analysts considered Oakley stock a good buy despite this significant loss of future earnings. They liked Oakley's diversification strategy. Trading on the NYSE under the eyeglass-evoking symbol OO, Oakley is known for its innovative approach to eyewear design. Its products have international appeal to athletes—from skiers and surfers to golfers and motorcyclists—and to nonathletes who just like the brand's trendy looks. To counter the loss of Sunglass Hut, Oakley added Foot Locker and Champs athletic apparel stores to its distribution channels. Expanded product lines include other high-performance athletic gear, such as apparel, footwear, accessories, and prescription eyewear. Company executives are also creative; CEO Jim Jannard conducted the firm's annual meeting wearing an Oakley specialty product—the Medusa, a leather helmet with mirrored goggles and braided strands. Wall Street watchers hoped that Oakley's iconoclastic style would take the company to new heights, even without Sunglass Hut.

Using the *price-earnings (P/E) multiple approach* to estimate the firm's share value, analysts calculated the share value would be \$23.44 (analysts' average estimated 2002 earnings of \$0.80 a share times the recreational-products industry P/E of 29.3 on December 14, 2001). Said Eric Beder, an analyst at Ladenburg, Thallmann, "If Oakley can grow at 20 percent a year without Sunglass Hut, then this stock is worth double what it is now [August 2001] because this company is just touching the tip of the iceberg with its product lines."

The new products, retail outlets, and a 20 percent increase in international sales boosted Oakley's third-quarter 2001 sales to record levels. In mid-December 2001, Oakley and Sunglass Hut signed a 3-year agreement to resume their business relationship. With the more optimistic earnings picture, by late March 2002 the stock valuation increased to \$31.19 (analysts' average estimated 2003 earnings of \$0.97 a share multiplied by a P/E for the recreational products industry on March 27, 2002, of 32.15), which was considerably above the \$17.90 level at which the stock had been trading.

Stock valuation requires models that bring together cash flows (returns), timing, and the required return (risk). In this chapter we will examine the differences between debt and equity capital, describe the characteristics of common and preferred stock, and use several different valuation models to determine the value of common stock.





## 7.1 Differences Between Debt and Equity Capital

### capital

The long-term funds of a firm; all items on the right-hand side of the firm's balance sheet, *excluding current liabilities*.

### debt capital

All long-term borrowing incurred by a firm, including bonds.

### equity capital

The long-term funds provided by the firm's owners, the stockholders.

The term **capital** denotes the long-term funds of a firm. All items on the right-hand side of the firm's balance sheet, *excluding current liabilities*, are sources of capital. **Debt capital** includes all long-term borrowing incurred by a firm, including bonds, which were discussed in Chapter 6. **Equity capital** consists of long-term funds provided by the firm's owners, the stockholders. A firm can obtain equity capital either *internally*, by retaining earnings rather than paying them out as dividends to its stockholders, or *externally*, by selling common or preferred stock. The key differences between debt and equity capital are summarized in Table 7.1 and discussed below.

### Voice in Management

Unlike creditors (lenders), holders of equity capital (common and preferred stockholders) are owners of the firm. Holders of common stock have voting rights that permit them to select the firm's directors and to vote on special issues. In contrast, debtholders and preferred stockholders may receive voting privileges only when the firm has violated its stated contractual obligations to them.

### Claims on Income and Assets

Holders of equity have claims on both income and assets that are secondary to the claims of creditors. Their *claims on income* cannot be paid until the claims of all creditors (including both interest and scheduled principal payments) have been satisfied. After satisfying these claims, the firm's board of directors decides whether to distribute dividends to the owners.

The equity holders' *claims on assets* also are secondary to the claims of creditors. If the firm fails, its assets are sold, and the proceeds are distributed in this order: employees and customers, the government, creditors, and (finally) equity holders. Because equity holders are the last to receive any distribution of assets, they expect greater returns from dividends and/or increases in stock price.

**TABLE 7.1** Key Differences Between Debt and Equity Capital

Characteristic	Type of capital	
	Debt	Equity
Voice in management <sup>a</sup>	No	Yes
Claims on income and assets	Senior to equity	Subordinate to debt
Maturity	Stated	None
Tax treatment	Interest deduction	No deduction

<sup>a</sup>In the event that the issuer violates its stated contractual obligations to them, debtholders and preferred stockholders *may* receive a voice in management; otherwise, only common stockholders have voting rights.

As is explained in Chapter 11, the costs of equity financing are generally higher than debt costs. One reason is that the suppliers of equity capital take more risk because of their subordinate claims on income and assets. Despite being more costly, equity capital is necessary for a firm to grow. All corporations must initially be financed with some common stock equity.

### Maturity

Unlike debt, equity capital is a *permanent form* of financing for the firm. It does not “mature” so repayment is not required. Because equity is liquidated only during bankruptcy proceedings, stockholders must recognize that although a ready market may exist for their shares, the price that can be realized may fluctuate. This fluctuation of the market price of equity makes the overall returns to a firm’s stockholders even more risky.

### Tax Treatment

Interest payments to debtholders are treated as tax-deductible expenses by the issuing firm, whereas dividend payments to a firm’s common and preferred stockholders are not tax-deductible. The tax deductibility of interest lowers the cost of debt financing, further causing it to be lower than the cost of equity financing.

## Review Question

7-1 What are the key differences between *debt capital* and *equity capital*?



## 7.2 Common and Preferred Stock

A firm can obtain equity, or ownership, capital by selling either common or preferred stock. All corporations initially issue common stock to raise equity capital. Some of these firms later issue either additional common stock or preferred stock to raise more equity capital. Although both common and preferred stock are forms of equity capital, preferred stock has some similarities to debt capital that significantly differentiate it from common stock. Here we first consider the key features and behaviors of both common and preferred stock and then describe the process of issuing common stock, including the use of venture capital.

### Common Stock

The true owners of business firms are the common stockholders. Common stockholders are sometimes referred to as *residual owners* because they receive what is left—the residual—after all other claims on the firm’s income and assets have been satisfied. They are assured of only one thing: that they cannot lose any more than they have invested in the firm. As a result of this generally uncertain position, common stockholders expect to be compensated with adequate dividends and, ultimately, capital gains.

**privately owned (stock)**  
All common stock of a firm owned by a single individual.

**closely owned (stock)**  
All common stock of a firm owned by a small group of investors (such as a family).

**publicly owned (stock)**  
Common stock of a firm owned by a broad group of unrelated individual or institutional investors.

**par value (stock)**  
A relatively useless value for a stock established for legal purposes in the firm's corporate charter.

**preemptive right**  
Allows common stockholders to maintain their *proportionate* ownership in the corporation when new shares are issued.

**dilution of ownership**  
Occurs when a new stock issue results in each present shareholder having a claim on a *smaller* part of the firm's earnings than previously.

**rights**  
Financial instruments that permit stockholders to purchase additional shares at a price below the market price, in direct proportion to their number of owned shares.

**authorized shares**  
The number of shares of common stock that a firm's corporate charter allows it to issue.

**outstanding shares**  
The number of shares of common stock held by the public.

**treasury stock**  
The number of shares of outstanding stock that have been repurchased by the firm.

**issued shares**  
The number of shares of common stock that have been put into circulation; the sum of outstanding shares and treasury stock.

## Ownership

The common stock of a firm can be **privately owned** by a single individual, **closely owned** by a small group of investors (such as a family), or **publicly owned** by a broad group of unrelated individual or institutional investors. Typically, small corporations are privately or closely owned; if their shares are traded, this occurs infrequently and in small amounts. Large corporations, which are emphasized in the following discussions, are publicly owned, and their shares are generally actively traded on the major securities exchanges described in Chapter 1.

## Par Value

Unlike bonds, which always have a par value, common stock may be sold with or without a par value. The **par value** of a common stock is a relatively useless value established for legal purposes in the firm's corporate charter. It is generally quite low, about \$1.

Firms often issue stock with no par value, in which case they may assign the stock a value or record it on the books at the price at which it is sold. A low par value may be advantageous in states where certain corporate taxes are based on the par value of stock; if a stock has no par value, the tax may be based on an arbitrarily determined per-share figure.

## Preemptive Rights

The **preemptive right** allows common stockholders to maintain their *proportionate* ownership in the corporation when new shares are issued. It allows existing shareholders to maintain voting control and protects them against the dilution of their ownership. **Dilution of ownership** usually results in the dilution of earnings, because each present shareholder has a claim on a *smaller* part of the firm's earnings than previously.

In a *rights offering*, the firm grants **rights** to its shareholders. These financial instruments permit stockholders to purchase additional shares at a price below the market price, in direct proportion to their number of owned shares. Rights are used primarily by smaller corporations whose shares are either *closely owned* or *publicly owned* and not actively traded. In these situations, rights are an important financing tool without which shareholders would run the risk of losing their proportionate control of the corporation. From the firm's viewpoint, the use of rights offerings to raise new equity capital may be less costly and may generate more interest than a public offering of stock.

## Authorized, Outstanding, and Issued Shares

A firm's corporate charter indicates how many **authorized shares** it can issue. The firm cannot sell more shares than the charter authorizes without obtaining approval through a shareholder vote. To avoid later having to amend the charter, firms generally attempt to authorize more shares than they initially plan to issue.

Authorized shares become **outstanding shares** when they are held by the public. If the *firm* repurchases any of its outstanding shares, these shares are recorded as **treasury stock** and are no longer considered to be outstanding shares. **Issued shares** are the shares of common stock that have been put into circulation; they represent the sum of outstanding shares and treasury stock.

**EXAMPLE** ▼ Golden Enterprises, a producer of medical pumps, has the following stockholders' equity account on December 31:

<b>Stockholders' Equity</b>	
Common stock—\$0.80 par value:	
Authorized 35,000,000 shares;	
issued 15,000,000 shares	\$ 12,000,000
Paid-in capital in excess of par	63,000,000
Retained earnings	<u>31,000,000</u>
	\$106,000,000
Less: Cost of treasury stock (1,000,000 shares)	<u>4,000,000</u>
Total stockholders' equity	<u><u>\$102,000,000</u></u>

How many shares of additional common stock can Golden sell without gaining approval from its shareholders? The firm has 35 million authorized shares, 15 million issued shares, and 1 million shares of treasury stock. Thus 14 million shares are outstanding (15 million issued shares – 1 million shares of treasury stock), and Golden can issue 21 million additional shares (35 million authorized shares – 14 million outstanding shares) without seeking shareholder approval. This total includes the treasury shares currently held, which the firm can reissue to the public without obtaining shareholder approval.

### Voting Rights

Generally, each share of common stock entitles its holder to one vote in the election of directors and on special issues. Votes are generally assignable and may be cast at the annual stockholders' meeting.

In recent years, many firms have issued two or more classes of common stock; they differ mainly in having unequal voting rights. A firm can use different classes of stock as a defense against a *hostile takeover* in which an outside group, without management support, tries to gain voting control of the firm by buying its shares in the marketplace. **Supervoting shares** of stock give each owner multiple votes. When supervoting shares are issued to “insiders,” an outside group, whose shares have only one vote each typically cannot obtain enough votes to gain control of the firm. At other times, a class of **nonvoting common stock** is issued when the firm wishes to raise capital through the sale of common stock but does not want to give up its voting control.

When different classes of common stock are issued on the basis of unequal voting rights, class A common is typically—but not universally—designated as nonvoting, and class B common has voting rights. Generally, higher classes of shares (class A, for example) are given preference in the distribution of earnings (dividends) and assets; lower-class shares, in exchange, receive voting rights. Treasury stock, which is held within the corporation, generally *does not* have voting rights, *does not* earn dividends, and *does not* have a claim on assets in liquidation.

Because most small stockholders do not attend the annual meeting to vote, they may sign a **proxy statement** giving their votes to another party. The solicitation of

**supervoting shares**  
Stock that carries with it multiple votes per share rather than the single vote per share typically given on regular shares of common stock.

**nonvoting common stock**  
Common stock that carries no voting rights; issued when the firm wishes to raise capital through the sale of common stock but does not want to give up its voting control.

**proxy statement**  
A statement giving the votes of a stockholder to another party.

**proxy battle**

The attempt by a nonmanagement group to gain control of the management of a firm by soliciting a sufficient number of proxy votes.

proxies from shareholders is closely controlled by the Securities and Exchange Commission to ensure that proxies are not being solicited on the basis of false or misleading information. Existing management generally receives the stockholders' proxies, because it is able to solicit them at company expense.

Occasionally, when the firm is widely owned, outsiders may wage a **proxy battle** to unseat the existing management and gain control. To win a corporate election, votes from a majority of the shares voted are required. However, the odds of a nonmanagement group winning a proxy battle are generally slim.

**Dividends**

The payment of dividends to the firm's shareholders is at the discretion of the corporation's board of directors. Most corporations pay dividends quarterly. Dividends may be paid in cash, stock, or merchandise. Cash dividends are the most common, merchandise dividends the least.

Common stockholders are not promised a dividend, but they come to expect certain payments on the basis of the historical dividend pattern of the firm. Before dividends are paid to common stockholders, the claims of the government, all creditors, and preferred stockholders must be satisfied. Because of the importance of the dividend decision to the growth and valuation of the firm, dividends are discussed in greater detail in Chapter 13.

**International Stock Issues**

Although the international market for common stock is not so large as the international market for bonds, cross-border issuance and trading of common stock have increased dramatically in the past 20 years.

Some corporations *issue stock in foreign markets*. For example, the stock of General Electric trades in Frankfurt, London, Paris, and Tokyo; the stocks of AOL Time Warner and Microsoft trade in Frankfurt; and the stock of McDonald's trades in Frankfurt and Paris. The London, Frankfurt, and Tokyo markets are the most popular. Issuing stock internationally broadens the ownership base and also helps a company to integrate itself into the local business scene. A listing on a foreign stock exchange both increases local business press coverage and serves as effective corporate advertising. Having locally traded stock can also facilitate corporate acquisitions, because shares can be used as an acceptable method of payment.

Foreign corporations have also discovered the benefits of trading their stock in the United States. The disclosure and reporting requirements mandated by the U.S. Securities and Exchange Commission have historically discouraged all but the largest foreign firms from directly listing their shares on the New York Stock Exchange or the American Stock Exchange. For example, in 1993, Daimler-Benz (now Daimler Chrysler) became the first large German company to be listed on the NYSE.

**American depositary receipts (ADRs)**

Claims issued by U.S. banks representing ownership of shares of a foreign company's stock held on deposit by the U.S. bank in the foreign market and issued in dollars to U.S. investors.

Alternatively, most foreign companies tap the U.S. market through **American depositary receipts (ADRs)**. These are claims issued by U.S. banks representing ownership of shares of a foreign company's stock held on deposit by the U.S. bank in the foreign market. Because ADRs are issued, in dollars, by a U.S. bank to U.S. investors, they are subject to U.S. securities laws. Yet they still give investors the opportunity to diversify their portfolios internationally.

## Preferred Stock

**par-value preferred stock**  
Preferred stock with a stated face value that is used with the specified dividend percentage to determine the annual dollar dividend.

