

STOCK VALUATION AND INVESTMENT DECISIONS

LEARNING GOALS

After studying this chapter, you should be able to:

LG 1 Explain the role that a company's future plays in the stock valuation process and develop a forecast of a stock's expected cash flow.

LG 2 Discuss the concepts of intrinsic value and required rates of return, and note how they are used.

LG 3 Determine the underlying value of a stock using the dividend valuation model, as well as other present value- and price/earnings-based stock valuation models.

LG 4 Gain a basic appreciation of the procedures used to value different types of stocks, from traditional dividend-paying shares to new-economy stocks with their extreme price/earnings ratios.

LG 5 Describe the key attributes of technical analysis, including some popular measures and procedures used to assess the market.

LG 6 Discuss the idea of random walks and efficient markets and note the challenges these theories hold for the stock valuation process.

Technology stocks have been at the forefront of stock market news the past few years. Often this sector, rather than blue-chip industrials, drives the market—both up and down. Take Qualcomm, for example; a company that is a leading developer and supplier of digital wireless communications products and services. It pioneered Code Division Multiple Access (CDMA) technology, a standard for the wireless communications industry. Investors in Qualcomm stock have experienced a roller coaster ride recently. The firm's 1999 stock price started at \$6.48 and soared steadily upward to end the year when it hits \$176.13—*after* splitting 2-for-1 in May and 4-for-1 in December. This represents an annual return of over 2,600%, the year's best. The following year was another matter, however. Fears of slowing growth sent the stock price into free-fall: It plummeted from \$163.25 to \$51.50, before rebounding to \$82.19 at year end, for a -53% return. Even after the decline, the stock was still trading at a price/earnings ratio of about 85 in early January 2001, a substantial premium over the average P/E of 29 for the S&P 500.

Despite Qualcomm's fluctuating stock price, investors looked with favor on the company's earnings growth—94% from 1997 through 2000, which far outstripped the S&P 500's 14%. The company consistently met or exceeded quarterly earnings estimates, and analysts project continued earning growth to \$1.26 per share in 2001, an increase of 48% over 2000.

What do all these numbers mean in terms of the value of Qualcomm's stock? This chapter explains how to determine a stock's intrinsic value by using dividend valuation, dividend-and-earnings, price/earnings, and other models. We also look at how to value technology stocks. Finally, we'll review the use of technical analysis as a way to assess the state of the market in general.

Sources: Adrienne Carter, "The Big Score," *Money Technology* 2000, October 15, 2000, p.60; "Morningstar Quicktake Report—Qualcomm" *Morningstar.com*, downloaded from www.morningstar.com, January 15, 2001; and Qualcomm Web site, www.qualcomm.com

Valuation: Obtaining a Standard of Performance

LG 1

LG 2

stock valuation

the process by which the underlying value of a stock is established on the basis of its forecasted risk and return performance.

INVESTOR FACTS

BLIND SPOT—As optical networking companies caught investors' attention, their market value soared. In September 2000, this hype drove the value of JDS Uniphase to \$96 billion, which made it the 36th most highly valued company in the world. Investors apparently turned a blind eye to the company's financial results for the fiscal year ended June 30, 2000: Its revenues were \$1.4 billion and its losses \$905 million. For about the same total market capitalization, you could theoretically buy all 11 of the following major companies—the New York Times, Saks Fifth Avenue, Georgia Pacific, T. Rowe Price, Delta Airlines, Tiffany & Co., Bear Stearns, FedEx, CVS, Gap, and John Hancock—with aggregate revenues of \$115 billion and \$6.4 billion in profits!

Source: Jon Birger, Pablo Galarza, Laura Lallo, and Jeanne Lee, "Best Stocks & Funds: Invest the Smart Way to Buy Tech," *Money/Tech 2000*, October 15, 2000, pp. 65–66.

Obtaining a standard of performance that can be used to judge the investment merits of a share of stock is the underlying purpose of **stock valuation**. A stock's intrinsic value provides such a standard because it indicates the future risk and return performance of a security. The question of whether and to what extent a stock is under- or overvalued is resolved by comparing its current market price to its intrinsic value. At any given point in time, the price of a share of common stock depends on investor expectations about the future behavior of the security. If the outlook for the company and its stock is good, the price will probably be bid up. If conditions deteriorate, the price of the stock will probably go down. Let's look now at the single most important issue in the stock valuation process: *the future*.

Valuing a Company and Its Future

Thus far, we have examined several aspects of security analysis: economic and industry analysis, and the historical (company) phase of fundamental analysis. It should be clear, however, that it's *not the past* that's important but *the future*. The primary reason for looking at past performance is to gain insight about the future direction of the firm and its profitability. Granted, past performance provides no guarantees about future returns, but it can give us a good idea of a company's strengths and weaknesses. For example, it can tell us how well the company's products have done in the marketplace, how the company's fiscal health shapes up, and how management tends to respond to difficult situations. In short, the past can reveal how well the company is positioned to take advantage of the things that may occur in the future.

Because *the value of a stock is a function of its future returns*, the investor's task is to use available historical data to project key financial variables into the future. In this way, you can assess the future prospects of the company and the expected returns from its stock. We are especially interested in dividends and price behavior.

Forecasted Sales and Profits The key to our forecast is, of course, the future behavior of the *company* and the most important aspects to consider in this regard are the outlook for sales and the trend in the net profit margin. One way to develop a sales forecast is to assume that the company will continue to perform as it has in the past and simply extend the historical trend. For example, if a firm's sales have been growing at the rate of 10% per year, then assume they will continue at that rate. Of course, if there is some evidence about the economy, industry, or company that suggests a faster or slower rate of growth, the forecast should be adjusted accordingly. More often than not, this "naive" approach will be about as effective as more complex techniques.

Once the sales forecast has been generated, we can shift our attention to the net profit margin. We want to know what kind of return on sales to expect. A naive estimate can be obtained by simply using the average profit margin that has prevailed for the past few years. Again, it should be adjusted to account for any unusual industry or company developments. For most individual investors, valuable insight about future revenues and earnings can be obtained from industry or company reports put out by brokerage houses, advisory services (e.g., *Value Line*), the financial media (e.g., *Forbes*), and from

HOT LINKS

For help researching a company, see the following sites. At the ClearStation site, enter a stock symbol and click on [Get Graphs].

www.askresearch.com
www.clearstation.com

various investor Web sites. Or, as the accompanying *Investing in Action* box explains, you might even want to take a look at so-called “whisper forecasts” as a way to get a handle on earnings estimates.

Given a satisfactory sales forecast and estimate of the future net profit margin, we can combine these two pieces of information to arrive at future earnings.

Equation 8.1

$$\text{Future after-tax earnings in year } t = \frac{\text{Estimated sales for year } t}{\text{for year } t} \times \frac{\text{Net profit margin expected in year } t}{\text{expected in year } t}$$

The “year t ” notation in this equation simply denotes a given calendar or fiscal year in the future. It can be next year, the year after that, or any other year in which we are interested. Let’s say that in the year just completed, a company reported sales of \$100 million, we estimate that revenues will grow at an 8% annual rate, and the net profit margin should be about 6%. Thus estimated sales next year will equal \$108 million (\$100 million \times 1.08). And, with a 6% profit margin, we should expect to see earnings next year of

$$\text{Future after-tax earnings next year} = \$108 \text{ million} \times 0.06 = \underline{\underline{\$6.5 \text{ million}}}$$

Using this same process, we would then estimate sales and earnings *for all other years* in our forecast period.

Forecasted Dividends and Prices At this point we have an idea of the future earnings performance of the company. We are now ready to evaluate the effects of this performance on returns to common stock investors. Given a corporate earnings forecast, we need three additional pieces of information:

- An estimate of future dividend payout ratios.
- The number of common shares that will be outstanding over the forecast period.
- A future price/earnings (P/E) ratio.

For the first two, unless we have evidence to the contrary, we can simply project the firm’s recent experience into the future. Payout ratios are usually fairly stable, so there is little risk in using a recent average figure. (Or, if a company follows a fixed-dividend policy, we could use the latest dividend rate in our forecast.) It is also generally safe to assume that the number of common shares outstanding will hold at the latest level or perhaps change at some moderate rate of increase (or decrease) that’s reflective of the past.

Getting a Handle on the P/E Ratio The only really thorny issue in this whole process is coming up with an estimate of the future P/E ratio—a figure that has considerable bearing on the stock’s future price behavior. Generally speaking, the P/E ratio is a function of several variables, including:

1. The growth rate in earnings.
2. The general state of the market.
3. The amount of debt in a company’s capital structure.

INVESTING in action

I've Got a Secret: Whisper Forecasts

As a fiscal quarter ends, investors rush to compare companies' actual reported earnings with consensus (average) security analysts' estimates published by firms such as First Call, Zacks, and I/B/E/S. If a company falls below the analysts' figure by even a penny or two, its stock price can tumble 30% or more in one day. In fact, *Kiplinger's* magazine considers this comparison perhaps the most important factor driving share price performance over the short term, and it affects longer-term performance as well.

Now investors have another set of earnings forecasts to follow. "Whisper forecasts" are unofficial earnings estimates that circulate among traders and investors. They are rumors rather than "official" (analysts') estimates. Whisper numbers tend to be higher than analysts' forecasts, and some market watchers believe they are the analysts' *real* earnings estimates.

Until recently, only the wealthiest individual and institutional investors had access to the super-secret analysts' forecasts. Now whisper numbers are widely available on the Internet. Data come from varied sources: from discussions with stockbrokers, from financial analysts, from investor relations departments, and from investors themselves. For example, Whisper Number (www.whispernumber.com), founded in 1998, combines information from investor forums with polling and daily computer searches of hundreds of thousands of sources, including message boards on Yahoo!, Silicon Investor, Motley Fool, Raging Bull, and America Online. Other Web sites dedicated to these unofficial earnings reports include Earnings Whispers (www.earningswhispers.com), Just Whispers (www.justwhispers.com), and The Whisper Number (www.thewhispernumbers.com). Each site claims to have the "real" whisper numbers. (The "Frequently Asked Questions" pages at these sites describe how each compiles its whisper earnings.)

How valid are whisper earnings? Whisper Numbers claims that about 74% of the time, a

company that beats the whisper number will see its stock rise within 5 days of its earnings announcement, and those that fail to reach their whisper numbers will see their stock values decline.

A formal study by professors at Purdue and Indiana Universities compared average whisper forecasts and consensus analysts' estimates (from First Call) for 127 mostly high-tech firms from January 1995 to May 1997. The study treated all whispers equally, making no judgments of the poster's credibility. In addition, they used whisper forecasts in several trading strategies. The results showed that whisper forecasts tended to be more accurate than analysts' estimates and also provided information not included in analysts' forecasts. Because whisper forecasts are distributed widely, part of this information is reflected in stock prices before the actual earnings reports. Proponents of whisper forecasts claim that these forecasts also counteract the pessimistic bias of analysts, which derives from corporate pressure to keep estimates low so that positive earnings surprises will be more common than disappointments.

Not everyone believes in whisper forecasts. Some in the industry criticize whisper numbers as rumors, unsubstantiated speculation, or idle gossip from unknown sources that lack accountability. Many observers question the ethics of the practice. Company insiders or short sellers, for example, could plant high numbers to manipulate prices. For this reason, you should use whisper forecasts only in combination with other securities analysis techniques and tools.

Sources: Mark Bagnoli, Messod Daniel Beneish, and Susan G. Watts, "Earnings Expectations: How Important Are the Whispers?" *AAIL Journal*, June 2000, pp. 11-14; Just Whispers Web site, www.justwhispers.com; Lynnette Khalfani, "Psst! Get the Scoop on Whisper Numbers," *Wall Street Journal*, January 12, 2001, p. C1; Manual Schiffros, "The Earnings Game," *Kiplinger's*, April 2000, pp. 60-62; and Whisper Numbers Web site, www.whispernumbers.com

4. The current and projected rate of inflation.
5. The level of dividends.

As a rule, higher P/E ratios can be expected with higher rates of growth in earnings, an optimistic market outlook, and lower debt levels (less debt means less financial risk).

The link between the inflation rate and P/E multiples is a bit more complex. Generally speaking, as inflation rates rise, so do bond interest rates. This, in turn, causes required returns on stocks to rise (in order for stock returns to remain competitive with bond returns) and higher required returns on stocks mean lower stock prices and lower P/E multiples. On the other hand, declining inflation (and interest) rates normally translate into higher P/E ratios and stock prices. We can also argue that a high P/E ratio should be expected with high dividend payouts. In practice, however, most companies with high P/E ratios have *low dividend payouts*. The reason: Earnings growth tends to be more valuable than dividends, especially in companies with high rates of return on equity.

A useful starting point for evaluating the P/E ratio is the *average market multiple*, which is simply the average P/E ratio of stocks in the marketplace. The average market multiple indicates the general state of the market. It gives us an idea of how aggressively the market, in general, is pricing stocks. Other things being equal, the higher the P/E ratio, the more optimistic the market. Table 8.1 lists S&P price/earnings multiples for the past 30 years. It shows that market multiples tend to move over a fairly wide range.

With the market multiple as a benchmark, you can evaluate a stock's P/E performance relative to the market. That is, you can calculate a **relative P/E multiple** by dividing a stock's P/E by the market multiple. For example, if a stock currently has a P/E of 35 and the market multiple is 25, the stock's relative P/E is $35/25 = 1.40$. Looking at the relative P/E, you can quickly get a feel for how aggressively the stock has been priced in the market and what kind of relative P/E is normal for the stock. Other things being equal, a high relative P/E is desirable. The higher this measure, the higher the stock will be priced in the market. But watch out for the downside: High relative P/E multiples can also mean lots of price volatility. (Similarly, we can use average *industry* multiples to get a feel for the kind of P/E multiples that are standard for a given industry. We can then use that information, along with market multiples, to assess or project the P/E for a particular stock.)

Now we can generate a forecast of what the stock's *future* P/E will be over the anticipated *investment horizon* (the period of time over which we expect to hold the stock). For example, with the existing P/E multiple as a base, an *increase* might be justified if you believe the *market multiple* will increase (as the market tone becomes more bullish), and the *relative P/E* is likely to increase also.

Estimating Earnings per Share So far we've been able to come up with an estimate for the dividend payout ratio, the number of shares outstanding, and the price/earnings multiple. We're now ready to forecast the stock's future earnings per share (EPS), which can be done as follows:

Equation 8.2

$$\text{Estimated EPS in year } t = \frac{\text{Future after-tax earnings in year } t}{\text{Number of shares of common stock outstanding in year } t}$$

relative P/E multiple
a measure of how a stock's P/E behaves relative to the average market multiple.

TABLE 8.1 Average Market P/E Multiples 1971–2000

Year	Market Multiples (Average S&P P/E Ratio)	Year	Market Multiples (Average S&P P/E Ratio)
1971	18.3	1986	16.3
1972	19.1	1987	15.1
1973	12.2	1988	12.2
1974	7.3	1989	15.1
1975	11.7	1990	15.5
1976	11.0	1991	26.2
1977	8.8	1992	22.8
1978	8.3	1993	21.3
1979	7.4	1994	17.0
1980	9.1	1995	17.4
1981	8.1	1996	20.7
1982	10.2	1997	23.9
1983	12.4	1998	32.3
1984	10.0	1999	33.4
1985	13.7	2000	28.5*

*Note: By May 2001, the average P/E ratio on the S&P 500 was down to about 23 times earnings.

Source: Average year-end multiples derived from various sources, including Standard & Poor's *Index of 500 Stocks* and its *Statistical Service—Security Price Index Record*. Listed P/Es are all year-end (December) figures, except 2000, which is as of end of the third quarter.

Equation 8.2 simply converts aggregate or total corporate earnings to a per-share basis, by relating company (forecasted) profits to the expected number of shares outstanding. Though this approach works quite effectively, some investors would rather bypass the projection of aggregate sales and earnings and instead, *concentrate on earnings from a per-share basis right from the start*. That can be done by looking at the major forces that drive earnings per share: ROE and book value. Quite simply, by employing these two variables, we can define earnings per share as follows:

Equation 8.3

$$\text{EPS} = \text{ROE} \times \text{Book value per share}$$

This formula will produce the same results as the standard EPS equation shown first in Chapter 6 (Equation 6.1) and then again in Chapter 7. The major advantage of this form of the equation is that it allows you to assess the extent to which EPS is influenced by the company's book value and (especially) its ROE. As we saw in the previous chapter, ROE is a key financial measure, because it captures the amount of success the firm is having in managing its assets, operations, and capital structure. And as we see here, ROE not only is important in defining overall corporate profitability but it also plays a crucial role in defining a stock's EPS.

To produce an estimated EPS using Equation 8.3, you would go directly to the two basic components of the formula and try to get a handle on their future behavior. In particular, what kind of growth is expected in the firm's book value per share, *and* what's likely to happen to the company's ROE? In the vast majority of cases, ROE is really the driving force, so it's important to produce a good estimate of that variable. Investors often do that by breaking ROE into its component parts—margin, turnover, and the equity multiplier (see Equation 7.13 in Chapter 7).

Once you have projected ROE and book value per share, you can plug these figures into Equation 8.3 to produce estimated EPS. The bottom line is that, one way or another (using the approach reflected in Equation 8.2 or that in Equation 8.3), you have to arrive at a forecasted EPS number that you are comfortable with. When that's been done, it's a pretty simple matter to use the forecasted payout ratio to estimate dividends per share:

$$\text{Equation 8.4} \quad \begin{array}{l} \text{Estimated dividends} \\ \text{per share in year } t \end{array} = \begin{array}{l} \text{Estimated EPS} \\ \text{in year } t \end{array} \times \begin{array}{l} \text{Estimated} \\ \text{payout ratio} \end{array}$$

The last item is the future price of the stock, which can be determined as

$$\text{Equation 8.5} \quad \begin{array}{l} \text{Estimated share price} \\ \text{at end of year } t \end{array} = \begin{array}{l} \text{Estimated EPS} \\ \text{in year } t \end{array} \times \begin{array}{l} \text{Estimated P/E} \\ \text{ratio} \end{array}$$

Pulling It All Together We've seen the various components that go into our estimates of future dividends and share prices. Now, to see how they all fit together, let's continue with the example we started above. Using the aggregate sales and earnings approach, if the company had 2 million shares of common stock outstanding and that number was expected to hold in the future, then given the estimated earnings of \$6.5 million that we computed earlier, the firm should generate earnings per share (EPS) next year of

$$\begin{array}{l} \text{Estimated EPS} \\ \text{next year} \end{array} = \frac{\$6.5 \text{ million}}{2 \text{ million}} = \underline{\underline{\$3.25}}$$

This result, of course, would be equivalent to the firm having a projected ROE of, say, 15% and an estimated book value per share of \$21.67. According to Equation 8.3, those conditions would also produce an estimated EPS of \$3.25 (i.e., $0.15 \times \$21.67$). Using this EPS figure, along with an estimated payout ratio of 40%, we see that dividends per share next year should equal

$$\begin{array}{l} \text{Estimated dividends} \\ \text{per share next year} \end{array} = \$3.25 \times .40 = \underline{\underline{\$1.30}}$$

If the firm adheres to a *fixed-dividend policy*, this estimate may have to be adjusted to reflect the level of dividends being paid. For example, if the company has been paying annual dividends at the rate of \$1.25 per share *and is expected to continue doing so for the near future*, then you would adjust estimated dividends accordingly (i.e., use \$1.25/share). Finally, if it has been estimated that the stock should sell at 17.5 times earnings, then a share of stock in this company should be trading at a price of about \$56.90 by the *end* of next year.

$$\begin{array}{l} \text{Estimated share price} \\ \text{at the end of next year} \end{array} = \$3.25 \times 17.5 = \underline{\underline{\$56.88}}$$

Actually, we are interested in the price of the stock at the end of our anticipated investment horizon. Thus the \$56.90 figure would be appropriate if we had a 1-year horizon. However, if we had a 3-year holding period, we would have to extend the EPS figure for 2 more years and repeat our calculations with

the new data. As we shall see, *the estimated share price is important because it has embedded in it the capital gains portion of the stock's total return.*



Developing an Estimate of Future Behavior

Using information obtained from Universal Office Furnishings (**UVRS**), we can illustrate the forecasting procedures we discussed above. Recall from Chapter 7 that an assessment of the economy and the office equipment industry was positive and that the company's operating results and financial condition looked strong, both historically and relative to industry standards. Because everything looks favorable for Universal, we decide to take a look at the future prospects of the company and its stock. Assume we have chosen a 3-year investment horizon, because we believe (from earlier studies of economic and industry factors) that the economy and the market for office equipment stocks will start running out of steam near the end of 2004 or early 2005.

