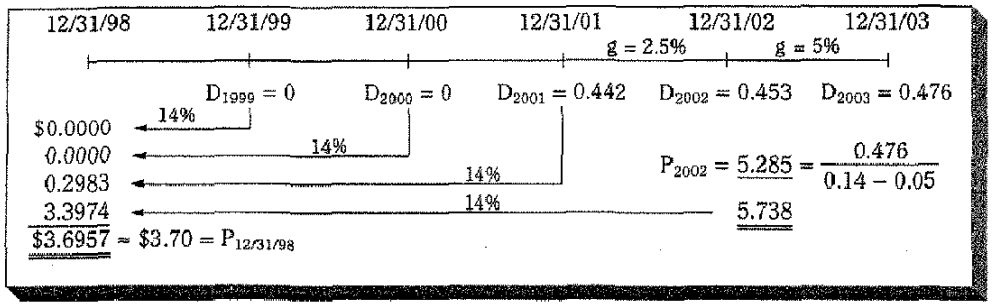
FIGURE 9-7 Using the DCF Dividend Model to Find MagnaVision's Stock Value



pays a dividend of 12 cents versus earnings of about $5, is an example of a company to which you could apply either model.

Now suppose you were trying to estimate the value of a company that has never paid a dividend, such as Microsoft, or a new firm that is about to go public, or a division which GE or some other large company is planning to sell. In all of these situations, you would have no choice: You would have to estimate future financial statements and use the total company valuation model.

Actually, even if a company is paying steady dividends, much can be learned from the corporate value model, so many analysts today use it for all types of valuations. The process of projecting the future financial statements can reveal quite a bit about the company's operations and financing needs. Also, such an analysis can provide insights into actions that might be taken to increase the company's value. This is called *value-based management,* and we discuss it in more detail in Chapter 14.

SELF-TEST QUESTIONS

Write out the equation for the corporate value model, and explain what it does.

What is the terminal, or horizon, value?

What conditions are necessary if one is to use the dividend growth model? When is it essential to use the corporate value model?

Why might someone use the corporate model even though the dividend model could be used?

STOCK MARKET EQUILIBRIUM

Recall from Chapter 5 that the required return on Stock X, k_X, can be found using the Security Market Line (SML) equation as it was developed in our discussion of the Capital Asset Pricing Model (CAPM):

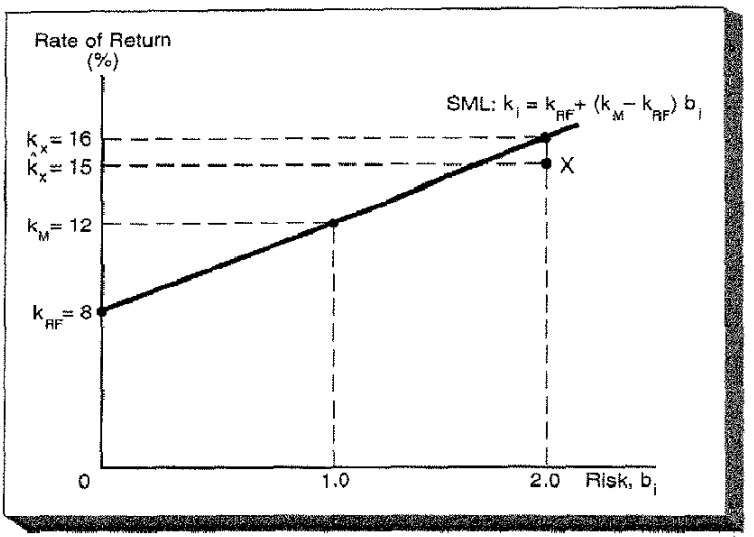
$$k_X = k_{RF} + (k_M - k_{RF})\, b_X.$$

If the risk-free rate of return is 8 percent, the required return on an average stock is 12 percent, and Stock X has a beta of 2, then the marginal investor will require a return of 16 percent on Stock X, calculated as follows:

$$k_X = 8\% + (12\% - 8\%)\, 2.0$$
$$= 16\%.$$

This 16 percent required return is shown as the point on the SML in Figure 9-8 associated with beta = 2.0.

FIGURE 9-8 Expected and Required Returns on Stock X



The **marginal investor** will want to buy Stock X if its expected rate of return is more than 16 percent, will want to sell it if the expected rate of return is less than 16 percent, and will be indifferent, hence will hold but not buy or sell, if the expected return is exactly 16 percent. Now suppose the investor's portfolio contains Stock X, and he or she analyzes the stock's prospects and concludes that its earnings, dividends, and price can be expected to grow at a constant rate of 5 percent per year. The last dividend was $D_0 = \$2.8571$, so the next expected dividend is

$$D_1 = \$2.8571(1.05) = \$3.$$

Our marginal investor observes that the present price of the stock, P_0, is \$30. Should he or she purchase more of Stock X, sell it, or maintain the present position?

The investor can calculate Stock X's *expected rate of return* as follows:

$$\hat{k}_X = \frac{D_1}{P_0} + g = \frac{\$3}{\$30} + 5\% = 15\%.$$

This value is plotted on Figure 9-8 as Point X, which is below the SML. Because the expected rate of return is less than the required return, this investor would want to sell the stock, as would most other holders. However, few people would want to buy at the \$30 price, so the present owners would be unable to find buyers unless they cut the price of the stock. Thus, the price would decline, and this decline would continue until the stock's price reached \$27.27. At that point, the security would be in **equilibrium**, defined as the price at which the expected rate of return, 16 percent, is equal to the required rate of return:

$$\hat{k}_X = \frac{\$3}{\$27.27} + 5\% = 11\% + 5\% = 16\% = k_X.$$

Had the stock initially sold for less than \$27.27, say, at \$25, events would have been reversed. Investors would have wanted to buy the stock because its expected rate of

return exceeded its required rate of return, and buy orders would have driven the price up to $27.27.