**no-par preferred stock**  
Preferred stock with no stated face value but with a stated annual dollar dividend.

*Preferred stock* gives its holders certain privileges that make them senior to common stockholders. Preferred stockholders are promised a fixed periodic dividend, which is stated either as a percentage or as a dollar amount. How the dividend is specified depends on whether the preferred stock has a *par value*, which, as in common stock, is a relatively useless stated value established for legal purposes. **Par-value preferred stock** has a stated face value, and its annual dividend is specified as a percentage of this value. **No-par preferred stock** has no stated face value, but its annual dividend is stated in dollars. Preferred stock is most often issued by public utilities, by acquiring firms in merger transactions, and by firms that are experiencing losses and need additional financing.

### Basic Rights of Preferred Stockholders

The basic rights of preferred stockholders are somewhat more favorable than the rights of common stockholders. Preferred stock is often considered *quasi-debt* because, much like interest on debt, it specifies a fixed periodic payment (dividend). Of course, as ownership, preferred stock is unlike debt in that it has no maturity date. Because they have a fixed claim on the firm's income that takes precedence over the claim of common stockholders, preferred stockholders are exposed to less risk. They are consequently *not normally given a voting right*.

Preferred stockholders have *preference over common stockholders in the distribution of earnings*. If the stated preferred stock dividend is "passed" (not paid) by the board of directors, the payment of dividends to common stockholders is prohibited. It is this preference in dividend distribution that makes common stockholders the true risk takers.

Preferred stockholders are also usually given *preference over common stockholders in the liquidation of assets* in a legally bankrupt firm, although they must "stand in line" behind creditors. The amount of the claim of preferred stockholders in liquidation is normally equal to the par or stated value of the preferred stock.

### Features of Preferred Stock

A number of features are generally included as part of a preferred stock issue. These features, along with the stock's par value, the amount of dividend payments, the dividend payment dates, and any restrictive covenants, are specified in an agreement similar to a *bond indenture*.

**Restrictive Covenants** The restrictive covenants in a preferred stock issue are aimed at ensuring the firm's continued existence and regular payment of the dividend. These covenants include provisions about passing dividends, the sale of senior securities, mergers, sales of assets, minimum liquidity requirements, and repurchases of common stock. The violation of preferred stock covenants usually permits preferred stockholders either to obtain representation on the firm's board of directors or to force the retirement of their stock at or above its par or stated value.

**cumulative preferred stock**  
Preferred stock for which all passed (unpaid) dividends in arrears, along with the current dividend, must be paid before dividends can be paid to common stockholders.

**Cumulation** Most preferred stock is **cumulative** with respect to any dividends passed. That is, all dividends in arrears, along with the current dividend,



**noncumulative preferred stock**  
Preferred stock for which passed (unpaid) dividends do not accumulate.

**conversion feature (preferred stock)**  
A feature of convertible preferred stock that allows holders to change each share into a stated number of shares of common stock.

**venture capital**  
Privately raised external equity capital used to fund early-stage firms with attractive growth prospects.

**venture capitalists (VCs)**  
Providers of venture capital; typically, formal businesses that maintain strong oversight over the firms they invest in and that have clearly defined exit strategies.

must be paid before dividends can be paid to common stockholders. If preferred stock is **noncumulative**, passed (unpaid) dividends do not accumulate. In this case, only the current dividend must be paid before dividends can be paid to common stockholders. Because the common stockholders can receive dividends only after the dividend claims of preferred stockholders have been satisfied, it is in the firm's best interest to pay preferred dividends when they are due.<sup>1</sup>

**Other Features** Preferred stock is generally *callable*—the issuer can retire outstanding stock within a certain period of time at a specified price. The call option generally cannot be exercised until a specified date. The call price is normally set above the initial issuance price, but it may decrease as time passes. Making preferred stock callable provides the issuer with a way to bring the fixed-payment commitment of the preferred issue to an end if conditions in the financial markets make it desirable to do so.

Preferred stock quite often contains a **conversion feature** that allows *holders of convertible preferred stock* to change each share into a stated number of shares of common stock. Sometimes the number of shares of common stock that the preferred stock can be exchanged for changes according to a prespecified formula.

## Issuing Common Stock

Because of the high risk associated with a business startup, a firm's initial financing typically comes from its founders in the form of a common stock investment. Until the founders have made an equity investment, it is highly unlikely that others will contribute either equity or debt capital. Early-stage investors in the firm's equity, as well as lenders who provide debt capital, want to be assured that they are taking no more risk than the founding owner(s). In addition, they want confirmation that the founders are confident enough in their vision for the firm that they are willing to risk their own money.

The initial nonfounder financing for business startups with attractive growth prospects comes from private equity investors. Then, as the firm establishes the viability of its product or service offering and begins to generate revenues, cash flow, and profits, it will often “go public” by issuing shares of common stock to a much broader group of investors.

Before we consider the initial *public* sales of equity, let's review some of the key aspects of early-stage equity financing in firms that have attractive growth prospects.

## Venture Capital

The initial external equity financing privately raised by firms, typically early-stage firms with attractive growth prospects, is called **venture capital**. Those who provide venture capital are known as **venture capitalists (VCs)**. They typically are

1. Most preferred stock is cumulative, because it is difficult to sell noncumulative stock. Common stockholders obviously prefer issuance of noncumulative preferred stock, because it does not place them in quite so risky a position. But it is often in the best interest of the firm to sell cumulative preferred stock because of its lower cost.

Most preferred stock has a fixed dividend, but some firms issue *adjustable-rate (floating-rate) preferred stock (ARPS)* whose dividend rate is tied to interest rates on specific government securities. Rate adjustments are commonly made quarterly. ARPS offers investors protection against sharp rises in interest rates, which means that the issue can be sold at an initially lower dividend rate.

**angel capitalists (angels)**  
 Wealthy individual investors who do not operate as a business but invest in promising early-stage companies in exchange for a portion of the firm's equity.

formal business entities that maintain strong oversight over the firms they invest in and that have clearly defined exit strategies. Less visible early-stage investors called **angel capitalists** (or **angels**) tend to be investors who do not actually operate as a business; they are often wealthy individual investors who are willing to invest in promising early-stage companies in exchange for a portion of the firm's equity. Although angels play a major role in early-stage equity financing, we will focus on VCs because of their more formal structure and greater public visibility.

**Organization and Investment Stages** Institutional venture capital investors tend to be organized in one of four basic ways, as described in Table 7.2. The *VC limited partnership* is by far the dominant structure. These funds have as their sole objective to earn high returns, rather than to obtain access to the companies in order to sell or buy other products or services.

VCs can invest in early-stage companies, later-stage companies, or buyouts and acquisitions. Generally, about 40 to 50 percent of VC investments are devoted to early-stage companies (for startup funding and expansion) and a similar percentage to later-stage companies (for marketing, production expansion, and preparation for public offering); the remaining 5 to 10 percent are devoted to the buyout or acquisition of other companies. Generally, VCs look for compound rates of return ranging from 20 to 50 percent or more, depending on both the development stage and the attributes of each company. Earlier-stage investments tend to demand higher returns than later-stage financing because of the higher risk associated with the earlier stages of a firm's growth.

**Deal Structure and Pricing** Regardless of the development stage, venture capital investments are made under a legal contract that clearly allocates responsibilities and ownership interests between existing owners (founders) and the VC fund or limited partnership. The terms of the agreement will depend on numerous

**TABLE 7.2** Organization of Institutional Venture Capital Investors

Organization	Description
Small business investment companies (SBICs)	Corporations chartered by the federal government that can borrow at attractive rates from the U.S. Treasury and use the funds to make venture capital investments in private companies.
Financial VC funds	Subsidiaries of financial institutions, particularly banks, set up to help young firms grow and, it is hoped, become major customers of the institution.
Corporate VC funds	Firms, sometimes subsidiaries, established by nonfinancial firms, typically to gain access to new technologies that the corporation can access to further its own growth.
VC limited partnerships	Limited partnerships organized by professional VC firms, who serve as the general partner and organize, invest, and manage the partnership using the limited partners' funds; the professional VCs ultimately liquidate the partnership and distribute the proceeds to all partners.

factors related to the founders; the business structure, stage of development, and outlook; and other market and timing issues. The specific financial terms will, of course, depend on the value of the enterprise, the amount of funding, and the perceived risk. To control the VC's risk, various covenants are included in the agreement, and the actual funding may be pegged to the achievement of measurable milestones. The VC will negotiate numerous other provisions into the contract, both to ensure the firm's success and to control its risk exposure. The contract will have an explicit exit strategy for the VC that may be tied both to measurable milestones and to time.

The amount of equity to which the VC is entitled will, of course, depend on the value of the firm, the terms of the contract, the exit terms, and the minimum compound rate of return required by the VC on its investment. Although each VC investment is unique and no standard contract exists, the transaction will be structured to provide the VC with a high rate of return that is consistent with the typically high risk of such transactions. The exit strategy of most VC investments is to take the firm public through an initial public offering.

## Going Public

When a firm wishes to sell its stock in the primary market, it has three alternatives. It can make (1) a *public offering*, in which it offers its shares for sale to the general public; (2) a *rights offering*, in which new shares are sold to existing stockholders; or (3) a *private placement*, in which the firm sells new securities directly to an investor or group of investors. Here we focus on public offerings, particularly the **initial public offering (IPO)**, which is the first public sale of a firm's stock. IPOs are typically made by small, rapidly growing companies that either require additional capital to continue expanding or have met a milestone for going public that was established in a contract signed earlier in order to obtain VC funding.

To go public, the firm must first obtain the approval of its current shareholders, the investors who own its privately issued stock. Next, the company's auditors and lawyers must certify that all documents for the company are legitimate. The company then finds an investment bank willing to *underwrite* the offering. This underwriter is responsible for promoting the stock and facilitating the sale of the company's IPO shares. The underwriter often brings in other investment banking firms as participants. We'll discuss the role of the investment banker in more detail in the next section.

The company files a registration statement with the SEC. One portion of the registration statement is called the **prospectus**. It describes the key aspects of the issue, the issuer, and its management and financial position. During the waiting period between the statement's filing and its approval, prospective investors can receive a preliminary prospectus. This preliminary version is called a **red herring**, because a notice printed in red on the front cover indicates the tentative nature of the offer. The cover of the preliminary prospectus describing the 2002 stock issue of Ribapharm, Inc. is shown in Figure 7.1. Note the red herring printed vertically on its left edge.

After the SEC approves the registration statement, the investment community can begin analyzing the company's prospects. However, from the time it files until at least one month after the IPO is complete, the company must observe a *quiet period*, during which there are restrictions on what company officials may say

**initial public offering (IPO)**  
The first public sale of a firm's stock.

**prospectus**  
A portion of a security registration statement that describes the key aspects of the issue, the issuer, and its management and financial position.

**red herring**  
A preliminary prospectus made available to prospective investors during the waiting period between the registration statement's filing with the SEC and its approval.

**FIGURE 7.1 Cover of a Preliminary Prospectus for a Stock Issue**

Some of the key factors related to the 2002 common stock issue by Ribapharm, Inc. are summarized on the cover of the prospectus. The type printed vertically on the left edge is normally red, which explains its name “red herring.” (Source: Ribapharm, Inc., March 21, 2002, p. 1.)

The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

PRELIMINARY PROSPECTUS      Subject to completion      March 21, 2002

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26,000,000 Shares

**Ribapharm**  
Common Stock

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This is an initial public offering of shares of our common stock. ICN Pharmaceuticals, Inc. is selling all of these shares of our common stock and will receive all of the proceeds of this offering. We expect the public offering price to be between \$13.00 and \$15.00 per share.

Upon completion of this offering, ICN will own approximately 82.67% of our outstanding shares of common stock, assuming no exercise of the over-allotment option referred to below. If the over-allotment option referred to below is exercised, ICN will own approximately 80.07% of our outstanding shares of common stock.

Our common stock is approved for listing on the New York Stock Exchange under the symbol “RNA,” subject to official notice of issuance.

Before buying any shares you should read the discussion of material risks of investing in our common stock in “Risk factors” beginning on page 11.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

	Per share	Total
Public offering price	\$	\$
Underwriting discounts and commissions	\$	\$
Proceeds, before expenses, to ICN	\$	\$

The underwriters may also purchase up to an additional 3,900,000 shares of our common stock from ICN at the public offering price, less the underwriting discounts and commissions, within 30 days from the date of this prospectus. The underwriters may exercise this option only to cover over-allotments, if any. If the underwriters exercise the option in full, the total underwriting discounts and commissions will be \$                      and the total proceeds to ICN, before expenses, will be \$                      .

The underwriters are offering the common stock as set forth under “Underwriting.” Delivery of the shares will be made on or about                      , 2002.

**UBS Warburg**                      **CIBC World Markets**                      **SG Cowen**

about the company. The purpose of the quiet period is to make sure that all potential investors have access to the same information about the company—the information presented in the preliminary prospectus—and not to any unpublished data that might give them an unfair advantage.

The investment bankers and company executives promote the company’s stock offering through a *road show*, a series of presentations to potential

**FOCUS ON PRACTICE** Investors Eat Up Weight Watchers Shares

After a sluggish year for initial public offerings (IPOs) of common stock, companies rushed to tap the equity markets again during the last few months of 2001. Many investors feasted on 17.4 million shares of **Weight Watchers International**, which went public on November 14, just before the holiday eating season began. Investor appetite raised the offering price to \$24 per share, up from the original range of \$21 to \$23 set by lead underwriters Credit Suisse First Boston and Goldman, Sachs & Co. Net proceeds from the IPO, after underwriting costs, were \$417 million. The share price fattened throughout the day, closing up 19 percent at \$28.50 on the first day. A month later, the shares were trading at the \$32 level.

"The company's timing for doing this offering now is good," said John LaRosa, research director of

Marketdata Enterprises Inc., a research firm that focuses on health care industries. "Their name is well known and their earnings have been strong." Other reasons for the popularity of the Weight Watchers' IPO included its global presence and strong retail sales. Its long history of profitability, its easily understood business plan, and its familiar product made it stand out from the crowd of Internet and other technology IPOs.

Was Weight Watchers a good investment at \$32 a share? Only time will tell. Some analysts thought the stock was overpriced. Although the company's \$1.5 billion in retail sales is attractive, franchisees and licensees such as Heinz retain most of the profits on food sales. The company also gained over \$481 million in debt when Artal Luxembourg S.A., a private European investment com-

pany, bought Weight Watchers from H. J. Heinz in 1999. The debt burden that Weight Watchers carries exceeds its assets, resulting in a negative net worth of almost \$200 million. Unlike most IPOs in which the company retains the proceeds, Artal—the selling shareholders—kept the proceeds rather than reducing the Weight Watchers debt. The company was also trading at a high price/earnings multiple, about 40 times.

