2. As the owner of shares of common stock in a corporation, you have various rights, including the right to vote to elect corporate directors. Voting in corporate elections can be either cumulative or straight. Most voting is actually done by proxy, and a proxy battle breaks out when competing sides try to gain enough votes to have their candidates for the board elected.
3. In addition to common stock, some corporations have issued preferred stock. The name stems from the fact that preferred stockholders must be paid first, before common stockholders can receive anything. Preferred stock has a fixed dividend.
4. The two biggest stock markets in the United States are the NYSE and the Nasdaq. We discussed the organization and operation of these two markets, and we saw how stock price information is reported in the financial press.

This chapter completes Part 3 of our book. By now, you should have a good grasp of what we mean by present value. You should also be familiar with how to calculate present values, loan payments, and so on. In Part 4, we cover capital budgeting decisions. As you will see, the techniques you learned in Chapters 5–8 form the basis for our approach to evaluating business investment decisions.

Chapter Review and Self-Test Problems

8.1 **Dividend Growth and Stock Valuation** The Brigapenski Co. has just paid a cash dividend of $2 per share. Investors require a 16 percent return from investments such as this. If the dividend is expected to grow at a steady 8 percent per year, what is the current value of the stock? What will the stock be worth in five years?

8.2 **More Dividend Growth and Stock Valuation** In Self-Test Problem 8.1, what would the stock sell for today if the dividend was expected to grow at 20 percent per year for the next three years and then settle down to 8 percent per year, indefinitely?

Answers to Chapter Review and Self-Test Problems

8.1 The last dividend, D_0, was $2. The dividend is expected to grow steadily at 8 percent. The required return is 16 percent. Based on the dividend growth model, we can say that the current price is:

$$\begin{aligned} P_0 &= D_1/(R - g) = D_0 \times (1 + g)/(R - g) \\ &= \$2 \times 1.08/(.16 - .08) \\ &= \$2.16/.08 \\ &= \$27 \end{aligned}$$

We could calculate the price in five years by calculating the dividend in five years and then using the growth model again. Alternatively, we could recognize that the stock price will increase by 8 percent per year and calculate the future price directly. We'll do both. First, the dividend in five years will be:

$$\begin{aligned} D_5 &= D_0 \times (1 + g)^5 \\ &= \$2 \times 1.08^5 \\ &= \$2.9387 \end{aligned}$$

The price in five years would therefore be:

$$\begin{aligned} P_5 &= D_5 \times (1 + g)/(R - g) \\ &= \$2.9387 \times 1.08/.08 \\ &= \$3.1738/.08 \\ &= \$39.67 \end{aligned}$$

Once we understand the dividend model, however, it's easier to notice that:

$$\begin{aligned} P_5 &= P_0 \times (1 + g)^5 \\ &= \$27 \times 1.08^5 \\ &= \$27 \times 1.4693 \\ &= \$39.67 \end{aligned}$$

Notice that both approaches yield the same price in five years.

8.2 In this scenario, we have supernormal growth for the next three years. We'll need to calculate the dividends during the rapid-growth period and the stock price in three years. The dividends are:

$$\begin{aligned} D_1 &= \$2.00 \times 1.20 = \$2.400 \\ D_2 &= \$2.40 \times 1.20 = \$2.880 \\ D_3 &= \$2.88 \times 1.20 = \$3.456 \end{aligned}$$

After three years, the growth rate falls to 8 percent indefinitely. The price at that time, P_3, is thus:

$$\begin{aligned} P_3 &= D_3 \times (1 + g)/(R - g) \\ &= \$3.456 \times 1.08/(.16 - .08) \\ &= \$3.7325/.08 \\ &= \$46.656 \end{aligned}$$