To summarize, in equilibrium two related conditions must hold:

1. A stock's expected rate of return as seen by the marginal investor must equal its required rate of return: $\hat{k}_i = k_i$.
2. The actual market price must equal the intrinsic value as estimated by the marginal investor: $P_0 = \hat{P}_0$.

Of course, some individual investors might believe that $\hat{k}_i > k$ and $\hat{P}_0 > P_0$, hence would invest most of their funds in the stock, while others might have an opposite view and would sell all of their shares. However, it is the marginal investor who establishes the actual market price, and for this investor, we must have $\hat{k}_i = k_i$ and $P_0 = \hat{P}_0$. If these conditions do not hold, trading will occur until they do hold.

Changes in Equilibrium Stock Prices

Stock prices are not constant—they undergo violent changes at times. For example, on October 19, 1987, the Dow Jones average dropped 508 points, and the average stock lost about 23 percent of its value on that one day. Some individual stocks lost more than 70 percent of their value. Many investors (and companies) were wiped out, and a number of suicides occurred. On a brighter note, the Dow Jones average has increased by more than 100 points on a number of days during the 1990s. But what goes up often comes down. The Dow dropped 554 points on October 27, 1997, wiping out more than $600 billion of wealth. This was the largest ever single-day point drop, and the 12th worst percentage loss (7.18 percent). On the next day, however, the Dow increased by 337 points, a record single-day increase. At the risk of understatement, the stock market is quite volatile!

To see how such changes can occur, assume that Stock X is in equilibrium, selling at a price of $27.27 per share. If all expectations were exactly met, during the next year the price would gradually rise to $28.63, or by 5 percent. However, many different events could occur to cause a change in the equilibrium price. To illustrate, consider again the inputs used to develop Stock X's price of $27.27, along with some new inputs:

	VARIABLE VALUE	
	ORIGINAL	NEW
Risk-free rate, k_{RF}	8%	7%
Market risk premium, $k_M - k_{RF}$	4%	3%
Stock X's beta coefficient, b_X	2.0	1.0
Stock X's expected growth rate, g_X	5%	6%
D_0	$2.8571	$2.8571
Price of Stock X	$27.27	?

Now give yourself a test: How would the change in each variable, by itself, affect the price, and what is your guess as to the new stock price?

Every change, taken alone, would lead to an *increase* in the price. The first three changes all lower k_X, which declines from 16 to 10 percent:

$$\text{Original } k_X = 8\% + 4\%(2.0) = 16\%.$$

$$\text{New } k_X = 7\% + 3\%(1.0) = 10\%.$$

Using these values together with the new g value, we find that $\hat{P}_0$ rises from \$27.27 to \$75.71.[15]

$$\text{Original } \hat{P}_0 = \frac{\$2.8571(1.05)}{0.16 - 0.05} = \frac{\$3}{0.11} = \$27.27.$$

$$\text{New } \hat{P}_0 = \frac{\$2.8571(1.06)}{0.10 - 0.06} = \frac{\$3.0285}{0.04} = \$75.71.$$

At the new price, the expected and required rates of return will be equal:[16]

$$\hat{k}_X = \frac{\$3.0285}{\$75.71} + 6\% = 10\% = k_X.$$

As this example illustrates, even small changes in the size or riskiness of expected future dividends can cause large changes in stock prices. What might cause investors to change their expectations about future dividends? It could be new information about the specific company, such as preliminary results for an R&D program, initial sales of a new product, or the discovery of harmful side effects from the use of an existing product. Or, new information that will affect many companies could arrive, such as a tightening of interest rates by the Federal Reserve. Given the existence of computers and telecommunications networks, new information hits the market on an almost continuous basis, and it causes frequent and sometimes large changes in stock prices. In other words, *ready availability of information causes stock prices to be volatile!*

If a stock's price is stable, that probably means that little new information is arriving. But if you think it's risky to invest in a volatile stock, imagine how risky it would be to invest in a stock which rarely released new information about its sales or operations. It may be bad to see your stock's price jump around, but it would be a lot worse to see a stable quoted price most of the time but then to see huge moves on the rare days when new information was released. Fortunately, in our economy timely information is readily available. Evidence suggests that stocks, especially those of large companies, adjust rapidly to new information. Consequently, equilibrium ordinarily exists for any given stock, and required and expected returns are generally equal. Stock prices certainly change, sometimes violently and rapidly, but this simply reflects changing conditions and expectations. There are, of course, times when a stock appears to react for several months to favorable or unfavorable developments, but this does not signify a long adjustment period; rather, it simply indicates that as more new pieces of information about the situation become available, the market adjusts to them. The ability of the market to adjust to new information is discussed in the next section.

The Efficient Markets Hypothesis

A body of theory called the **Efficient Markets Hypothesis (EMH)** holds (1) that stocks are always in equilibrium and (2) that it is impossible for an investor to consistently "beat the market." Essentially, those who believe in the EMH note that there are 100,000 or so full-time, highly trained, professional analysts and traders operating in

[15]A price change of this magnitude is by no means rare. The prices of *many* stocks double or halve during a year. For example, during 1996, TSR, a software firm, increased in value by 967 percent. On the other hand, Best Products, a catalog retailer, fell by 99.7 percent.

[16]It should be obvious by now that *actual realized* rates of return are not necessarily equal to expected and required returns. Thus, an investor might have *expected* to receive a return of 15 percent if he or she had bought TSR or Best Products stock in 1996, but, after the fact, the realized return on TSR was far above 15 percent, whereas that on Best Products was far below.

the market, while there are fewer than 3,000 major stocks. Therefore, if each analyst followed 30 stocks (which is about right, as analysts tend to specialize in the stocks in a specific industry), there would on average be 1,000 analysts following each stock. Further, these analysts work for organizations such as Citibank, Merrill Lynch, Prudential Insurance, and the like, which have billions of dollars available with which to take advantage of bargains. In addition, as a result of SEC disclosure requirements and electronic information networks, as new information about a stock becomes available, these 1,000 analysts generally receive and evaluate it at about the same time. Therefore, the price of a stock will adjust almost immediately to any new development.

