SUMMARY

- Stocks are commonly valued using the price–earnings (PE) method, the dividend discount model, or the free cash flow model. The PE method applies the industry PE ratio to the firm's earnings to derive its value. The dividend discount model estimates the value as the present value of expected future dividends. The free cash flow model is based on the present value of future cash flows.
- When applying the free cash flow model to value a stock, a required rate of return must be estimated. One method of estimating the required rate of return is to apply the capital asset pricing model, in which the required return depends on the risk-free interest rate and the firm's beta.
- Stock prices are affected by those factors that affect future cash flows or the required rate of return by investors. Economic conditions, market conditions, and firm-specific conditions can affect a firm's cash flows or the required rate of return.
- The risk of a stock is measured by its volatility, its beta, or its value-at-risk estimate. Investors are giving more attention to risk measurement in light of abrupt downturns in the prices of some stocks in recent years.
- Stock market efficiency implies that stock prices reflect all available information. Weak-form efficiency suggests that security prices reflect all trade-related information, such as historical security price movements and the volume of securities trades. Semistrong-form efficiency suggests that security prices fully reflect all public information. Strong-form efficiency suggests that security prices fully reflect all information, including private or insider information. Evidence supports weak-form efficiency to a degree, but there is less support for semistrong- or strong-form efficiency.

POINT COUNTER-POINT

Is the Stock Market Efficient?

Point Yes. Investors fully incorporate all available information when trading stocks. Thus, the prices of stocks fully reflect all information.

Counter-Point No. The high degree of stock price volatility offers evidence of how much disagreement there is among stock prices. The fact that many stocks declined by more than 40 percent during the end of 2008 and beginning of 2009 suggests that stock prices are not always properly valued to reflect available information.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

QUESTIONS AND APPLICATIONS

1. **Price-Earnings Model** Explain the use of the price–earnings ratio for valuing a stock. Why might investors derive different valuations for a stock when using the PE method? Why might investors derive an inaccurate valuation of a firm when using the PE method?

2. **Dividend Discount Model** Describe the dividend discount valuation model. What are some limitations of the dividend discount model?

3. **Impact of Economic Growth** Explain how economic growth affects the valuation of a stock.

4. **Impact of Interest Rates** How are the interest rate, the required rate of return on a stock, and the valuation of a stock related?

5. **Impact of Inflation** Assume that the expected inflation rate has just been revised upward by the market. Would the required return by investors who invest in stocks be affected? Explain.

6. **Impact of Exchange Rates** Explain how the value of the dollar affects stock valuations.

7. **Investor Sentiment** Explain why investor sentiment can affect stock prices.

8. January Effect Describe the January effect.

9. Earnings Surprises How do earnings surprises affect valuations of stocks?

10. Impact of Takeover Rumors Why can expectations of an acquisition affect the value of the target's stock?

11. Emerging Markets What are the risks of investing in stocks in emerging markets?

12. Stock Volatility during the Credit Crisis Explain how stock volatility changed during the credit crisis.

13. Stock Portfolio Volatility Identify the factors that affect a stock portfolio's volatility and explain their effects.

14. Beta Explain how to estimate the beta of a stock. Explain why beta serves as a measure of the stock's risk.

15. Wall Street In the movie *Wall Street*, Bud Fox is a broker who conducts trades for Gordon Gekko's firm. Gekko purchases shares of firms he believes are undervalued. Various scenes in the movie offer excellent examples of concepts discussed in this chapter.

a. Bud Fox comments to Gordon Gekko that a firm's breakup value is twice its market price. What is Bud suggesting in this statement? How would employees of the firm respond to Bud's statement?

b. When Bud informs Gekko that another investor, Mr. Wildman, is secretly planning to acquire a target firm in Pennsylvania, Gekko tells Bud to buy a large amount of this stock. Why?

c. Gekko says, "Wonder why fund managers can't beat the S&P 500? Because they are sheep." What is Gekko's point? How does it relate to market efficiency?