To complete the calculation of the stock's present value, we have to determine the present value of the three dividends and the future price:

$$\begin{aligned} P_0 &= \frac{D_1}{(1 + R)^1} + \frac{D_2}{(1 + R)^2} + \frac{D_3}{(1 + R)^3} + \frac{P_3}{(1 + R)^3} \\ &= \frac{\$2.40}{1.16} + \frac{2.88}{1.16^2} + \frac{3.456}{1.16^3} + \frac{46.656}{1.16^3} \\ &= \$2.07 + 2.14 + 2.21 + 29.89 \\ &= \$36.31 \end{aligned}$$

Concepts Review and Critical Thinking Questions

1. **Stock Valuation** Why does the value of a share of stock depend on dividends?
2. **Stock Valuation** A substantial percentage of the companies listed on the NYSE and the Nasdaq don't pay dividends, but investors are nonetheless willing to buy shares in them. How is this possible given your answer to the previous question?
3. **Dividend Policy** Referring to the previous questions, under what circumstances might a company choose not to pay dividends?

4. **Dividend Growth Model** Under what two assumptions can we use the dividend growth model presented in the chapter to determine the value of a share of stock? Comment on the reasonableness of these assumptions.
5. **Common versus Preferred Stock** Suppose a company has a preferred stock issue and a common stock issue. Both have just paid a $2 dividend. Which do you think will have a higher price, a share of the preferred or a share of the common?
6. **Dividend Growth Model** Based on the dividend growth model, what are the two components of the total return on a share of stock? Which do you think is typically larger?
7. **Growth Rate** In the context of the dividend growth model, is it true that the growth rate in dividends and the growth rate in the price of the stock are identical?
8. **Voting Rights** When it comes to voting in elections, what are the differences between U.S. political democracy and U.S. corporate democracy?
9. **Corporate Ethics** Is it unfair or unethical for corporations to create classes of stock with unequal voting rights?
10. **Voting Rights** Some companies, such as Reader's Digest, have created classes of stock with no voting rights at all. Why would investors buy such stock?
11. **Stock Valuation** Evaluate the following statement: Managers should not focus on the current stock value because doing so will lead to an overemphasis on short-term profits at the expense of long-term profits.

Questions and Problems

Basic
(Questions 1–8)

1. **Stock Values** Heard, Inc., just paid a dividend of $1.75 per share on its stock. The dividends are expected to grow at a constant rate of 6 percent per year, indefinitely. If investors require a 12 percent return on Heard stock, what is the current price? What will the price be in three years? In 15 years?
2. **Stock Values** The next dividend payment by SAF, Inc., will be $2.50 per share. The dividends are anticipated to maintain a 5 percent growth rate, forever. If SAF stock currently sells for $48.00 per share, what is the required return?
3. **Stock Values** For the company in the previous problem, what is the dividend yield? What is the expected capital gains yield?
4. **Stock Values** Cannone Corporation will pay a $4.00 per share dividend next year. The company pledges to increase its dividend by 4 percent per year, indefinitely. If you require a 13 percent return on your investment, how much will you pay for the company's stock today?
5. **Stock Valuation** Shocking Co. is expected to maintain a constant 7 percent growth rate in its dividends, indefinitely. If the company has a dividend yield of 4.2 percent, what is the required return on the power company's stock?
6. **Stock Valuation** Suppose you know that a company's stock currently sells for $60 per share and the required return on the stock is 14 percent. You also know that the total return on the stock is evenly divided between a capital gains yield and a dividend yield. If it's the company's policy to always maintain a constant growth rate in its dividends, what is the current dividend per share?
7. **Stock Valuation** Kiessling Corp. pays a constant $9 dividend on its stock. The company will maintain this dividend for the next eight years and will then cease

Basic
(*continued*)

paying dividends forever. If the required return on this stock is 11 percent, what is the current share price?

8. **Valuing Preferred Stock** Sowell, Inc., has an issue of preferred stock outstanding that pays an $8.50 dividend every year, in perpetuity. If this issue currently sells for $124 per share, what is the required return?