Levels of Market Efficiency

If markets are efficient, stock prices will rapidly reflect all available information. This raises an important question: What types of information are available and, therefore, incorporated into stock prices? Financial theorists have discussed three forms, or levels, of market efficiency.

Weak-Form Efficiency. The **weak form** of the EMH states that all information contained in past price movements is fully reflected in current market prices. If this were true, then information about recent trends in stock prices would be of no use in selecting stocks — the fact that a stock has risen for the past three days, for example, would give us no useful clues as to what it will do today or tomorrow. People who believe that weak-form efficiency exists also believe that "tape watchers" and "chartists" are wasting their time.[17]

For example, after studying the past history of the stock market, a chartist might "discover" the following pattern: If a stock falls three consecutive days, its price typically rises 10 percent the following day. The technician would then conclude that investors could make money by purchasing a stock whose price has fallen three consecutive days.

But if this pattern truly existed, wouldn't other investors also discover it, and if so, why would anyone be willing to sell a stock after it had fallen three consecutive days if they know the stock's price is expected to increase by 10 percent the next day? In other words, if a stock is selling at $40 per share after falling three consecutive days, why would investors sell the stock if they expected it to rise to $44 per share one day later? Those who believe in weak-form efficiency argue that if the stock would really rise to $44 per share tomorrow, its price *today* would actually rise to somewhere near $44 per share immediately, thereby eliminating the trading opportunity. Consequently, weak-form efficiency implies that any information that comes from past stock prices is rapidly incorporated into the current stock price.

Semistrong-Form Efficiency. The **semistrong form** of the EMH states that current market prices reflect all *publicly available* information. Therefore, if semistrong-form efficiency exists, it would do no good to pore over annual reports or other published data, because market prices would have adjusted to any good or bad news contained in such reports back when the news came out. With semistrong-form efficiency, investors should expect to earn the returns predicted by the SML, but they should not expect to do any better unless they have good luck or information that is not publicly available. However, insiders (for example, the presidents of companies) who have information

[17]Tape watchers are people who watch the NYSE tape, while chartists plot past patterns of stock price movements. Both are called "technicians," and both believe that they can tell if something is happening to the stock that will cause its price to move up or down in the near future.

which is not publicly available can earn abnormal returns (returns higher than those predicted by the SML) even under semistrong-form efficiency.

Another implication of semistrong-form efficiency is that whenever information is released to the public, stock prices will respond only if the information is different from what had been expected. If, for example, a company announces a 30 percent increase in earnings, and if that increase is about what analysts had been expecting, the announcement should have little or no effect on the company's stock price. On the other hand, the stock price would fall if analysts had expected earnings to increase by more than 30 percent, but it would rise if they had expected a smaller increase.

Strong-Form Efficiency. The **strong form** of the EMH states that current market prices reflect all pertinent information, whether publicly available or privately held. If this form holds, even insiders would find it impossible to earn abnormal returns in the stock market.[18]

Many empirical studies have been conducted to test for the three forms of market efficiency. Most of these studies suggest that the stock market is indeed highly efficient in the weak form and reasonably efficient in the semistrong form, at least for the larger and more widely followed stocks. However, the strong-form EMH does not hold, so abnormal profits can be made by those who possess inside information.

Implications of Market Efficiency

What bearing does the EMH have on financial decisions? Since stock prices do seem to reflect public information, most stocks appear to be fairly valued. This does not mean that new developments could not cause a stock's price to soar or to plummet, but it does mean that stocks in general are neither overvalued nor undervalued—they are fairly priced and in equilibrium. However, there are certainly cases in which corporate insiders have information not known to outsiders.

If the EMH is correct, it is a waste of time for most of us to analyze stocks by looking for those that are undervalued. If stock prices already reflect all publicly available information, and hence are fairly priced, one can "beat the market" only by luck, and it is difficult, if not impossible, for anyone to consistently outperform the market averages. Empirical tests have shown that the EMH is, in its weak and semistrong forms, valid. However, people such as corporate officers who have inside information can do better than the averages, and individuals and organizations that are especially good at digging out information on small, new companies also seem to do consistently well. Also, some investors may be able to analyze and react more quickly than others to releases of new information, and these investors may have an advantage over others. However, the buy-sell actions of those investors quickly bring market prices into equilibrium. Therefore, it is generally safe to assume that $\hat{k} = k$, that $\hat{P}_0 = P_0$, and that stocks plot on the SML.[19]

[18]Several cases of illegal insider trading have made the news headlines. These cases involved employees of several major investment banking houses and even an employee of the SEC. In the most famous case, Ivan Boesky admitted to making $50 million by purchasing the stock of firms he knew were about to be acquired. He went to jail, and he had to pay a large fine, but he helped disprove the strong-form EMH.

[19]Market efficiency also has important implications for managerial decisions, especially those pertaining to common stock issues, stock repurchases, and tender offers. Stocks appear to be fairly valued, so decisions based on the premise that a stock is undervalued or overvalued must be approached with caution. However, managers do have better information about their own companies than outsiders, and this information can legally be used to the companies' (but not the managers') advantage.

We should also note that some Wall Street pros have consistently beaten the market over many years, which is inconsistent with the EMH. An interesting article in the April 3, 1995, issue of *Fortune* (Terence P. Paré, "Yes, You Can Beat the Market") argued strongly against the EMH. Paré suggested that each stock

RUN-UPS BEFORE DEALS: CHICANERY OR COINCIDENCE?

Most studies find that markets are not strong-form efficient—the market can be beaten by those with access to inside information. Inside information is particularly valuable when it comes to corporate takeovers.

An article in *Business Week* claimed that one out of every three big mergers in 1994 was preceded by suspicious insider trading. For example, the day before American Home Products launched a $95 per share hostile takeover bid for American Cyanamid, there was heavy trading in Cyanamid, and its stock price jumped from $60⅝ to $63 a share. The article went on to document a number of similar cases, all with sharp run-ups in the target firms' stock prices just before merger announcements.