Table 8.2 provides selected historical financial data for the company. They cover a 5-year period (ending with the latest fiscal year) and will provide the basis for much of our forecast. The data reveal that, with one or two exceptions, the company has performed at a fairly steady pace and has been able to maintain a very attractive rate of growth. Our economic analysis suggests that the economy is about to pick up, and our research (from Chapter 7) indicates that the industry and company are well situated to take advantage of the upswing. Therefore, we conclude that the rate of growth in sales should pick up dramatically from the abnormally low level of 2001, attaining a growth rate of over 20% in 2002—more in line with the firm's 5-year average. After a modest amount of pent-up demand is worked off, the rate of growth in sales should drop to about 19% in 2003 and to 15% in 2004.

The essential elements of the financial forecast for 2002–2004 are provided in Table 8.3. Highlights of the key assumptions and the reasoning behind them follow.

- *Net profit margin.* Various published industry and company reports suggest a comfortable improvement in earnings, so we decide to use a profit margin of 8.0% in 2002 (up a bit from the latest margin of 7.2% recorded in 2001). We're projecting even better profit margins (8.5%) in 2003 and 2004, as some cost improvements start to take hold.

TABLE 8.2 Selected Historical Financial Data, Universal Office Furnishings

	1997	1998	1999	2000	2001
Total assets (millions)	\$554.2	\$694.9	\$755.6	\$761.5	\$941.2
Total asset turnover	1.72×	1.85×	1.98×	2.32×	2.06×
Net sales (millions)	\$953.2	\$1,283.9	\$1,495.9	\$1,766.2	\$1,938.0
Annual rate of growth in sales*	11.5%	34.7%	16.5%	18.1%	9.7%
Net profit margin	4.2%	3.6%	5.0%	8.0%	7.2%
Payout ratio	6.8%	5.6%	5.8%	6.0%	6.6%
Price/earnings ratio	13.5×	21.7×	14.9×	15.7×	18.4×
Number of common shares outstanding (millions)	77.7	78.0	72.8	65.3	61.8

*Annual rate of growth in sales = Change in sales from one year to the next ÷ Level of sales in the base (or earliest) years. For 1998, the annual rate of growth in sales equaled 34.7% = (1998 sales – 1997 sales)/1997 sales = (\$1,283.9 – \$953.2)/\$953.2 = 0.3467.

TABLE 8.3 Summary Forecast Statistics, Universal Office Furnishings

	Latest Actual Figures (Fiscal 2001)	Average for the Past 5 Years (1997–2001)	Forecasted Figures		
			2002	2003	2004
Annual rate of growth in sales	9.7%	18.1%	22%	19%	15%
Net sales (millions)	\$1,938.0	N/A*	\$2,364.4**	\$2,813.6**	\$3,235.6**
× Net profit margin	<u>7.2%</u>	<u>5.6%</u>	<u>8.0%</u>	<u>8.5%</u>	<u>8.5%</u>
= Net after-tax earnings (millions)	\$139.7	N/A	\$189.2	\$239.2	\$275.0
÷ Common shares outstanding (millions)	<u>61.8</u>	<u>71.1</u>	<u>61.5</u>	<u>60.5</u>	<u>59.0</u>
= Earnings per share	\$ 2.26	N/A	\$ 3.08	\$ 3.95	\$ 4.66
× Payout ratio	<u>6.6%</u>	<u>6.2%</u>	<u>6.0%</u>	<u>6.0%</u>	<u>6.0%</u>
= Dividends per share	<u>\$ 0.15</u>	<u>\$0.08</u>	<u>\$ 0.18</u>	<u>\$ 0.24</u>	<u>\$ 0.28</u>
Earnings per share	\$ 2.26	N/A	\$ 3.08	\$ 3.95	\$ 4.66
× P/E ratio	<u>18.4</u>	<u>16.8</u>	<u>20</u>	<u>19</u>	<u>20</u>
= Share price at year end	<u>\$ 41.58</u>	<u>N/A</u>	<u>\$ 61.60</u>	<u>\$ 75.00</u>	<u>\$ 93.20</u>

*N/A: Not applicable.

**Forecasted sales figures: Sales from *preceding* year × Growth rate in sales = Growth in sales; then Growth in sales + Sales from preceding year = Forecast sales for the year. For example, for 2002: \$1,938.0 × 0.22 = \$426.4 + \$1938.0 = \$2,364.4.

- **Common shares outstanding.** We believe the company will continue to pursue its share buyback program, but at a substantially lower pace than in the 1998–2001 period. From a current level of 61.8 million shares, we project that the number of shares outstanding will drop to 61.5 million in 2002, to 60.5 million in 2003, and to 59.5 million in 2004.
- **Payout ratio.** We assume that the dividend payout ratio will hold at a steady 6% of earnings, as it has for most of the recent past.
- **P/E ratio.** Primarily on the basis of expectations for improved growth in revenues and earnings, we are projecting a P/E multiple that will rise from its present level of 18½ times earnings to roughly 20 times earnings in 2002. Although this is a fairly conservative increase in the P/E, when it is coupled with the hefty growth in EPS, the net effect will be a big jump in the projected price of Universal stock.

Table 8.3 also shows the sequence involved in arriving at forecasted dividends and price behavior:

1. The company dimensions of the forecast are handled first. These include sales and revenue estimates, net profit margins, net earnings, and the number of shares of common stock outstanding. Note that after-tax earnings are derived according to the procedure described earlier in this chapter.
2. Next we estimate earnings per share, following the procedures established earlier.
3. The bottom line of the forecast is, of course, the returns in the form of dividends and capital gains expected from a share of Universal stock, given that the assumptions about net sales, profit margins, earnings per

share, and so forth hold up. We see in Table 8.3 that dividends should go up to 28 cents a share, which is a big jump. Even so, with annual dividends of a little over a quarter a share, it's clear that dividends still won't account for much of the stock's return. In fact, the dividend yield in 2004 is projected to *fall* to just 3/10 of 1%. The returns from this stock are going to come from capital gains, not dividends. That's clear when you look at year-end share prices, which are expected to more than double over the next 3 years. That is, if our projections are valid, the price of a share of stock should rise from around \$41.50 to over \$93.00 by year-end 2004.

We now have an idea of what the future cash flows of the investment are likely to be. We now can establish an intrinsic value for Universal Office Furnishings stock.

The Valuation Process

valuation

process by which an investor uses risk and return concepts to determine the worth of a security.

Valuation is a process by which an investor determines the worth of a security using the risk and return concepts introduced in Chapter 5. This process can be applied to any asset that produces a stream of cash flow—a share of stock, a bond, a piece of real estate, or an oil well. To establish the value of an asset, the investor must determine certain key inputs, including the amount of future cash flows, the timing of these cash flows, and the rate of return required on the investment.

In terms of common stock, the essence of valuation is to determine what the stock *ought to be worth*, given estimated returns to stockholders (future dividends and price behavior) and the amount of potential risk exposure. Toward this end, we employ various types of stock valuation models, the end product of which represents the elusive intrinsic value we have been seeking. That is, the stock valuation models determine either an *expected rate of return* or the *intrinsic worth of a share of stock*, which in effect represents the stock's "justified price." In this way, we obtain a standard of performance, based on future stock behavior, that can be used to judge the investment merits of a particular security.

Either of two conditions would make us consider a stock a worthwhile investment candidate: (1) if the computed rate of return equals or exceeds the yield we feel is warranted, or (2) if the justified price (intrinsic worth) is equal to or greater than the current market price. Note especially that a security is considered acceptable even if its yield simply *equals* the required rate of return or if its intrinsic value simply *equals* the current market price of the stock. There is nothing irrational about such behavior. In either case, the security meets your minimum standards to the extent that it is giving you the rate of return you wanted.

However, remember this about the valuation process: Even though valuation plays an important part in the investment process, there is *absolutely no assurance* that the actual outcome will be even remotely similar to the forecasted behavior. The stock is still subject to economic, industry, company, and market risks, any one of which could negate *all* your assumptions about the future. Security analysis and stock valuation models are used not to guarantee success but to help you better understand the return and risk dimensions of a proposed transaction.

HOT LINKS

For a valuation example, see

www.stocksense.com/valuation.html

required rate of return
the return necessary to
compensate an investor for the
risk involved in an investment.

Required Rate of Return One of the key elements in the stock valuation process is the **required rate of return**. Generally speaking, the amount of return required by an investor should be related to the level of risk that must be assumed in order to generate that return. In essence, the required return establishes a level of compensation compatible with the amount of risk involved. Such a standard helps you determine whether the expected return on a stock (or any other security) is satisfactory. Because you don't know for sure what the cash flow of an investment will be, you should expect to earn a rate of return that reflects this uncertainty. Thus the greater the perceived risk, the more you should expect to earn. As we saw in Chapter 5, this is basically the notion behind the *capital asset pricing model* (CAPM).

Recall that using the CAPM, we define a stock's required return as

Equation 8.6

$$\text{Required rate of return} = \text{Risk-free rate} + \left[\text{Stock's beta} \times \left(\text{Market return} - \text{Risk-free rate} \right) \right]$$

The required inputs for this equation are readily available: You can obtain a stock's beta from *Value Line* or S&P's *Stock Reports* (or from just about any of the many Internet sites, such as **Quicken.com**, **MSN MoneyCentral**, or **Morningstar.com**). The risk-free rate is basically the average return on Treasury bills for the past year or so. And a good proxy for the market return is the average stock returns over the past 10 to 15 years (like the data reported in Table 6.1).

In the CAPM, the risk of a stock is captured by its beta. For that reason, the required return on a stock increases (or decreases) with increases (or decreases) in its beta. As an illustration of the CAPM at work, consider Universal's stock, which has a beta of 1.30. Given that the risk-free rate is 5.5% and the expected market return is, say, 15%, this stock would have a required return of

$$\text{Required return} = 5.5\% + [1.30 \times (15.0\% - 5.5\%)] = \underline{17.85\%}$$

This return—let's round it to 18%—can now be used in a stock valuation model to assess the investment merits of a share of stock.

As an alternative, or perhaps even in conjunction with the CAPM, you could take a more subjective approach to finding required return. For example, if your assessment of the historical performance of the company had uncovered some volatility in sales and earnings, you could conclude that the stock is subject to a good deal of business risk. Also important is market risk, as measured by a stock's beta. A valuable reference point in arriving at a measure of risk is the rate of return available on less risky but competitive investment vehicles. For example, you could use the rate of return on long-term Treasury bonds or high-grade corporate issues as a starting point in defining your desired rate of return. That is, starting with yields on long-term bonds, you could adjust such returns for the levels of business and market risk to which you believe the common stock is exposed.

To see how these elements make up the desired rate of return, let's go back to Universal Office Furnishings. Assume that it is now early 2002 and rates on high-grade corporate bonds are hovering around 9%. Given that our analysis thus far has indicated that the office equipment industry in general and Universal in particular are subject to a "fair" amount of business risk, we

would want to adjust that figure upward—probably by around 2 or 3 points. In addition, with its beta of 1.30, we can conclude that the stock carries a good deal of market risk. Thus we should increase our base rate of return even more—say, by another 4 or 5 points. That is, starting from a base (high-grade corporate bond) rate of 9%, we tack on, say, 3% for the company's added business risk and another 4½ or 5% for the stock's market risk. Adding these up, we find that an appropriate required rate of return for Universal's common stock is around 17% or 17½%. This figure is reasonably close to what we would obtain with CAPM using a beta of 1.30, a risk-free rate of 5.5%, and an expected market return of 15% (as in Equation 8.6). The fact that the two numbers are close shouldn't be surprising. If they're carefully (and honestly) done, the CAPM and the subjective approach should yield similar results. Whichever procedure you use, the required rate of return stipulates the minimum return you should expect to receive from an investment. To accept anything less means you'll fail to be fully compensated for the risk you must assume.

I N R E V I E W

C O N C E P T S

- 8.1** What is the purpose of stock valuation? What role does *intrinsic value* play in the stock valuation process?
- 8.2** Are the expected future earnings of the firm important in determining a stock's investment suitability? Discuss how these and other future estimates fit into the stock valuation framework.
- 8.3** Can the growth prospects of a company affect its price/earnings multiple? Explain. How about the amount of debt a firm uses? Are there any other variables that affect the level of a firm's P/E ratio?
- 8.4** What is the *market multiple*, and how can it help in evaluating a stock's P/E? Is a stock's *relative P/E* the same thing as the market multiple? Explain.
- 8.5** In the stock valuation framework, how can you tell whether a particular security is a worthwhile investment candidate? What roles does the required rate of return play in this process? Would you invest in a stock if all you could earn was a rate of return that equaled your required return? Explain.
- 8.6** According to the *Investing in Action* box on page 317, what are *whisper forecasts* and how can investors use them? How accurate are whisper forecasts? Explain.

Stock Valuation Models

LG 3

LG 4

Take a look at the market and you'll discover that investors employ a number of different types of stock valuation models. Though they all may be aimed at a security's future cash benefits, their approaches to valuation are nonetheless considerably different. Take, for example, those investors who search for value in a company's financials—by keying in on such factors as book value, debt load, return on equity, and cash flow. These are the so-called *value investors*, who rely as much on historical performance as on earnings projections to identify undervalued stock. Then there are the *growth investors*, who concentrate solely on growth in earnings. To them, though past growth is important, the real key lies in projected earnings—that is, in finding companies that are going to produce big earnings, along with big price/earnings multiples, in the future.

HOT LINKS

More often than not, investors tend to be either value investors or growth investors. An *Investing in Action* box at the book's home-page discusses the differences.

www.awl.com/gitman_joehnk

There are still other stock valuation models being used in this market—models that employ variables such as dividend yield, price-to-sales ratios, abnormally low P/E multiples, relative price performance over time, and even company size or market caps as key elements in the decision-making process. For purposes of our discussion here, we'll focus on several stock valuation models that are both theoretically sound and widely used. In one form or another, these models use the required rate of return, along with expected cash flows from dividends and/or the future price of the stock, to derive the intrinsic value of an investment. We'll look first at stocks that pay dividends and at a procedure known as the dividend valuation model. From there, we'll look at several valuation procedures that can be used with companies that pay little or nothing in dividends (the more growth-oriented companies). Then we'll move on to tech stocks, many of which not only don't pay dividends but may not even generate earnings (at least for now), or if they do produce earnings, they trade at astronomical P/E multiples.



The Dividend Valuation Model

In the valuation process, the intrinsic value of any investment equals the *present value of the expected cash benefits*. For common stock, this amounts to the cash dividends received each year plus the future sale price of the stock. One way to view the cash flow benefits from common stock is to assume that the dividends will be received over an infinite time horizon—an assumption that is appropriate so long as the firm is considered a “going concern.” Seen from this perspective, *the value of a share of stock is equal to the present value of all the future dividends it is expected to provide over an infinite time horizon*.

Although a stockholder can earn capital gains in addition to dividends by selling a stock for more than he or she paid for it, from a strictly theoretical point of view, what is really being sold is the right to all remaining future dividends. Thus, just as the *current* value of a share of stock is a function of future dividends, the *future* price of the stock is also a function of future dividends. In this framework, the *future* price of the stock will rise or fall as the outlook for dividends (and the required rate of return) changes. This approach, which holds that the value of a share of stock is a function of its future dividends, is known as the **dividend valuation model (DVM)**.

There are three versions of the dividend valuation model, each based on different assumptions about the future rate of growth in dividends: (1) *The zero-growth model*, which assumes that dividends will not grow over time. (2) *The constant-growth model*, which is the basic version of the dividend valuation model, and assumes that dividends will grow by a fixed/constant rate over time. (3) *The variable-growth model*, which assumes that the rate of growth in dividends varies over time.

Zero Growth The simplest way to picture the dividend valuation model is to assume the stock has a fixed stream of dividends. In other words, dividends stay the same year in and year out, and they're expected to do so in the future. Under such conditions, the value of a zero-growth stock is simply *the capitalized value of its annual dividends*. To find the capitalized value, just divide annual dividends by the required rate of return, which in effect acts as the capitalization rate. That is,

dividend valuation model (DVM)
a model that values a share of stock on the basis of the future dividend stream it is expected to produce; its three versions are zero-growth, constant-growth, and variable-growth.

HOT LINKS

See the dividend valuation model at

www.stocksense.com/valuation.html

Equation 8.7

$$\text{Value of a share of stock} = \frac{\text{Annual dividends}}{\text{required rate of return}}$$

For example, if a stock paid a (constant) dividend of \$3 a share and you wanted to earn 10% on your investment, the value of the stock would be \$30 a share ($\$3/0.10 = \30).

As you can see, the only cash flow variable that's used in this model is the fixed annual dividend. Given that the annual dividend on this stock never changes, does that mean the price of the stock never changes? Absolutely not! For as the capitalization rate—that is, the required rate of return—changes, so will the price of the stock. Thus, if the capitalization rate goes up to, say, 15%, the price of the stock will fall to \$20 ($\$3/0.15$). Although this may be a very simplified view of the valuation model, it's actually not as far-fetched as it may appear. As we'll see in Chapter 11, this is basically the procedure used to price *preferred stocks* in the marketplace.

Constant Growth The zero-growth model is a good beginning, but it does not take into account a growing stream of dividends, which is more likely to be the case in the real world. The standard and more widely recognized version of the dividend valuation model assumes that dividends will grow over time at a specified rate. In this version, the value of a share of stock is still considered to be a function of its future dividends, but such dividends are expected to grow forever (to infinity) at a constant rate of growth, g . Accordingly, the value of a share of stock can be found as follows:

Equation 8.8

$$\text{Value of a share of stock} = \frac{\text{Next year's dividends}}{\text{Required rate of return} - \text{Constant rate of growth in dividends}}$$

Equation 8.8a

$$V = \frac{D_1}{k - g}$$

where

D_1 = annual dividends expected to be paid *next* year (the first year in the forecast period)

k = the capitalization rate, or discount rate (which defines the required rate of return on the investment)

g = the annual rate of growth in dividends, which is expected to hold constant to infinity

This model succinctly captures the essence of stock valuation: *Increase* the cash flow (through D or g) and/or *decrease* the required rate of return (k), and the value of the stock will *increase*. Also note that in the DVM, k defines the total return to the stockholder and g represents the expected capital gains on the investments. We know that, in practice, there are potentially two components that make up the total return to a stockholder: dividends and capital gains. As it turns out, the returns from both dividends and capital gains are captured in the DVM. That is, because k represents total returns and g defines the amount of capital gains embedded in k , it follows that if you subtract g from k ($k - g$), you'll have the expected dividend yield on the stock. Thus the expected total return on a stock (k) equals the returns from capital gains (g) plus the returns from dividends ($k - g$).

The constant-growth DVM should not be used with just any stock. Rather, *it is best suited to the valuation of mature companies* that hold established market positions. These are companies with strong track records that have reached the “mature” stage of growth. This means that you’re probably dealing with large-cap (or perhaps even some mature mid-cap) companies that have demonstrated an ability to generate steady—though perhaps not spectacular—rates of growth year in and year out. The growth rates *may not be identical* from year to year, but they tend to move within such a small range that they are seldom far off the average rate. These are companies that have established dividend policies, particularly with regard to the payout ratio, and fairly predictable growth rates in earnings and dividends. Thus, to use the constant-growth DVM on such companies, all that’s required is some basic information about the stock’s *current* level of dividends and the expected rate of growth in dividends, g .

One popular and fairly simple way to find the dividend growth rate is to look at the *historical* behavior of dividends. If they are growing at a relatively constant rate, you could assume that they’ll continue to grow at (or near) that average rate in the future. You can get historical dividend data in a company’s annual report, from various online Internet sources, or from publications like *Value Line*. Given this stream of dividends, you can use basic present-value arithmetic to find the average rate of growth. Here’s how: Take the level of dividends, say, 10 years ago and the level that’s being paid today. Presumably, dividends today will be (much) higher than they were 10 years ago, so, using your calculator, find the present value discount rate that equates the (higher) dividend today to the level paid 10 years earlier. When you find that, you’ve found the growth rate, because in this case, the *discount rate is the average rate of growth in dividends*. (See Chapter 5 for a detailed discussion of how to use present value to find growth rates.)