16. Market Efficiency Explain the difference between weak-form, semistrong-form, and strong-form efficiency. Which of these forms of efficiency is most difficult to test? Which is most likely to be refuted? Explain how to test weak-form efficiency in the stock market.

17. Market Efficiency A consulting firm was hired to determine whether a particular trading strategy could generate abnormal returns. The strategy involved taking positions based on recent historical movements in stock prices. The strategy did not achieve abnormal returns. Consequently, the consulting firm concluded that the stock market is weak-form efficient. Do you agree? Explain.

Advanced Questions

18. Value at Risk Describe the value-at-risk method for measuring risk.

19. Implied Volatility Explain the meaning and use of implied volatility.

20. Leveraged Buyout At the time a management group of RJR Nabisco initially considered engaging in a leveraged buyout, RJR's stock price was less than $70 per share. Ultimately, RJR was acquired by the firm Kohlberg Kravis Roberts (KKR) for about $108 per share. Does the large discrepancy between the stock price before an acquisition was considered and after the acquisition mean that RJR's price was initially undervalued? If so, does this imply that the market was inefficient?

21. How Stock Prices May Respond to Prevailing Conditions Consider the prevailing conditions that could affect the demand for stocks, including inflation, the economy, the budget deficit, the Fed's monetary policy, political conditions, and the general mood of investors. Based on these conditions, do you think stock prices will increase or decrease during this semester? Offer some logic to support your answer. Which factor do you think will have the biggest impact on stock prices?

22. Application of CAPM to Stock Pricing Explain (using intuition instead of math) why stock prices may decrease in response to a higher risk-free rate according to the CAPM. Explain (using intuition instead of math) why stock prices may increase in this situation even though the risk-free rate increases.

23. Impact of SOX on Stock Valuations Use a stock valuation framework to explain why the Sarbanes-Oxley Act (SOX) could improve the valuation of a stock. Why might SOX cause a reduction in the valuation of a stock? (See the Appendix.)

24. Interpretation of the VIX Index Explain why participants in the stock market monitor the VIX index. What does a decline in the VIX index imply about a change in expected volatility by market participants?

Interpreting Financial News

Interpret the following statements made by Wall Street analysts and portfolio managers.

a. "The stock market's recent climb has been driven by falling interest rates."

b. "Future stock prices are dependent on the Fed's policy meeting next week."

c. "Given the recent climb in stocks that cannot be explained by fundamentals, a correction is inevitable."

Managing in Financial Markets

Stock Portfolio Dilemma As an investment manager, you frequently make decisions about investing in stocks versus other types of investments and about types of stocks to purchase.

a. You have noticed that investors tend to invest more heavily in stocks after interest rates have declined. You are considering this strategy as well. Is it rational to invest more heavily in stocks once interest rates have declined?

b. Assume that you are about to select a specific stock that will perform well in response to an expected runup in the stock market. You are very confident that the stock market will perform well in the near future. Recently, a friend recommended that you consider purchasing stock of a specific firm because it had decent earnings over the last few years, it has a low beta (reflecting a low degree of systematic risk), and its beta is expected to remain low. You normally rely on beta as a measurement of a firm's systematic risk. Should you seriously consider buying that stock? Explain.

c. You are considering an investment in an initial public offering by Marx Company, which has performed very well recently, according to its financial statements. The firm will use some of the proceeds from selling stock to pay off some of its bank loans. How can you apply stock valuation models to estimate this firm's value when its stock is not yet publicly traded? Once you estimate the value of the firm, how can you use this information to determine whether to invest in it? What are some limitations in estimating the value of this firm?

d. In the past, your boss assessed your performance based on the actual return on the portfolio of U.S. stocks that you manage. For each quarter in which your portfolio generated an annualized return of at least 20 percent, you received a bonus. Now your boss wants you to develop a method for measuring your performance from managing the portfolio. Offer a method that accurately measures your performance.

e. Assume that you were also asked to manage a portfolio of European stocks. How would your method for measuring your performance in managing this portfolio differ from the method you devised for the U.S. stock portfolio in the previous question?