*Sources:* Adapted from Robert Barker, "Weight Watchers: A Little Debt Heavy?" *Business Week* (December 10, 2001), p. 100; Alan Clendenning, "Weight Watchers Shares Surge," *AP Online* (November 15, 2001), downloaded from [www.findarticles.com](http://www.findarticles.com); Elena Molinari, "IPO Market Ends Sluggish Year with a Boom," *Reuters Business Report* (December 9, 2001), downloaded from [eLibrary, ask.elibrary.com](http://eLibrary.ask.elibrary.com); and Tania Padgett, "Weight Watchers New Plan Offers IPO," *Newsday* (November 13, 2001), p. A71, downloaded from [eLibrary, ask.elibrary.com](http://eLibrary.ask.elibrary.com).

**investment banker**

Financial intermediary that specializes in selling new security issues and advising firms with regard to major financial transactions.

**underwriting**

The role of the investment banker in bearing the risk of reselling, at a profit, the securities purchased from an issuing corporation at an agreed-on price.

**underwriting syndicate**

A group formed by an investment banker to share the financial risk associated with underwriting new securities.

**selling group**

A large number of brokerage firms that join the originating investment banker(s); each accepts responsibility for selling a certain portion of a new security issue on a commission basis.

investors around the country and sometimes overseas. In addition to providing investors with information about the new issue, road show sessions help the investment bankers gauge the demand for the offering and set an expected pricing range. After the underwriter sets terms and prices the issue, the SEC must approve the offering.

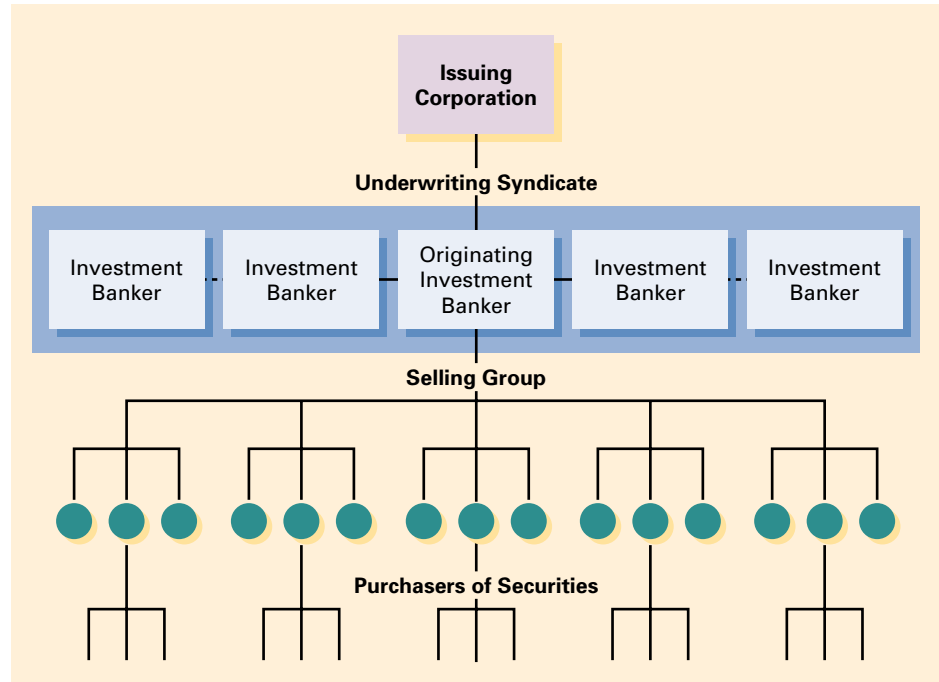
**The Investment Banker's Role**

Most public offerings are made with the assistance of an **investment banker**. The investment banker is a financial intermediary (such as Salomon Brothers or Goldman, Sachs) that specializes in selling new security issues and advising firms with regard to major financial transactions. The main activity of the investment banker is **underwriting**. This process involves purchasing the security issue from the issuing corporation at an agreed-on price and bearing the risk of reselling it to the public at a profit. The investment banker also provides the issuer with advice about pricing and other important aspects of the issue.

In the case of very large security issues, the investment banker brings in other bankers as partners to form an **underwriting syndicate**. The syndicate shares the financial risk associated with buying the entire issue from the issuer and reselling the new securities to the public. The originating investment banker and the syndicate members put together a **selling group**, normally made up of themselves and a

**FIGURE 7.2****The Selling Process for a Large Security Issue**

The investment banker hired by the issuing corporation may form an underwriting syndicate. The underwriting syndicate buys the entire security issue from the issuing corporation at an agreed-on price. The underwriter then has the opportunity (and bears the risk) of reselling the issue to the public at a profit. Both the originating investment banker and the other syndicate members put together a selling group to sell the issue on a commission basis to investors.



large number of brokerage firms. Each member of the selling group accepts the responsibility for selling a certain portion of the issue and is paid a commission on the securities it sells. The selling process for a large security issue is depicted in Figure 7.2.

Compensation for underwriting and selling services typically comes in the form of a discount on the sale price of the securities. For example, an investment banker may pay the issuing firm \$24 per share for stock that will be sold for \$26 per share. The investment banker may then sell the shares to members of the selling group for \$25.25 per share. In this case, the original investment banker earns \$1.25 per share (\$25.25 sale price – \$24 purchase price). The members of the selling group earn 75 cents for each share they sell (\$26 sale price – \$25.25 purchase price). Although some primary security offerings are directly placed by the issuer, the majority of new issues are sold through public offering via the mechanism just described.

## Interpreting Stock Quotations

The financial manager needs to stay abreast of the market values of the firm's outstanding stock, whether it is traded on an organized exchange, over the counter, or in international markets. Similarly, existing and prospective stockholders need to monitor the prices of the securities they own because these prices represent the current value of their investments. Price *quotations*, which include current price data along with statistics on recent price behavior, are readily available for actively traded stocks. The most up-to-date "quotes" can be obtained electronically, via a personal computer. Price information is available from stockbrokers and is widely published in news media. Popular sources of daily security price

quotations include financial newspapers, such as the *Wall Street Journal* and *Investor's Business Daily*, and the business sections of daily general newspapers.

Figure 7.3 includes an excerpt from the NYSE quotations, reported in the *Wall Street Journal* of March 18, 2002, for transactions through the close of trading on Friday, March 15, 2002. We'll look at the quotations for common stock for McDonalds, highlighted in the figure. The quotations show that stock prices are quoted in dollars and cents.

**Hint** Preferred stock quotations are listed separately and include only four data items: dividend, dividend yield, closing price, and change in closing price from the previous day.

The first column gives the percent change in the stock's closing price for the calendar year to date. You can see that McDonalds' price has increased 8.5 percent (+8.5) since the start of 2002. The next two columns, labeled "HI" and "LO," show the highest and lowest prices at which the stock sold during the preceding 52 weeks. McDonalds common stock, for example, traded between \$24.75 and \$31.00 during the 52-week period that ended March 15, 2002. Listed to the right of the company's name is its *stock symbol*; McDonalds goes by "MCD." The figure listed right after the stock symbol under "DIV" is the annual cash dividend paid on each share of stock. The dividend for McDonalds was \$0.23 per share. The next item, labeled "YLD%," is the *dividend yield*, which is found by dividing the stated dividend by the last share price. The dividend yield for McDonalds is 0.8 percent ( $0.23 \div 28.72 = 0.0080 = 0.8\%$ ).

**FIGURE 7.3**

**Stock Quotations**

Selected stock quotations  
for March 15, 2002

YTD	52 WEEKS		STOCK (SYM)	YLD	PE	VOL	NET
% CHG	HI	LO		DIV %		100S LAST	CHG
- 5.6	15.70	9.40	Masisa ADS MYS	.41e 3.4	...	361	12.20 -0.05
▲ +23.8	15	4.95	MasoniteIntl MHM	...	18	37	15.12 +0.31
- 20.6	28.95	12.25	MasseyEngy MEE	.16 1.0	dd	3883	16.45 +0.70
- 12.7	19.45	3.98	MasTec MTZ	...	dd	590	6.07 -0.44
+ 4.9	19.04	10.85	Matav MTA	.17e 1.0	...	34	17.83 -0.01
+ 2.2	10.96	6.64	MaterlSci MSC	...	dd	166	10.34 -0.19
+ 7.4	19.47	11.14	MatsuElec MC	.08e .6	...	2312	13.53 -0.03
▲ + 16.5	19.92	14.25	Mattel MAT	.05 .2	28 51657	20.04	+ 1.21
+ 10.4	27.20	8.47	MavrckTube MVK	...	17	2724	14.30 +0.15
+ 4.7	8.38	3.30	Maxtor MXO	...	dd	11416	6.64 -0.18
+ 1.7	39.65	27	MayDeptStrs MAY	.95f 2.5	17	13201	37.60 +0.58
+ 44.4	45.58	22.25	Maytag MYG	.72 1.6	65	8034	44.80 +0.05
+ 21.1	59.40	36.50	McClatchy A MNI	.40 .7	45	394	56.93 +0.77
+ 15.3	49.57	36.50	McCrnkCo MKC	.84 1.7	...	3337	48.41 +1.14
+ 14.0	49	40.80	McCrnkCo Vtg MKCV n	.21 .4	...	10	48.60 +0.75
+ 18.3	15.17	7.31	McDermInt MDR	.15j	...	dd 3621	14.51 +0.26
+ 8.5	31	24.75	McDonalds MCD	.23f .8	23 59195	28.72	+ 0.57
+ 11.5	70.87	48.70	McGrawH MHP	1.02f 1.5	35	10305	67.99 +0.48
- 0.5	41.50	23.40	McKesson MCK	.24 .6	98	24513	37.22 +0.95
- 21.4	15	3.20	McMoRanExpt MMR	...	dd	762	4.55 +0.16
+ 48.2	4.10	1.66	MdwrklinsGp MIG	.12 4.1	dd	43	2.95 +0.05
+ 14.1	36.50	23.71	MeadWstVaco MWV	...	dd	14191	35.25 -0.51
+ 20.2	4.85	1.88	MediaArts MDA	...	dd	277	3.16 +0.03
+ 15.4	59.10	38.45	MediaGen A MEG	.72f 1.3	73	973	57.51 +0.51
- 20.4	35.75	18.50	MedOne PIES II	3.04 14.1	...	16	21.60 +0.13
- 12.5	64.60	31	MedicisPhrm MRX	...	36	2123	56.50 +0.60
- 10.0	51.68	36.64	Medtronic MDT	.23 .5	54	56604	46.08 +0.98
+ 6.6	47.25	27.75	MellonFnl MEL	.48 1.2	15	22026	40.09 +0.72
+ 21.5	30	17	MensWearhs MW	...	24	1572	25.10 +0.79
+ 1.6	80.85	56.71	Merck MRK	1.40 2.3	19 266814	59.75	- 3.69
- 0.4	44.50	32	MercuryGen MCY	1.20f 2.8	22	675	43.48 -0.12
+ 17.8	42.27	26.50	Meredith MDP	.36 .9	45	1648	41.98 +0.03
+ 9.4	14.78	5.75	MeridnGld MDG	...	22	3804	11.30 -0.25
+ 2.8	7.98	2.65	MeridnRes TMR	...	11	2376	4.10 -0.09

← McDonalds

Source: *Wall Street Journal*, March 18, 2002, p. C4.

The price/earnings (P/E) ratio, labeled “PE,” is next. It is calculated by dividing the closing market price by the firm’s most recent annual earnings per share (EPS). The price/earnings (P/E) ratio, as noted in Chapter 2, measures the amount investors are willing to pay for each dollar of the firm’s earnings. McDonalds’ P/E ratio was 23—the stock was trading at 23 times its earnings. The P/E ratio is believed to reflect investor expectations concerning the firm’s future prospects: Higher P/E ratios reflect investor optimism and confidence; lower P/E ratios reflect investor pessimism and concern.

The daily volume, labeled “VOL 100s,” follows the P/E ratio. Here the day’s sales are quoted in lots of 100 shares. The value 59195 for McDonalds indicates that 5,919,500 shares of its common stock were traded on March 15, 2002. The next column, labeled “LAST,” contains the last price at which the stock sold on the given day. The value for McDonalds was \$28.72. The final column, “NET CHG,” indicates the change in the closing price from that on the prior trading day. McDonalds closed up \$0.57 from March 14, 2002, which means the closing price on that day was \$28.15.

Similar quotations systems are used for stocks that trade on other exchanges such as the American Stock Exchange (AMEX) and for the over-the-counter (OTC) exchange’s Nasdaq National Market Issues. Also note that when a stock (or bond) issue is not traded on a given day, it generally is not quoted in the financial and business press.

## Review Questions

- 7-2 What risks do common stockholders take that other suppliers of long-term capital do not?
- 7-3 How does a rights offering protect a firm’s stockholders against the *dilution of ownership*?
- 7-4 Explain the relationships among authorized shares, outstanding shares, treasury stock, and issued shares.
- 7-5 What are the advantages to both U.S.-based and foreign corporations of issuing stock outside their home markets? What are *American depositary receipts (ADRs)*?
- 7-6 What claims do preferred stockholders have with respect to distribution of earnings (dividends) and assets?
- 7-7 Explain the *cumulative feature* of preferred stock. What is the purpose of a *call feature* in a preferred stock issue?
- 7-8 What is the difference between a *venture capitalist (VC)* and an *angel capitalist (angel)*?
- 7-9 Into what bodies are institutional VCs most commonly organized? How are their deals structured and priced?
- 7-10 What general procedures must a private firm go through in order to go public via an *initial public offering (IPO)*?
- 7-11 What role does an *investment banker* play in a public offering? Explain the sequence of events in the issuing of stock.
- 7-12 Describe the key items of information included in a stock *quotation*. What information does the stock’s price/earnings (P/E) ratio provide?





## 7.3 Common Stock Valuation

Common stockholders expect to be rewarded through periodic cash dividends and an increasing—or at least nondeclining—share value. Like current owners, prospective owners and security analysts frequently estimate the firm's value. Investors purchase the stock when they believe that it is *undervalued*—when its true value is greater than its market price. They sell the stock when they feel that it is *overvalued*—when its market price is greater than its true value.

In this section, we will describe specific stock valuation techniques. First, though, we will look at the concept of an efficient market, which questions whether the prices of actively traded stocks can differ from their true values.

### Market Efficiency<sup>2</sup>

Economically rational buyers and sellers use their assessment of an asset's risk and return to determine its value. To a buyer, the asset's value represents the maximum price that he or she would pay to acquire it; a seller views the asset's value as a minimum sale price. In competitive markets with many active participants, such as the New York Stock Exchange, the interactions of many buyers and sellers result in an equilibrium price—the *market value*—for each security. This price reflects the collective actions that buyers and sellers take on the basis of all available information. Buyers and sellers are assumed to digest new information immediately as it becomes available and, through their purchase and sale activities, to create a new market equilibrium price quickly.

**Hint** Be sure to clarify in your own mind the difference between the required return and the expected return. *Required return* is what an investor *has to have* to invest in a specific asset, and *expected return* is the return an investor *thinks she will get* if the asset is purchased.