Intermediate
(Questions 9–18)

9. **Stock Valuation** Smashed Pumpkin Farms (SPF) just paid a dividend of $3.00 on its stock. The growth rate in dividends is expected to be a constant 7.5 percent per year, indefinitely. Investors require an 18 percent return on the stock for the first three years, a 12 percent return for the next three years, and then a 13 percent return, thereafter. What is the current share price for SPF stock?
10. **Nonconstant Growth** Metallica Bearings, Inc., is a young start-up company. No dividends will be paid on the stock over the next nine years, because the firm needs to plow back its earnings to fuel growth. The company will pay a $7 per share dividend in 10 years and will increase the dividend by 6 percent per year, thereafter. If the required return on this stock is 14 percent, what is the current share price?
11. **Nonconstant Dividends** Corn, Inc., has an odd dividend policy. The company has just paid a dividend of $6 per share and has announced that it will increase the dividend by $2 per share for each of the next four years, and then never pay another dividend. If you require an 11 percent return on the company's stock, how much will you pay for a share today?
12. **Nonconstant Dividends** South Side Corporation is expected to pay the following dividends over the next four years: $6.50, $5, $3, and $2. Afterwards, the company pledges to maintain a constant 5 percent growth rate in dividends, forever. If the required return on the stock is 16 percent, what is the current share price?
13. **Supernormal Growth** Super Growth Co. is growing quickly. Dividends are expected to grow at a 32 percent rate for the next three years, with the growth rate falling off to a constant 7 percent thereafter. If the required return is 15 percent and the company just paid a $2.25 dividend, what is the current share price?
14. **Supernormal Growth** Janicek Corp. is experiencing rapid growth. Dividends are expected to grow at 25 percent per year during the next three years, 18 percent over the following year, and then 8 percent per year, indefinitely. The required return on this stock is 15 percent, and the stock currently sells for $60.00 per share. What is the projected dividend for the coming year?
15. **Negative Growth** Antiques R Us is a mature manufacturing firm. The company just paid a $9 dividend, but management expects to reduce the payout by 8 percent per year, indefinitely. If you require a 14 percent return on this stock, what will you pay for a share today?
16. **Finding the Dividend** Fernandez Corporation stock currently sells for $45 per share. The market requires a 12 percent return on the firm's stock. If the company maintains a constant 8 percent growth rate in dividends, what was the most recent dividend per share paid on the stock?
17. **Valuing Preferred Stock** Bruin Bank just issued some new preferred stock. The issue will pay an $8 annual dividend in perpetuity, beginning six years from now. If the market requires a 6 percent return on this investment, how much does a share of preferred stock cost today?
18. **Using Stock Quotes** You have found the following stock quote for RJW Enterprises, Inc., in the financial pages of today's newspaper. What was the closing

price for this stock that appeared in *yesterday's* paper? If the company currently has two million shares of stock outstanding, what was net income for the most recent four quarters?

Intermediate (*continued*)

YTD % Chg	52 Weeks Hi	Lo	Stock	Sym	Div	Yld %	PE	Vol 100s	Last	Net Chg
34.2	38.12	19.92	RJW	RJW	.48	1.3	51	10918	??	+0.95

Challenge (Questions 19–22)

19. **Capital Gains versus Income** Consider four different stocks, all of which have a required return of 20 percent and a most recent dividend of $4.50 per share. Stocks W, X, and Y are expected to maintain constant growth rates in dividends for the foreseeable future of 10 percent, 0 percent, and −5 percent per year, respectively. Stock Z is a growth stock that will increase its dividend by 20 percent for the next two years and then maintain a constant 12 percent growth rate, thereafter. What is the dividend yield for each of these four stocks? What is the expected capital gains yield? Discuss the relationship among the various returns that you find for each of these stocks.

20. **Stock Valuation** Most corporations pay quarterly dividends on their common stock rather than annual dividends. Barring any unusual circumstances during the year, the board raises, lowers, or maintains the current dividend once a year and then pays this dividend out in equal quarterly installments to its shareholders.
    a. Suppose a company currently pays a $2.50 annual dividend on its common stock in a single annual installment, and management plans on raising this dividend by 8 percent per year, indefinitely. If the required return on this stock is 14 percent, what is the current share price?
    b. Now suppose that the company in (*a*) actually pays its annual dividend in equal quarterly installments; thus, this company has just paid a $.625 dividend per share, as it has for the previous three quarters. What is your value for the current share price now? (Hint: Find the equivalent annual end-of-year dividend for each year.) Comment on whether or not you think that this model of stock valuation is appropriate.