Once you’ve determined the dividend growth rate, g , you can find next year’s dividend, D_1 , as $D_0 \times (1 + g)$, where D_0 equals the actual (current) level of dividends. Let’s say that in the latest year Amalgamated Anything paid \$2.50 a share in dividends. If you expect these dividends to grow at the rate of 6% a year, you can find next year’s dividends as follows: $D_1 = D_0 (1 + g) = \$2.50 (1 + .06) = \$2.50 (1.06) = \$2.65$. The only other information you need is the capitalization rate, or required rate of return, k . (Note that k must be greater than g for the constant-growth model to be mathematically operative.)

To see this dividend valuation model at work, consider a stock that currently pays an annual dividend of \$1.75 a share. Let’s say that by using the present-value approach described above, you find that dividends are growing at a rate of 8% a year, and you expect they will continue to do so into the future. In addition, you feel that because of the risks involved, the investment should carry a required rate of return of 12%. Given this information, you can use Equation 8.8 to price the stock. That is, given $D_0 = \$1.75$, $g = 0.08$, and $k = 0.12$, it follows that

$$\text{Value of a share of stock} = \frac{D_0 (1 + g)}{k - g} = \frac{\$1.75 (1.08)}{0.12 - 0.08} = \frac{\$1.89}{0.04} = \underline{\underline{\$47.25}}$$

Thus, if you want to earn a 12% return on this investment—made up of 8% in capital gains (g), plus 4% in dividend yield (i.e., $\$1.89/\$47.25 = 0.04$)—

then according to the constant-growth dividend valuation model, you should pay no more than \$47.25 a share for this stock.

With this version of the DVM, *the price of the stock will increase over time* so long as k and g don't change. This occurs because the cash flow from the investment will increase as dividends grow. To see how this happens, let's carry our example further. Recall that $D_0 = \$1.75$, $g = 8\%$, and $k = 12\%$. On the basis of this information, we found the current value of the stock to be \$47.25. Now look what happens to the price of this stock if k and g don't change:

Year	Dividend	Stock Price*
(Current year) 0	\$1.75	\$47.25
1	1.89	51.00
2	2.04	55.00
3	2.20	59.50
4	2.38	64.25
5	2.57	69.50

*As determined by the dividend valuation model, given $g = 0.08$, $k = 0.12$, and $D_0 =$ dividend level for any given year.

As the table shows, we can also find the expected price of the stock *in the future* by using the standard dividend valuation model. To do this, we simply redefine the appropriate level of dividends. For example, to find the price of the stock in year 3, we use the expected dividend in the third year, \$2.20, and increase it by the factor $(1 + g)$. Thus the stock price in year 3 = $D_3 \times (1 + g)/(k - g) = \$2.20 \times (1 + 0.08)/(0.12 - 0.08) = \$2.38/0.04 = \$59.50$. Of course, if future expectations about k or g do change, the *future price* of the stock will change accordingly. Should that occur, an investor could use the new information to decide whether to continue to hold the stock.

Variable Growth Although the constant-growth dividend valuation model is an improvement over the zero-growth model, it still has some shortcomings. The most obvious of these is the fact that it does not allow for changes in expected growth rates. To overcome this problem, we can use a form of the DVM that allows for *variable rates of growth* over time. Essentially, the *variable-growth dividend valuation model* derives, in two stages, a value based on future dividends and the future price of the stock (which price is a function of all future dividends to infinity). The variable-growth version of the model finds the value of a share of stock as follows:

Equation 8.9

$$\text{Value of a share of stock} = \begin{array}{l} \text{Present value of} \\ \text{future dividends} \\ \text{during the initial} \\ \text{variable-growth period} \end{array} + \begin{array}{l} \text{Present value of the price} \\ \text{of the stock at the end of} \\ \text{the variable-growth period} \end{array}$$

Equation 8.9a

$$V = (D_1 \times PVIF_1) + (D_2 \times PVIF_2) + \dots + (D_v \times PVIF_v) + \left(\frac{D_v(1+g)}{k-g} \times PVIF_v \right)$$

where

$D_1, D_2,$ etc. = future annual dividends

$PVIF_t$ = present value interest factor, as specified by the required rate of return for a given year t (Table A.3 in the Appendix)

v = number of years in the initial variable-growth period

Note that the last element in this equation is the standard constant-growth dividend valuation model, which is used to find the price of the stock at the end of the initial variable-growth period.

This form of the DVM is appropriate for companies that are expected to experience rapid or variable rates of growth for a period of time—perhaps for the first 3 to 5 years—and then settle down to a constant (average) growth rate thereafter. This, in fact, is the growth pattern of many companies, so the model has considerable application in practice. (It also overcomes one of the operational shortcomings of the constant-growth DVM in that k does not always have to be greater than g . That is, *during the variable-growth period*, the rate of growth, g , can be greater than the required rate of return, k , and the model will still be fully operational.)

Finding the value of a stock using Equation 8.9 is actually a lot easier than it looks. All you need do is follow these steps:

1. Estimate annual dividends during the initial variable-growth period and then specify the constant rate, g , at which dividends will grow after the initial period.
2. Find the present value of the dividends expected during the initial variable-growth period.
3. Using the constant-growth DVM, find the price of the stock at the end of the initial growth period.
4. Find the present value of the price of the stock (as determined in step 3). Note that the price of the stock is discounted at the same PVIF as the last dividend payment in the initial growth period, because the stock is being priced (per step 3) at the end of this initial period.
5. Add the two present-value components (from steps 2 and 4) to find the value of a stock.

To see how this works, let's apply the variable-growth model to one of our favorite companies: Sweatmore Industries. Let's assume that dividends will grow at a variable rate for the first 3 years (2001, 2002, and 2003). After that, the annual rate of growth in dividends is expected to settle down to 8% and stay there for the foreseeable future. Starting with the latest (2000) annual dividend of \$2.21 a share, we estimate that Sweatmore's dividends should grow by 20% next year (in 2001), by 16% in 2002, and then by 13% in 2003 before dropping to an 8% rate. Using these (initial) growth rates, we therefore project that dividends in 2001 will amount to \$2.65 a share ($\2.21×1.20), and will rise to \$3.08 ($\2.65×1.16) in 2002 and to \$3.48 ($\3.08×1.13) in 2003. In addition, given Sweatmore's risk profile, we feel that the investment should produce a minimum (required) rate of return (k) of at least 14%. We now have all the input we need and are ready to put a value on Sweatmore Industries. Table 8.4 shows the variable-growth DVM in action. The value of Sweatmore stock, according to the variable-growth DVM, is just under \$49.25 a share. In essence, that's the maximum price you should be willing to pay for the stock if you want to earn a 14% rate of return.

TABLE 8.4 Using the Variable-Growth DVM to Value Sweatmore Stock

Step				
1. Projected annual dividends:				
	2001			\$2.65
	2002			\$3.08
	2003			\$3.48
Estimated annual rate of growth in dividends, g , for 2004 and beyond: 8%				
2. Present value of dividends, using a required rate of return, k , of 14%, during the initial variable-growth period:				
			<i>PVIF</i>	
			($k = 14\%$)	
Year	Dividends	×	=	Present Value
2001	\$2.65		0.877	\$2.32
2002	3.08		0.769	2.37
2003	3.48		0.675	2.35
			Total	<u>\$7.04</u> (to step 5)
3. Price of the stock at the end of the initial growth period:				
$P_{2003} = \frac{D_{2004}}{k - g} = \frac{D_{2003} \times (1 + g)}{k - g} = \frac{\$3.48 \times (1.08)}{0.14 - 0.08} = \frac{\$3.75}{0.06} = \underline{\underline{\$62.50}}$				
4. Discount the price of the stock (as computed above) back to its present value, at $k = 14\%$:				
$PV(P_{2003}) = \$62.50 \times PVIF_{14\%, 3 \text{ yr}} = \$62.50 \times 0.675 = \underline{\underline{\$42.19}}$ (to step 5)				
5. Add the present value of the initial dividend stream (step 2) to the present value of the price of the stock at the end of the initial growth period (step 4):				
Value of Sweatmore stock = \$7.04 + \$42.19 = <u>\$49.23</u>				

Defining the Expected Growth Rate Mechanically, application of the DVM is really quite simple. It relies on just three key pieces of information: future dividends, future growth in dividends, and a required rate of return. But this model is not without its difficulties, and certainly one of the most difficult (and most important) aspects of the DVM is *specifying the appropriate growth rate, g , over an extended period of time*. Whether you are using the constant-growth or the variable-growth version of the dividend valuation model, the growth rate, g , is a crucial element in the DVM and has an enormous impact on the value derived from the model. Indeed, the DVM is *very sensitive* to the growth rate being used, because that rate affects both the model's numerator and its denominator.

As we saw earlier in this chapter, we can choose the growth rate from a strictly historical perspective (by using present value to find the past rate of growth) and then use it (or something close) in the DVM. That technique might work fine with the constant-growth model, but it has some obvious shortcomings with the variable-growth DVM. One procedure widely used in practice is to define the growth rate, g , as follows:

Equation 8.10

$$g = \text{ROE} \times \text{The firm's retention rate, } rr$$

where

$$rr = 1 - \text{dividend payout ratio}$$

Both variables in Equation 8.10 (ROE and rr) are *directly related to the firm's rate of growth*, and both play key roles in defining a firm's future growth. The *retention rate* represents the percentage of the firm's profits that are plowed back into the company. Thus, if the firm pays out 35% of its earnings in dividends (i.e., it has a dividend payout ratio of 35%), then it has a retention rate of 65%: $rr = 1 - 0.35 = 0.65$. The retention rate, in effect, indicates the amount of capital that is flowing into the company to finance its growth. Other things being equal, the more money that's being retained in the company, the higher the rate of growth. The other component of Equation 8.10 is the familiar return on equity. Clearly, the more the company can earn on its retained capital, the higher the growth rate.

Let's look at some numbers to see how this actually works. For example, if a company retained, on average, about 80% of its earnings and generated an ROE of around 15%, you'd expect it to have a growth rate of around:

$$g = \text{ROE} \times rr = 0.15 \times 0.80 = \underline{12\%}$$

Actually, the growth rate will probably be a bit more than 12%, because Equation 8.10 ignores financial leverage, which in itself will magnify growth. But at least the equation gives you a good idea what to expect. Or it can serve as a starting point in assessing past and future growth. That is, you can use Equation 8.10 to compute expected growth and then assess the two key components of the formula (ROE and rr) to see whether they're likely to undergo major changes in the future. If so, then what impact is the change in ROE and/or rr likely to have on the growth rate, g ? The idea is to take the time to study the forces (ROE and rr) that drive the growth rate, because the DVM itself is so sensitive to the rate of growth being used. Employ a growth rate that's too high and you'll end up with an intrinsic value that's way too high also. The downside to that, of course, is that you may end up buying a stock that you really shouldn't.



Some Alternatives to the DVM

The variable-growth approach to stock valuation is fairly compatible with the way most people invest. That is, unlike the underlying assumptions in the standard dividend valuation model (which employs an infinite investment horizon), most investors have a holding period that seldom exceeds 5 to 7 years. Under such circumstances, *the relevant cash flows are future dividends and the future selling price of the stock*.

There are some alternatives to the DVM that use such cash flow streams to value stock. One is the so-called *dividends-and-earnings approach*, which in many respects is similar to the variable-growth DVM. Another is the *P/E approach*, which builds the stock valuation process around the stock's price/earnings ratio. One of the major advantages of these procedures is that *they don't rely on dividends as the key input*. Accordingly, they can be used with stocks that are more growth-oriented and pay little or nothing in dividends. It is very difficult, if not impossible, to apply the DVM to stocks that pay little or nothing in dividends. That's not a problem with the dividend-and-earnings approach or the P/E approach. Let's now take a closer look at both of these, as well as a technique that arrives at the expected return on the stock (in percentage terms) rather than a (dollar-based) "justified price."

A Dividends-and-Earnings Approach As we saw earlier the value of a share of stock is a function of the amount and timing of future cash flows and the level of risk that must be taken on to generate that return. A stock valuation model has been developed that conveniently captures the essential elements of expected risk and return and does so in a present-value context. The model is as follows:

Equation 8.11

$$\text{Present value of a share of stock} = \text{Present value of future dividends} + \text{Present value of the price of the stock at date of sale}$$

Equation 8.11a

$$V = (D_1 \times PVIF_1) + (D_2 \times PVIF_2) + \dots + (D_N \times PVIF_N) + (SP_N \times PVIF_N)$$

where

D_t = future annual dividend in year t

$PVIF_t$ = present-value interest factor, specified at the required rate of return (Table A.3 in the Appendix near the end of the book)

SP_N = estimated share price of the stock at date of sale, year N

N = number of years in the investment horizon

dividends-and-earnings (D&E) approach

stock valuation approach that uses projected dividends, EPS, and P/E multiples to value a share of stock.

This is the so-called **dividends-and-earnings (D&E) approach** to stock valuation. Note its similarities to the variable-growth DVM: It's also present-value-based, and its value is also derived from future dividends and the expected future price of the stock. The big difference between the two procedures revolves around the role that dividends play in determining the future price of the stock. That is, the D&E approach doesn't rely on dividends as the principal player in the valuation process. Therefore, it works just as well with companies that pay little or nothing in dividends as with stocks that pay out a lot in dividends. And along that line, whereas the variable-growth DVM relies on future dividends to price the stock, the D&E approach employs projected earnings per share and estimated P/E multiples. These are the same two variables that drive the price of the stock in the market. Thus, the D&E approach is far more flexible than the DVM and is easier to understand and apply. Using the D&E valuation approach, we focus on projecting future dividends and share price behavior over a defined, finite investment horizon, much as we did for Universal Office Furnishings in Table 8.3.

Especially important in the D&E approach is finding a viable P/E multiple that can be used to project the future price of the stock. This is a critical part of this valuation process, because of the major role that capital gains (and therefore the estimated price of the stock at its date of sale) play in defining the level of security returns. Using market or industry P/Es as benchmarks, you should try to establish a multiple that you feel the stock will trade at in the future. Like the growth rate, g , in the DVM, the P/E multiple is the single most important (and most difficult) variable to project in the D&E approach. Using this input, along with estimated future dividends, this present-value-based model generates a *justified price* based on estimated returns. This intrinsic value represents the price you should be willing to pay for the stock, given its expected dividend and price behavior, and assuming you want to generate a return that is equal to or greater than your required rate of return.

To see how this procedure works, consider once again the case of Universal Office Furnishings. Let's return to our original 3-year investment horizon. Given the forecasted annual dividends and share price from Table 8.3, along with a required rate of return of 18% (as computed earlier using Equation 8.6), we can see that the value of Universal's stock is

$$\begin{aligned}
 \text{Present value of a share} &= (\$0.18 \times 0.847) + (\$0.24 \times 0.718) + (\$0.28 \times 0.609) \\
 \text{of Universal stock} &+ (\$93.20 \times 0.609) \\
 &= \$0.15 + \$0.17 + \$0.17 + \$56.76 \\
 &= \underline{\underline{\$57.25}}
 \end{aligned}$$

According to the D&E approach, Universal's stock should be valued at about \$57 a share. That assumes, of course, that our projections hold up—particularly with regard to our forecasted EPS and P/E multiple in 2004. For example, if the P/E drops from 20 to 17 times earnings, then the value of a share of stock will drop to less than \$50 (to around \$48.75/share). Given that we have confidence in our projections, the present-value figure computed here means that we would realize our (18%) desired rate of return so long as we can buy the stock at no more than \$57 a share. Because UVRS is currently trading at (around) \$41.50, we can conclude that the stock at present is an *attractive investment vehicle*. That is, because we can buy the stock at *less* than its computed intrinsic value, we'll be able to earn our required rate of return, *and then some*. By most standards, Universal would be considered a highly risky investment, if for no other reason than the fact that *nearly all the return is derived from capital gains*. Indeed, dividends alone account for less than 1% of the value of the stock. That is, only 49 cents of the \$57.25 comes from dividends! Clearly, if we're wrong about EPS or the P/E multiple, the future price of the stock (in 2004) could be way off the mark, and so, too, would our projected return.

INVESTOR FACTS

UNEXPECTED RETURNS—No matter how good your estimates of a stock's forecasted dividends or expected return, you can undermine your analytical efforts by trading too frequently. A recent study of returns for over 66,000 investors over the 6 years 1991 to 1997 grouped them according to annual portfolio turnover (how much of the portfolio the investor replaces each year). Buy-and-hold investors, with turnover of 2% a year, earned annual returns of 18.5%. Average traders (76% turnover) fared a little worse at 16.4%. The most active traders, with 258% portfolio turnover, averaged only 11.4% per year, 5 to 7 percentage points less than more patient investors.

Source: Walter Updegrave, "Terms of Trade," *Money*, March 2000, p. 75.

Determining Expected Return

Sometimes investors find it more convenient to deal in terms of expected return rather than a dollar-based justified price. This is no problem, nor is it necessary to sacrifice the present-value dimension of the stock valuation model to achieve such an end. That's because expected return can be found by using the (present-value-based) *internal rate of return (IRR)* procedure first introduced in Chapter 5. This approach to stock valuation uses forecasted dividend and price behavior, along with the *current market price*, to arrive at the fully compounded rate of return you can expect from a given investment.

To see how a stock's expected return is computed, let's look once again at Universal Office Furnishings. Using 2002–2004 data from Table 8.3, along with the stock's current price of \$41.58, we can determine Universal's expected return. To do so, we find the discount rate that equates the future stream of benefits (i.e., the future annual dividends and future price of the stock) to the stock's current market price. In other words, find the discount rate that produces a present value of future benefits equal to the price of the stock, and you have the IRR, or expected return on that stock.

Here's how it works: Using the Universal example, we know that the stock is expected to pay per-share dividends of \$0.18, \$0.24, and \$0.28 over the next 3 years. At the end of that time, we hope to sell the stock for \$93.20. Given that the stock is currently trading at \$41.58, we're looking for the discount rate that will produce a present value (of the future annual dividends and stock price) equal to \$41.58. That is,

$$(\$0.18 \times PVIF_1) + (\$0.24 \times PVIF_2) + (\$0.28 \times PVIF_3) + (\$93.20 \times PVIF_3) = \$41.58$$

We need to solve for the discount rate (the present-value interest factors) in this equation. Through a process of “hit and miss” (and with the help of a personal computer or hand-held calculator), you'll find that with an interest factor of 31.3%, the present value of the future cash benefits from this investment will equal exactly \$41.58. That, of course, is our expected return. Thus Universal can be expected to earn a fully compounded annual return of about 31%, assuming that the stock can be bought at \$41.58, is held for 3 years (during which time investors receive indicated annual dividends), and then is sold for \$93.20 at the end of the 3-year period. When compared to its 18% *required rate of return*, the 31.3% *expected return* makes Universal look like a very attractive investment candidate.

The Price/Earnings (P/E) Approach

One of the problems with the stock valuation procedures we've looked at above is that they are fairly mechanical. They involve a good deal of “number crunching.” Although such an approach is fine with some stocks, it doesn't work well with others. Fortunately, there is a more intuitive approach. That alternative is the **price/earnings** (or **P/E**) **approach** to stock valuation.

price/earnings (P/E) approach
stock valuation approach that tries to find the P/E ratio that's most appropriate for the stock; this ratio along with estimated EPS, is used to determine a reasonable stock price.