#### expected return, $\hat{k}$

The return that is expected to be earned on a given asset each period over an infinite time horizon.

**Hint** This relationship between the expected return and the required return can be seen in Equation 7.1, where a decrease in asset price will result in an increase in the expected return.

### Market Adjustment to New Information

The process of market adjustment to new information can be viewed in terms of rates of return. From Chapter 5, we know that for a given level of risk, investors require a specified periodic return—the *required return*,  $k$ —which can be estimated by using beta and CAPM. At each point in time, investors estimate the **expected return**,  $\hat{k}$ —the return that is expected to be earned on a given asset each period over an infinite time horizon. The expected return can be estimated by using a simplified form of Equation 5.1:

$$\hat{k} = \frac{\text{Expected benefit during each period}}{\text{Current price of asset}} \quad (7.1)$$

Whenever investors find that the expected return is not equal to the required return ( $\hat{k} \neq k$ ), a market price adjustment occurs. If the expected return is less than the required return ( $\hat{k} < k$ ), investors sell the asset, because they do not expect it to earn a return commensurate with its risk. Such action drives the asset's price down, which (assuming no change in expected benefits) causes its expected return to rise to the level of its required return. If the expected return were above the

2. A great deal of theoretical and empirical research has been performed in the area of market efficiency. For purposes of this discussion, generally accepted beliefs about market efficiency are described, rather than the technical aspects of the various forms of market efficiency and their theoretical implications. For a good discussion of the theory and evidence relative to market efficiency, see William L. Megginson, *Corporate Finance Theory* (Boston, MA: Addison Wesley, 1997), Chapter 3.

required return ( $\hat{k} > k$ ), investors would buy the asset, driving its price up and its expected return down to the point where it equals the required return.

### EXAMPLE ▼

The common stock of Alton Industries (AI) is currently selling for \$50 per share, and market participants expect it to generate benefits of \$6.50 per share during each coming period. In addition, the risk-free rate,  $R_F$ , is currently 7%; the market return,  $k_m$ , is 12%; and the stock's beta,  $b_{AI}$ , is 1.20. When these values are substituted into Equation 7.1, the firm's current expected return,  $\hat{k}_0$ , is

$$\hat{k}_0 = \frac{\$6.50}{\$50.00} = \underline{\underline{13\%}}$$

When the appropriate values are substituted into the CAPM (Equation 5.8), the current required return,  $k_0$ , is

$$k_0 = 7\% + [1.20 \times (12\% - 7\%)] = 7\% + 6\% = \underline{\underline{13\%}}$$

Because  $\hat{k}_0 = k_0$ , the market is currently in equilibrium, and the stock is fairly priced at \$50 per share.

Assume that a press release announces that a major product liability suit has been filed against Alton Industries. As a result, investors immediately adjust their risk assessment upward, raising the firm's beta from 1.20 to 1.40. The new required return,  $k_1$ , becomes

$$k_1 = 7\% + [1.40 \times (12\% - 7\%)] = 7\% + 7\% = \underline{\underline{14\%}}$$

Because the expected return of 13% is now below the required return of 14%, many investors sell the stock—driving its price down to about \$46.43—the price that will result in a 14% expected return,  $\hat{k}_1$ .

$$\hat{k}_1 = \frac{\$6.50}{\$46.43} = \underline{\underline{14\%}}$$

The new price of \$46.43 brings the market back into equilibrium, because the expected return now equals the required return.

## The Efficient-Market Hypothesis

### efficient-market hypothesis

Theory describing the behavior of an assumed “perfect” market in which (1) securities are typically in equilibrium, (2) security prices fully reflect all public information available and react swiftly to new information, and, (3) because stocks are fairly priced, investors need not waste time looking for mispriced securities.

As noted in Chapter 1, active markets such as the New York Stock Exchange are *efficient*—they are made up of many rational investors who react quickly and objectively to new information. The **efficient-market hypothesis**, which is the basic theory describing the behavior of such a “perfect” market, specifically states that

1. Securities are typically in equilibrium, which means that they are fairly priced and that their expected returns equal their required returns.
2. At any point in time, security prices fully reflect all public information available about the firm and its securities,<sup>3</sup> and these prices react swiftly to new information.

3. Those market participants who have nonpublic—*inside*—information may have an unfair advantage that enables them to earn an excess return. Since the mid-1980s disclosure of the insider-trading activities of a number of well-known financiers and investors, major national attention has been focused on the “problem” of insider trading and its resolution. Clearly, those who trade securities on the basis of inside information have an unfair and illegal advantage. Empirical research has confirmed that those with inside information do indeed have an opportunity to earn an excess return. Here we ignore this possibility, given its illegality and that given enhanced surveillance and enforcement by the securities industry and the government have in recent years (it appears) significantly reduced insider trading. We, in effect, assume that all relevant information is public and that therefore the market is efficient.

3. Because stocks are fully and fairly priced, investors need not waste their time trying to find and capitalize on mispriced (undervalued or overvalued) securities.

Not all market participants are believers in the efficient-market hypothesis. Some feel that it is worthwhile to search for undervalued or overvalued securities and to trade them to profit from market inefficiencies. Others argue that it is mere luck that would allow market participants to anticipate new information correctly and as a result earn *excess returns*—that is, actual returns greater than required returns. They believe it is unlikely that market participants can *over the long run* earn excess returns. Contrary to this belief, some well-known investors such as Warren Buffett and Peter Lynch *have* over the long run consistently earned excess returns on their portfolios. It is unclear whether their success is the result of their superior ability to anticipate new information or of some form of market inefficiency.

*Throughout this text we ignore the disbelievers and continue to assume market efficiency.* This means that *the terms “expected return” and “required return” are used interchangeably*, because they should be equal in an efficient market. This also means that stock prices accurately reflect true value based on risk and return. In other words, we will operate under the assumption that the market price at any point in time is the best estimate of value. We’re now ready to look closely at the mechanics of stock valuation.

## The Basic Stock Valuation Equation

Like the value of a bond, which we discussed in Chapter 6, *the value of a share of common stock is equal to the present value of all future cash flows (dividends) that it is expected to provide over an infinite time horizon.*<sup>4</sup> Although a stockholder can earn capital gains by selling stock at a price above that originally paid, what is really sold is the right to all future dividends. What about stocks that are not expected to pay dividends in the foreseeable future? Such stocks have a value attributable to a distant dividend expected to result from sale of the company or liquidation of its assets. Therefore, *from a valuation viewpoint, only dividends are relevant.*

By redefining terms, the basic valuation model in Equation 6.5 can be specified for common stock, as given in Equation 7.2:

$$P_0 = \frac{D_1}{(1 + k_s)^1} + \frac{D_2}{(1 + k_s)^2} + \dots + \frac{D_\infty}{(1 + k_s)^\infty} \quad (7.2)$$

where

$P_0$  = value of common stock

$D_t$  = per-share dividend *expected* at the end of year  $t$

$k_s$  = required return on common stock

4. The need to consider an infinite time horizon is not critical, because a sufficiently long period—say, 50 years—will result in about the same present value as an infinite period for moderate-sized required returns. For example, at 15%, a dollar to be received 50 years from now,  $PVIF_{15\%,50\text{yrs}}$ , is worth only about \$0.001 today.

The equation can be simplified somewhat by redefining each year's dividend,  $D_t$ , in terms of anticipated growth. We will consider three models here: zero-growth, constant-growth, and variable-growth.

### Zero-Growth Model

**zero-growth model**  
An approach to dividend valuation that assumes a constant, nongrowing dividend stream.

The simplest approach to dividend valuation, the **zero-growth model**, assumes a constant, nongrowing dividend stream. In terms of the notation already introduced,

$$D_1 = D_2 = \dots = D_\infty$$

When we let  $D_1$  represent the amount of the annual dividend, Equation 7.2 under zero growth reduces to

$$P_0 = D_1 \times \sum_{t=1}^{\infty} \frac{1}{(1+k_s)^t} = D_1 \times (PVIFA_{k_s, \infty}) = D_1 \times \frac{1}{k_s} = \frac{D_1}{k_s} \quad (7.3)$$

The equation shows that with zero growth, the value of a share of stock would equal the present value of a perpetuity of  $D_1$  dollars discounted at a rate  $k_s$ . (Perpetuities were introduced in Chapter 4; see Equation 4.19 and the related discussion.)

**EXAMPLE** ▼ The dividend of Denham Company, an established textile producer, is expected to remain constant at \$3 per share indefinitely. If the required return on its stock is 15%, the stock's value is \$20 ( $\$3 \div 0.15$ ) per share.

**Preferred Stock Valuation** Because preferred stock typically provides its holders with a fixed annual dividend over its assumed infinite life, *Equation 7.3 can be used to find the value of preferred stock*. The value of preferred stock can be estimated by substituting the stated dividend on the preferred stock for  $D_1$  and the required return for  $k_s$  in Equation 7.3. For example, a preferred stock paying a \$5 stated annual dividend and having a required return of 13 percent would have a value of \$38.46 ( $\$5 \div 0.13$ ) per share.

### Constant-Growth Model

**constant-growth model**  
A widely cited dividend valuation approach that assumes that dividends will grow at a constant rate, but a rate that is less than the required return.

The most widely cited dividend valuation approach, the **constant-growth model**, assumes that dividends will grow at a constant rate, but a rate that is less than the required return. (The assumption that the constant rate of growth,  $g$ , is less than the required return,  $k_s$ , is a necessary mathematical condition for deriving this model.<sup>5</sup>) By letting  $D_0$  represent the most recent dividend, we can rewrite Equation 7.2 as follows:

$$P_0 = \frac{D_0 \times (1+g)^1}{(1+k_s)^1} + \frac{D_0 \times (1+g)^2}{(1+k_s)^2} + \dots + \frac{D_0 \times (1+g)^\infty}{(1+k_s)^\infty} \quad (7.4)$$

5. Another assumption of the constant-growth model as presented is that earnings and dividends grow at the same rate. This assumption is true only in cases in which a firm pays out a fixed percentage of its earnings each year (has a fixed payout ratio). In the case of a declining industry, a negative growth rate ( $g < 0\%$ ) might exist. In such a case, the constant-growth model, as well as the variable-growth model presented in the next section, remains fully applicable to the valuation process.

**Gordon model**  
 A common name for the *constant-growth model* that is widely cited in dividend valuation.

If we simplify Equation 7.4, it can be rewritten as<sup>6</sup>

$$P_0 = \frac{D_1}{k_s - g} \tag{7.5}$$

The constant-growth model in Equation 7.5 is commonly called the **Gordon model**. An example will show how it works.

**EXAMPLE** ▼ Lamar Company, a small cosmetics company, from 1998 through 2003 paid the following per-share dividends:

Year	Dividend per share
2003	\$1.40
2002	1.29
2001	1.20
2000	1.12
1999	1.05
1998	1.00

We assume that the historical compound annual growth rate of dividends is an accurate estimate of the future constant annual rate of dividend growth,  $g$ . Using Appendix Table A-2 or a financial calculator, we find that the historical compound annual growth rate of Lamar Company dividends equals 7%.<sup>7</sup> The com-

6. For the interested reader, the calculations necessary to derive Equation 7.5 from Equation 7.4 follow. The first step is to multiply each side of Equation 7.4 by  $(1 + k_s)/(1 + g)$  and subtract Equation 7.4 from the resulting expression. This yields

$$\frac{P_0 \times (1 + k_s)}{1 + g} - P_0 = D_0 - \frac{D_0 \times (1 + g)^\infty}{(1 + k_s)^\infty} \tag{1}$$

Because  $k_s$  is assumed to be greater than  $g$ , the second term on the right side of Equation 1 should be zero. Thus

$$P_0 \times \left( \frac{1 + k_s}{1 + g} - 1 \right) = D_0 \tag{2}$$

Equation 2 is simplified as follows:

$$P_0 \times \left[ \frac{(1 + k_s) - (1 + g)}{1 + g} \right] = D_0 \tag{3}$$

$$P_0 + (k_s - g) = D_0 \times (1 + g) \tag{4}$$

$$P_0 = \frac{D_1}{k_s - g} \tag{5}$$

Equation 5 equals Equation 7.5.

7. The technique involves solving the following equation for  $g$ :

$$D_{2003} = D_{1998} \times (1 + g)^5$$

$$\frac{D_{1998}}{D_{2003}} = \frac{1}{(1 + g)^5} = PVIF_{g,5}$$

To do so, we can use financial tables or a financial calculator.

Two basic steps can be followed using the present value table. First, dividing the earliest dividend ( $D_{1998} = \$1.00$ ) by the most recent dividend ( $D_{2003} = \$1.40$ ) yields a factor for the present value of one dollar,  $PVIF$ , of 0.714 ( $\$1.00 \div \$1.40$ ). Although six dividends are shown, *they reflect only 5 years of growth*. (The number of years of growth can also be found by subtracting the earliest year from the most recent year—that is,  $2003 - 1998 = 5$  years of growth.) By looking across the Appendix Table A-2 at the  $PVIF$  for 5 years, we find that the factor closest to 0.714 occurs at 7% (0.713). Therefore, the growth rate of the dividends, rounded to the nearest whole percent, is 7%.

Alternatively, a financial calculator can be used. (Note: Most calculators require *either* the  $PV$  or  $FV$  value to be input as a negative number to calculate an unknown interest or growth rate. That approach is used here.) Using the inputs shown at the left, you should find the growth rate to be 6.96%, which we round to 7%.

Input	Function
1.00	PV
-1.40	FV
5	N
	CPT
	I
Solution	
6.96	

pany estimates that its dividend in 2004,  $D_1$ , will equal \$1.50. The required return,  $k_s$ , is assumed to be 15%. By substituting these values into Equation 7.5, we find the value of the stock to be

$$P_0 = \frac{\$1.50}{0.15 - 0.07} = \frac{\$1.50}{0.08} = \underline{\underline{\$18.75}} \text{ per share}$$

Assuming that the values of  $D_1$ ,  $k_s$ , and  $g$  are accurately estimated, Lamar Company's stock value is \$18.75 per share.

### Variable-Growth Model

The zero- and constant-growth common stock models do not allow for any shift in expected growth rates. Because future growth rates might shift up or down because of changing expectations, it is useful to consider a **variable-growth model** that allows for a change in the dividend growth rate.<sup>8</sup> We will assume that a single shift in growth rates occurs at the end of year  $N$ , and we will use  $g_1$  to represent the initial growth rate and  $g_2$  for the growth rate after the shift. To determine the value of a share of stock in the case of variable growth, we use a four-step procedure.