The Securities and Exchange Commission (SEC), which is responsible for policing insider trading, regularly investigates such cases to determine whether there was any illegal insider trading. To be sure, some preannouncement run-ups are undoubtedly legitimate—perhaps a large number of buy orders just randomly came in, or, more likely, perhaps some market professionals guessed correctly that a merger was likely. However, there are cases in which the evidence strongly suggests information was "leaked" prior to the takeover. Harry C. Johnson, chairman and president of Red Eagle Resources Corporation, which was recently acquired by Lomak Petroleum, put it best after he saw the stock price of his company rise 16 percent the day before the deal was announced: "When there are a lot of people involved in a deal, you have to believe in the tooth fairy to think there can't be leakage."

SOURCE: Adapted from "Insider Trading," *Business Week*, December 12, 1994.

SELF-TEST QUESTIONS

For a stock to be in equilibrium, what two conditions must hold?

What is the Efficient Markets Hypothesis (EMH)?

What is the difference among the three forms of the EMH: (1) weak form, (2) semi-strong form, and (3) strong form?

What are the implications of the EMH for financial decisions?

ACTUAL STOCK PRICES AND RETURNS

Our discussion thus far has focused on *expected* stock prices and *expected* rates of return. Anyone who has ever invested in the stock market knows that there can be, and there generally are, large differences between *expected* and *realized* prices and returns.

We can use IBM to illustrate this point. In early 1991, IBM's stock price was about $120 per share. Its 1990 dividend, D_0, was $4.84, but analysts expected the dividend to grow at a constant rate of about 8 percent in the future. Thus, an average investor who bought IBM at a price of $120 expected to earn about 12.4 percent:

$$\hat{k}_s = \begin{matrix}\text{Expected dividend}\\ \text{yield}\end{matrix} + \begin{matrix}\text{Expected growth rate, which is also}\\ \text{the expected capital gains yield}\end{matrix}$$

$$= \frac{D_0(1+g)}{P_0} + g = \frac{\$5.23}{\$120} + 8\%$$

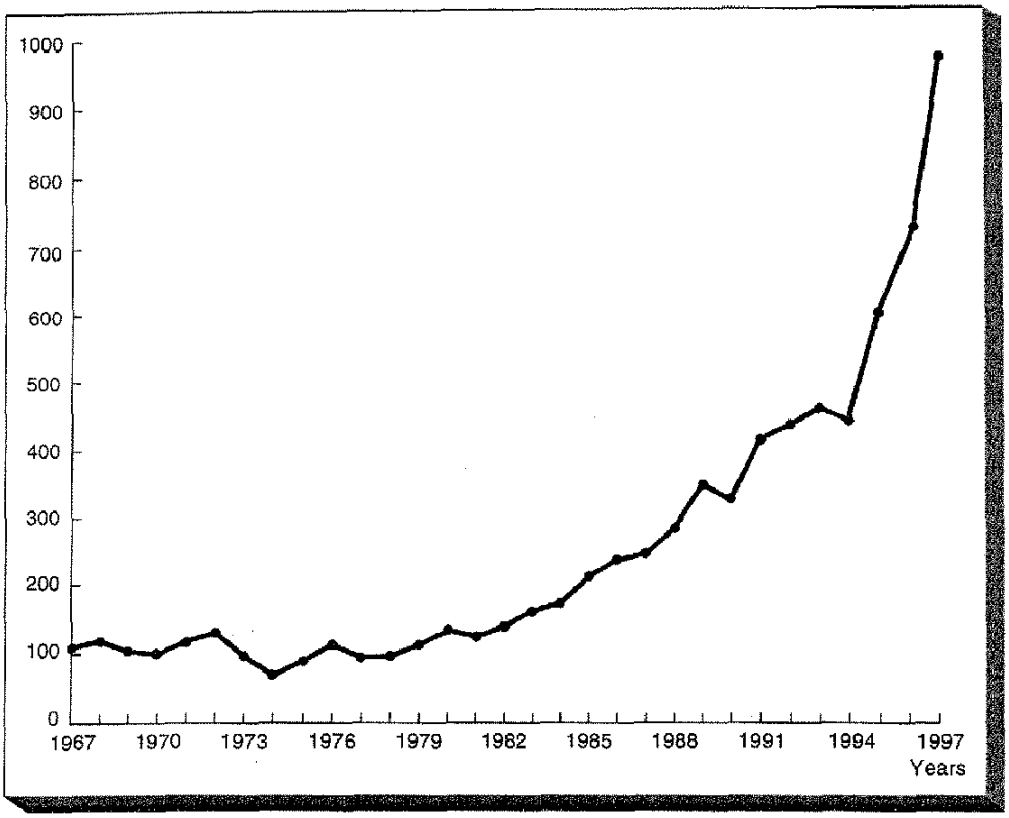
$$= 4.4\% + 8.0\% = 12.4\%.$$

a fundamental value, but when good or bad news about it is announced, most investors fail to interpret this news correctly. As a result, stocks are generally priced above or below their long-term values.

Think of a graph with stock price on the vertical axis and years on the horizontal axis. A stock's fundamental value might be moving up steadily over time as it retains and reinvests earnings. However, its actual price might fluctuate about the intrinsic value line, overreacting to good or bad news and indicating departures from equilibrium. Successful value investors, according to the article, use fundamental analysis to identify stocks' intrinsic values, and then they buy stocks that are undervalued and sell those that are overvalued.

Paré's argument implies that the market is systematically out of equilibrium and that investors can act on this knowledge to beat the market. That position may turn out to be correct, but it may also be that the superior performance Paré noted simply demonstrates that some people are better at obtaining and interpreting information than others, or have been lucky in the past.

FIGURE 9-9 S&P 500 Index, 1967–1997



SOURCE: Data taken from various issues of *The Wall Street Journal*, "Stock Market Data Bank" section.