The P/E approach is a favorite of professional security analysts and is widely used in practice. It's relatively simple to use, because it's based on the standard P/E formula first introduced in Chapter 7 (Equation 7.14). There we showed that a stock's P/E is equal to its market price divided by the stock's EPS. Using this equation and solving for the market price of the stock, we have

Equation 8.12

$$\text{Stock price} = \text{EPS} \times \text{P/E ratio}$$

Equation 8.12 basically captures the P/E approach to stock valuation. That is, given an estimated EPS figure, *you decide on a P/E ratio that you feel is appropriate for the stock. Then you use it in Equation 8.12 to see what kind of price you come up with and how that compares to the stock's current price.*

Actually, this approach is no different from what's used in the market every day. Look at the stock quotes in the *Wall Street Journal*. They include the stock's P/E and show what investors are willing to pay for one dollar of earnings. The higher the multiple, the better investors feel about the company and its future prospects. Essentially, the *Journal* relates the company's earnings per share for the *last 12 months* (known as *trailing earnings*) to the latest price of the stock. In practice, however, investors buy stocks not for their past earnings but for their *expected future earnings*. Thus, in Equation 8.12, it's customary to *use forecasted EPS for next year*.

To implement the P/E approach, the first thing you have to do is come up with forecasted EPS one year out. In the early part of this chapter, we saw how this might be done (see, for instance, Equation 8.3). Given the forecasted EPS, the next task is to evaluate the variables that drive the P/E ratio. Most of that assessment is intuitive. For example, you might want to look at the stock's expected rate of growth in earnings, any potential major changes in the firm's capital structure or dividends, and any other factors such as relative market or industry P/Es that might affect the stock's multiple. You could use such inputs to come up with a base P/E, and then adjust that base, as necessary, to account for the perceived state of the market and/or anticipated changes in the rate of inflation.

Along with estimated EPS, we now have the P/E we need to compute (via Equation 8.12) the price at which the stock should be trading. By comparing that targeted price to the current market price of the stock, we can decide whether the stock is a good buy. For example, we would consider the stock undervalued and therefore a good buy if the computed price of the stock were more than its market price.

Putting a Value on Tech Stocks

Tech stocks have become a major force both in the United States and in equity markets around the world. As a result, they're playing a more important role in a growing number of individual as well as institutional portfolios. As an example of just how important they've become, consider the *Fidelity Blue Chip Growth* fund. According to recent information, 39.4% of the fund was invested in the technology sector, and six of the fund's top ten holdings were tech stocks: Cisco Systems, Intel, EMC Corporation, Microsoft, Sun Microsystems, and IBM. Now, keep in mind, Fidelity Blue Chip Growth is not even considered a tech-stock fund!

Broadly speaking, most investors would define a tech stock as *the stock of a firm whose core business contains a significant technology component*. Admittedly, this definition could include almost any firm, because technology now plays a key role in the development and production of even the most basic products. What separates tech stocks from the rest is that these are the companies that are *providing the technology*, not just using it. Table 8.5 presents an overview of selected tech-stock groups as they are categorized on the Yahoo! Finance Web site (finance.yahoo.com). Some groupings, such as *Computer software*, quickly come to mind—this is, after all, a very large group made up of some 227 firms. We also see some fairly specialized groups, such as *Optical character recognition* (6 firms). Of course, we cannot discuss tech stocks without referring to those firms that specialize in the Internet. Interestingly, Yahoo! has three Internet stock groups: *Internet content*, *Internet services*, and *Internet software*. In addition, Yahoo! has a closely related group called *Electronic commerce*. Many high-tech firms are fairly young and not exactly household names, while others (like Microsoft and Oracle) are big-name companies with market caps in the hundreds of billions of dollars.

Tiers of Tech Stocks For valuation purposes, it is often convenient to put tech stocks into three broad categories, or tiers. *Top-tier* tech stocks include firms like Microsoft, Intel, and Cisco Systems. These firms are well-established

HOT LINKS

See the Internet stock valuation technique at

www.stocksontheweb.com/1overv.htm

TABLE 8.5 Some Tech-Stock Groups

Group Name	Numbers of Firms	Selected Firms
Business information services	22	Gartner Group, Keynote Systems
Computer networks	87	Cisco Systems, Juniper Networks
Computer software	227	Microsoft, Oracle
Defense electronics	27	REMEC, Teledyne
Electrical components-semiconductors	114	Intel, Xilinx
Electronic commerce	59	Amazon.com, eBay
Fiber optics	18	Corning, JDS Uniphase
Industrial automation/robotics	5	Gerber Scientific, Rockwell
Instrumentation—control	10	Datum, Eaton
Internet content	62	CNET, Travelocity.com
Internet services	102	America Online, CMGI
Internet software	94	Ariba, Synquest
Medical—biomedical/gene	145	Amgen, Biogen
Optical character recognition	6	PSC, Scansource
Telecommunications—wireless	57	AT&T Wireless, Vodafone
Telecommunications equipment	139	Lucent, Motorola
Telecommunications services	21	Global Crossing, RCN

Source: Yahoo! finance Web site (finance.yahoo.com).

market leaders with solid track records. There are probably no more than a hundred or so firms that would fall into this category. Most of them have normal financial and market ratios and are valued pretty much like any other growth stock, as described earlier in this chapter.

Next are the *mid-tier* stocks; there are literally hundreds of these firms, such as NVIDIA, Transwitch, and Black Box Corporation. Though many of them may not be household names, they have been around for some time and have demonstrated an ability to not only generate substantial revenues but also to earn solid profits year after year. NVIDIA, for example, had sales of nearly \$650 million in 1999 and profits of over \$80 million. Many of these tech stocks have very high P/E ratios and therefore may not be compatible with standard stock valuation models. A potential problem in valuing some of these mid-tier firms is that they may not have highly diversified product offerings and customer bases. Thus, a shift in industry fundamentals or technology could change their fortunes (i.e., earnings and growth rates) dramatically.

Lower-tier tech stocks include firms like bingo.com and Laser Corporation. Firms at this level typically have yet to generate any earnings. In many cases, they have very little in revenues. Valuation of these firms is extremely difficult and often amounts to little more than hunches. Indeed, these stocks are often bought by investors who pay little attention to fundamentals but instead rely on little more than “stories,” such as some media report that’s related to the firm’s products, an unsubstantiated comment on the Internet, or the advice of a friend who has suddenly become an “expert” at investing.

Tech-Stock Valuation Methods Generally speaking, the methods used to value tech stocks are pretty much the same as those used to value any other type of stock. However, *tech-stock valuation definitely presents some unique*

challenges. We'll look at the two primary techniques used to value tech stocks: discounted cash flow analysis and the use of price multiples. After describing each of these methods, we will discuss a concept known as the "burn rate," and then conclude with an example of a tech-stock valuation.

Discounted Cash Flow (DCF) Analysis Earlier in this chapter, we noted that the intrinsic value of any investment is the present value of its expected cash benefits. Actually, that's the principle behind the dividend valuation model (DVM). Recall that in the DVM the value of a share of stock is the present value of its future stream of dividends. The same can be said of the dividends-and-earnings (D&E) approach, except that it relies not only on dividends but also on expected future earnings, P/E multiples, and the future price of the stock. Both the DVM and D&E approaches are examples of discounted cash flow (DCF) models. DCF analysis involves the projection of future cash flows, such as dividends, which are then discounted back to the present at a rate that reflects the investor's required return.

There's an obvious problem in trying to apply the DVM to the valuation of tech stocks: *Very few of them pay dividends*. We could, of course, assume that the companies will *eventually* pay dividends and then discount these dividends back to the present to obtain an estimated value. But far more often than not, such computed values are *highly unreliable!* A viable alternative to the DVM would be to use a variation of the dividends-and-earnings approach. In this version, all of the dividends would be set to zero, so the computed value of the stock would come solely from our future projection of the firm's earnings and P/E ratio—in other words, the future price of the stock. That may work in some cases. But for many tech firms, earnings growth rates are so uncertain that techniques such as the D&E approach are not feasible. In an attempt to get around some of the problems that arise forecasting earnings, some investors use other measures of cash flow, such as *free cash flow*. But even here, it is difficult to forecast cash flow figures for rapidly growing high-tech firms. In fact, it may be *more difficult* to forecast cash flows for these firms because of all the assumptions that have to be made regarding growth rates, capital expenditures, and working-capital requirements. Thus, although DCF may be useful in valuing some of the larger, more established high-tech companies, most market observers regard it as impractical in the valuation of smaller and newer firms.

Price-Multiple Methods Instead of using DCF, a lot of tech-stock investors base their valuations on *stock price multiples*. To do so, investors identify firms that are comparable to the one being valued, determine the average (or typical) multiples being applied to those comparable firms, and then use it/them to put a value on the firm under consideration. Commonly used multiples include those based on *earnings* (price/earnings), *book value* (price/book value), and *sales* (price/sales). The use of these multiples follows the same steps that we outlined earlier in our discussion of the price/earnings (P/E) approach. That is, given the appropriate P/E multiple, we simply multiply EPS by the P/E ratio, and we have our estimate of the stock price. Similarly, we could *multiply book value per share by the appropriate price/book ratio*, or *sales per share by the appropriate price/sales ratio*, to estimate the value of the stock.

Although price/earnings multiples are widely used in valuation, they can be difficult or even impossible to apply to many tech stocks, because these companies often have earnings that are either highly erratic or even negative. Moreover, the use of price/book ratios may work well when valuing banks or other firms *whose assets are easily measured*, but it can be problematic when valuing tech stocks. The reason is that the book value of the firm as reported on the balance sheet may bear little resemblance to the value of the firm in the marketplace. Much of the marketplace value may stem from *intangible assets* such as the firm's growth potential or technological capabilities. The potential shortcomings of price/earnings and price/book ratios have led many investors to use the price/sales (P/S) ratio as the "multiple of choice" when valuing tech stocks. An advantage of the P/S ratio is that even when earnings are negative, sales are positive.

As is the case with P/E ratios, the P/S multiple can be calculated two ways: on a *trailing* basis or on a *forward* basis. The trailing price/sales ratio is computed simply by dividing share price by the sales per share for the most recent year. Alternatively, the forward price/sales ratio is computed by dividing share price by the *estimated* or *forecasted* sales per share for the *coming year*. This estimate can be obtained from analysts' reports (or, if you are adventurous, you could generate your own forecast). Because it's common for sales to grow over time, the forward price/sales ratio will tend to be lower than the trailing ratio.

Although price/sales ratios are popular in the valuation of tech stocks with little or no earnings, they do have shortcomings. First, although sales will be positive even when earnings are negative, many analysts would argue that our focus should ultimately be on the "bottom line" (earnings and profitability) rather than on the "top line" (sales). A second potential shortcoming of using any price multiple with tech stocks is that the multiple itself is highly volatile because of wide fluctuations in both share price and the characteristic (such as sales) in the denominator. Earlier in this chapter, we showed that there was considerable variation in marketwide P/E multiples over time. For tech stocks, the variation in P/S multiples can be even greater. The problem is this: An investor may determine that a set of comparable firms currently has an average P/S ratio of say, $6\frac{1}{2}$ and then finds that this average has dropped to $3\frac{1}{2}$ only a short time later. Such wide swings introduce into the valuation process the potential for considerable error. In addition, the question arises as to whether the firm being valued should receive the average multiple for the industry, that for a group of comparable firms, or some higher or lower value. Although this is a very difficult question to answer, all else being equal, price multiples do tend to increase with a firm's growth rate and to decrease with higher risk. We noted this earlier for P/E multiples, and the same concept applies to price/sales (P/S) multiples.

The "Burn Rate" in Tech Stocks Before proceeding to an example of valuation, we should define one other term that is often used in discussing tech stocks: the **burn rate**, or the **cash burn rate**. The burn rate refers to the *rate at which the firm is using up ("burning up") its supply of cash over time*. Because it usually takes a while for many start-up firms to generate cash from operations, their survival depends on their having an adequate supply of cash on hand to meet expenses. The burn rate is determined by examining a firm's statement of cash flows. As we saw in Chapter 7, the statement of cash flows

burn rate

the rate at which the firm is using up its supply of cash over time.

reports the change in the firm's cash position from one period to the next by accounting for the cash flows from operations, investment activities, and financing activities. Other things being equal, a higher burn rate is viewed more negatively, and is likely to result in a lower valuation for the firm.

To illustrate the concept of the “burn rate” refer to Table 8.6, which presents a highly abbreviated statement of cash flows for U.S. Internetworking, Inc. (USIX). This firm implements, operates, and supports packaged software applications over the Internet. The statement of cash flows in Table 8.6 covers the first 9 months of 2000 and the corresponding period for 1999. Let's focus on a few of the key cash flow items relevant to USIX's burn rate. First, the net cash from operations was a *negative* \$93 million for the first 9 months of 2000. This result implies that the core business operations of the firm consumed (burned) cash at the rate of about \$10 million per month, largely because of the firm's substantial—and growing—operating loss. Second, USIX made significant capital investment in new assets. As a result, the net cash flow from investing also was *negative*, to the tune of \$63 million. That represents another significant use of cash. Indeed, the net cash burned by operations and investing together amounted to over \$150 million—or a burn rate of nearly \$17 million a month! Some would argue that a more appropriate (and more liberal) way to estimate a firm's burn rate would be to ignore the cash used for investing and simply focus on the cash from operations. But that doesn't seem to be very realistic, because most firms do, in fact, have to make some capital expenditures in order to continue operations. As a compromise, we won't even consider the cash used to meet payments on the firm's long-term debt and lease obligations, as that would just *add* another \$2.5 million to the monthly burn rate.

Examination of the firm's financing activities gives us some idea of how USIX met these substantial cash outflows. In particular, the firm raised nearly \$150 million by issuing additional common stock and long-term debt. Because USIX had approximately \$81 million in cash at the end of the period, it is likely to run out of cash in about 6 to 8 months, depending on which burn rate you use. USIX can avoid that fate if it (1) significantly decreases its burn rate or perhaps even begins to *generate* cash from operations, or (2) continues to issue significant amounts of debt or equity. Of course, the continued ability to raise additional capital is not guaranteed for any firm and is particularly questionable for risky tech firms.

Tech-Stock Valuation Example As an exercise in tech-stock valuation, let's consider the hypothetical firm Global Applications Software Products (GASP). Actually, although the name is fictitious, the financial statements and values are for a real company operating in roughly the same line of business. GASP is an application software provider, which means that it essentially “hosts” software on its computers and rents this software to other firms. GASP's income statement (see Table 8.7) indicates that revenues for the most recent year were \$56.5 million, yet net income was a negative \$92.2 million. In other words, the firm had a loss of almost \$100 million on sales of some \$56 million.

Constructing a set of comparable firms is probably the most challenging part of this valuation process. Investors face a difficult tradeoff: On one hand, the larger the set of comparable firms, the more confident we might be in our estimate of the appropriate multiple. On the other hand, a larger set of com-

TABLE 8.6 Statement of Cash Flows

U.S. Internetworking, Inc. Statement of Cash Flows (\$ in millions)		
	For the 9 Months Ended Sept. 30	
	2000	1999
Net loss	(\$129.4)	(\$ 69.1)
Other operating activities	<u>36.1</u>	<u>12.6</u>
Net cash flow from operations	(\$ 93.3)	(\$ 56.5)
Net cash flow from investing	(\$ 63.0)	(\$ 98.9)
Payments on long-term debt & capital leases	(\$ 22.9)	(\$ 4.5)
Other financing activities	<u>148.0</u>	<u>144.7</u>
Net cash flow from financing	\$125.1	\$140.2
Net cash flow	(\$ 31.2)	(\$ 15.2)
Cash & equivalents, at beginning of period	<u>\$ 112.3</u>	<u>\$ 43.8</u>
Cash & equivalents, at end of period	<u>\$ 81.1</u>	<u>\$ 28.6</u>

parable firms may include some that are not truly similar to the firm being valued. Let's assume that we have collected data on the price/sales ratios and other financial characteristics for five publicly traded companies in roughly the same line of business as GASP, as shown in Table 8.8.

The sales levels of the comparable firms range from \$32.2 million for Corio to \$128.8 million for Interliant. *Net losses* range from \$164 million for U.S. Internetworking to \$44 million for Breakaway Solutions. The levels of sales and net losses for GASP are within those ranges, although GASP had lower sales than average (\$56.5 million vs. \$79.4 million) and generated less of a loss than the average firm (\$92.2 million vs. \$110.4 million).

TABLE 8.7 Income Statement for a Tech Firm

Global Applications Software Products Income Statement Fiscal Year Ended December 31, 2000 (\$ in thousands)	
Sales	\$56,500
Expenses	
Direct cost of services	\$64,700
Network and infrastructure costs	35,900
General and administrative	22,400
Sales and marketing	59,300
Depreciation and amortization	31,400
Total costs and expenses	\$133,700
Operating loss	(\$77,200)
Interest expense	15,000
Net loss	<u>(\$92,200)</u>

(No taxes are shown because of the operating loss.)

TABLE 8.8 Financial Data on Five Firms Comparable to GASP

Company Name	Market Cap (\$ millions)	Sales (\$ millions)	Losses (\$ millions)	Price/Sales Ratio
U.S. Internetworking	\$532	\$ 87	\$-164	5.2
Corio	174	32	-161	2.9
Interliant	313	129	-125	2.3
Navisite	311	50	-58	5.7
Breakaway Solutions	76	99	-44	0.6
Averages	\$281.2	\$79.4	\$-110.4	3.34

Using the price/sales multiple, the simplest approach is to use the average multiple of the comparable firms to find the value of our GASP shares. But first we have to find sales per share for GASP. Using trailing sales, that can be done by taking the firm's total sales for last year and dividing it by the number of shares outstanding. Assuming 30 million shares outstanding, GASP had trailing sales per share of

$$\$56.5 \text{ million} / 30 \text{ million} = \underline{\$1.88/\text{share}}$$

Now, to find the value of a share of GASP stock, we simply multiply the firm's sales per share by the average price to sales ratio (of 3.34 times):

$$\$1.88 \times 3.34 = \underline{\$6.28/\text{share}}$$

Thus we end up with an estimated share price of \$6.28.

How does that stack up to our set of comparable firms? To find out, we can convert the GASP share price to a market cap by multiplying price per share by the number of shares outstanding. That results in a market cap of some \$188.4 million ($\6.28×30 million shares). This result is within the range of our five comparable firms, but still below average, so we're probably about where we want to be.

For illustrative purposes, we've greatly simplified the tech-stock valuation process. In practice, you might want to discard one or more of the firms from the comparable analysis, or you might subjectively adjust the average multiple to a higher or lower value on the basis of differences between GASP and the comparables. Or you might want to make some other adjustment based on, say, perceived exposure to risk or perhaps some other variable. The idea is to continue to modify (or "tweak") the P/S ratio until you come up with a multiple that you're comfortable with and that you feel is a proper basis for valuation. Once that's done, the procedure becomes purely mechanical. Simply multiply the ratio you've come up with by the firm's trailing or forward *annual* sales figure. In the case of GASP, if we conclude that a price/sales ratio of around 3.3 to 3.4 is appropriate, then on the basis of trailing annual sales, the stock should be trading for around \$6.25 to \$6.30 a share. If we can buy it for that price or less, the stock might make a good investment. If not, we'll have to keep looking.

HOT LINKS

To focus on Internet stocks, market news, financials, charts, and analyst reports, see

www.stockset.com

I N R E V I E W

C O N C E P T S

- 8.7** Briefly describe the *dividend valuation model* and the three versions of this model. Explain how CAPM fits into the *variable-growth DVM*.
- 8.8** What is the difference between the variable-growth dividend valuation model and the *dividends-and-earnings approach* to stock valuation? Which procedure would work better if you were trying to value a growth stock that pays little or no dividends? Explain.
- 8.9** How would you go about finding the *expected return* on a stock? Note how such information would be used in the stock selection process.
- 8.10** Briefly describe the *P/E approach* to stock valuation and note how this approach differs from the variable-growth DVM.
- 8.11** Explain how risk fits into the stock valuation process. Note especially its relationship to the investment return of a security.
- 8.12** Why are (some) tech stocks difficult to value? What are some of the problems you're likely to encounter in using the DVM or D&E approach to value tech stocks?
- 8.13** Briefly describe the *price/sales ratio* (multiple), and explain how it is used to value tech stocks. Why not just use the P/E or price-to-book-value multiple?

Technical Analysis

LG 5

technical analysis
the study of the various forces at work in the marketplace and their effect on stock prices.

How many times have you turned on the TV or radio and in the course of the day's news heard a reporter say, "The market was up 47 points today" or "The market remained sluggish in a day of light trading"? Such comments reflect the importance of the stock market itself in determining the price behavior of common stocks. In fact, some experts believe that studying the market should be the major, if not the only, ingredient in the stock selection process. These experts argue that much of what is done in security analysis is useless because it is the *market* that matters, not individual companies. Others argue that studying the stock market is only one element in the security analysis process and is useful in helping the investor time decisions.