**variable-growth model**  
A dividend valuation approach that allows for a change in the dividend growth rate.

**Step 1** Find the value of the cash dividends at the end of *each year*,  $D_t$ , during the initial growth period, years 1 through  $N$ . This step may require adjusting the most recent dividend,  $D_0$ , using the initial growth rate,  $g_1$ , to calculate the dividend amount for each year. Therefore, for the first  $N$  years,

$$D_t = D_0 \times (1 + g_1)^t = D_0 \times FVIF_{g_1,t}$$

**Step 2** Find the present value of the dividends expected during the initial growth period. Using the notation presented earlier, we can give this value as

$$\sum_{t=1}^N \frac{D_0 \times (1 + g_1)^t}{(1 + k_s)^t} = \sum_{t=1}^N \frac{D_t}{(1 + k_s)^t} = \sum_{t=1}^N (D_t \times PVIF_{k_s,t})$$

**Step 3** Find the value of the stock *at the end of the initial growth period*,  $P_N = (D_{N+1}) / (k_s - g_2)$ , which is the present value of all dividends expected from year  $N + 1$  to infinity, assuming a constant dividend growth rate,  $g_2$ . This value is found by applying the constant-growth model (Equation 7.5) to the dividends expected from year  $N + 1$  to infinity. The present value of  $P_N$  would represent the value *today* of all dividends that are expected to be received from year  $N + 1$  to infinity. This value can be represented by

$$\frac{1}{(1 + k_s)^N} \times \frac{D_{N+1}}{k_s - g_2} = PVIF_{k_s,N} \times P_N$$

8. More than one change in the growth rate can be incorporated into the model, but to simplify the discussion we will consider only a single growth-rate change. The number of variable-growth valuation models is technically unlimited, but concern over all possible shifts in growth is unlikely to yield much more accuracy than a simpler model.

**Step 4** Add the present value components found in Steps 2 and 3 to find the value of the stock,  $P_0$ , given in Equation 7.6:

$$P_0 = \underbrace{\sum_{t=1}^N \frac{D_0 \times (1+g_1)^t}{(1+k_s)^t}}_{\substack{\text{Present value of} \\ \text{dividends} \\ \text{during initial} \\ \text{growth period}}} + \underbrace{\left[ \frac{1}{(1+k_s)^N} \times \frac{D_{N+1}}{k_s - g_2} \right]}_{\substack{\text{Present value of} \\ \text{price of stock} \\ \text{at end of initial} \\ \text{growth period}}} \quad (7.6)$$

The following example illustrates the application of these steps to a variable-growth situation with only one change in growth rate.

**EXAMPLE**

The most recent (2003) annual dividend payment of Warren Industries, a rapidly growing boat manufacturer, was \$1.50 per share. The firm’s financial manager expects that these dividends will increase at a 10% annual rate,  $g_1$ , over the next 3 years (2004, 2005, and 2006) because the introduction of a hot new boat. At the end of the 3 years (the end of 2006), the firm’s mature product line is expected to result in a slowing of the dividend growth rate to 5% per year,  $g_2$ , for the foreseeable future. The firm’s required return,  $k_s$ , is 15%. To estimate the current (end-of-2003) value of Warren’s common stock,  $P_0 = P_{2003}$ , the four-step procedure must be applied to these data.

**Step 1** The value of the cash dividends in each of the next 3 years is calculated in columns 1, 2, and 3 of Table 7.3. The 2004, 2005, and 2006 dividends are \$1.65, \$1.82, and \$2.00, respectively.

**Step 2** The present value of the three dividends expected during the 2004–2006 initial growth period is calculated in columns 3, 4, and 5 of Table 7.3. The sum of the present values of the three dividends is \$4.14.

**Step 3** The value of the stock at the end of the initial growth period ( $N = 2006$ ) can be found by first calculating  $D_{N+1} = D_{2007}$ :

$$D_{2007} = D_{2006} \times (1 + 0.05) = \$2.00 \times (1.05) = \$2.10$$

**TABLE 7.3 Calculation of Present Value of Warren Industries Dividends (2004–2006)**

$t$	End of year	$D_0 = D_{2003}$ (1)	$FVIF_{10\%,t}$ (2)	$D_t$ [(1) × (2)] (3)	$PVIF_{15\%,t}$ (4)	Present value of dividends [(3) × (4)] (5)
1	2004	\$1.50	1.100	\$1.65	0.870	\$1.44
2	2005	1.50	1.210	1.82	0.756	1.38
3	2006	1.50	1.331	2.00	0.658	<u>1.32</u>

Sum of present value of dividends =  $\sum_{t=1}^3 \frac{D_0 \times (1+g_1)^t}{(1+k_s)^t} = \underline{\underline{\$4.14}}$

By using  $D_{2007} = \$2.10$ , a 15% required return, and a 5% dividend growth rate, we can calculate the value of the stock at the end of 2006 as follows:

$$P_{2006} = \frac{D_{2007}}{k_s - g_2} = \frac{\$2.10}{0.15 - 0.05} = \frac{\$2.10}{0.10} = \$21.00$$

Finally, in Step 3, the share value of \$21 at the end of 2006 must be converted into a present (end-of-2003) value. Using the 15% required return, we get

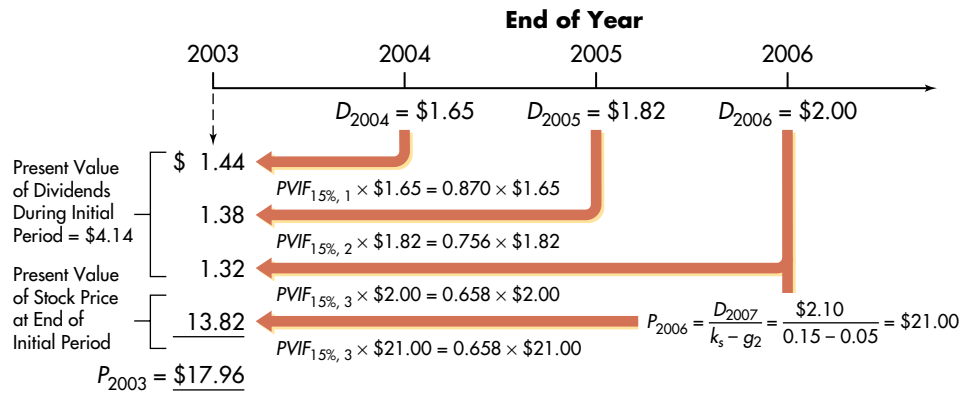
$$PVIF_{k_s, N} \times P_N = PVIF_{15\%, 3} \times P_{2006} = 0.658 \times \$21.00 = \$13.82$$

**Step 4** Adding the present value of the initial dividend stream (found in Step 2) to the present value of the stock at the end of the initial growth period (found in Step 3) as specified in Equation 7.6, we get the current (end-of-2003) value of Warren Industries stock:

$$P_{2003} = \$4.14 + \$13.82 = \underline{\underline{\$17.96}} \text{ per share}$$

The stock is currently worth \$17.96 per share. The calculation of this value is depicted graphically on the following time line.

**Time line for finding Warren Industries current (end-of-2003) value with variable growth**



The zero-, constant-, and variable-growth valuation models provide useful frameworks for estimating stock value. Clearly, the estimates produced cannot be very precise, given that the forecasts of future growth and discount rates are themselves necessarily approximate. Furthermore, a great deal of measurement error can be introduced into the stock price estimate as a result of the imprecise and rounded growth and discount rate estimates used as inputs. When applying valuation models, it is therefore advisable to estimate these rates carefully and round them conservatively, probably to the nearest tenth of a percent.

### Free Cash Flow Valuation Model

As an alternative to the dividend valuation models presented above, a firm's value can be estimated by using its projected *free cash flows* (FCFs). This approach is appealing when one is valuing firms that have no dividend history or are startups or when one is valuing an operating unit or division of a larger public company.



## In Practice

## FOCUS ON e-FINANCE What's the Value of the American Dream?

For many people, owning their own business represents the dream of a lifetime. But how much should this dream cost? To get an idea of how to value a small business, check out the "Business for Sale" column in *Inc.*, a magazine that focuses on smaller emerging businesses. Each month the column describes the operations, financial situation, industry outlook, price rationale, and pros and cons of a small business offered for sale. For example, columns featured in 2000 and 2001 included such diverse companies as a distributor of semiprecious stones, a software developer, a Christmas tree grower, a small chain of used-book stores, and a baseball camp, with prices ranging from \$200,000 to \$9 million. Most valuations are based on a multiple of cash flow or annual sales, with accepted guidelines for different industries. That number is

just a starting point, however, and must be adjusted for other factors.

For example, food distributors typically sell for about 30 percent of annual sales. A Southeastern seafood distributor was recently offered for \$2.25 million, a discount from the \$3.9 million price you'd get strictly on the basis of annual sales. The reason? The new owner would have to buy or lease a warehouse facility, freezers, and other equipment.

Because valuing a small business is difficult, many owners make use of reasonably priced valuation software such as BallPark Business Valuation and VALUware. These programs offer buyers and sellers a quick way to estimate the business's value and to answer such questions as:

- How much cash will my business generate or consume?
- What will my balance sheet, income statement, and cash flow statement look like in 5 years?
- Should I seek debt or equity to finance growth?
- What impact will capital purchases have on my venture?
- How much ownership in my business should I give up for a \$2 million equity contribution?

Once the negotiators decide to move forward, however, they usually should hire an experienced valuation professional to develop a formal valuation.

Sources: "About Ballpark Business Valuation," *Bullet Proof Business Plans*, downloaded from [www.bulletproofbizplans.com/BallPark/About/about\\_.html](http://www.bulletproofbizplans.com/BallPark/About/about_.html); Jill Andresky Fraser, "Business for Sale: Southeastern Seafood Distributor," *Inc.* (October 1, 2000), downloaded from [www.inc.com](http://www.inc.com); VALUware, [www.bizbooksoftware.com/VALUWARE.HTM](http://www.bizbooksoftware.com/VALUWARE.HTM).

**free cash flow valuation model**  
A model that determines the value of an entire company as the present value of its expected free cash flows discounted at the firm's weighted average cost of capital, which is its expected average future cost of funds over the long run.

Although dividend valuation models are widely used and accepted, in these situations it is preferable to use a more general free cash flow valuation model.

The **free cash flow valuation model** is based on the same basic premise as dividend valuation models: The value of a share of common stock is the present value of all future cash flows it is expected to provide over an infinite time horizon. However, in the free cash flow valuation model, instead of valuing the firm's expected dividends, we value the firm's expected *free cash flows*, defined in Equation 3.3 (page 106). They represent the amount of cash flow available to investors—the providers of debt (creditors) and equity (owners)—after all other obligations have been met.

The free cash flow valuation model estimates the value of the entire company by finding the present value of its expected free cash flows discounted at its *weighted average cost of capital*, which is its expected average future cost of funds over the long run (see Chapter 11), as specified in Equation 7.7.

$$V_C = \frac{FCF_1}{(1+k_a)^1} + \frac{FCF_2}{(1+k_a)^2} + \dots + \frac{FCF_\infty}{(1+k_a)^\infty} \quad (7.7)$$

where

$V_C$  = value of the entire company  
 $FCF_t$  = free cash flow *expected* at the end of year  $t$   
 $k_a$  = the firm's weighted average cost of capital

Note the similarity between Equations 7.7 and 7.2, the general stock valuation equation.

Because the value of the entire company,  $V_C$ , is the market value of the entire enterprise (that is, of all assets), to find common stock value,  $V_S$ , we must subtract the market value of all of the firm's debt,  $V_D$ , and the market value of preferred stock,  $V_P$ , from  $V_C$ .

$$V_S = V_C - V_D - V_P \quad (7.8)$$

Because it is difficult to forecast a firm's free cash flow, specific annual cash flows are typically forecast for only about 5 years, beyond which a constant growth rate is assumed. Here we assume that the first 5 years of free cash flows are explicitly forecast and that a constant rate of free cash flow growth occurs beyond the end of year 5 to infinity.<sup>9</sup> This model is methodologically similar to the variable-growth model presented earlier. Its application is best demonstrated with an example.

### EXAMPLE ▼

Dewhurst Inc. wishes to determine the value of its stock by using the free cash flow valuation model. In order to apply the model, the firm's CFO developed the data given in Table 7.4. Application of the model can be performed in four steps.

**Step 1** Calculate the present value of the free cash flow occurring from the end of 2009 to infinity, measured at the beginning of 2009 (that is, at the end of 2008). Because a constant rate of growth in FCF is forecast beyond 2008, we can use the constant-growth dividend valuation model (Equation 7.5) to calculate the value of the free cash flows from the end of 2009 to infinity.

$$\begin{aligned} \text{Value of } FCF_{2009 \rightarrow \infty} &= \frac{FCF_{2009}}{k_a - g_{FCF}} \\ &= \frac{\$600,000 \times (1 + 0.03)}{0.09 - 0.03} \\ &= \frac{\$618,000}{0.06} = \underline{\underline{\$10,300,000}} \end{aligned}$$

**TABLE 7.4 Dewhurst Inc.'s Data for Free Cash Flow Valuation Model**

Free cash flow		Other data
Year ( $t$ )	( $FCF_t$ ) <sup>a</sup>	
2004	\$400,000	Growth rate of FCF, beyond 2008 to infinity, $g_{FCF} = 3\%$
2005	450,000	Weighted average cost of capital, $k_a = 9\%$
2006	520,000	Market value of all debt, $V_D = \$3,100,000$
2007	560,000	Market value of preferred stock, $V_P = \$800,000$
2008	600,000	Number of shares of common stock outstanding = 300,000

<sup>a</sup>Developed using Equations 3.2 and 3.3 (page 106).

9. The approach demonstrated here is consistent with that found in Alfred Rappaport, *Creating Shareholder Value* (New York: The Free Press, 1998). A somewhat similar approach to value can be found in G. Bennett Stewart III, *The Quest for Value* (New York: HarperCollins, 1999).

Note that to calculate the FCF in 2009, we had to increase the 2008 FCF value of \$600,000 by the 3% FCF growth rate,  $g_{FCF}$ .

- Step 2** Add the present value of the FCF from 2009 to infinity, which is measured at the end of 2008, to the 2008 FCF value to get the total FCF in 2008.

$$\text{Total } FCF_{2008} = \$600,000 + \$10,300,000 = \$10,900,000$$

- Step 3** Find the sum of the present values of the FCFs for 2004 through 2008 to determine the value of the entire company,  $V_C$ . This calculation is shown in Table 7.5, using present value interest factors,  $PVIFs$ , from Appendix Table A-2.

- Step 4** Calculate the value of the common stock using Equation 7.8. Substituting the value of the entire company,  $V_C$ , calculated in Step 3, and the market values of debt,  $V_D$ , and preferred stock,  $V_P$ , given in Table 7.4, yields the value of the common stock,  $V_S$ :

$$V_S = \$8,628,620 - \$3,100,000 - \$800,000 = \underline{\underline{\$4,728,620}}$$

The value of Dewhurst's common stock is therefore estimated to be \$4,728,620. By dividing this total by the 300,000 shares of common stock that the firm has outstanding, we get a common stock value of \$15.76 *per share* ( $\$4,728,620 \div 300,000$ ).

It should now be clear that the free cash flow valuation model is consistent with the dividend valuation models presented earlier. The appeal of this approach is its focus on the free cash flow estimates rather than on forecast dividends, which are far more difficult to estimate, given that they are paid at the discretion of the firm's board. The more general nature of the free cash flow model is responsible for its growing popularity, particularly with CFOs and other financial managers.