In fact, things did not work out as expected. IBM's share of the computer market in 1991 was weaker than had been predicted, so IBM's earnings did not grow as fast as expected, and its dividend remained at $4.84. So, rather than growing, IBM's stock price declined, and it closed on December 31, 1991, at $89, down $31 for the year. Thus, on a beginning-of-the-year investment of $120, the annual return on IBM for 1991 was –21.8 percent:

$$\bar{k}_s = \text{Actual dividend yield} + \text{Actual capital gains yield}$$

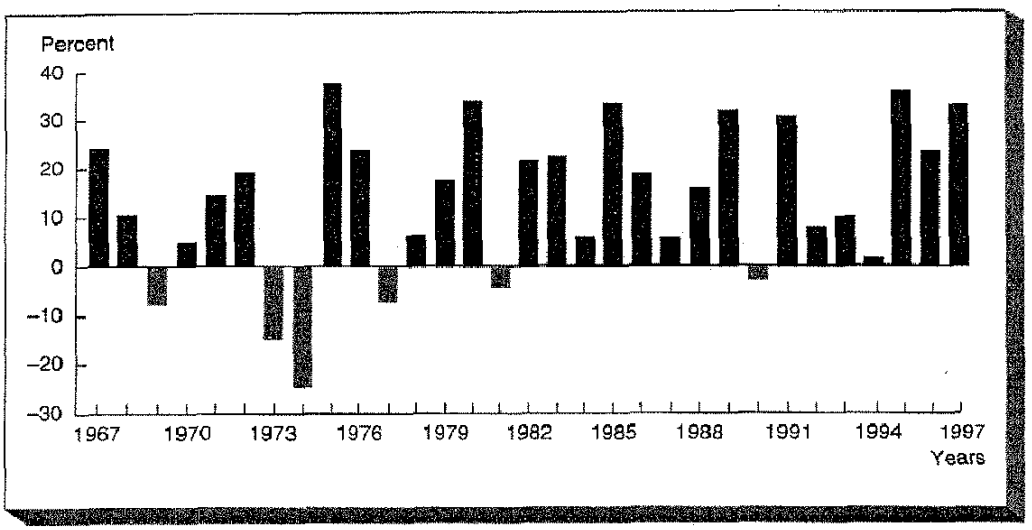
$$= \frac{\$4.84}{\$120} + \frac{-\$31}{\$120} = 4.0\% - 25.8\% = -21.8\%.$$

Many other stocks performed similarly to IBM, or worse, in 1991.

By contrast, IBM's realized returns in recent years have been higher than expected. IBM's shareholders enjoyed a total return of roughly 25 percent in 1995, 67 percent in 1996, and 38 percent in 1997. A turnaround of the company's fortunes, combined with a strong overall market, led to these better-than-expected results.

Figure 9-9 shows how the market value of a portfolio of stocks has moved in recent years, and Figure 9-10 shows how total realized returns on the portfolio have varied from year to year. The market trend has been strongly up, but it has gone up in some

FIGURE 9-10 S&P 500 Index, Total Returns: Dividend Yield + Capital Gain or Loss, 1967–1997



Source: *Stocks, Bonds, Bills, and Inflation: 1998 Yearbook* (Chicago: Ibbotson Associates, 1998).

years and down in others, and the stocks of individual companies have likewise gone up and down.[20] We know from theory that expected returns, as estimated by a marginal investor, are always positive, but in some years, as Figure 9-10 shows, actual returns are negative. Of course, even in bad years some individual companies do well, so "the name of the game" in security analysis is to pick the winners. Financial managers attempt to take actions which will put their companies into the winners' column, but they don't always succeed. In subsequent chapters, we will examine the actions that managers can take to increase the odds of their firms doing relatively well in the marketplace.

Investing in International Stocks

As noted in Chapter 5, the U.S. stock market amounts to only 35 percent of the world stock market, and this is prompting many U.S. investors to hold at least some foreign stocks. Analysts have long touted the benefits of investing overseas, arguing that foreign stocks both improve diversification and provide good growth opportunities. For example, after the U.S. stock market rose an average of 17.5 percent a year during the 1980s, many analysts thought that the U.S. market in the 1990s was due for a correction, and they suggested that investors should increase their holdings of foreign stocks.

To the surprise of many, however, U.S. stocks have outperformed foreign stocks thus far in the 1990s — they have gained about 15 percent a year versus only 3 percent for foreign

[20] If we constructed graphs like Figures 9-9 and 9-10 for individual stocks rather than for a large portfolio, far greater variability would be shown. Also, if we constructed a graph like Figure 9-10 for bonds, it would have the same general shape, but the bars would be somewhat smaller, indicating that gains and losses on bonds are generally smaller than those on stocks. Above-average bond returns occur in years when interest rates decline, and losses on bonds occur only when interest rates rise sharply.

INVESTING IN EMERGING MARKETS

Given the possibilities of better diversification and higher returns, U.S. investors have been putting more and more money into foreign stocks. While many investors limit their foreign holdings to developed countries such as Japan, Germany, Canada, and the United Kingdom, others have broadened their portfolios to include emerging markets such as South Korea, Mexico, Singapore, Taiwan, and Russia.

Emerging markets provide opportunities for larger returns, but they also entail greater risks. For example, Russian stocks rose more than 150 percent in the first half of 1996, as it became apparent that Boris Yeltsin would be reelected president. By contrast, if you had invested in Taiwanese stocks, you would have lost 30 percent in 1995—a year in which most stock markets performed extremely well.

Stocks in emerging markets are intriguing for two reasons. First, developing nations have the greatest potential for growth. Second, while stock returns in developed countries often move in sync with one another, stocks in emerging markets march to their own drummers. Therefore, the correlation between U.S. stocks and those in emerging markets are generally lower than between U.S. stocks and those of other developed countries. Thus, correlation data suggest that emerging markets improve the diversification of U.S. investors' portfolios. (Recall from Chapter 5 that the lower the correlation, the better the diversification.)