Analyzing the various forces at work in the stock market is known as **technical analysis**. For some investors, it's another piece of information to use when deciding whether to buy, hold, or sell a stock. For others, it's the *only* input they use in their investment decisions. And for still others, technical analysis, like fundamental analysis, is regarded as a big waste of time. Here we will assume that technical analysis does have some role to play in the investment decision process. We will examine the major principles of market analysis, as well as some of the techniques used to assess market behavior.

Principles of Market Analysis

Analyzing market behavior dates back to the 1800s, when there was no such thing as industry or company analysis. Detailed financial information simply was not made available to stockholders, let alone the general public. There were no industry figures, balance sheets, or income statements to study, no sales forecasts to make, and no EPS data or P/E multiples. About the only

thing investors could study was the market itself. Some investors used detailed charts in an attempt to monitor what large market operators were doing. These charts were intended to show when major buyers were moving into or out of particular stocks and to provide information that could be used to make profitable buy-and-sell decisions. The charts centered on stock price movements. It was believed that these movements produced certain “formations” that indicated when the time was right to buy or sell a particular stock. The same principle is still applied today: Technical analysts argue that internal market factors, such as trading volume and price movements, often reveal the market’s future direction long before it is evident in financial statistics.

If the behavior of stock prices were completely independent of market movements, market studies and technical analysis would be useless. But we have ample evidence that stock prices do, in fact, tend to move with the market. Studies of stock betas have shown that as a rule, anywhere from 20% to 50% of the price behavior of a stock can be traced to market forces. When the market is bullish, stock prices in general can be expected to behave accordingly. When the market turns bearish, you can safely expect most issues to be affected by the “downdraft.”

Stock prices, in essence, react to various forces of supply and demand that are at work in the market. After all, it’s the *demand* for securities and the *supply* of funds in the market that determine whether we’re in a bull or a bear market. So long as a given supply-and-demand relationship holds, the market will remain strong (or weak). When the balance begins to shift, however, future prices can be expected to change as the market itself changes. Thus, more than anything else, technical analysis is intended to monitor the pulse of the supply-and-demand forces in the market and to detect any shifts in this important relationship.

Measuring the Market

If assessing the market is a worthwhile endeavor, then we need some sort of tool or measure to do it. Charts are popular with many investors because they provide a visual summary of the behavior of the market and the price movements of individual stocks. As an alternative or supplement to *charting*, some investors prefer to study various *market statistics*. These statistics include the volume of trading, the amount of short selling, and the buying and selling patterns of small investors (odd-lot transactions). This approach is based on the idea that by assessing some of the key elements of market behavior, investors can gain valuable insights into the general condition of the market and, perhaps, where it’s headed over the next few months. Normally, several of these measures are used together, either in an informal way or more formally as a series of complex ratios and measures.

Although there are many market measures—or *technical indicators*, as they are called—we will confine our discussion here to several of the more widely followed technical measures: (1) market volume, (2) breadth of the market, (3) short interest, and (4) odd-lot trading. In addition to these, the accompanying *Investing in Action* box describes another popular market measure, the *relative strength index* (RSI for short).

HOT LINKS

It happens to every investor: You’ve been watching for signs of movement in the market and the prices suddenly fall. For suggestions of what to do in response—other than to panic—see the *Investing in Action* box at our Web site:

www.awl.com/gitman_joehnk

HOT LINKS

At the Bloomberg site shown below, click on charts. At the Equis site, check the Hot Stocks list.

www.bloomberg.com
www.equis.com/java

INVESTING in action

Relative Strength Weighs In on Buy and Sell Decisions

One of the most widely used technical indicators is the *relative strength index (RSI)*. It is an internal index measuring a security's price relative to itself over time. The RSI indicates a security's momentum, and it gives the best results when used by active investors for short trading periods. It also helps to identify market extremes and points of divergence, signaling that a security is approaching its price top or bottom and may reverse its price trend. (Another type of RSI shows how a security's price movement performs *against a broad market measure* such as the DJIA or S&P 500.)

The RSI is the ratio of the average price change on up days to the average price change on down days during the same period. The index formula is

$$RSI = 100 - \left[100 / \left(1 + \frac{\text{Average price change on up days}}{\text{Average price change on down days}} \right) \right]$$

The RSI can cover various periods of time (days, weeks, or months). The most common RSIs at the popular technical-analysis Web sites are 9-, 14-, and 25-period RSIs.

The RSI ranges between 0 and 100. Most RSIs range between 30 and 70. Generally, RSI values above 70–80 indicate an *overbought* condition (more and stronger buying than the fundamentals justify), which may signal that a reversal of the upward price trend is possible. RSI values below 30 indicate a possible *oversold* condition (more selling than fundamentals might indicate) and a possible reversal of the downward trend. When the RSI crosses these points, it signals a possible trend reversal. The wider 80–20 range is often used with the 9-day RSI, which tends to be more volatile than longer-period RSIs. In bull markets, 80 may be a better upper indicator than 70, whereas in bear markets, 20 is a more accurate lower level. Different sectors and industries have varying RSI threshold levels. By watching the RSI over the long

term (one year or more), you can determine the historical RSI trading level and the turning points for a particular stock. Also, the entrance of the RSI into the extreme levels does not mean you should buy or sell, but it does tell you to watch for that possibility.

How can you use the RSI in your own trading? Here are three possible strategies using extremes:

- Buy when the RSI moves above 70 and sell when it falls below 30. However, the trend may have further to run, and you may trade too soon.
- Sell when the RSI crosses below 70 and buy when it moves above 30. This is a popular strategy using 9-day RSIs. However, this strategy has the opposite drawback to the strategy above: You could enter a trade after the trend reversal occurs.
- Sell when an above-70 RSI begins to turn down or buy when a below-30 RSI turns upward. This also has some pitfalls, because the RSI tends to move to extremes during periods of strong price trends and may give false signals.

Another way to use RSIs is to compare price charts and RSIs. Most of the time, both move in the same direction. Hence a divergence between RSI and a price chart can be a strong signal of a changing trend.

Like other technical indicators, the RSI has limitations. It should not be used alone but, rather, works best in combination with other tools such as charting, moving averages, and trendlines. Among the Web sites that offer RSI as a charting option are BigCharts (www.bigcharts.com) and MetaStock Online (www.metastock.com).

Sources: "Using the Relative Strength Index," *Investopedia.com*, www.investopedia.com; Geoffrey N. Smith, "Riding the Wave," *Fidelity Outlook*, Fall 1999, pp. 8–9; and Wayne A. Thorp, "Measuring Internal Strength: Wilder's Indicator," *AAIL Journal*, May 2000, pp. 28–32.

FIGURE 8.1

Some Market Statistics

Individual investors can obtain all sorts of technical information at little or no cost from brokerage houses, investment services, the popular financial media, or the Internet. Here, for example, is a sample of information from the *Wall Street Journal*. Note that a variety of information about market volume, new highs and lows, number of advancing and declining stocks, and market averages is available from this one source. (Source: *Wall Street Journal*, October 10, 2000, p. C.)

STOCK MARKET DATA BANK 10/9/00

MAJOR INDEXES

+12-MO		DAILY			NET		+12-MO		FROM		
HIGH	LOW	HIGH	LOW	CLOSE	CHG	% CHG	CHG	% CHG	12/31	% CHG	
DOW JONES AVERAGES											
11722.98	9796.03	30 Industrials	10641.31	10546.23	10568.43	- 28.11	- 0.27	- 79.75	- 0.75	- 928.69	- 8.08
3099.67	2263.59	20 Transportation	2543.65	2483.75	2490.63	- 53.02	- 2.08	- 535.39	- 17.69	- 486.57	- 16.34
401.47	269.20	15 Utilities	384.72	378.92	381.50	+ 2.52	+ 0.66	+ 85.78	+ 29.01	+ 98.14	+ 34.63
3305.46	2751.55	65 Composite	3143.80	3113.62	3120.64	- 11.52	- 0.37	+ 31.57	+ 1.02	- 93.74	- 2.92
364.71	285.95	DJ US Total Mkt	330.10	324.80	328.51	- 1.13	- 0.34	+ 22.79	+ 7.46	- 13.06	- 3.82

NEW YORK STOCK EXCHANGE

677.58	576.17	Composite	656.73	651.55	653.55	- 2.57	- 0.39	+ 40.22	+ 6.56	+ 3.25	+ 0.50
851.94	728.87	Industrials	815.84	809.44	812.68	- 1.08	- 0.13	+ 37.75	+ 4.87	- 15.53	- 1.88
519.96	443.98	Utilities	467.25	462.83	463.74	- 2.90	- 0.62	- 25.86	- 5.28	- 47.41	- 9.28
493.03	353.51	Transportation	412.96	405.09	406.04	- 5.82	- 1.41	- 53.23	- 11.59	- 60.66	- 13.00
634.16	442.71	Finance	606.34	598.22	599.44	- 6.41	- 1.06	+ 104.11	+ 21.02	+ 82.83	+ 16.03

STANDARD & POOR'S INDEXES

1527.46	1247.41	500 Index	1409.69	1392.48	1402.03	- 6.96	- 0.49	+ 66.82	+ 5.00	- 67.22	- 4.58
1917.64	1544.13	Industrials	1687.16	1664.50	1677.99	- 7.04	- 0.42	+ 29.03	+ 1.76	- 163.93	- 8.90
341.15	215.62	Utilities	326.33	321.87	325.77	+ 3.90	+ 1.21	+ 87.51	+ 36.73	+ 98.55	+ 43.37
548.60	369.50	400 MidCap	513.31	502.85	513.04	+ 0.12	+ 0.02	+ 121.48	+ 31.02	+ 68.37	+ 15.38
225.12	168.96	600 SmallCap	206.57	203.02	206.14	- 0.43	- 0.21	+ 29.36	+ 16.61	+ 8.35	+ 4.22
324.40	262.26	1500 Index	300.76	296.96	299.32	- 1.36	- 0.45	+ 19.36	+ 6.92	- 9.57	- 3.10

NASDAQ STOCK MARKET

5048.62	2688.18	Composite	3376.92	3233.19	3355.56	- 5.45	- 0.16	+ 439.61	+ 15.08	- 713.75	- 17.54
4704.73	2362.11	Nasdaq 100	3359.93	3185.28	3318.90	+ 6.96	+ 0.21	+ 740.02	+ 28.70	- 388.93	- 10.49
2841.00	1549.93	Industrials	1886.69	1806.19	1879.09	- 3.45	- 0.18	+ 194.58	+ 11.55	- 359.88	- 16.07
2075.12	1602.08	Insurance	1840.73	1818.94	1840.73	- 24.09	- 1.29	- 167.08	- 8.32	- 55.55	- 2.93
1837.10	1340.36	Banks	1749.17	1721.52	1735.59	- 13.50	- 0.77	+ 1.98	+ 0.11	+ 44.30	+ 2.62
2964.66	1448.32	Computer	1946.91	1855.05	1927.72	- 6.74	- 0.35	+ 346.39	+ 21.90	- 397.68	- 17.10
1230.06	639.02	Telecommunications	678.53	645.71	673.67	+ 6.42	+ 0.96	- 33.24	- 4.70	- 341.73	- 33.65

OTHERS

1036.40	774.49	Amex Composite	923.34	914.11	921.90	+ 1.19	+ 0.13	+ 131.88	+ 16.69	+ 44.93	+ 5.12
813.71	646.79	Russell 1000	752.37	740.87	748.51	- 3.07	- 0.41	+ 57.05	+ 8.25	- 19.46	- 2.53
606.12	408.90	Russell 2000	491.02	481.64	489.53	- 1.49	- 0.30	+ 59.34	+ 13.79	- 15.22	- 3.02
844.78	667.03	Russell 3000	776.72	764.94	773.13	- 3.12	- 0.40	+ 61.54	+ 8.65	- 20.18	- 2.54
439.78	394.35	Value-Line (geom.)	405.45	401.08	405.16	- 0.15	- 0.04	+ 15.49	+ 3.68	- 25.88	- 6.00
14751.64	11446.60	Wilshire 5000	13099.79	- 42.37	- 0.32	+ 902.69	+ 7.40	- 712.88	- 5.16

†Based on comparable trading day in preceding year.

MOST ACTIVE ISSUES

NYSE	VOLUME	CLOSE	CHANGE
Motorola	15,679,200	27.00	- 0.75
Nokia	11,569,900	37.00	- 0.69
NortelNtwks	11,531,400	63.25	+ 0.94
EMC Cp	11,522,500	89.75	+ 0.56
LucentTch	11,443,800	32.31	- 0.94
AT&T	10,183,000	26.56	- 0.69
TX Instr	9,756,500	45.38	- 1.50
GenElec	9,687,200	58.50	- 0.94
SBC Comm	9,384,900	52.44	- 0.88
AmOnline	8,565,400	57.10	- 2.03
AdvMicro	7,879,500	22.38	+ 0.38
MicronTch	7,038,800	39.75	- 1.06
OwenCorn	6,749,100	1.06	+ 0.31
Firstar	6,550,900	17.94	- 1.06
Compaq	6,509,500	25.48	+ 0.47
NASDAQ			
Intel	55,627,000	39.06	- 0.88
CiscoSys	45,487,400	53.69	- 2.50
DellCplr	37,031,700	25.63	+ 0.31
Microsoft	28,166,400	54.19	- 1.38
WorldCom	23,456,400	25.94	+ 0.75
BroadVsn	20,481,800	21.94	+ 3.69
OracleCp	20,037,000	66.75	- 0.88
Connetics	20,027,900	5.31	- 20.19
SunMircsys	19,674,100	106.81	- 0.69
JDS Uniphys	17,489,000	93.56	+ 2.19
AlteraCp	14,390,100	40.88	- 3.44
AppdMtl	13,702,100	55.75	+ 1.56
Yahoo	12,844,800	85.75	+ 4.50
AMEX			
NASDAQ100	28,825,000	82.63	- 0.38
SPDR	4,499,800	140.00	- 1.06
SPDR Engy	1,375,800	32.75	+ 0.50
Biotech HLDrs	1,028,400	174.50	+ 1.31
S&P Midcap	768,900	94.25	+ 0.25

DIARIES

NYSE	MON	FRI	WK 10/6
Issues traded	3,241	3,284	3,353
Advances	1,194	816	1,265
Declines	1,562	2,009	1,646
Unchanged	485	459	442
New highs	18	47	109
New lows	88	119	75
zAdv vol (000)	302,482	256,079	527,508
zDecl vol (000)	379,166	833,336	438,532
zTotal vol (000)	714,147	1,139,205	1,023,912
Closing tick ¹	-204	-747	-304
Closing Arms ² (trin)	.96	1.32	.64
zBlock trades	14,794	24,596	21,083
NASDAQ			
Issues traded	4,548	4,596	4,726
Advances	1,497	1,076	1,422
Declines	2,378	2,902	2,731
Unchanged	673	618	573
New highs	16	21	85
New lows	300	313	168
Adv vol (000)	656,400	347,249	445,623
Decl vol (000)	715,415	1,413,816	1,223,868
Total vol (000)	1,401,613	1,801,431	1,721,643
Block trades	n.a.	22,543	20,552
AMEX			
Issues traded	713	742	779
Advances	211	155	225
Declines	346	427	383
Unchanged	156	160	171
New highs	2	3	13
New lows	50	45	32
zAdv vol (000)	8,391	4,400	11,380
zDecl vol (000)	31,759	50,771	30,912
zTotal vol (000)	41,868	57,393	44,746
Comp vol (000)	58,223	78,577	63,237
zBlock trades	n.a.	1,399	954

INVESTOR FACTS

THE JANUARY INDICATOR—

Wall Streeters are always on the lookout for new market measures, some of which bear no relationship to the financial world at all. One market adage holds that if the National Football League Conference team wins the Super Bowl, the market will have a good year. Another, more “financial” January-based measure looks at January’s market results as a prediction for the year: If the market falls in January, the year will register a decline, and vice versa. From 1900 to 2000, the Dow Jones Industrial Average (DJIA) registered a drop in January 35 times, but this was followed by a full year’s decline just 22 times. So this rule of thumb held true only 63% of the time—most recently in 2000, when the January decline was 4.8% and the DJIA ended the year down 6.2%. In 1998, however, the January indicator was wrong: The DJIA fell 2.2% in January but ended the year up 16.1%.

Source: E. S. Browning, “Stocks End Stormy January with Strong Bounce Back,” *Wall Street Journal*, February 1, 2000.

short interest

the number of stocks sold short in the market at any given time; a technical indicator believed to indicate future market demand.

Market Volume Market volume is an obvious reflection of the amount of investor interest. Volume is a function of the supply of and demand for stock, and it indicates underlying market strengths and weaknesses. The market is considered *strong* when volume goes up in a rising market or drops off during market declines. It is considered *weak* when volume rises during a decline or drops during rallies. For instance, the market would be considered strong if the Dow Jones Industrial Average went up by, say, 108 points while market volume was heavy. Investor eagerness to buy or sell is felt to be captured by market volume figures. The financial press regularly publishes volume data, and investors can conveniently watch this important technical indicator. An example of this and other vital market information is shown in Figure 8.1.

Breadth of the Market Each trading day, some stocks go up in price and others go down. In market terminology, some stocks *advance* and others *decline*. The breadth-of-the-market indicator deals with these advances and declines. The idea is actually quite simple: So long as the number of stocks that advance in price on a given day exceeds the number that decline, the market is considered strong. The extent of that strength depends on the spread between the number of advances and declines. For example, if the spread narrows so that the number of declines starts to approach the number of advances, market strength is said to be deteriorating. Similarly, the market is considered weak when the number of declines repeatedly exceeds the number of advances. The principle behind this indicator is that the number of advances and declines reflects the underlying sentiment of investors. When the mood is optimistic, for example, look for advances to outnumber declines. Again, data on advances and declines are published daily in the financial press.

Short Interest When investors anticipate a market decline, they sometimes sell a stock short. That is, they sell borrowed stock. The number of stocks sold short in the market at any given point in time is known as the **short interest**. The more stocks that are sold short, the higher the short interest. Because all short sales must eventually be “covered” (the borrowed shares must be returned), a short sale in effect ensures *future demand for the stock*. Thus, the market is viewed optimistically when the level of short interest becomes relatively high by historical standards. The logic is that as shares are bought back to cover outstanding short sales, the additional demand will push stock prices up. The amount of short interest on the NYSE, the AMEX, and Nasdaq’s National Market is published monthly in the *Wall Street Journal* and *Barron’s*. Figure 8.2 shows the type of information that’s available.

Keeping track of the level of short interest can indicate future market demand, but it can also reveal *present* market optimism or pessimism. Short selling is usually done by knowledgeable investors, and a significant buildup or decline in the level of short interest is thought to reveal the sentiment of sophisticated investors about the current state of the market or a company. For example, a significant shift upward in short interest is believed to indicate pessimism concerning the *current* state of the market, even though it may signal optimism with regard to *future* levels of demand.

Odd-Lot Trading A rather cynical saying on Wall Street suggests that the best thing to do is just the opposite of whatever the small investor is doing. The reasoning behind this is that as a group, small investors are notoriously wrong in their timing of investment decisions: The investing public usually does not

FIGURE 8.2 Short Interest in the NYSE and the AMEX

The amount of short selling in the market is closely watched by many investment professionals and individual investors. The summary report shown here provides an overview of the extent to which stocks are being shorted in the NYSE and the AMEX. In addition to summary statistics, this monthly report lists all stocks that have been sold short and the number of shares shorted. (Source: *Wall Street Journal*, October 20, 2000.)