**TABLE 7.5** Calculation of the Value of the Entire Company for Dewhurst Inc.

Year ( $t$ )	$FCF_t$ (1)	$PVIF_{9\%,t}$ (2)	Present value of $FCF_t$ [(1) $\times$ (2)] (3)
2004	\$ 400,000	0.917	\$ 366,800
2005	450,000	0.842	378,900
2006	520,000	0.772	401,440
2007	560,000	0.708	396,480
2008	10,900,000 <sup>a</sup>	0.650	<u>7,085,000</u>
			Value of entire company, $V_C = \underline{\underline{\$8,628,620}}$

<sup>a</sup>This amount is the sum of the  $FCF_{2008}$  of \$600,000 from Table 7.4 and the \$10,300,000 value of the  $FCF_{2009-\infty}$  calculated in Step 1.

## Other Approaches to Common Stock Valuation

Many other approaches to common stock valuation exist. The more popular approaches include book value, liquidation value, and some type of price/earnings multiple.

### Book Value

#### book value per share

The amount per share of common stock that would be received if all of the firm's assets were sold for their exact book (accounting) value and the proceeds remaining after paying all liabilities (including preferred stock) were divided among the common stockholders.

**Book value per share** is simply the amount per share of common stock that would be received if all of the firm's assets were *sold for their exact book (accounting) value* and the proceeds remaining after paying all liabilities (including preferred stock) were divided among the common stockholders. This method lacks sophistication and can be criticized on the basis of its reliance on historical balance sheet data. It ignores the firm's expected earnings potential and generally lacks any true relationship to the firm's value in the marketplace. Let us look at an example.

#### EXAMPLE ▼

At year-end 2003, Lamar Company's balance sheet shows total assets of \$6 million, total liabilities (including preferred stock) of \$4.5 million, and 100,000 shares of common stock outstanding. Its book value per share therefore would be

$$\frac{\$6,000,000 - \$4,500,000}{100,000 \text{ shares}} = \underline{\$15} \text{ per share}$$

Because this value assumes that assets could be sold for their book value, it may not represent the minimum price at which shares are valued in the marketplace. As a matter of fact, although most stocks sell above book value, it is not unusual to find stocks selling below book value when investors believe either that assets are overvalued or that the firm's liabilities are understated.

#### liquidation value per share

The actual amount per share of common stock that would be received if all of the firm's assets were sold for their market value, liabilities (including preferred stock) were paid, and any remaining money were divided among the common stockholders.

### Liquidation Value

**Liquidation value per share** is the *actual amount* per share of common stock that would be received if all of the firm's assets were *sold for their market value*, liabilities (including preferred stock) were paid, and any remaining money were divided among the common stockholders.<sup>10</sup> This measure is more realistic than book value—because it is based on the current market value of the firm's assets—but it still fails to consider the earning power of those assets. An example will illustrate.

#### EXAMPLE ▼

Lamar Company found upon investigation that it could obtain only \$5.25 million if it sold its assets today. The firm's liquidation value per share therefore would be

$$\frac{\$5,250,000 - \$4,500,000}{100,000 \text{ shares}} = \underline{\$7.50} \text{ per share}$$

Ignoring liquidation expenses, this amount would be the firm's minimum value.

10. In the event of liquidation, creditors' claims must be satisfied first, then those of the preferred stockholders. Anything left goes to common stockholders. A more detailed discussion of liquidation procedures is presented in Chapter 17.

## Price/Earnings (P/E) Multiples

**price/earnings multiple approach**  
A popular technique used to estimate the firm's share value; calculated by multiplying the firm's expected earnings per share (EPS) by the average price/earnings (P/E) ratio for the industry.

The *price/earnings (P/E) ratio*, introduced in Chapter 2, reflects the amount investors are willing to pay for each dollar of earnings. The average P/E ratio in a particular industry can be used as the guide to a firm's value—if it is assumed that investors value the earnings of that firm in the same way they do the “average” firm in the industry. The **price/earnings multiple approach** is a popular technique used to estimate the firm's share value; it is calculated by multiplying the firm's expected earnings per share (EPS) by the average price/earnings (P/E) ratio for the industry. The average P/E ratio for the industry can be obtained from a source such as *Standard & Poor's Industrial Ratios*.

The use of P/E multiples is especially helpful in valuing firms that are not publicly traded, whereas market price quotations can be used to value publicly traded firms.<sup>11</sup> In any case, the price/earnings multiple approach is considered superior to the use of book or liquidation values because it considers *expected* earnings.<sup>12</sup> An example will demonstrate the use of price/earnings multiples.

**EXAMPLE** ▼ Lamar Company is expected to earn \$2.60 per share next year (2004). This expectation is based on an analysis of the firm's historical earnings trend and of expected economic and industry conditions. The average price/earnings (P/E) ratio for firms in the same industry is 7. Multiplying Lamar's expected earnings per share (EPS) of \$2.60 by this ratio gives us a value for the firm's shares of \$18.20, assuming that investors will continue to measure the value of the average firm at 7 times its earnings.

So how much is Lamar Company's stock really worth? That's a trick question, because there's no one right answer. It is important to recognize that the answer depends on the assumptions made and the techniques used. Professional securities analysts typically use a variety of models and techniques to value stocks. For example, an analyst might use the constant-growth model, liquidation value, and price/earnings (P/E) multiples to estimate the worth of a given stock. If the analyst feels comfortable with his or her estimates, the stock would be valued at no more than the largest estimate. Of course, should the firm's estimated liquidation value per share exceed its “going concern” value per share, estimated by using one of the valuation models (zero-, constant-, or variable-growth or free cash flow) or the P/E multiple approach, the firm would be viewed as being “worth more dead than alive.” In such an event, the firm would lack sufficient earning power to justify its existence and should probably be liquidated.

**Hint** From an investor's perspective, the stock in this situation would be an attractive investment only if it could be purchased at a price below its liquidation value—which in an efficient market could never occur.

11. Generally, when the P/E ratio is used to value *privately owned* or *closely owned* corporations, a premium is added to adjust for the issue of control. This adjustment is necessary because the P/E ratio implicitly reflects minority interests of noncontrolling investors in *publicly owned* companies—a condition that does not exist in privately or closely owned corporations.

12. The price/earnings multiple approach to valuation does have a theoretical explanation. If we view 1 divided by the price/earnings ratio, or the *earnings/price ratio*, as the rate at which investors discount the firm's earnings, and if we assume that the projected earnings per share will be earned indefinitely (i.e., no growth in earnings per share), the price/earnings multiple approach can be looked on as a method of finding the present value of a perpetuity of projected earnings per share at a rate equal to the earnings/price ratio. This method is in effect a form of the zero-growth model presented in Equation 7.3 on page 325.

## Review Questions

- 7-13 Describe the events that occur in an *efficient market* in response to new information that causes the expected return to exceed the required return. What happens to the market value?
- 7-14 What does the *efficient-market hypothesis* say about (a) securities prices, (b) their reaction to new information, and (c) investor opportunities to profit?
- 7-15 Describe, compare, and contrast the following common stock dividend valuation models: (a) zero-growth, (b) constant-growth, and (c) variable-growth.
- 7-16 Describe the *free cash flow valuation model* and explain how it differs from the dividend valuation models. What is the appeal of this model?
- 7-17 Explain each of the three other approaches to common stock valuation: (a) book value, (b) liquidation value, and (c) price/earnings (P/E) multiples. Which of these is considered the best?



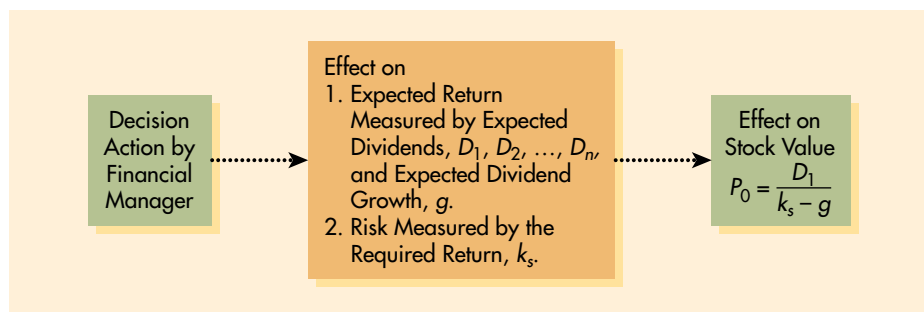
## 7.4 Decision Making and Common Stock Value

Valuation equations measure the stock value at a point in time based on expected return and risk. Any decisions of the financial manager that affect these variables can cause the value of the firm to change. Figure 7.4 depicts the relationship among financial decisions, return, risk, and stock value.

### Changes in Expected Return

Assuming that economic conditions remain stable, any management action that would cause current and prospective stockholders to raise their dividend expectations should increase the firm's value. In Equation 7.5,<sup>13</sup> we can see that  $P_0$  will

**FIGURE 7.4**  
**Decision Making and Stock Value**  
 Financial decisions, return, risk, and stock value



13. To convey the interrelationship among financial decisions, return, risk, and stock value, the constant-growth model is used. Other models—zero-growth, variable-growth, or free cash flow—could be used, but the simplicity of exposition using the constant-growth model justifies its use here.

increase for any increase in  $D_1$  or  $g$ . Any action of the financial manager that will increase the level of expected returns without changing risk (the required return) should be undertaken, because it will positively affect owners' wealth.

**EXAMPLE** ▼ Using the constant-growth model, we found Lamar Company to have a share value of \$18.75. On the following day, the firm announced a major technological breakthrough that would revolutionize its industry. Current and prospective stockholders would not be expected to adjust their required return of 15%, but they would expect that future dividends will increase. Specifically, they expect that although the dividend next year,  $D_1$ , will remain at \$1.50, the expected rate of growth thereafter will increase from 7% to 9%. If we substitute  $D_1 = \$1.50$ ,  $k_s = 0.15$ , and  $g = 0.09$  into Equation 7.5, the resulting value is \$25 [ $\$1.50 \div (0.15 - 0.09)$ ]. The increased value therefore resulted from the higher expected future dividends reflected in the increase in the growth rate. ▲

## Changes in Risk

Although  $k_s$  is defined as the required return, we know from Chapter 5 that it is directly related to the nondiversifiable risk, which can be measured by beta. The *capital asset pricing model (CAPM)* given in Equation 5.8 is restated here as Equation 7.9:

$$k_s = R_F + [b \times (k_m - R_F)] \quad (7.9)$$

With the risk-free rate,  $R_F$ , and the market return,  $k_m$ , held constant, the required return,  $k_s$ , depends directly on beta. Any action taken by the financial manager that increases risk (beta) will also increase the required return. In Equation 7.5, we can see that with everything else constant, an increase in the required return,  $k_s$ , will reduce share value,  $P_0$ . Likewise, a decrease in the required return will increase share value. Thus any action of the financial manager that increases risk contributes to a reduction in value, and any action that decreases risk contributes to an increase in value.

**EXAMPLE** ▼ Assume that Lamar Company's 15% required return resulted from a risk-free rate of 9%, a market return of 13%, and a beta of 1.50. Substituting into the capital asset pricing model, Equation 7.9, we get a required return,  $k_s$ , of 15%:

$$k_s = 9\% + [1.50 \times (13\% - 9\%)] = \underline{15\%}$$

With this return, the value of the firm was calculated in the example above to be \$18.75.

Now imagine that the financial manager makes a decision that, without changing expected dividends, causes the firm's beta to increase to 1.75. Assuming that  $R_F$  and  $k_m$  remain at 9% and 13%, respectively, the required return will increase to 16% ( $9\% + [1.75 \times (13\% - 9\%)]$ ) to compensate stockholders for the increased risk. Substituting  $D_1 = \$1.50$ ,  $k_s = 0.16$ , and  $g = 0.07$  into the valuation equation, Equation 7.5, results in a share value of \$16.67 [ $\$1.50 \div (0.16 - 0.07)$ ]. As expected, raising the required return, without any corresponding increase in expected return, causes the firm's stock value to decline. Clearly, the financial manager's action was not in the owners' best interest. ▲

## Combined Effect

A financial decision rarely affects return and risk independently; most decisions affect both factors. In terms of the measures presented, with an increase in risk ( $b$ ), one would expect an increase in return ( $D_1$  or  $g$ , or both), assuming that  $R_F$  and  $k_m$  remain unchanged. The net effect on value depends on the size of the changes in these variables.

**EXAMPLE** ▼ If we assume that the two changes illustrated for Lamar Company in the preceding examples occur simultaneously, key variable values would be  $D_1 = \$1.50$ ,  $k_s = 0.16$ , and  $g = 0.09$ . Substituting into the valuation model, we obtain a share price of \$21.43 [ $\$1.50 \div (0.16 - 0.09)$ ]. The net result of the decision, which increased return ( $g$ , from 7% to 9%) as well as risk ( $b$ , from 1.50 to 1.75 and therefore  $k_s$  from 15% to 16%), is positive: The share price increased from \$18.75 to \$21.43. The decision appears to be in the best interest of the firm's owners, because it increases their wealth. ▲

## Review Questions

- 7-18 Explain the linkages among financial decisions, return, risk, and stock value.
- 7-19 Assuming that all other variables remain unchanged, what impact would *each* of the following have on stock price? (a) The firm's beta increases. (b) The firm's required return decreases. (c) The dividend expected next year decreases. (d) The rate of growth in dividends is expected to increase.

# SUMMARY

## FOCUS ON VALUE

The price of each share of a firm's common stock is the value of each ownership interest. Although common stockholders typically have voting rights, which indirectly give them a say in management, their only significant right is their claim on the residual cash flows of the firm. This claim is subordinate to those of vendors, employees, customers, lenders, the government (for taxes), and preferred stockholders. The value of the common stockholders' claim is embodied in the cash flows they are entitled to receive from now to infinity. The present value of those expected cash flows is the firm's share value.

To determine this present value, cash flows are discounted at a rate that reflects the riskiness of the forecast cash flows. Riskier cash flows are discounted at higher rates, resulting in lower present values than less risky expected cash flows, which are discounted at



lower rates. The value of the firm's common stock is therefore driven by its expected cash flows (returns) and risk (certainty of the expected cash flows).

In pursuing the firm's goal of **maximizing the stock price**, the financial manager must carefully consider the balance of return and risk associated with each proposal and must undertake only those that create value for owners—that is, increase share price. By focusing on value creation and by managing and monitoring the firm's cash flows and risk, the financial manager should be able to achieve the firm's goal of share price maximization.

## REVIEW OF LEARNING GOALS

**LG1 Differentiate between debt and equity capital.** Holders of equity capital (common and preferred stock) are owners of the firm. Typically, only common stockholders have a voice in management through their voting rights. Equity holders have claims on income and assets that are secondary to the claims of creditors, there is no maturity date, and the firm does not benefit from tax deductibility of dividends paid to stockholders, as is the case for interest paid to debtholders.