On the other hand, stocks in emerging markets are often extremely risky, they are less liquid, they involve higher transaction costs, and most U.S. investors do not have ready access to information on the companies involved. To reduce these problems, mutual fund companies have created *country funds*, which invest in "baskets of stocks," for many emerging nations.

stocks. Figure 9-11 shows how stocks in different countries performed in 1997. In each case, the lower number in the white box indicates how stocks in that country performed in terms of its local currency, while the upper number shows how the country's stocks performed in terms of the U.S. dollar. For example, in 1997 Australian stocks rose by 9.5 percent, but the Australian dollar declined more than 19 percent versus the U.S. dollar. Therefore, if U.S. investors had bought Australian stocks, they would have made 9.5 percent in Australian dollar terms, but those Australian dollars would have bought 19 percent fewer dollars, so the effective return would have been −10.3 percent. So, the results of foreign investments depend in part on what happens to the exchange rate. Indeed, when you invest overseas, you are making two bets: (1) that foreign stocks will increase in their local markets and (2) that the currencies in which you will be paid will rise relative to the dollar.

Despite the fact that U.S. stocks have outperformed foreign stocks in recent years, this by no means suggests that investors should avoid foreign stocks. Foreign investments still improve diversification, and it is inevitable that there will be years when foreign stocks outperform domestic stocks. When this occurs, U.S. investors will be glad they put some of their eggs in overseas markets.

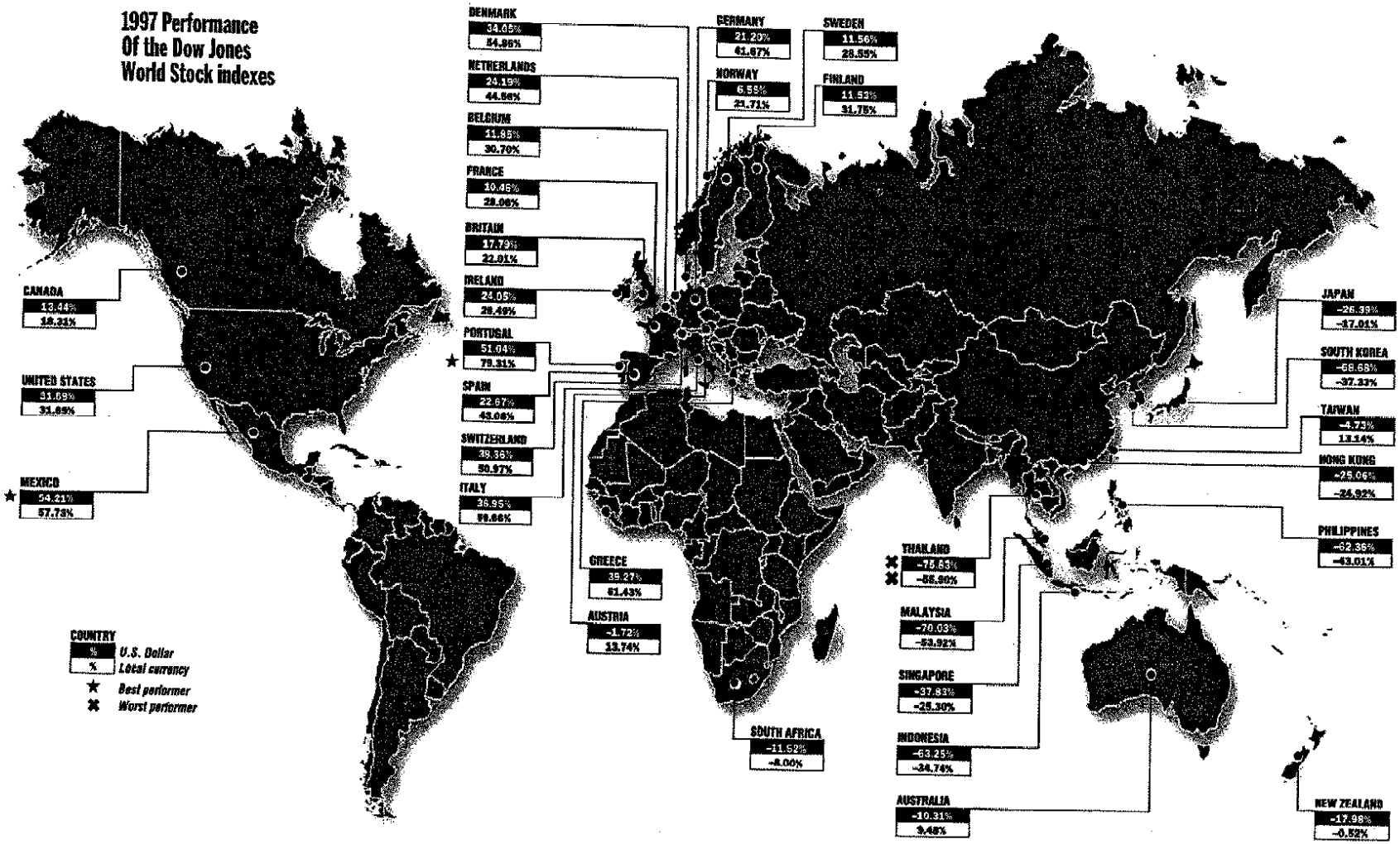
Stock Market Reporting

Figure 9-12, taken from a daily newspaper, is a section of the stock market page for stocks listed on the NYSE. For each stock, the NYSE report provides specific data on the trading that took place the prior day. Similar information is available for stocks listed on the other exchanges as well as for the larger stocks traded over the counter.