NYSE AND AMEX SHORT-SELLING HIGHLIGHTS

LARGEST SHORT POSITIONS

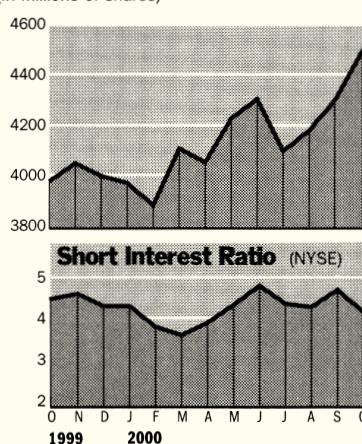
RANK		Oct. 13	Sep. 15	CHANGE
NYSE				
1	Sprint Corp PCS	66,415,612	74,456,483	-8,040,871
2	Citigroup Inc.	59,637,216	49,068,672	10,568,544
3	Conseco Inc.	59,353,764	66,583,520	-7,229,756
4	Disney (Walt)	58,335,995	56,281,733	2,054,262
5	Nortel Networks	53,909,149	49,342,343	4,566,806
6	VodafoneGroPlcAd.	51,661,895	47,106,170	4,555,725
7	America Online Inc.	49,938,130	56,219,225	-6,281,095
8	Motorola Inc.	43,513,358	37,351,171	6,162,187
9	Rite Aid Corp.	41,647,092	37,854,017	3,793,075
10	Lucent Techs	39,733,955	30,721,305	9,012,650
11	AT&T Corp.	39,382,017	45,378,252	-5,996,235
12	Deutsche Telekom AG	38,821,574	27,056,296	11,765,278
13	Dow Chemical	35,187,991	33,674,653	1,513,338
14	HCA-Healthcare Co.	34,518,092	32,378,947	2,139,145
15	Wal-Mart Stores	33,995,355	35,030,387	-1,035,032
16	Chase Manhattan	30,865,889	7,336,920	23,528,969
17	Adv Micro Dev Inc.	30,368,955	25,631,649	4,737,306
18	General Electric	27,419,114	27,622,049	-202,935
19	Telefonos Mex Serf.	27,175,400	28,008,846	-833,446
20	Wells Fargo Co.	26,907,461	23,438,098	3,469,363
AMEX				
1	Nasdaq-100 Trust	43,061,899	51,574,112	-8,512,213
2	SPDR	15,145,106	14,877,818	267,288
3	Nabor Indus Inc.	10,054,415	9,649,077	405,338
4	Trans World Airlin.	9,233,693	9,673,034	-439,341
5	Ivax Corp.	6,758,079	7,387,020	-628,941

LARGEST CHANGES

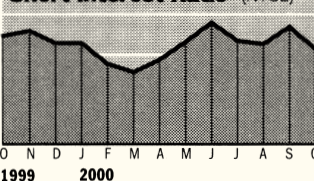
RANK		Oct. 13	Sep. 15	CHANGE
NYSE				
POSITIVE				
1	Chase Manhattan	30,865,889	7,336,920	23,528,969
2	Federal-Mogul	18,858,451	4,338,848	14,519,603
3	Deutsche Telekom AG	38,821,574	27,056,296	11,765,278
4	Citigroup Inc.	59,637,216	49,068,672	10,568,544
5	Lucent Techs	39,733,955	30,721,305	9,012,650
6	Tyco Intl.	25,881,088	17,064,934	8,816,154
7	NISource Inc.	18,143,636	11,517,539	6,626,097
8	Motorola Inc.	43,513,358	37,351,171	6,162,187
NEGATIVE				
1	Sprint Corp PCS	66,415,612	74,456,483	-8,040,871
2	Conseco Inc.	59,353,764	66,583,520	-7,229,756
3	America Online Inc.	49,938,130	56,219,225	-6,281,095
4	AT&T Corp.	39,382,017	45,378,252	-5,996,235
5	Compaq Computer	20,483,166	26,301,585	-5,818,419
6	ClearChannelCommun.	14,613,705	20,108,201	-5,494,496
7	Micron Technology	12,028,233	16,242,673	-4,214,440
8	Limited Inc.	7,468,738	11,520,926	-4,052,188
AMEX				
POSITIVE				
1	SPDR Enrgy Sel XLE	4,328,985	1,511,584	2,817,401
2	SPDR Fin Selct XLF	3,269,081	720,753	2,548,328
3	SPDR Cycl/Trans	1,643,780	232,040	1,411,740
4	Biotech Holdrs Tru	3,194,219	2,195,468	998,751
5	iShares S&P500	1,815,197	1,138,255	676,942
NEGATIVE				
1	Nasdaq-100 Trust	43,061,899	51,574,112	-8,512,213
2	S&P MidCap	2,428,659	3,661,636	-1,232,977
3	U.S. Cellular Corp.	3,693,788	4,688,187	-994,399
4	iShares MSCI UK	71,920	793,733	-721,813
5	Ivax Corp.	6,758,079	7,387,020	-628,941

NYSE Short Interest

(In millions of shares)



Short Interest Ratio (NYSE)



LARGEST SHORT INTEREST RATIOS

The short interest ratio is the number of days it would take to cover the short interest if trading continued at the average daily volume for the month.

RANK		Oct. 13	AVG DLY	DAYS TO
		SHORT INT.	VOL-a	COVER
NYSE				
1	Philippine LdTel-G	1,839,900	1,605	1,146
2	Madeco Adr	4,170,300	15,335	272
3	Quebecor World Inc.	1,181,093	5,715	207
4	Comp Cerv Unidas	4,161,100	29,225	142
5	Co Siderurgica ADS	4,034,006	31,815	127
6	Royal Group Techno	3,081,090	26,165	118
7	Compnha Vle DoRioD	14,830,873	151,035	98
8	FitchrChlBlgADS	2,000,900	24,150	83
9	Advocat Inc.	1,945,200	29,375	66
10	Vector Group LTD	1,577,345	25,530	62
11	TelecomNZ ADR	4,108,655	65,915	62
12	Revlon Inc. Cl A	3,400,272	58,330	58
13	Total Sys Svcs	1,735,756	29,905	58
14	Nova Chemicals	1,225,518	21,895	56
15	Penn Treaty Americ	954,091	18,175	52
16	Chiquita Brands	3,827,179	78,880	49
17	Aviation Sales	2,563,891	54,405	47
18	Coachmen Indus	1,133,375	24,055	47
AMEX				
1	Blackrock 1999 Ter	1,500,061	6,225	241
2	BioTime Inc.	1,441,606	22,630	64
3	iShares MSCI Mexico	2,005,032	33,160	60
4	Hemispherx Biophar	3,584,269	64,320	56
5	Alterra Healthcare	2,493,147	73,055	34

a-Includes securities with average daily volume of 20,000 shares or more. n-New. r-Revised.

Issues that split in the latest month are excluded.

The largest percentage increase and decrease sections are limited to issues with previously established short provisions in both months.

LARGEST % INCREASES

RANK		Oct. 13	Sep. 15	%
NYSE				
1	Connectiv	2,802,595	264,949	957.8
2	Gulf Canada Resour	3,368,086	341,607	886.0
3	GPU Inc.	1,808,172	381,978	373.4
4	Federal-Mogul	18,858,451	4,338,848	334.6
5	Chase Manhattan	30,865,889	7,336,920	320.7
6	Alliant Energy	1,306,216	364,477	258.4
7	Gabelli Eqty Tr	964,100	284,662	238.7
8	AmbacFinlGrp	984,589	299,174	229.1
9	Vivendi	4,806,932	1,559,812	208.2
10	JohnsonControls	1,081,475	379,814	184.7
11	Analog Devices Inc.	5,289,947	1,893,027	179.4
12	Scana Corp	1,629,705	625,838	160.4
13	Intl Game Tech	2,519,920	1,032,534	144.1
14	Korea Telecom	1,121,799	459,884	143.9
15	Paine Webber Grp	1,957,592	841,000	132.8
16	Rockwell Intl	3,774,401	1,663,914	126.8
17	SunGard Data Systm	3,930,772	1,762,217	123.1
18	Pitney Bowes	4,653,647	2,090,339	122.6
19	United Technologies	4,558,864	2,051,191	122.3
20	Furniture Brands	1,208,087	545,090	121.6
AMEX				
1	SPDR Cycl/Trans	1,643,780	232,040	608.4
2	SPDR Fin Selct XLF	3,269,081	720,753	353.6
3	SPDR Enrgy Sel XLE	4,328,985	1,511,584	186.4
4	iShares S&P500	1,815,197	1,138,255	59.5
5	Biotech Holdrs Tru	3,194,219	2,195,468	45.5

LARGEST % DECREASES

RANK		Oct. 13	Sep. 15	%
NYSE				
1	Pearson PLC	146,001	1,240,855	-88.2
2	Energy East Cp-Hld	114,351	936,646	-87.8
3	Repsol YPE S.A.Ads	379,705	2,136,419	-82.2
4	Homestake Mining	939,550	4,797,345	-80.4
5	Northeast Util	250,892	1,263,620	-80.1
6	UltramarDiamondShm	353,513	1,408,915	-74.9
7	Unicom Corp	775,030	2,564,199	-69.8
8	Ahold NV ADS	474,805	1,483,099	-68.0
9	Nabisco Grp Hldgs	489,992	1,483,293	-67.0
10	Praxair Inc	700,894	1,877,167	-62.7
11	Scientific-Atlanta	732,349	1,914,601	-61.7
12	TXU Corp	2,328,336	6,079,240	-61.7
13	Lincoln Natl Corp	1,079,785	2,799,976	-61.4
14	Stora Enso Oyj	1,066,432	2,764,438	-61.4
15	OGE Energy Corp	1,180,221	2,946,598	-59.9
16	Taiwan Semi	2,525,063	6,088,230	-58.5
17	Fox Entertainment	1,214,996	2,899,208	-58.1
18	Intrstate Bakeries	537,136	1,263,873	-57.5
19	Sherwin-Williams	729,687	1,694,424	-56.9
20	Hillenbrand Indus	657,187	1,453,999	-54.8
AMEX				
1	iShares MSCI UK	71,920	793,733	-90.9
2	S&P MidCap	2,428,659	3,661,636	-33.7
3	U.S. Cellular Corp	3,693,788	4,688,187	-21.2
4	Diamonds Trust	1,981,893	2,375,294	-16.6
5	Nasdaq-100 Trust	43,061,899	51,574,112	-16.5

theory of contrary opinion

a technical indicator that uses the amount and type of odd-lot trading as an indicator of the current state of the market and pending changes.

come into the market in force until after a bull market has pretty much run its course, and it does not get out until late in a bear market. Although its validity is debatable, this is the premise behind a widely followed technical indicator and is the basis for the **theory of contrary opinion**. This theory uses the amount and type of odd-lot trading as an indicator of the current state of the market and pending changes.

Because many individual investors deal in transactions of less than 100 shares, their combined sentiments are supposedly captured in odd-lot figures. The idea is to see what odd-lot investors are doing “on balance.” So long as there is little or no difference in the spread between the volume of odd-lot purchases and sales, the theory of contrary opinion holds that the market will probably continue pretty much along its current line (either up or down). When the balance of odd-lot purchases and sales begins to change dramatically, it may be a signal that a bull or bear market is about to end. For example, if the amount of odd-lot purchases starts to exceed odd-lot sales by an ever widening margin, it may suggest that speculation on the part of small investors is starting to get out of control—an ominous signal that the final stages of a bull market may be at hand.

Using Technical Analysis

Investors have a wide range of choices with respect to technical analysis. They can use the charts and complex ratios of the technical analysts. Or they can, more informally, use technical analysis just to get a general sense of the market. In the latter case, market behavior itself is not as important as the implications such behavior can have on the price performance of a particular stock. Thus technical analysis might be used in conjunction with fundamental analysis to determine when to add a particular stock to one’s portfolio. Some investors and professional money managers, in fact, look at the technical side of a stock *before* doing any fundamental analysis. If the stock is found to be technically sound, then they’ll look at its fundamentals; if not, they’ll look for another stock. For these investors, the concerns of technical analysis are still the same: *Do the technical factors indicate that this might be a good stock to buy?*

Most investors rely on published sources, such as those put out by brokerage firms—or, now, widely available on the Internet—to obtain necessary technical insights. They often find it helpful to use several different approaches. For example, an investor might follow market P/Es and dividend yields and also keep track of market volume and breadth of the market. Such information provides the investor with a convenient and low-cost way of staying abreast of the market. Certainly, trying to determine the right (or best) time to get into the market is a principal objective of technical analysis—and one of the major pastimes of many investors.

Charting

Charting is perhaps the best-known activity of the technical analyst. Technicians—analysts who believe it is chiefly (or solely) supply and demand that drives stock prices—use various types of charts to plot the behavior of everything from the Dow Jones Industrial Average to the share price movements of individual listed and OTC stocks. Just about every kind of technical

HOT LINKS

Other technical analysis sites that help with research are the following:

www.dailystocks.com
www.justquotes.com
www.stockcharts.com
stockmaster.com
my.zacks.com

charting

the activity of charting price behavior and other market information and then using the patterns these charts form to make investment decisions.

FIGURE 8.3 A Stock Chart

This chart for Medtronic, Inc. contains information about the daily price behavior of the stock, along with the stock's relative strength, its moving average, its trading volume, and several other pieces of supplementary data. (Source: Chart courtesy of Stockcharts.com Note: Visit this Web site's glossary for expanded definitions.)



indicator is charted in one form or another. Figure 8.3 shows a typical stock chart. In this case, the price behavior of Medtronic, Inc. has been plotted, along with a variety of supplementary technical information about the stock.

Charts are popular because they provide a visual summary of activity over time. Perhaps more important (in the eyes of technicians, at least), they contain valuable information about developing trends and the future behavior of the market and/or individual stocks. Chartists believe price patterns evolve into *chart formations* that provide signals about the future course of the market or a stock. We will now briefly review the practice of charting, including popular types of charts, chart formations, and investor uses of charts.

Bar Charts The simplest and probably most widely used type of chart is the **bar chart**. Market or share prices are plotted on the vertical axis, and time is plotted on the horizontal axis. This type of chart derives its name from the fact that prices are recorded as vertical bars that depict high, low, and closing prices. A typical bar chart is shown in Figure 8.4. Note that on December 31, this particular stock had a high price of 29 a low of 27, and closed at 27.50. Because these charts contain a time element, technicians frequently plot a variety of other pertinent information on them. For example, volume is often put at the base of bar charts (see the Medtronic chart in Figure 8.3).

Point-and-Figure Charts **Point-and-figure charts** are used strictly to keep track of emerging price patterns. Because there is no time dimension on them, they are *not* used for plotting technical measures. Point-and-figure charts are unique in

bar chart

the simplest kind of chart, on which share price is plotted on the vertical axis and time on the horizontal axis; stock prices are recorded as vertical bars showing high, low, and closing prices.

point-and-figure charts

charts used to keep track of emerging price patterns by plotting significant price changes with Xs and Os but with no time dimension used.

FIGURE 8.4

A Bar Chart

Bar charts are widely used to track stock prices, market averages, and numerous other technical measures.



two other ways: First, only *significant* price changes are recorded on these charts. That is, prices have to move by a certain minimum amount—usually at least a point or two—before a new price level is recognized. Second, price *reversals* show up only after a predetermined change in direction occurs. Normally, only closing prices are charted, though some point-and-figure charts use all price changes during the day. An *X* is used to denote an increase in price, an *O* a decrease.

Figure 8.5 shows a common point-and-figure chart. In this case, the chart employs a 2-point box: The stock must move by a minimum of 2 points before any changes are recorded. The chart can cover a span of one year or less if the stock is highly active. Or it can cover a number of years if the stock is not very active. As a rule, low-priced stocks are charted with 1-point boxes, moderately priced shares with increments of 2 to 3 points, and high-priced securities with 3- to 5-point boxes.

Here is how point-and-figure charts work: Suppose we are at point A on the chart in Figure 8.5. The stock has been hovering around this \$40–\$41 mark for some time. Assume, however, that it just closed at \$42.25. Now, because the minimum 2-point movement has been met, the chartist would place an *X* in the box immediately *above* point A. The chartist would remain with this new box as long as the price moved (up or down) within the 2-point range of 42 to 44. Although the chartist follows *daily* prices, a new entry is made on the chart only after the price has changed by a certain minimum amount and moved into a new 2-point box. We see that from point A, the price generally moved up over time to nearly \$50 a share. At that point (indicated as point B on the chart), things began to change as a reversal set in. That is, the price of the stock began to drift downward and in time moved out of the \$48–\$50 box. This reversal prompts the chartist to change columns and symbols, by moving one column to the right and recording the new price level with an *O* in the \$46–\$48 box. The chartist will continue to use *O*s as long as the stock continues to close on a generally lower note.

FIGURE 8.5

A Point-and-Figure Chart

Point-and-figure charts are unusual because they have no time dimension. Rather, a column of Xs is used to reflect a general upward drift in prices, and a column of Os is used when prices are drifting downward.

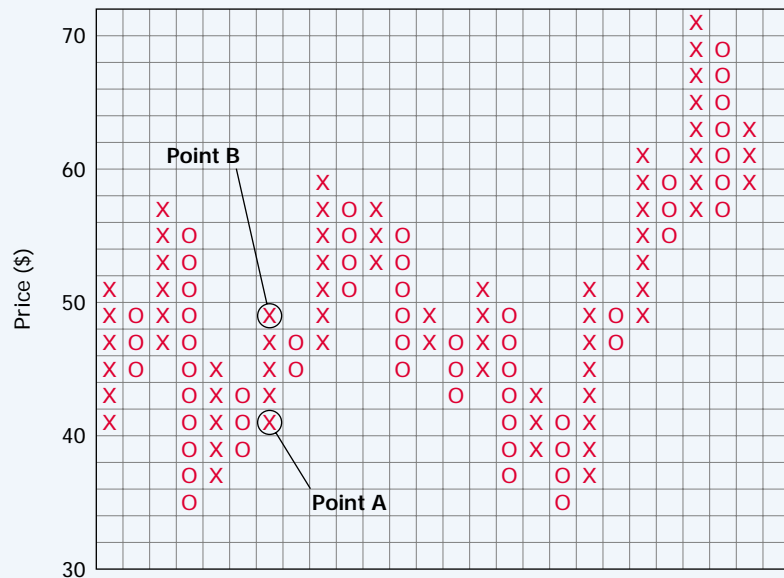


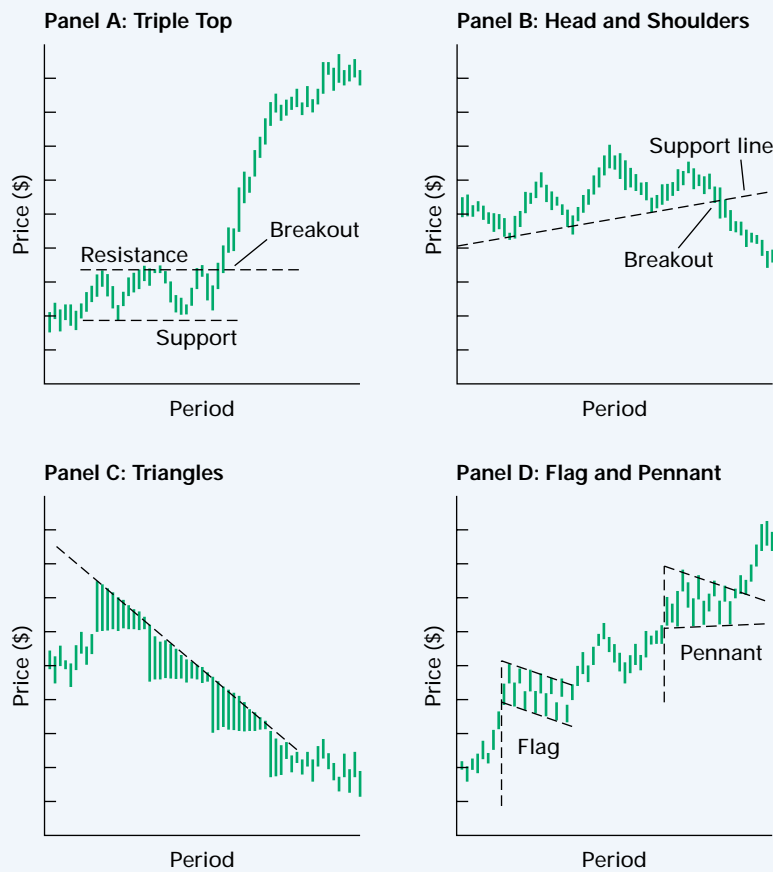
Chart Formations The information that charts supposedly contain about the future course of the market (or a stock) is thought by some to be revealed in chart *formations*. That is, chartists believe that in response to certain supply and demand forces, emerging price patterns result in various formations that historically have indicated that certain types of market behavior are imminent. If you know how to interpret charts (which is no easy task), you can see formations building and recognize buy and sell signals. These chart formations are often given some pretty exotic names, such as *head and shoulders*, *falling wedge*, *scallop and saucer*, *ascending triangle*, and *island reversal*, to name just a few.