**LG2 Discuss the rights, characteristics, and features of both common and preferred stock.** The common stock of a firm can be privately owned, closely owned, or publicly owned. It can be sold with or without a par value. Preemptive rights allow common stockholders to avoid dilution of ownership when new shares are issued. Not all shares authorized in the corporate charter are outstanding. If a firm has treasury stock, it will have issued more shares than are outstanding. Some firms have two or more classes of common stock that differ mainly in having unequal voting rights. Proxies transfer voting rights from one party to another. Dividend distributions to common stockholders are made at the discretion of the firm's board of directors. Firms can issue stock in foreign markets. The stock of many foreign corporations is traded in the form of American depositary receipts (ADRs) in U.S. markets.

Preferred stockholders have preference over common stockholders with respect to the distribution of earnings and assets and so are normally not given voting privileges. Preferred stock issues may have certain restrictive covenants, cumulative dividends, a call feature, and a conversion feature.

**LG3 Describe the process of issuing common stock, including in your discussion venture capital, go-**

**ing public, the investment banker's role, and stock quotations.** The initial nonfounder financing for business startups with attractive growth prospects typically comes from private equity investors. These investors can be either angel capitalists or venture capitalists (VCs), which are more formal business entities. Institutional VCs can be organized in a number of ways, but the VC limited partnership is the most common. VCs usually invest in both early-stage and later-stage companies that they hope to take public in order to cash out their investments.

The first public issue of a firm's stock is called an initial public offering (IPO). The company selects an investment banker to advise it and to sell the securities. The lead investment banker may form a selling syndicate with other investment bankers to sell the issue. The IPO process includes filing a registration statement with the Securities and Exchange Commission (SEC), getting SEC approval, promoting the offering to investors, pricing the issue, and selling the shares.

Stock quotations, published regularly in the financial media, provide information on stocks, including calendar year change in price, 52-week high and low, dividend, dividend yield, P/E ratio, volume, latest price, and net price change from the prior trading day.

**LG4 Understand the concept of market efficiency and basic common stock valuation under each of three cases: zero growth, constant growth, and variable growth.** Market efficiency, which is assumed throughout the text, suggests that there are many rational investors whose quick reactions to new information cause the market value of common stock to adjust upward or downward depending upon whether the expected return is above or

below, respectively, the required return for the period. The efficient-market hypothesis suggests that securities are fairly priced, that they reflect fully all publicly available information, and that investors should therefore not waste time trying to find and capitalize on mispriced securities. The value of a share of common stock is the present value of all future dividends it is expected to provide over an infinite time horizon. Three dividend growth models—zero-growth, constant-growth, and variable-growth—can be considered in common stock valuation. The basic stock valuation equation and these models are summarized in Table 7.6. The most widely cited model is the constant-growth model.

**LG5** Discuss the free cash flow valuation model and the use of book value, liquidation value, and price/earnings (P/E) multiples to estimate common stock values. The free cash flow valuation model is appealing when one is valuing firms that have no dividend history, startups, or operating units or divisions of a larger public company. The model finds the value of the entire company by discounting the firm's expected free cash flow at its weighted average cost of capital. The common stock value is found by subtracting the market values of the firm's debt and preferred stock from the value of the entire company. The two equations involved in this model are summarized in Table 7.6.

Book value per share is the amount per share of common stock that would be received if all of the firm's assets were *sold for their book (accounting) value* and the proceeds remaining after paying all liabilities (including preferred stock) were divided among the common stockholders. Liquidation value per share is the *actual amount* per share of common stock that would be received if all of the firm's assets were *sold for their market value*, liabilities (including preferred stock) were paid, and the remaining money were divided among the common stockholders. The price/earnings (P/E) multiples approach estimates stock value by multiplying the firm's expected earnings per share (EPS) by the average price/earnings (P/E) ratio for the industry.

**LG6** Explain the relationships among financial decisions, return, risk, and the firm's value. In a stable economy, any action of the financial manager that increases the level of expected return without changing risk should increase share value, and any action that reduces the level of expected return without changing risk should reduce share value. Similarly, any action that increases risk (required return) will reduce share value, and any action that reduces risk will increase share value. Because most financial decisions affect both return and risk, an assessment of their combined effect on stock value must be part of the financial decision-making process.

## SELF-TEST PROBLEMS (Solutions in Appendix B)



- ST 7-1 Common stock valuation** Perry Motors' common stock currently pays an annual dividend of \$1.80 per share. The required return on the common stock is 12%. Estimate the value of the common stock under each of the following assumptions about the dividend.
- Dividends are expected to grow at an annual rate of 0% to infinity.
  - Dividends are expected to grow at a constant annual rate of 5% to infinity.
  - Dividends are expected to grow at an annual rate of 5% for each of the next 3 years, followed by a constant annual growth rate of 4% in years 4 to infinity.



- ST 7-2 Free cash flow valuation** Erwin Footwear wishes to assess the value of its Active Shoe Division. This division has debt with a market value of \$12,500,000 and no preferred stock. Its weighted average cost of capital is 10%. The Active

**TABLE 7.6 Summary of Key Valuation Definitions and Formulas for Common Stock**


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**Definitions of variables**


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$D_t$  = per-share dividend *expected* at the end of year  $t$

$FCF_t$  = free cash flow *expected* at the end of year  $t$

$g$  = constant rate of growth in dividends

$g_1$  = initial dividend growth rate (in variable-growth model)

$g_2$  = subsequent dividend growth rate (in variable-growth model)

$k_a$  = weighted average cost of capital

$k_s$  = required return on common stock

$N$  = last year of initial growth period (in variable-growth model)

$P_0$  = value of common stock

$V_C$  = value of the entire company

$V_D$  = market value of all the firm's debt

$V_P$  = market value of preferred stock

$V_S$  = value of common stock

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**Valuation formulas**


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Basic stock value:

$$P_0 = \frac{D_1}{(1+k_s)^1} + \frac{D_2}{(1+k_s)^2} + \cdots + \frac{D_\infty}{(1+k_s)^\infty} \quad [\text{Eq. 7.2}]$$

Common stock value:

Zero-growth:

$$P_0 = \frac{D_1}{k_s} \quad (\text{also used to value preferred stock}) \quad [\text{Eq. 7.3}]$$

Constant-growth:

$$P_0 = \frac{D_1}{k_s - g} \quad [\text{Eq. 7.5}]$$

Variable-growth:

$$P_0 = \sum_{t=1}^N \frac{D_0 \times (1+g_1)^t}{(1+k_s)^t} + \left[ \frac{1}{(1+k_s)^N} \times \frac{D_{N+1}}{k_s - g_2} \right] \quad [\text{Eq. 7.6}]$$

FCF value of entire company:

$$V_C = \frac{FCF_1}{(1+k_a)^1} + \frac{FCF_2}{(1+k_a)^2} + \cdots + \frac{FCF_\infty}{(1+k_a)^\infty} \quad [\text{Eq. 7.7}]$$

FCF common stock value:

$$V_S = V_C - V_D - V_P \quad [\text{Eq. 7.8}]$$


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Shoe Division's estimated free cash flow each year from 2004 through 2007 is given in the accompanying table. Beyond 2007 to infinity, the firm expects its free cash flow to grow at 4% annually.

Year ( $t$ )	Free cash flow ( $FCF_t$ )
2004	\$ 800,000
2005	1,200,000
2006	1,400,000
2007	1,500,000

- Use the *free cash flow valuation model* to estimate the value of Erwin's Active Shoe Division.
- Use your finding in part **a** along with the data provided above to find this division's common stock value.
- If the Active Shoe Division as a public company will have 500,000 shares outstanding, use your finding in part **b** to calculate its value per share.

## PROBLEMS

- LG2** 7-1 **Authorized and available shares** Aspin Corporation's charter authorizes issuance of 2,000,000 shares of common stock. Currently, 1,400,000 shares are outstanding and 100,000 shares are being held as treasury stock. The firm wishes to raise \$48,000,000 for a plant expansion. Discussions with its investment bankers indicate that the sale of new common stock will net the firm \$60 per share.
- What is the maximum number of new shares of common stock that the firm can sell without receiving further authorization from shareholders?
  - Judging on the basis of the data given and your finding in part **a**, will the firm be able to raise the needed funds without receiving further authorization?
  - What must the firm do to obtain authorization to issue more than the number of shares found in part **a**?
- LG2** 7-2 **Preferred dividends** Slater Lamp Manufacturing has an outstanding issue of preferred stock with an \$80 par value and an 11% annual dividend.
- What is the annual dollar dividend? If it is paid quarterly, how much will be paid each quarter?
  - If the preferred stock is *noncumulative* and the board of directors has passed the preferred dividend for the last 3 quarters, how much must be paid to preferred stockholders before dividends are paid to common stockholders?
  - If the preferred stock is *cumulative* and the board of directors has passed the preferred dividend for the last 3 quarters, how much must be paid to preferred stockholders before dividends are paid to common stockholders?
- LG2** 7-3 **Preferred dividends** In each case in the following table, how many dollars of preferred dividends per share must be paid to preferred stockholders before common stock dividends are paid?

Case	Type	Par value	Dividend per share per period	Periods of dividends passed
A	Cumulative	\$ 80	\$ 5	2
B	Noncumulative	110	8%	3
C	Noncumulative	100	\$11	1
D	Cumulative	60	8.5%	4
E	Cumulative	90	9%	0



**7-4 Convertible preferred stock** Valerian Corp. convertible preferred stock has a fixed conversion ratio of 5 common shares per 1 share of preferred stock. The preferred stock pays a dividend of \$10.00 per share per year. The common stock currently sells for \$20.00 per share and pays a dividend of \$1.00 per share per year.

- Judging on the basis of the conversion ratio and the price of the common shares, what is the current conversion value of each preferred share?
- If the preferred shares are selling at \$96.00 each, should an investor convert the preferred shares to common shares?
- What factors might cause an investor not to convert from preferred to common?



**7-5 Stock quotation** Assume that the following quote for the Advanced Business Machines stock (traded on the NYSE) was found in the Thursday, December 14, issue of the *Wall Street Journal*.

+3.2 84.13 51.25 AdvBusMach ABM 1.32 1.6 23 12432 81.75 +1.63

Given this information, answer the following questions:

- On what day did the trading activity occur?
- At what price did the stock sell at the end of the day on Wednesday, December 13?
- What percentage change has occurred in the stock's last price since the beginning of the calendar year?
- What is the firm's price/earnings ratio? What does it indicate?
- What is the last price at which the stock traded on the day quoted?
- How large a dividend is expected in the current year?
- What are the highest and the lowest price at which the stock traded during the latest 52-week period?
- How many shares of stock were traded on the day quoted?
- How much, if any, of a change in stock price took place between the day quoted and the day before? At what price did the stock close on the day before?



**7-6 Common stock valuation—Zero growth** Scotto Manufacturing is a mature firm in the machine tool component industry. The firm's most recent common stock dividend was \$2.40 per share. Because of its maturity as well as its stable sales and earnings, the firm's management feels that dividends will remain at the current level for the foreseeable future.

- If the required return is 12%, what will be the value of Scotto's common stock?
- If the firm's risk as perceived by market participants suddenly increases, causing the required return to rise to 20%, what will be the common stock value?

- c. Judging on the basis of your findings in parts a and b, what impact does risk have on value? Explain.



**7-7 Common stock value—Zero growth** Kelsey Drums, Inc., is a well-established supplier of fine percussion instruments to orchestras all over the United States. The company’s class A common stock has paid a dividend of \$5.00 per share per year for the last 15 years. Management expects to continue to pay at that rate for the foreseeable future. Sally Talbot purchased 100 shares of Kelsey class A common 10 years ago at a time when the required rate of return for the stock was 16%. She wants to sell her shares today. The current required rate of return for the stock is 12%. How much capital gain or loss will she have on her shares?



**7-8 Preferred stock valuation** Jones Design wishes to estimate the value of its outstanding preferred stock. The preferred issue has an \$80 par value and pays an annual dividend of \$6.40 per share. Similar-risk preferred stocks are currently earning a 9.3% annual rate of return.

- What is the market value of the outstanding preferred stock?
- If an investor purchases the preferred stock at the value calculated in part a, how much does she gain or lose per share if she sells the stock when the required return on similar-risk preferreds has risen to 10.5%? Explain.



**7-9 Common stock value—Constant growth** Use the constant-growth model (Gordon model) to find the value of each firm shown in the following table.

Firm	Dividend expected next year	Dividend growth rate	Required return
A	\$1.20	8%	13%
B	4.00	5	15
C	0.65	10	14
D	6.00	8	9
E	2.25	8	20



**7-10 Common stock value—Constant growth** McCracken Roofing, Inc., common stock paid a dividend of \$1.20 per share last year. The company expects earnings and dividends to grow at a rate of 5% per year for the foreseeable future.

- What required rate of return for this stock would result in a price per share of \$28?
- If McCracken had both earnings growth and dividend growth at a rate of 10%, what required rate of return would result in a price per share of \$28?



**7-11 Common stock value—Constant growth** Elk County Telephone has paid the dividends shown in the following table over the past 6 years.

Year	Dividend per share
2003	\$2.87
2002	2.76
2001	2.60
2000	2.46
1999	2.37
1998	2.25

The firm's dividend per share next year is expected to be \$3.02.

- If you can earn 13% on similar-risk investments, what is the most you would be willing to pay per share?
- If you can earn only 10% on similar-risk investments, what is the most you would be willing to pay per share?
- Compare and contrast your findings in parts a and b, and discuss the impact of changing risk on share value.



LG4

- 7-12 **Common stock value—Variable growth** Newman Manufacturing is considering a cash purchase of the stock of Grips Tool. During the year just completed, Grips earned \$4.25 per share and paid cash dividends of \$2.55 per share ( $D_0 = \$2.55$ ). Grips' earnings and dividends are expected to grow at 25% per year for the next 3 years, after which they are expected to grow at 10% per year to infinity. What is the maximum price per share that Newman should pay for Grips if it has a required return of 15% on investments with risk characteristics similar to those of Grips?



LG4

- 7-13 **Common stock value—Variable growth** Home Place Hotels, Inc., is entering into a 3-year remodeling and expansion project. The construction will have a limiting effect on earnings during that time, but when it is complete, it should allow the company to enjoy much improved growth in earnings and dividends. Last year, the company paid a dividend of \$3.40. It expects zero growth in the next year. In years 2 and 3, 5% growth is expected, and in year 4, 15% growth. In year 5 and thereafter, growth should be a constant 10% per year. What is the maximum price per share that an investor who requires a return of 14% should pay for Home Place Hotels common stock?



LG4

- 7-14 **Common stock value—Variable growth** Lawrence Industries' most recent annual dividend was \$1.80 per share ( $D_0 = \$1.80$ ), and the firm's required return is 11%. Find the market value of Lawrence's shares when:
- Dividends are expected to grow at 8% annually for 3 years, followed by a 5% constant annual growth rate in years 4 to infinity.
  - Dividends are expected to grow at 8% annually for 3 years, followed by a 0% constant annual growth rate in years 4 to infinity.
  - Dividends are expected to grow at 8% annually for 3 years, followed by a 10% constant annual growth rate in years 4 to infinity.