Stocks are listed alphabetically, from AAR Industries to Zweig; the data in Figure 9-12 were taken from the top of the listing. We examine the data for Abbott Laboratories, AbbotLab, shown about three-fourths down the table. The two columns on the left show the highest and lowest prices at which the stocks have sold during the past year; Abbott Labs has traded in the range from $68 15/16 to $47 3/8 during the preceding 52 weeks. The figure just to the right of the company's ticker symbol is the dividend. Abbott Labs had a current indicated annual dividend rate of $1.08 per share and a dividend yield (which is the current dividend divided by the closing stock price) of 1.7 per

FIGURE 9-11 1997 Performance of the Dow Jones World Stock Indexes

FIGURE 9-11 1997 Performance of the Dow Jones World Stock Indexes



SOURCE: "1997 Performance of the Dow Jones World Stock Indexes," *The Wall Street Journal,* January 2, 1998, R10. © 1997 Dow Jones & Company, Inc. All Rights Reserved Worldwide.

FIGURE 9-12 Stock Market Transactions, September 19, 1997

Quotations as of 5 p.m. Eastern Time
Friday, September 19, 1997

52 Weeks Hi	Lo	Stock	Sym	Div	Yld %	PE	Vol 100s	Hi	Lo	Close	Net Chg
		-A-A-A-									
38⅞	22⅞	AAR	AIR	.48	1.4	23	816	33 15/16	33½	33 15/16	...
▲ 26¼	15½	ABM Indus	ABM	.40	1.5	23	120	26½	26	26⅛	+ ⅛
n 24¼	18⅜	ABN AMRO ADR	AAR	.25p	...	...	832	20⅛	20¼	20⅛	− ¼
10¼	9¾	ACM Gvt Fd	ACG	.80a	8.3	...	733	10⅛	10⅛	10 11/16	...
8	6⅞	ACM OppFd	AOF	.63	8.1	...	148	7 15/16	7 15/16	7 15/16	− 1/16
10¼	8¾	ACM SecFd	GSF	.90	8.9	...	998	10⅛	10	10⅛	...
7	6¼	ACM SpctrmFd	SI	.57	8.8	...	437	6⅝	6½	6½	...
14⅞	11⅜	ACM MgmdInc	ADF	1.35	9.2	...	379	14⅝	14 9/16	14⅝	...
10 9/16	9¼	ACM MgdIncFd	AMF	.90	8.8	...	688	10⅜	10⅜	10 3/16	− 1/16
14	12⅛	ACM MuniSec	AMU	.90	6.5	...	49	14	13 15/16	13 15/16	+ 1/16
27⅛	16⅝	▲ACX Tch A	ACX		...	dd	168	26 15/16	26⅛	26¾	− ⅛
s 42¼	16⅛	▲AES Cp	AES		...	45	4173	41 15/16	41⅝	41 13/16	+ 3/16
57⅞	34	▲AFLAC	AFL	.46	.8	13	2408	56 3/16	55⅝	55⅝	− ½
36⅛	22⅞	AGCO Cp	AG	.04	.1	14	2383	34½	34⅛	34 1/16	+ ⅛
22	18⅜	AGL Res	ATG	1.08	5.8	14	1047	19 1/16	19 1/16	19⅛	− 3/16
20¼	11½	AgSvcAm	ASV		...	20	421	19¼	19	19⅛	− ⅛
nk 25¾	25	AICI CapTr pf		.35p	...	...	362	25⅝	25⅛	25⅝	...
20⅜	13⅛	AJL PepsTr	AJP	1.44	9.1	...	483	15 15/16	15⅝	15¾	+ ⅛
24¾	20¼	▲AMLI Residntl	AML	1.72	7.5	19	616	23 9/16	22⅞	23	− 1 1/16
55⅝	32⅞	▲AMP	AMP	1.04	1.9	46	5827	55⅛	54 3/16	55⅛	+ ⅛
118½	78¼	AMR	AMR		...	10	12045	118	114 9/16	116¼	+ 1 7/16
50¾	40⅛	▲ARCO Chm	RCM	2.80	6.3	18	432	45⅛	44¾	44¾	− ⅛
f 41	28 13/16	ASA	ASA	1.20	4.2	...	720	29 3/16	28 11/16	28 11/16	− ¾
s 45 9/16	30¾	AT&T	T	1.32	3.0	14	59865	44 9/16	43⅞	44	− 3/16
35⅛	27⅞	AXA-UAP ADR	AXA	.65p	...	...	363	33⅜	33	33½	+ ⅛
s 40¾	10½	AamesFnl	AAM	.13	.8	91	8132	17⅛	16¾	16½	− ½
n 26⅛	24½	AbbeyNtl		2.19	8.4	...	49	26⅛	25 15/16	26	...
66 15/16	47⅜	AbbotLab	ABT	1.08	1.7	25	14249	64 15/16	63 9/16	64 7/16	+ 1 1/16
nl 27 1/16	12½	Abercrombie A	ANF		...	...	806	27 9/16	26 15/16	27¼	+ 1/16
21	12⅜	Abitibi g	ABY	.40	...	...	444	17 13/16	17⅝	17 13/16	+ 3/16
24¾	17⅜	▲Acceptins	AIF		...	12	327	24 9/16	23 15/16	24⅛	− 1/16
▲ 31	15¾	AccuStaff	ASI		...	53	5743	31⅜	30⅜	31⅛	+ ⅜
▲ 69¾	46⅞	ACE Ltd	ACL	.88	1.0	13	1733	93⅜	91 15/16	92⅝	+ 3⅜
10⅜	6⅛	AcmeElec	ACE		...	cc	179	7⅛	7 1/16	7 1/16	...
21⅜	13	AcmeMetals	AMI		...	dd	215	16 15/16	16 1/16	16 1/16	− 1/16
n 24⅝	14	ACNielsen	ART		...	...	2022	24	23 15/16	23⅝	+ ⅜