Figure 8.6 shows four formations. The patterns form “support levels” and “resistance lines” that, when combined with the basic formations, yield buy and sell signals. Panel A is an example of a *buy* signal that occurs when prices break out above a resistance line in a particular pattern. In contrast, when prices break out below a support level, as they do at the end of the formation in panel B, a *sell* signal is said to occur. Supposedly, a sell signal means everything is in place for a major drop in the market (or in the price of a share of stock). A buy signal indicates that the opposite is about to occur. Unfortunately, one of the major problems with charting is that the formations rarely appear as neatly and cleanly as those in Figure 8.6. Rather, identifying and interpreting them often demands considerable imagination.

Investor Uses Charts are merely tools used by market analysts and technicians to assess conditions in the market and/or the price behavior of individual stocks. Unlike other types of technical measures, charting is seldom done on an informal basis. Either you chart because you believe in its value, or you don’t chart at all. A chart by itself tells you little more than where the market or a stock has been. But to chartists, those price patterns yield formations that, along with things like resistance lines, support levels, and breakouts, tell them what to expect in the future. Chartists believe that history repeats itself, so they study the historical reactions of stocks (or the market) to various formations, and they devise trading rules based on these observations. It makes no

FIGURE 8.6**Some Popular Chart Formations**

To chartists, each of these formations has meaning about the future course of events.



difference to chartists whether they are following the market or an individual stock. *It is the formation that matters*, not the issue being plotted. The value of charts lies in knowing how to “read” them and how to respond to the signals they are said to give about the future. A long-standing debate (some would call it a feud) still rages on Wall Street regarding the merits of charting. Although a large segment of investors and investment professionals may scoff at it, to avid chartists, charting is no laughing matter.

I N R E V I E W**C O N C E P T S**

- 8.14** What is the purpose of *technical analysis*? Explain how and why it is used by technicians; note how it can be helpful in timing investment decisions.
- 8.15** Can the market really have a measurable effect on the price behavior of individual securities? Explain.
- 8.16** What is the *relative strength index* (as described in the *Investing in Action* box on page 345)?
- 8.17** What is a stock chart? What kind of information can be put on charts, and what is the purpose of charting?
- What is the difference between a bar chart and a point-and-figure chart?
 - What are chart formations, and why are they important?

Random Walks and Efficient Markets

LG 6

random walk hypothesis
the theory that stock price movements are unpredictable, so there's no way to know where prices are headed.

efficient market
a market in which securities reflect all possible information quickly and accurately.

If a drunk were abandoned in an open field at night, where would you begin to search for him the next morning? The answer, of course, is the spot where the drunk was left the night before, because there's no way to predict where he will go. To some analysts, stock prices seem to wander about in a similar fashion. Observations of such erratic movements have led to a body of evidence called the **random walk hypothesis**. Its followers believe that price movements are unpredictable and therefore security analysis will not help to predict future market behavior. This hypothesis obviously has serious implications for much of what we have discussed in the last two chapters.

A Brief Historical Overview

To describe stock prices as a random walk suggests that price movements cannot be expected to follow any type of pattern. Or, put another way, price movements are independent of one another. In order to find a theory for such behavior, researchers developed the concept of efficient markets. As we discussed briefly in Chapter 7, the basic idea behind an efficient market is that the market price of securities always fully reflects available information. This means that it would be difficult, if not impossible, to consistently outperform the market by picking “undervalued” stocks.

Random Walks The first evidence of random price movements dates back to the early 1900s. During that period, statisticians noticed that commodity prices seemed to follow a “fair game” pattern. That is, prices seemed to move up and down randomly, giving no advantage to any particular trading strategy. Although a few studies on the subject appeared in the 1930s, thorough examination of the randomness in stock prices did not begin until 1959. From that point on, particularly through the decade of the 1960s, the random walk issue was one of the most keenly debated topics in stock market literature. The development of high-speed computers has helped researchers compile convincing evidence that stock prices do, in fact, come very close to a random walk.

Efficient Markets Given the extensive random walk evidence, market researchers were faced with another question: What sort of market would produce prices that seem to fluctuate randomly? Such behavior could be the result of investors who are irrational and make investment decisions on whim. However, it has been argued much more convincingly that investors are not irrational. Rather, random price movements are evidence of highly efficient markets.

An **efficient market** is one in which securities fully reflect all possible information quickly and accurately. The concept holds that investors incorporate all available information into their decisions about the price at which they are willing to buy or sell. At any point in time, then, the current price of a security incorporates all information. Additionally, the current price reflects not only past information, such as might be found in company reports and financial publications, but also information about events that have been announced but haven't yet occurred, like a forthcoming dividend payment. Furthermore, the current price reflects *predictions* about future information: Investors actively forecast important events and incorporate those forecasts into their

estimates. Obviously, because of keen competition among investors, when new information becomes known, the price of the security adjusts quickly. This adjustment is not always perfect. Sometimes it is too large and at other times too small. But on average it balances out and is correct. The new price, in effect, is set after investors have fully assessed the new information.

Why Should Markets Be Efficient?

Active markets, such as the New York Stock Exchange, are efficient because they are made up of many rational, highly competitive investors who react quickly and objectively to new information. Investors, searching for market profits, compete vigorously for new information and do extremely thorough analyses. The **efficient markets hypothesis (EMH)**, which is the basic theory describing the behavior of such a market, has several tenets:

1. There are many knowledgeable investors actively analyzing, valuing, and trading any particular security. No one of these individual traders alone can affect the price of any security.
2. Information is widely available to all investors at approximately the same time, and this information is practically “free,” or nearly so.
3. Information on events, such as labor strikes, industrial accidents, and changes in product demand, tends to occur randomly.
4. Investors react quickly and accurately to new information, causing prices to adjust quickly and, on average, accurately.

For the most part, the securities markets do, in fact, exhibit these characteristics.

Levels of Market Efficiency

The efficient markets hypothesis is concerned with *information*—not only the type and source of information, but also the quality and speed with which it is disseminated among investors. It is convenient to discuss the EMH in three cumulative categories or forms: past prices only; past prices *plus* all other public data, and, finally, past prices and public data *plus* private information. Together, these three ways of looking at information flows in the market represent three forms of the EMH: the weak, semi-strong, and strong forms.

Weak Form The **weak form of the EMH** holds that past data on stock prices are of no use in predicting future price changes. If prices follow a random walk, price changes over time are random. Today’s price change is unrelated to yesterday’s or to that of any other day, just as each step by a drunk is unrelated to previous steps. If new information arrives randomly, then prices will change randomly.

A number of people have asserted that it is possible to profit from “runs” in a stock’s price. They contend that when a stock’s price starts moving up, it will continue to move up for a period of time, developing momentum. If you can spot a run, then, on the basis of past prices alone, you can develop a trading strategy that will produce a profit. The results from much careful research suggest that momentum in stock prices does exist, and if investors quickly trade at the beginning of the run, large profits can be made. But there’s a problem: In addition to spotting a run (no easy task), an investor would have

efficient markets hypothesis (EMH)

basic theory of the behavior of efficient markets, in which there are a large number of knowledgeable investors who react quickly to new information, causing securities prices to adjust quickly and accurately.

weak form (EMH)

form of the EMH holding that past data on stock prices are of no use in predicting future prices.

to make numerous trades; when commissions are factored in, the person most likely to make a profit is the broker. Many other trading rules have been tested to determine whether profits can be made by examining past price movements, and there is very little, if any, evidence that a trading rule *based solely on past price data* can outperform a simple buy-and-hold strategy.

semi-strong form (EMH)
form of the EMH holding that abnormally large profits cannot be consistently earned using publicly available information.

Semi-Strong Form The **semi-strong form of the EMH** holds that abnormally large profits cannot be consistently earned using publicly available information. This information includes not only past price and volume data but also data such as corporate earnings, dividends, inflation, and stock splits. The semi-strong information set includes all of the information publicly considered in the weak form, *as well as all other information publicly available*. Tests of the semi-strong form of the EMH are basically concerned with the speed at which information is disseminated to investors. The research conclusions of research tests support the position that stock prices adjust very rapidly to new information and therefore support the semi-strong form of the EMH.

Most tests of semi-strong efficiency have examined how a stock price changes in response to an economic or financial event. A famous study involved stock splits. A stock split does not change the value of a company, so the value of the stock should not be affected by a stock split. The research indicated that there are sharp increases in the price of a stock *before* a stock split, but the changes after the split are random. Investors, therefore, cannot gain by purchasing stocks on or after the announcement of a split. To earn abnormal profits they would have to purchase before the split is announced. By the time of the announcement, the market has already incorporated into the price any favorable information associated with the split.

Other studies have examined the impact of major events on stock prices. The overwhelming evidence indicates that stock prices react within minutes, if not seconds, to any important new information. Certainly, by the time an investor reads about the event in the newspaper, the stock price has almost completely adjusted to the news. Even hearing about the event on the radio or television usually allows too little time to complete the transaction in time to make an abnormal profit.

strong form (EMH)
form of the EMH that holds that there is no information, public or private, that allows investors to earn abnormal profits consistently.

Strong Form The **strong form of the EMH** holds that there is no information, public or private, that allows investors to consistently earn abnormal profits. It states that stock prices immediately adjust to any information, even if it isn't available to every investor. This extreme form of the EMH has not received universal support.

One type of private information is the kind obtained by corporate insiders, such as officers or directors of a corporation. They have access to valuable information about major strategic and tactical decisions the company makes. They also have detailed information about the financial state of the firm that may not be available to other shareholders. Corporate insiders may legally trade shares of stock in their company, if they report the transactions to the Securities and Exchange Commission (SEC) each month. This information is then made public, usually within several weeks. It should not be surprising to learn that most studies of corporate insiders find that they consistently earn abnormally large profits when they sell their company stock. They are able to sell stock holdings before major announcements are made to the public and can thereby profit from the stock price adjustment that comes quickly after important news is released.

Other market participants occasionally have inside—nonpublic—information that they obtained *illegally*. With this information, they can gain an unfair advantage that permits them to earn an excess return. Clearly, those who trade securities on the basis of illegal inside information have an unfair advantage. Empirical research has confirmed that those with such inside information do indeed have an opportunity to earn an excess return—but there might be an awfully high price attached, such as spending time in prison, if they're caught.

Possible Implications

The concept of an efficient market holds serious implications for investors. In particular, it could have considerable bearing on traditional security analysis and stock valuation procedures. Some, in fact, contend that investors should spend less time analyzing securities and more time on such matters as reducing taxes and transaction costs, eliminating unnecessary risk, and constructing a widely diversified portfolio. Make no mistake about it: *Even in an efficient market, all sorts of return opportunities are available.* But to proponents of efficient markets, the only way to increase returns is to invest in a portfolio of higher-risk securities.

Implications for Technical Analysis The most serious challenge the random walk evidence presents is to technical analysis. If price fluctuations are purely random, charts of past prices are unlikely to produce significant trading profits. In a highly efficient market, shifts in supply and demand occur so rapidly that technical indicators simply measure after-the-fact events, with no implications for the future. But if markets are less than perfectly efficient, information may be absorbed slowly, producing gradual shifts in supply and demand conditions—and profit opportunities for those who recognize the shifts early. Although the great bulk of evidence supports a random walk, many investors follow a technical approach because they believe it improves their investment results.

Implications for Fundamental Analysis Many strict fundamental analysts were at first pleased by the random walk attack on technical analysis. Further development of the efficient markets concept, however, was not so well received: In an efficient market, it's argued, prices react so quickly to new information that not even security analysis will enable investors to realize consistently superior returns. Because of the extreme competition among investors, security prices are seldom far above or below their justified levels, and fundamental analysis thus loses much of its value. The problem is not that fundamental analysis is poorly done. On the contrary, it is done all too well! So many investors, competing so vigorously for profit opportunities, simply eliminate the opportunities before other investors can capitalize on them.

So Who Is Right?

Some type of fundamental analysis probably has a role in the stock selection process, for even in an efficient market, there is no question that stock prices reflect a company's profit performance. Some companies are fundamentally

strong and others fundamentally weak, and investors must be able to distinguish between the two. Thus some time can profitably be spent in evaluating a company and its stock to determine, not if it is undervalued, but whether it is fundamentally strong.

The level of investor return, however, is more than a function of the fundamental condition of the company; it is also related to risk exposure. Fundamental analysis can help assess risk exposure and identify securities that possess risk commensurate with the return they offer.

The extent to which the markets are efficient is still subject to considerable debate. At present, there seems to be a growing consensus that although the markets may not be *perfectly* efficient, evidence suggests that they are at least *reasonably* efficient.

In the final analysis, the individual investor must decide on the merits of fundamental and technical analysis. Certainly, a large segment of the investing public believes in security analysis, even in a market that may be efficient. What is more, the principles of stock valuation—that promised return should be commensurate with exposure to risk—are valid in any type of market setting.

IN REVIEW

CONCEPTS

- 8.18** What is the *random walk hypothesis*, and how does it apply to stocks? What is an *efficient market*? How can a market be efficient if its prices behave in a random fashion?
- 8.19** Explain why it is difficult, if not impossible, to consistently outperform an efficient market.
- Does this mean that high rates of return are not available in the stock market?
 - How can an investor earn a high rate of return in an efficient market?
- 8.20** What are the implications of random walks and efficient markets for technical analysis? For fundamental analysis? Do random walks and efficient markets mean that technical analysis and fundamental analysis are useless? Explain.

Summary

LG 1

Explain the role a company's future plays in the stock valuation process and develop a forecast of a stock's expected cash flow. The final phase of security analysis involves an assessment of the investment merits of a specific company and its stock. The focus here is on formulating expectations about the company's prospects and the risk and return behavior of the stock. In particular, we would want some idea of the stock's future earnings, dividends, and share prices, because that's ultimately the basis of our return.

LG 2

Discuss the concepts of intrinsic value and required rates of return, and note how they are used. Information such as projected sales, forecasted earnings, and estimated dividends are important in establishing intrinsic value. This is a measure, based on expected return and on risk exposure, of what the stock ought to be worth. A key element is the investor's required rate of return, which is used to define the amount of return that should be earned given the stock's perceived exposure to risk. The more risk in the investment, the more return one should require.

LG 3

Determine the underlying value of a stock using the dividend valuation model, as well as other present value- and price/earnings-based stock valuation models. The dividend valuation model derives the value of a share of stock from the stock's future growth in dividends. Another popular valuation procedure is the dividends-and-earnings approach, which uses a finite investment horizon to derive a present value-based "justified price." There's also the price/earnings approach to stock valuation, which uses projected EPS and the stock's P/E ratio to determine whether a stock is fairly valued. At times, investors find it more convenient to deal in terms of expected returns than in dollar-based justified prices. To do so, one would find the fully compounded rate of return by solving for the discount rate in the present value-based stock valuation model.

LG 4

Gain a basic appreciation of the procedures used to value different types of stock, from traditional dividend-paying shares to new-economy stocks with their extreme price/earnings ratios. Various forms of the dividend valuation model work fine for companies that pay dividends. For those that pay little or nothing in dividends, the dividend-and-earnings and P/E approaches are used. But even these procedures often don't work well with many of the new-economy tech stocks, which may not have dividends, may not even have profits, and may sell at astronomical P/E ratios. To value these stocks, we use the discounted cash flow approach (which is like the D&E approach except that value is based solely on the estimated future price of the stock) or some type of price multiple (usually, the price/sales multiple). Though far from perfect, these procedures at least enable investors to get a rough idea of the value of these high-flying tech stocks.

LG 5

Describe the key attributes of technical analysis, including some popular measures and procedures used to assess the market. Technical analysis is another phase of the analytical process. It deals with the behavior of the stock market itself and the various economic forces at work in the marketplace. A number of tools can be used to assess the state of the market, including market measures like volume of trading, breadth of the market, short-interest positions, odd-lot trading, and relative strength. Some investors use charting to assess the condition of everything from the overall market to specific stocks.

LG 6

Discuss the idea of random walks and efficient markets, and note the challenges these theories hold for the stock valuation process. In recent years, both technical and fundamental analysis have been seriously challenged by the random walk and efficient market hypotheses. Indeed, considerable evidence indicates that stock prices do move in a random fashion. The efficient market hypothesis is an attempt to explain *why* prices behave randomly. The idea behind an efficient market is that available information is always fully reflected in the price of securities, so investors should *not* expect to outperform the market consistently.

Discussion Questions

LG 1

LG 2

LG 3



Q8.1 Using the resources available at your campus or public library, select a company from *Value Line* that would be of interest to you. (*Hint:* Pick a company that's been publicly traded for at least 10 to 15 years, and avoid public utilities, banks, and other financial institutions.) Obtain a copy of the latest *Value Line* report on your chosen company. Using the historical and forecasted data reported in *Value Line*, along with one of the valuation techniques described in this chapter, calculate the maximum (i.e., justified) price you'd be willing to pay for this stock. Use the CAPM to find the required rate of return on your stock. (For this problem, use a market rate of return of 12%, and for the risk-free rate, use the latest 3-month Treasury bill rate.)

- a. How does the justified price you computed above compare to the latest market price of the stock?
- b. Would you consider this stock a worthwhile investment candidate? Explain.

LG 5

Q8.2 Briefly define each of the following, and note the conditions that would suggest the market is technically strong.

- Breadth of the market.
- Short interest.
- The relative strength index (RSI).
- Theory of contrary opinion.
- Head and shoulders.

LG 6

Q8.3 A lot has been written and said about the concept of an *efficient market*. It's probably safe to say that some of your classmates believe the markets are efficient and others believe they are not. Have a debate to see whether you can resolve this issue (at least among yourselves). Pick a side, either for or against efficient markets, and then develop your "ammunition." Be prepared to discuss these three aspects:

- Exactly what is an efficient market? Do such markets really exist?
- Are stock prices always (or nearly always) correctly set in the market? If so, does that mean there's little opportunity to find undervalued stocks?
- Can you find any reason(s) to use fundamental and/or technical analysis in your stock selection process? If not, how would you go about selecting stocks?

LG 4

Q8.4 The *burn rate* is a concept that is often employed to help investors gain insights about performance of tech stocks, especially relatively new high-tech firms (those that have recently gone public). Define the burn rate, and explain how it is used in the valuation of tech stocks. Is it used to actually put a value on tech stocks. Explain.

- Take another look at Table 8.6. Using the 1999 statement of cash flows, find the *monthly* burn rate based on *net cash flows from operations*. (Remember that the statements cover only 9 months.) What is the *monthly* burn rate if you include the net cash flows from *both* operations and investing? If the firm had \$150 million cash on hand, how long would it take to run out of cash at these burn rates? What can the firm do to avoid running out of cash?

Problems

LG 1



P8.1 An investor estimates that next year's sales for New World Products should amount to about \$75 million. The company has 2.5 million shares outstanding, generates a net profit margin of about 5%, and has a payout ratio of 50%. All figures are expected to hold for next year. Given this information, compute the following.

- Estimated net earnings for next year.
- Next year's dividends per share.
- The expected price of the stock (assuming the P/E ratio is 24.5 times earnings).
- The expected holding period return (latest stock price: \$25/share).

LG 2



P8.2 Charlene Lewis is thinking about buying some shares of Education, Inc. at \$50 per share. She expects the price of the stock to rise to \$75 over the next 3 years. During that time she also expects to receive annual dividends of \$5 per share.

- What is the intrinsic worth of this stock, given a 10% required rate of return?
- What is its expected return?

LG 1



P8.3 Amalgamated Aircraft Parts, Inc. is expected to pay a dividend of \$1.50 in the coming year. The required rate of return is 16%, and dividends are expected to grow at 7% per year. Using the dividend valuation model, find the intrinsic value of the company's common shares.

LG 3



P8.4 Assume you've generated the following information about the stock of Bufford's Burger Barns: The company's latest dividends of \$4 a share are expected to

grow to \$4.32 next year, to \$4.67 the year after that, and to \$5.04 in year 3. In addition, the price of the stock is expected to rise to \$77.75 in 3 years.