PROBLEMS

1. Risk-Adjusted Return Measurements Assume the following information over a five-year period:

- Average risk-free rate = 6%
- Average return for Crane stock = 11%
- Average return for Load stock = 14%
- Standard deviation of Crane stock returns = 2%
- Standard deviation of Load stock returns = 4%
- Beta of Crane stock = 0.8
- Beta of Load stock = 1.1

Determine which stock has higher risk-adjusted returns according to the Sharpe index. Which stock has higher risk-adjusted returns according to the Treynor index? Show your work.

2. Measuring Expected Return Assume Mess stock has a beta of 1.2. If the risk-free rate is 7 percent and the market return is 10 percent, what is the expected return of Mess stock?

3. Using the PE Method You found that Verto stock is expected to generate earnings of $4.38 per share this year and that the mean PE ratio for its industry is 27.195. Use the PE valuation method to determine the value of Verto shares.

4. Using the Dividend Discount Model Suppose that you are interested in buying the stock of a company that has a policy of paying a $6 per share dividend every year. Assuming no changes in the firm's policies, what is the value of a share of stock if the required rate of return is 11 percent?

5. Using the Dividend Discount Model Micro, Inc., will pay a dividend of $2.30 per share next year. If the company plans to increase its dividend by 9 percent per year indefinitely, and you require a 12 percent

return on your investment, what should you pay for the company's stock?

6. Using the Dividend Discount Model Suppose you know that a company *just paid* an annual dividend of $1.75 per share on its stock and that the dividend will continue to grow at a rate of 8 percent per year. If the required return on this stock is 10 percent, what is the current share price?

7. Deriving the Required Rate of Return The next expected annual dividend for Sun, Inc., will be $1.20 per share, and analysts expect the dividend to grow at an annual rate of 7 percent indefinitely. If Sun stock currently sells for $22 per share, what is the required rate of return?

8. Deriving the Required Rate of Return A share of common stock currently sells for $110. Current dividends are $8 per share annually and are expected to grow at 6 percent per year indefinitely. What is the rate of return required by investors in the stock?

9. Deriving the Required Rate of Return A stock has a beta of 2.2, the risk-free rate is 6 percent, and the expected return on the market is 12 percent. Using the CAPM, what would you expect the required rate of return on this stock to be? What is the market risk premium?

10. Deriving a Stock's Beta You are considering investing in a stock that has an expected return of 13 percent. If the risk-free rate is 5 percent and the market risk premium is 7 percent, what must the beta of this stock be?

11. Measuring Stock Returns Suppose you bought a stock at the beginning of the year for $76.50. During the year, the stock paid a dividend of $0.70 per share and had an ending share price of $99.25. What is the total percentage return from investing in that stock over the year?

12. Measuring the Portfolio Beta Assume the following information:

- Beta of IBM = 1.31
- Beta of LUV = 0.85
- Beta of ODP = 0.94

If you invest 40 percent of your money in IBM, 30 percent in LUV, and 30 percent in ODP, what is your portfolio's beta?

13. Measuring the Portfolio Beta Using the information from Problem 12, suppose that you instead decide to invest $20,000 in IBM, $30,000 in LUV, and $50,000 in ODP. What is the beta of your portfolio now?

14. Value at Risk Assume that Quitar Co. has a beta of 1.31.

a. If you assume that the stock market has a maximum expected loss of −3.2 percent on a daily basis (based on a 95 percent confidence level), what is the maximum daily loss for the Quitar Co. stock?

b. If you have $19,000 invested in Quitar Co. stock, what is your maximum daily dollar loss?

15. Value at Risk If your portfolio beta is 0.89 and the stock market has a maximum expected loss of −2.5 percent on a daily basis, what is the maximum daily loss to your portfolio?

16. Dividend Model Relationships

a. When computing the price of a stock with the dividend discount model, how would the price be affected if the required rate of return is increased? Explain the logic of this relationship.

b. When computing the price of a stock using the constant-growth dividend discount model, how would the price be affected if the growth rate is reduced? Explain the logic of this relationship.