LG4

- 7-15 **Common stock value—All growth models** You are evaluating the potential purchase of a small business currently generating \$42,500 of after-tax cash flow ( $D_0 = \$42,500$ ). On the basis of a review of similar-risk investment opportunities, you must earn an 18% rate of return on the proposed purchase. Because you are relatively uncertain about future cash flows, you decide to estimate the firm's value using several possible assumptions about the growth rate of cash flows.
- What is the firm's value if cash flows are expected to grow at an annual rate of 0% from now to infinity?
  - What is the firm's value if cash flows are expected to grow at a constant annual rate of 7% from now to infinity?
  - What is the firm's value if cash flows are expected to grow at an annual rate of 12% for the first 2 years, followed by a constant annual rate of 7% from year 3 to infinity?



**7-16 Free cash flow valuation** Nabor Industries is considering going public but is unsure of a fair offering price for the company. Before hiring an investment banker to assist in making the public offering, managers at Nabor have decided to make their own estimate of the firm's common stock value. The firm's CFO has gathered data for performing the valuation using the free cash flow valuation model.

The firm's weighted average cost of capital is 11%, and it has \$1,500,000 of debt at market value and \$400,000 of preferred stock at its assumed market value. The estimated free cash flows over the next 5 years, 2004 through 2008, are given below. Beyond 2008 to infinity, the firm expects its free cash flow to grow by 3% annually.

Year ( $t$ )	Free cash flow ( $FCF_t$ )
2004	\$200,000
2005	250,000
2006	310,000
2007	350,000
2008	390,000

- Estimate the value of Nabor Industries' entire company by using the *free cash flow valuation model*.
- Use your finding in part a, along with the data provided above, to find Nabor Industries' common stock value.
- If the firm plans to issue 200,000 shares of common stock, what is its estimated value per share?



**7-17 Using the free cash flow valuation model to price an IPO** Assume that you have an opportunity to buy the stock of CoolTech, Inc., an IPO being offered for \$12.50 per share. Although you are very much interested in owning the company, you are concerned about whether it is fairly priced. In order to determine the value of the shares, you have decided to apply the free cash flow valuation model to the firm's financial data that you've developed from a variety of data sources. The key values you have compiled are summarized in the following table.

Free cash flow		Other data
Year ( $t$ )	$FCF_t$	
2004	\$ 700,000	Growth rate of FCF, beyond 2007 to infinity = 2%
2005	800,000	Weighted average cost of capital = 8%
2006	950,000	Market value of all debt = \$2,700,000
2007	1,100,000	Market value of preferred stock = \$1,000,000
		Number of shares of common stock outstanding = 1,100,000

- Use the *free cash flow valuation model* to estimate CoolTech's common stock value per share.
- Judging on the basis of your finding in part a and the stock's offering price, should you buy the stock?



- c. Upon further analysis, you find that the growth rate in FCF beyond 2007 will be 3% rather than 2%. What effect would this finding have on your responses in parts a and b?



**7–18 Book and liquidation value** The balance sheet for Gallinas Industries is as follows.

Gallinas Industries Balance Sheet December 31			
Assets		Liabilities and Stockholders' Equity	
Cash	\$ 40,000	Accounts payable	\$100,000
Marketable securities	60,000	Notes payable	30,000
Accounts receivable	120,000	Accrued wages	<u>30,000</u>
Inventories	<u>160,000</u>	Total current liabilities	<u>\$160,000</u>
Total current assets	<u>\$380,000</u>	Long-term debt	<u>\$180,000</u>
Land and buildings (net)	\$150,000	Preferred stock	\$ 80,000
Machinery and equipment	<u>250,000</u>	Common stock (10,000 shares)	<u>360,000</u>
Total fixed assets (net)	<u>\$400,000</u>	Total liabilities and stockholders' equity	<u>\$780,000</u>
Total assets	<u>\$780,000</u>		

Additional information with respect to the firm is available:

- (1) Preferred stock can be liquidated at book value.
- (2) Accounts receivable and inventories can be liquidated at 90% of book value.
- (3) The firm has 10,000 shares of common stock outstanding.
- (4) All interest and dividends are currently paid up.
- (5) Land and buildings can be liquidated at 130% of book value.
- (6) Machinery and equipment can be liquidated at 70% of book value.
- (7) Cash and marketable securities can be liquidated at book value.

Given this information, answer the following:

- a. What is Gallinas Industries' book value per share?
- b. What is its liquidation value per share?
- c. Compare, contrast, and discuss the values found in parts a and b.



**7–19 Valuation with price/earnings multiples** For each of the firms shown in the following table, use the data given to estimate their common stock value employing price/earnings (P/E) multiples.

Firm	Expected EPS	Price/earnings multiple
A	\$3.00	6.2
B	4.50	10.0
C	1.80	12.6
D	2.40	8.9
E	5.10	15.0

- LG6** 7-20 **Management action and stock value** REH Corporation's most recent dividend was \$3 per share, its expected annual rate of dividend growth is 5%, and the required return is now 15%. A variety of proposals are being considered by management to redirect the firm's activities. Determine the impact on share price for each of the following proposed actions, and indicate the best alternative.
- Do nothing, which will leave the key financial variables unchanged.
  - Invest in a new machine that will increase the dividend growth rate to 6% and lower the required return to 14%.
  - Eliminate an unprofitable product line, which will increase the dividend growth rate to 7% and raise the required return to 17%.
  - Merge with another firm, which will reduce the growth rate to 4% and raise the required return to 16%.
  - Acquire a subsidiary operation from another manufacturer. The acquisition should increase the dividend growth rate to 8% and increase the required return to 17%.

- LG4** **LG6** 7-21 **Integrative—Valuation and CAPM formulas** Given the following information for the stock of Foster Company, calculate its beta.

Current price per share of common	\$50.00
Expected dividend per share next year	\$ 3.00
Constant annual dividend growth rate	9%
Risk-free rate of return	7%
Return on market portfolio	10%

- LG4** **LG6** 7-22 **Integrative—Risk and valuation** Giant Enterprises has a beta of 1.20, the risk-free rate of return is currently 10%, and the market return is 14%. The company, which plans to pay a dividend of \$2.60 per share in the coming year, anticipates that its future dividends will increase at an annual rate consistent with that experienced over the 1997–2003 period, when the following dividends were paid:

Year	Dividend per share
2003	\$2.45
2002	2.28
2001	2.10
2000	1.95
1999	1.82
1998	1.80
1997	1.73

- Use the capital asset pricing model (CAPM) to determine the required return on Giant's stock.
- Using the constant-growth model and your finding in part a, estimate the value of Giant's stock.
- Explain what effect, if any, a decrease in beta would have on the value of Giant's stock.



**7-23 Integrative—Valuation and CAPM** Hamlin Steel Company wishes to determine the value of Craft Foundry, a firm that it is considering acquiring for cash. Hamlin wishes to use the capital asset pricing model (CAPM) to determine the applicable discount rate to use as an input to the constant-growth valuation model. Craft's stock is not publicly traded. After studying the betas of firms similar to Craft that are publicly traded, Hamlin believes that an appropriate beta for Craft's stock would be 1.25. The risk-free rate is currently 9%, and the market return is 13%. Craft's dividend per share for each of the past 6 years is shown in the following table.

Year	Dividend per share
2003	\$3.44
2002	3.28
2001	3.15
2000	2.90
1999	2.75
1998	2.45

- Given that Craft is expected to pay a dividend of \$3.68 next year, determine the maximum cash price that Hamlin should pay for each share of Craft.
- Discuss the use of the CAPM for estimating the value of common stock, and describe the effect on the resulting value of Craft of:
  - A decrease in its dividend growth rate of 2% from that exhibited over the 1998–2003 period.
  - A decrease in its beta to 1.

## CHAPTER 7 CASE

### Assessing the Impact of Suarez Manufacturing's Proposed Risky Investment on Its Stock Value

Early in 2004, Inez Marcus, the chief financial officer for Suarez Manufacturing, was given the task of assessing the impact of a proposed risky investment on the firm's stock value. To perform the necessary analysis, Inez gathered the following information on the firm's stock.

During the immediate past 5 years (1999–2003), the annual dividends paid on the firm's common stock were as follows:

Year	Dividend per share
2003	\$1.90
2002	1.70
2001	1.55
2000	1.40
1999	1.30

The firm expects that without the proposed investment, the dividend in 2004 will be \$2.09 per share and the historical annual rate of growth (rounded to the nearest whole percent) will continue in the future. Currently, the required return on the common stock is 14%. Inez's research indicates that if the proposed

investment is undertaken, the 2004 dividend will rise to \$2.15 per share and the annual rate of dividend growth will increase to 13%. She feels that in the *best case*, the dividend would continue to grow at this rate each year into the future and that in the *worst case*, the 13% annual rate of growth in dividends would continue only through 2006, and then, at the beginning of 2007, would return to the rate that was experienced between 1999 and 2003. As a result of the increased risk associated with the proposed risky investment, the required return on the common stock is expected to increase by 2% to an annual rate of 16%, regardless of which dividend growth outcome occurs.

Armed with the preceding information, Inez must now assess the impact of the proposed risky investment on the market value of Suarez's stock. To simplify her calculations, she plans to round the historical growth rate in common stock dividends to the nearest whole percent.

### Required

- Find the *current* value per share of Suarez Manufacturing's common stock.
- Find the value of Suarez's common stock in the event that it *undertakes the proposed risky investment* and assuming that the dividend growth rate stays at 13% forever. Compare this value to that found in part **a**. What effect would the proposed investment have on the firm's stockholders? Explain.
- On the basis of your findings in part **b**, do the stockholders win or lose as a result of undertaking the proposed risky investment? Should the firm do it? Why?
- Rework parts **b** and **c** assuming that at the beginning of 2007 the annual dividend growth rate returns to the rate experienced between 1999 and 2003.

### WEB EXERCISE



To use the price/earnings multiples approach to valuation, you need to find a firm's projected earnings and the P/E multiple. One of the most popular sites to obtain these estimates is Zacks Investment Research, [www.zacks.com](http://www.zacks.com).

- At the top of the page, locate the area where you can enter a company's ticker symbol and select the desired information.
- Enter OO for Oakley Inc. and select **estimates** from the pull-down menu.
  - What is the current mean/consensus estimate for the next fiscal year's earnings?
  - Using the indicated price/earnings ratio further down on that page, calculate the stock price.
- Repeat steps 2a and b for the following stocks:
  - Southwest Airlines: LUV
  - Microsoft: MSFT
  - Weight Watchers: WTW

**Remember to check the book's Web site at**

[www.aw.com/gitman](http://www.aw.com/gitman)

**for additional resources, including additional Web exercises.**

## INTEGRATIVE CASE 2

### Encore International

In the world of trendsetting fashion, instinct and marketing savvy are prerequisites to success. Jordan Ellis had both. During 2003, his international casual-wear company, Encore, rocketed to \$300 million in sales after 10 years in business. His fashion line covered the young woman from head to toe with hats, sweaters, dresses, blouses, skirts, pants, sweatshirts, socks, and shoes. In Manhattan, there was an Encore shop every five or six blocks, each featuring a different color. Some shops showed the entire line in mauve, and others featured it in canary yellow.

Encore had made it. The company's historical growth was so spectacular that no one could have predicted it. However, securities analysts speculated that Encore could not keep up the pace. They warned that competition is fierce in the fashion industry and that the firm might encounter little or no growth in the future. They estimated that stockholders also should expect no growth in future dividends.

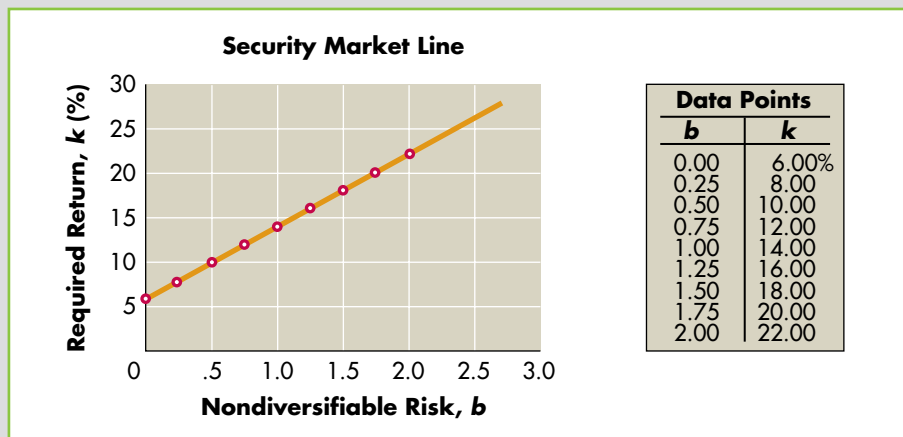
Contrary to the conservative securities analysts, Jordan Ellis felt that the company could maintain a constant annual growth rate in dividends per share of 6% in the future, or possibly 8% for the next 2 years and 6% thereafter. Ellis based his estimates on an established long-term expansion plan into European and Latin American markets. Venturing into these markets was expected to cause the risk of the firm, as measured by beta, to increase immediately from 1.10 to 1.25.

In preparing the long-term financial plan, Encore's chief financial officer has assigned a junior financial analyst, Marc Scott, to evaluate the firm's current stock price. He has asked Marc to consider the conservative predictions of the securities analysts and the aggressive predictions of the company founder, Jordan Ellis.

Marc has compiled these 2003 financial data to aid his analysis:

Data item	2003 value
Earnings per share (EPS)	\$6.25
Price per share of common stock	\$40.00
Book value of common stock equity	\$60,000,000
Total common shares outstanding	2,500,000
Common stock dividend per share	\$4.00

**Figure 1**



### Required

- a. What is the firm's current book value per share?
- b. What is the firm's current P/E ratio?
- c. (1) What are the required return and risk premium for Encore stock using the capital asset pricing model, assuming a beta of 1.10? (*Hint:* Use the security market line—with data points noted—given in Figure 1 to find the market return.)
  - (2) What are the required return and risk premium for Encore stock using the capital asset pricing model, assuming a beta of 1.25?
  - (3) What will be the effect on the required return if the beta rises as expected?
- d. If the securities analysts are correct and there is no growth in future dividends, what will be the value per share of the Encore stock? (*Note:* Beta = 1.25.)
- e. (1) If Jordan Ellis's predictions are correct, what will be the value per share of Encore stock if the firm maintains a constant annual 6% growth rate in future dividends? (*Note:* Beta = 1.25.)
  - (2) If Jordan Ellis's predictions are correct, what will be the value per share of Encore stock if the firm maintains a constant annual 8% growth rate in dividends per share over the next 2 years and 6% thereafter? (*Note:* Beta = 1.25.)
- f. Compare the current (2003) price of the stock and the stock values found in parts a, d, and e. Discuss why these values may differ. Which valuation method do you believe most clearly represents the true value of the Encore stock?