- Use the dividends-and-earnings model and a required rate of return of 15% to find the value of the stock.
- Use the IRR procedure to find the stock's expected return.
- Given that dividends are expected to grow indefinitely at 8%, use a 15% required rate of return and the dividend valuation model to find the value of the stock.
- Assume dividends in year 3 actually amount to \$5.04, the dividend growth rate stays at 8%, and the required rate of return stays at 15%. Use the dividend valuation model to find the price of the stock at the end of year 3. [Hint: In this case, the value of the stock will depend on dividends in year 4, which equal $D_3 \times (1 + g)$.] Do you note any similarity between your answer here and the forecasted price of the stock (\$77.75) given in the problem? Explain.



LG 3

P8.5 Let's assume that you're thinking about buying stock in West Coast Electronics. So far in your analysis, you've uncovered the following information: The stock pays annual dividends of \$2.50 a share (and that's not expected to change within the next few years—*nor are any of the other variables*). It trades at a P/E of 18 times earnings and has a beta of 1.15. In addition, you plan on using a risk-free rate of 7% in the CAPM, along with a market return of 14%. You would like to hold the stock for 3 years, at the end of which time you think EPS will peak out at about \$7 a share. Given that the stock currently trades at \$70, use the IRR approach to find this security's expected return. Now use the present-value (dividends-and-earnings) model to put a price on this stock. Does this look like a good investment to you? Explain.



LG 3

P8.6 The price of Consolidated Everything is now \$75. The company pays no dividends. Ms. Bossard expects the price 3 years from now to be \$100 per share. Should Ms. B. buy Consolidated E. if she desires a 10% rate of return? Explain.



LG 3

P8.7 This year, Shoreline Light and Gas (SLL&G) paid its stockholders an annual dividend of \$3 a share. A major brokerage firm recently put out a report on SLL&G stating that, in its opinion, the company's annual dividends should grow at the rate of 10% per year for each of the next 5 years and then level off and grow at the rate of 6% a year thereafter.

- Use the variable-growth DVM and a required rate of return of 12% to find the maximum price you should be willing to pay for this stock.
- Redo the SLL&G problem in part (a), this time assuming that after year 5, dividends stop growing altogether (for year 6 and beyond, $g = 0$). Use all the other information given to find the stock's intrinsic value.
- Contrast your two answers and comment on your findings. How important is growth to this valuation model?



LG 3

P8.8 Assume there are three companies that in the past year paid exactly the same annual dividend of \$2.25 a share. In addition, the future annual rate of growth in dividends for each of the three companies has been estimated as follows:

Buggies-Are-Ups	Steady Freddie, Inc.	Gang Buster Group	
$g = 0\%$ (i.e., dividends are expected to remain at \$2.25/share)	$g = 6\%$ (for the foreseeable future)	Year 1	\$2.53
		2	\$2.85
		3	\$3.20
		4	\$3.60
		Year 5 and beyond: $g = 6\%$	

Assume also that as the result of a strange set of circumstances, these three companies all have the same required rate of return ($k = 10\%$).

- Use the appropriate DVM to value each of these companies.
- Comment briefly on the comparative values of these three companies. What is the major cause of the differences among these three valuations?



LG 3

P8.9 New Millenium Company's stock sells at a P/E ratio of 21 times earnings. It is expected to pay dividends of \$2 per share in each of the next 5 years and to generate an EPS of \$5 in year 5. Using the dividends-and-earnings model and a 12% discount rate, compute the stock's justified price.



LG 3

P8.10 A particular company currently has sales of \$250 million; these are expected to grow by 20% next year (year 1). For the year after next (year 2), the growth rate in sales is expected to equal 10%. Over each of the next 2 years, the company is expected to have a net profit margin of 8% and a payout ratio of 50%, and to maintain the number of shares of common stock outstanding at 15 million shares. The stock always trades at a P/E ratio of 15 times earnings, and the investor has a required rate of return of 20%. Given this information:

- Find the stock's intrinsic value (its justified price).
- Use the IRR approach to determine the stock's expected return, given that it is currently trading at \$15 per share.
- Find the holding period returns for this stock for year 1 and for year 2.



LG 2

LG 3

P8.11 Assume a major investment service has just given Oasis Electronics its highest investment rating, along with a strong buy recommendation. As a result, you decide to take a look for yourself and to place a value on the company's stock. Here's what you find: This year, Oasis paid its stockholders an annual dividend of \$3 a share, but because of its high rate of growth in earnings, its dividends are expected to grow at the rate of 12% a year for the next 4 years and then to level out at 9% a year. So far, you've learned that the stock has a beta of 1.80, the risk-free rate of return is 6%, and the expected return on the market is 11%. Using the CAPM to find the required rate of return, put a value on this stock.



LG 3

P8.12 Consolidated Software doesn't currently pay any dividends but is expected to start doing so in 4 years. That is, Consolidated will go 3 more years without paying any dividends, and then is expected to pay its first dividend (of \$3 per share) in the fourth year. Once the company starts paying dividends, it's expected to continue to do so. The company is expected to have a dividend payout ratio of 40% and to maintain a return on equity of 20%. Based on the DVM, and given a required rate of return of 15%, what is the maximum price you should be willing to pay for this stock today?



LG 3

P8.13 Assume you obtain the following information about a certain company:

Total assets	\$50,000,000
Total equity	\$25,000,000
Net income	\$ 3,750,000
EPS	\$5.00 per share
Dividend payout ratio	40%
Required return	12%

Use the constant-growth DVM to place a value on this company's stock.



LG 3

P8.14 You're thinking about buying some stock in Affiliated Computer Corporation and want to use the P/E approach to value the shares. You've estimated that next year's

earnings should come in at about \$4.00 a share. In addition, although the stock normally trades at a relative P/E of 1.15 times the market, you believe that the relative P/E will rise to 1.25, whereas the market P/E should be around $18\frac{1}{2}$ times earnings. Given this information, what is the maximum price you should be willing to pay for this stock? If you buy this stock today at \$87.50, what rate of return will you earn over the next 12 months if the price of the stock rises to \$110.00 by the end of the year? (Assume that the stock doesn't pay any dividends.)



LG 3

P8.15 AviBank Plastics generated an EPS of \$2.75 over the last 12 months. The company's earnings are expected to grow by 25% next year, and because there will be no significant change in the number of shares outstanding, EPS should grow at about the same rate. You feel the stock should trade at a P/E of around 30 times earnings. Use the P/E approach to set a value on this stock.



LG 4

P8.16 World Wide Web Wares (4W, for short) is an online retailer of small kitchen appliances and utensils. The firm has been around for a few years and has created a nice market niche for itself. In fact, it actually turned a profit last year, though a fairly small one. After doing some basic research on the company, you've decided to take a closer look. You plan to use the price/sales ratio to value the stock, and you have collected P/S multiples on the following Internet retailer stocks:

Company	P/S Multiples
Amazing.com	4.5
PotsAnPans Online	12.2
Furnishings.com	1.3
ReallyCooking.com	4.1
Fixtures & Appliances Online	3.8

Pick *three* of these firms to use as your set of comparables, and compute the *average P/S ratio* of those three firms. Given that 4W had sales last year of \$40 million and has 10 million shares of stock outstanding, use the average P/S ratio you computed above to put a value on 4W's stock.

Now repeat the valuation process, but this time use all five of the companies to compute the average P/S ratio. Then use the P/S ratio to value 4W's stock. If you had to put a value on 4W stock, what would it be? Explain. If the stock were trading at \$15 a share right now, would you buy it? Explain.

Case Problem 8.1

Chris Looks for a Way to Invest His Newfound Wealth

LG 1

Chris Norton is a young Hollywood writer who is well on his way to television superstardom. After writing several successful television specials, he was recently named the head writer for one of TV's top-rated sitcoms. Chris fully realizes that his business is a fickle one and, on the advice of his dad and manager, has decided to set up an investment program. Chris will earn about a half-million dollars this year. Because of his age, income level, and desire to get as big a bang as possible from his investment dollars, he has decided to invest in speculative, high-growth stocks.

Chris is currently working with a respected Beverly Hills broker and is in the process of building up a diversified portfolio of speculative stocks. The broker recently sent him information on a hot new issue. She advised Chris to study the numbers and, if he likes them, to buy as many as 1,000 shares of the stock. Among other things, corporate sales for the next 3 years have been forecasted as follows:

Year	Sales (in millions)
1	\$22.5
2	35.0
3	50.0

The firm has 2.5 million shares of common stock outstanding. They are currently being traded at \$70 a share and pay no dividends. The company has a net profit rate of 20%, and its stock has been trading at a P/E of around 40 times earnings. All these operating characteristics are expected to hold in the future.



Questions

- a. Looking first at the stock:
 1. Compute the company's net profits and EPS for each of the next 3 years.
 2. Compute the price of the stock 3 years from now.
 3. Assuming that all expectations hold up and that Chris buys the stock at \$70, determine his expected return on this investment.
 4. What risks is he facing by buying this stock? Be specific.
 5. Should he consider the stock a worthwhile investment candidate? Explain.
- b. Now, looking at Chris's investment program in general:
 1. What do you think of his investment program? What do you see as its strengths and weaknesses?
 2. Are there any suggestions you would make?
 3. Do you think Chris should consider adding foreign stocks to his portfolio? Explain.

Case Problem 8.2

An Analysis of a High-Flying Stock

LG 3

LG 5

Glenn Wilt is a recent university graduate and a security analyst with the Kansas City brokerage firm of Lippman, Brickbats, and Shaft. Wilt has been following one of the hottest issues on Wall Street, C&I Medical Supplies, a company that has turned in an outstanding performance lately and, even more important, has exhibited excellent growth potential. It has 5 million shares outstanding and pays a nominal annual dividend of 5 cents per share. Wilt has decided to take a closer look at C&I to see whether it still has any investment play left. Assume the company's sales for the past 5 years have been as follows:

Year	Sales (in millions)
1997	\$10.0
1998	12.5
1999	16.2
2000	22.0
2001	28.5

Wilt is concerned with the future prospects of the company, not its past. As a result, he pores over the numbers and generates the following estimates of future performance:

Expected net profit margin	12%
Estimated annual dividends per share	5¢
Number of common shares outstanding	No change
P/E ratio at the end of 2002	35
P/E ratio at the end of 2003	50

Questions



a. Determine the average annual rate of growth in sales over the past 5 years. (Assume sales in 1996 amounted to \$7.5 million.)

1. Use this average growth rate to forecast revenues for next year (2002) and the year after that (2003).
2. Now determine the company's net earnings and EPS for each of the next 2 years (2002 and 2003).
3. Finally, determine the expected future price of the stock at the end of this 2-year period.



b. Because of several intrinsic and market factors, Wilt feels that 25% is a viable figure to use for a desired rate of return.

1. Using the 25% rate of return and the forecasted figures you came up with in question (a), compute the stock's justified price.
2. If C&I is currently trading at \$32.50 per share, should Wilt consider the stock a worthwhile investment candidate? Explain.

c. The stock is actively traded on the Nasdaq National Market and enjoys considerable market interest. Recent closing prices are shown in the accompanying table.

1. Prepare a point-and-figure chart of these prices (use a 1-point system—that is, make each box worth \$1).
2. Discuss how these and similar charts are used by technical analysts.
3. Cite several other types of technical measures, and note how they might be used in the analysis of this stock.

Recent Price Behavior: C&I Medical Supplies

14 (8/15/01)	18.55	20	17.50
14.25	17.50	20.21	18.55
14.79	17.50	20.25	19.80
15.50	17.25	20.16	19.50
16	17	20	19.25
16	16.75	20.25	20
16.50	16.50	20.50	20.90
17	16.55	20.80	21
17.25	16.15	20	21.75
17.20	16.80	20	22.50
18	17.15	20.25	23.25
18 (9/30/01)	17.22	20	24
18.55	17.31 (10/31/01)	19.45	24.25
18.65	17.77	19.20	24.15
18.80	18.23	18.25 (11/30/01)	24.75
19	19.22	17.50	25
19.10	20.51	16.75	25.50
18.92	20.15	17	25.55 (12/31/01)

Web Exercises



W8.1 Check out the dividend valuation model (zero growth, constant growth, and non-constant growth) at www.bluebloodcells.com/fun/cs4262/div.html. Using the constant-growth model, a dividend D_0 of 2, an expected growth rate, G , of 15%, a number of years t of 4, and a required equity return, K_e , of 18%, calculate the market price of the stock.

W8.2 ASK Research at www.askresearch.com has one of the best and fastest charting tools. It will provide you with several technical indicators, company news, and portfolio tracking. The pages will automatically refresh themselves with latest quotes and charts. Assume that you are a day trader, and follow the market activity. For example, click on [Nasdaq Composite Index] and compare the Intraday Chart with the On-Balance Volume. Is there a correlation between the movements of the two lines?

W8.3 10K Wizard at www.10kwizard.com provides real-time online access and full text search of EDGAR, thus providing a link to SEC filings. You can view the latest SEC filings of more than 68,000 companies and search historical filings, from the start date of each company's existence, by keywords, phrases, and names. For example, select [Computer/Office Equipment] in the [Industry] box, and type ORCL in the [Ticker] box. This will retrieve a list of recently filed forms for Oracle. Click on the first [10-Q Quarterly report] form. What were Oracle's reported earnings per share? What was its comprehensive income?

W8.4

- NAIC Investor's Tool Kit at www.better-investing.org/computer/toolkit.html provides what you need to analyze and evaluate common stocks for your portfolio. Investor's Toolkit PRO adds the portfolio management tools you will want later to optimize the performance of your portfolio.
- Validea at www.validea.com allows you to analyze an individual stock. Check the "buzz" on your stock by entering ticker symbol ORCL, and click on the [Go] button. Check [Guru Analysis] on this stock by clicking on it. Analyze the report cards from the All Star Gurus. What factors do they consider? How might these opinions influence your estimate of the stock? Check the [Media Buzz] for the stock. What does it report?

W8.5 Find the stock analyzer at www.decisionpoint.com. Click on [Chart Spotlight] for quick technical analysis of the selected stock, market index, and market indicator charts. New charts are featured weekly. Select the article [VXN:New Volatility Index] for the Nasdaq 100 Index for the latest available date. What does the index measure? How does volatility correlate with performance?

W8.6 If you are interested in socially responsible investing, see www.environmentalinvestors.com, www.socialinvest.org, and www.goodmoney.com. Examine a couple of stocks (or mutual funds) at these sites. Can you determine how they qualify as socially responsible investments? How does their performance compare with that of other stocks?

W8.7

- See how to value stocks at www.fool.com/school/howtovaluestocks.htm
- See Internet stock valuation techniques at the following sites:
www.acusd.edu/~mpraum/internetvalue.html
www.timeinc.net/fortune/year.in.review/1998/internetstock.html
www.techweek.com/articles/5-3-99/stockwat.htm

For additional practice with concepts from this chapter, visit

www.awl.com/gitman_joehnk



CFA EXAM QUESTIONS

MAJOR INDEXES

Investing in Common Stocks

Following is a sample of 12 Level-I CFA exam questions that deal with many of the topics covered in Chapters 6, 7, and 8 of this text, including the use of financial ratios, various stock valuation models, technical analysis, and efficient market concepts. (Note: You will find the term, “dividend discount model” used in many of the questions below; read that as “dividend valuation model,” as these two terms have the same meaning).

1. Assume that at the end of the next year, Company A will pay a \$2.00 dividend per share, an increase from the current dividend of \$1.50 per share. After that, the dividend is expected to increase at a constant rate of 5%. If you require a 12% return on the stock, what is the value of the stock?
 - a. \$28.57.
 - b. \$28.79.
 - c. \$30.00.
 - d. \$31.78.

2. The constant-growth dividend discount model will *not* produce a finite value for a stock if the dividend growth rate is:
 - a. above its historical average.
 - b. below its historical average.
 - c. above the required rate of return on the stock.
 - d. below the required rate of return on the stock.

3. Which of the following assumptions is **NOT** required by the constant-growth dividend discount model?
 - a. Dividends grow at a constant rate.
 - b. The stock is sold at some future date.
 - c. The dividend growth rate continues indefinitely.
 - d. The required rate of return is greater than the dividend growth rate.

4. The constant-growth dividend discount model would typically be most appropriate in valuing the stock of a:
 - a. new venture expected to retain all earnings for several years.
 - b. rapidly growing company.
 - c. moderate growth, “mature” company.
 - d. company with valuable assets not yet generating profits.

5. In applying the constant-growth dividend discount model, lowering the market capitalization rate will cause a stock’s intrinsic value to:
 - a. decrease.
 - b. increase.
 - c. remain unchanged.
 - d. decrease or increase, depending upon other factors.

6. A company’s current ratio is 2.0. If the company uses cash to retire notes payable that are due within one year, would this transaction *most likely* increase or decrease the current ratio and total asset turnover ratio, respectively?

<u>Current Ratio</u>	<u>Asset Turnover Ratio</u>
----------------------	-----------------------------

- | | |
|-------------|----------|
| a. Increase | Increase |
| b. Increase | Decrease |
| c. Decrease | Increase |
| d. Decrease | Decrease |

OTHERS

CFA EXAM QUESTIONS

MAJOR INDEXES

+12-MO	
HIGH	LOW

DOW JONES AVERAGE

11722.98	9796.03	30	Industrials
3099.67	2263.59	20	Transportation
397.04	269.20	15	Utilities
3305.46	2751.55	65	Composite
364.71	285.95		DJ US Total

NEW YORK STOCK EXCHANGE

677.58	576.17		Composite
851.94	728.87		Industrials
519.96	443.98		Utilities
493.03	353.57		Transportation
634.16	442.71		Finance

STANDARD & POOR'S

1527.46	1247.41	500	Index
1917.64	1544.13		Industrials
338.42	215.62		Utilities
548.60	369.50	400	MidCap
225.12	168.96	600	SmallCap
324.40	262.26	1500	Index

NASDAQ STOCK MARKET

5048.62	2688.18		Composite
4704.73	2362.11		Nasdaq 100
2841.00	1549.93		Industrials
2075.12	1602.08		Insurance
1837.10	1340.36		Banks
2964.66	1448.32		Computer
1230.06	616.80		Telecommunications

OTHERS

1036.77	774.49		Amex Composite
813.71	646.79		Russell 1000
606.12	455.90		Russell 2000
244.39	157.93		Russell 2000

7. Two companies are identical except for substantially different dividend payout ratios. After several years, the company with the lower dividend payout ratio is *most likely* to have:
- lower stock price.
 - higher debt/equity ratio.
 - less rapid growth of earnings per share.
 - more rapid growth of earnings per share.
8. A share of stock is expected to pay a dividend of \$1.00 one year from now, with growth at 5 percent thereafter. In the context of a dividend discount model, the stock is correctly priced today at \$10. According to the single stage, constant growth dividend discount model, if the required return is 15 percent, the value of the stock two years from now should be:
- \$11.03.
 - \$12.10.
 - \$13.23.
 - \$14.40.
9. Company B paid a \$1.00 dividend per share last year and is expected to continue to pay out 40% of its earnings as dividends for the foreseeable future. If the firm is expected to generate a 10% return on equity in the future, and if you require a 12% return on the stock, what is the value of the stock?
- \$12.50.
 - \$13.00.
 - \$16.67.
 - \$17.67.
10. A stock is not expected to pay dividends until three years from now. The dividend is then expected to be \$2.00 per share, the dividend payout ratio is expected to be 40 percent, and the return on equity is expected to be 15 percent. If the required rate of return is 12 percent, the value of the stock today is *closest to*:
- \$27.
 - \$33.
 - \$53.
 - \$67.
11. A basic assumption of technical analysis in contrast to fundamental analysis is that:
- financial statements provide information crucial in valuing a stock.
 - a stock's market price will approach its intrinsic value over time.
 - aggregate supply of and demand for goods and services are key determinants of stock value.
 - security prices move in patterns, which repeat over long periods.
12. The semi-strong form of the efficient market hypothesis asserts that stock prices:
- fully reflect all historical security market information.
 - fully reflect all public information.
 - fully reflect all relevant information from public and private sources.
 - may be predictable.