17. CAPM Relationships

a. When using the CAPM, how would the required rate of return on a stock be affected if the risk-free rate were lower?

b. When using the CAPM, how would the required rate of return on a stock be affected if the market return were lower?

c. When using the CAPM, how would the required rate of return on a stock be affected if the beta were higher?

18. Value at Risk

a. How is the maximum expected loss on a stock affected by an increase in the volatility (standard deviation), based on a 95 percent confidence interval?

b. Determine how the maximum expected loss on a stock would be affected by an increase in the expected return of the stock, based on a 95 percent confidence interval.

Flow of Funds Exercise

Valuing Stocks

Recall that if the economy continues to be strong, Carson Company may need to increase its production capacity by about 50 percent over the next few years to satisfy demand. It would need financing to expand and accommodate the increase in production. Recall that the yield curve is currently upward sloping. Also recall that Carson is concerned about a possible slowing of the economy because of potential Fed actions to reduce inflation. It is also considering issuing stock or bonds to raise funds in the next year. If Carson goes public, it might even consider using its stock as a means of acquiring some target firms. It would also consider engaging in a secondary offering at a future point in time if the IPO is successful and if its growth continues over time. It would also change its compensation system so that most of its managers would receive about 30 percent of their compensation in shares of Carson stock and the remainder as salary.

a. At the present time, the price–earnings ratio (stock price per share divided by earnings per share) of other firms in Carson's industry is relatively low but should rise in the future. Why might this information affect the time at which Carson issues its stock?

b. Assume that Carson Company believes that issuing stock is an efficient means of circumventing the potential for high interest rates. Even if long-term interest rates have increased by the time it issues stock, Carson thinks that it would be insulated by issuing stock instead of bonds. Is this view correct?

c. Carson Company recognizes the importance of a high stock price at the time it engages in an IPO (if it goes public). But why would its stock price be important to Carson Company even after the IPO?

d. If Carson Company goes public, it may be able to motivate its managers by granting them stock as part of their compensation. Explain why the stock may motivate them to perform well. Then explain why the use of stock as compensation may motivate them to focus on short-term goals even though they are supposed to focus on maximizing shareholder wealth over the long run. How can a firm provide stock as motivation but prevent its managers from using a short-term focus?

Internet/Excel Exercises

1. Go to finance.yahoo.com/indices?. Compare the performance of the Dow, Nasdaq, and S&P 500 indexes. Click on each of these indexes and describe the trend for that index since January. Which index has had the best performance?

2. Go to finance.yahoo.com, type in the symbol DELL (for Dell, Inc.), and click on "Get Quotes." Then go to the bottom of the stock price chart and retrieve the end-of-month stock price of Dell over the last 12 months. Record this information on an Excel spreadsheet and estimate the standard deviation of the stock's price movements. (See Appendix B for guidance on how to estimate the standard deviation of a stock's price movements.) Repeat the process for Oracle Corporation (its symbol is ORCL). Which stock does your analysis show to be riskier?

3. Assume that the expected return on Dell stock and Oracle stock is 0 percent for the next month. Use the value-at-risk method to determine the maximum expected loss of Dell and Oracle for the next month, based on a 95 percent confidence level.

WSJ Exercise

Reviewing Abrupt Shifts in Stock Valuation

Review Section C of a recent issue of the *Wall Street Journal*. Notice that the stocks with the largest one-day gains and losses are shown. Do an Internet search for news about the stock with the biggest gain.What is the reason for the gain? Repeat the exercise for the stock with the biggest loss.

Online Articles with Real-World Examples

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it. If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as a search term to ensure that the online articles are recent):

1. stock AND valuation
2. price-earnings AND valuation
3. free cash flow AND valuation
4. stock AND investor sentiment
5. stock AND risk
6. stock valuation AND uncertainty
7. stock valuation AND beta
8. stock AND value at risk
9. stock AND volatility
10. stock market AND efficient