21. **Nonconstant Growth** Warf Co. just paid a dividend of $4.00 per share. The company will increase its dividend by 20 percent next year and will then reduce its dividend growth rate by 5 percentage points per year until it reaches the industry average of 5 percent, after which the company will keep a constant growth rate, forever. If the required return on Warf stock is 13 percent, what will a share of stock sell for today?

22. **Nonconstant Growth** This one's a little harder. Suppose the current share price for the firm in the previous problem is $104.05 and all the dividend information remains the same. What required return must investors be demanding on Warf stock? (Hint: Set up the valuation formula with all the relevant cash flows, and use trial and error to find the unknown rate of return.)

S & P Problems

STANDARD & POOR'S

1. **Calculating Required Return** A drawback of the dividend growth model is the need to estimate the growth rate of dividends. One way to estimate this growth rate is to use the sustainable growth rate. Look back at Chapter 4 and find the formula for the sustainable growth rate. Using the annual income

statement and balance sheet, calculate the sustainable growth rate for the Kellogg Company (K). Find the most recent closing monthly stock price under the "Mthly. Adj. Prices" link. Using the growth rate you calculated, the most recent dividend per share, and the most recent stock price, calculate the required return for Kellogg's shareholders. Does this number make sense? Why or why not?

2. **Calculating Growth Rates** Coca-Cola (KO) is a dividend-paying company. Recently, dividends for Coca-Cola have increased at about 5.5 percent per year. Find the most recent closing monthly stock price under the "Mthly. Adj. Prices" link. Locate the most recent annual dividend for KO and calculate the dividend yield. Using your answer and the 5.5 percent dividend growth rate, what is the required return for shareholders? Suppose instead that you know that the required return is 13 percent. What price should Coca-Cola stock sell for now? What if the required return is 15 percent?

What's On the Web?

8.1 **Dividend Discount Model** According to the 2001 Value Line *Investment Survey,* the dividend growth for Phillips Petroleum (P) is 2.5 percent. Find the current price quote and dividend information at finance.yahoo.com. If the growth rate given in the Value Line *Investment Survey* is correct, what is the required return for Phillips Petroleum? Does this number make sense to you?

8.2 **Dividend Discount Model** Go to www.dividenddiscountmodel.com and enter ONE (for Bank One) as the ticker symbol. You can enter a required return in the Discount Rate box and the site will calculate the stock price using the dividend discount model. If you want an 11 percent return, what price should you be willing to pay for the stock? At what required return does the current stock price make sense? You will need to enter different required returns until you arrive at the current stock price. Does this required return make sense? Using this market required return for Bank One, how does the price change if the required return increases by 1 percent? What does this tell you about the sensitivity of the dividend discount model to the inputs of the equation?

8.3 **Stock Quotes** What is the most expensive publicly traded stock in the United States? Go to finance.yahoo.com and enter BRKA (for Berkshire Hathaway Class A) and select "Detailed" on the pull down menu. What is the current price per share? What is the 52-week high and low? How many shares trade on an average day? How many shares have traded today?

8.4 **Supernormal Growth** You are interested in buying stock in Coca-Cola (KO). You believe that the dividends will grow at 15 percent for the next four years and level off at 6 percent thereafter. Using the most recent dividend on finance.yahoo.com, if you want a 12 percent return, how much should you be willing to pay for a share of stock?

8.5 **Market Operations** How does a stock trade take place? Go to www.nyse.com, click on "The Trading Floor" and "Anatomy of a Trade." Describe the process of a trade on the NYSE.

Spreadsheet Templates 8–4, 8–6, 8–9, 8–12, 8–19, 8–21