NOTES: The "pf" following the stock name of the AICI Captr listing tells us that this one is a preferred stock rather than a common stock. A "▲" preceding the columns containing a stock's 52-week high and low prices indicates that the price hit a new 52-week high, whereas a "▼" indicates a new 52-week low. An "x" preceding the columns containing the 52-week high and low prices indicates that the stock went ex-dividend that day; this means that someone who buys the stock will not receive the next dividend. An "s" preceding the 52-week high and low prices indicates that the stock was split within the past 52 weeks. (See Chapter 17 for a discussion of stock splits.) AT&T had a stock split during the past 52-week period. An "n" preceding the 52-week high and low prices indicates that the stock is newly issued within the past 52 weeks. There were four stocks in Figure 9-12 that were newly issued within the past 52 weeks. Those companies whose listings are underlined have had large changes in volume compared with average trading volume. An "a" following the dividend column indicates an extra dividend in addition to the regular dividend, while an "f" following the dividend column indicates that the annual dividend was increased on the last declaration date. An "e" following the dividend column indicates that a dividend was declared or paid in the preceding 12 months, but there is no regular dividend rate. A "j" following the dividend column indicates the dividend paid this year, however, at the last dividend meeting a dividend was omitted or deferred. An "m" following the dividend column indicates that the dividend was reduced when the Board last declared the dividend. A "p" following the dividend column indicates that this is an initial dividend and that no yield is calculated. A "dd" in the PE column indicates a loss in the most recent four quarters, and a "cc" in the PE column indicates that the PE ratio is 100 or more. Finally, a "club" appearing before the company name indicates that *Journal* readers can obtain a copy of the company's annual report.

SOURCE: *The Wall Street Journal,* September 22, 1997, C3.

cent. Next comes the ratio of the stock's price to its last 12 months' earnings (the PE ratio), followed by the volume of trading for the day: 1,424,900 shares of Abbott Labs stock were traded on September 19, 1997. Following the volume come the high and low prices for the day, and then the closing price. On September 19, Abbott Labs traded as high as $64 15/16 and as low as $63 9/16, while the last trade was at $64 7/16. The last column gives the change from the closing price on the previous day. Abbott Labs' closing price was up 1/16 from the previous day's closing price.

SELF-TEST QUESTIONS

If a stock is *not* in equilibrium, explain how financial markets adjust to bring it into equilibrium.

Explain why expected, required, and realized returns are often different.

What are the key benefits of adding foreign stocks to a portfolio?

When a U.S. investor purchases foreign stocks, what two things is he or she hoping will happen?

PREFERRED STOCK[21]

Preferred stock is a *hybrid*—it is similar to bonds in some respects and to common stock in others. The hybrid nature of preferred stock becomes apparent when we try to classify it in relation to bonds and common stock. Like bonds, preferred stock has a par value and a fixed amount of dividends which must be paid before dividends can be paid on the common stock. However, if the preferred dividend is not earned, the directors can omit (or "pass") it without throwing the company into bankruptcy. So, although preferred stock has a fixed payment like bonds, a failure to make this payment will not lead to bankruptcy.

As noted above, preferred stocks entitle their owners to regular, fixed dividend payments. If the payments last forever, the issue is a perpetuity whose value, V_{ps}, is found as follows:

$$V_{ps} = \frac{D_{ps}}{k_{ps}}. \tag{9-8}$$

V_{ps} is the value of the preferred stock, D_{ps} is the preferred dividend, and k_{ps} is the required rate of return. MicroDrive has preferred stock outstanding which pays a dividend of $10 per year. If the required rate of return on this preferred stock is 10 percent, its value is $100, found by solving Equation 9-8 as follows:

$$V_{ps} = \frac{\$10.00}{0.10} = \$100.00.$$

If we know the current price of a preferred stock and its dividend, we can solve for the rate of return:

$$k_{ps} = \frac{D_{ps}}{V_{ps}}. \tag{9-8a}$$

Some preferred stocks have a stated maturity date, say, 50 years. If MicroDrive's preferred matured in 50 years, paid a $10 annual dividend, and had a required return of 8 percent, then we could find its price as follows: Enter N = 50, I = 8, PMT = 10, and FV = 100. Then press PV to find the price, V_{ps} = $124.47. If k = I = 10%, change I = 8 to I = 10, and find P = V_{ps} = PV = $100. If you know the price of a share of preferred stock, you can solve for I to find the expected rate of return, $\hat{k}_{ps}$.

Most preferred stock pays dividends quarterly. This is true for MicroDrive, so we could find the effective rate of return on its preferred stock (perpetual or maturing) as follows:

$$EFF\% = EAR_{ps} = \left(1 + \frac{k_{Nom}}{m}\right)^m - 1 = \left(1 + \frac{0.10}{4}\right)^4 - 1 = 10.38\%.$$

If an investor wanted to compare the returns on MicroDrive's bonds and its preferred stock, it would be best to convert the nominal rates on each security to effective rates and then compare these "equivalent annual rates."

[21]Additional information on preferred stock is provided in Chapter 20.

SELF-TEST QUESTIONS

Explain the following statement: "Preferred stock is a hybrid security."

Is the equation used to value preferred stock more like the one used to evaluate a bond or the one used to evaluate a "normal" common stock?

SUMMARY

Corporate decisions should be analyzed in terms of how alternative courses of action are likely to affect a firm's value. However, it is necessary to know how stock prices are established before attempting to measure how a given decision will affect a specific firm's value. This chapter showed how stock values are determined, and also how investors go about estimating the rates of return they expect to earn. The key concepts covered are summarized below.

- A **proxy** is a document which gives one person the power to act for another person, typically the power to vote shares of common stock. A **proxy fight** occurs when an outside group solicits stockholders' proxies in an effort to vote a new management team into office.
- A **takeover** occurs when a person or group succeeds in ousting a firm's management and taking control of the company.
- Stockholders often have the right to purchase any additional shares sold by the firm. This right, called the **preemptive right,** protects the control of the present stockholders and prevents dilution of their stock's value.
- Although most firms have only one type of common stock, in some instances **classified stock** is used to meet the special needs of the company. One type of classified stock is **founders' shares.** This is stock owned by the firm's founders that carries sole voting rights but restricted dividends for a specified number of years.
- A **closely held corporation** is one that is owned by a few individuals who are typically associated with the firm's management.
- A **publicly owned corporation** is one that is owned by a relatively large number of individuals who are not actively involved in its management.
- Whenever stock in a closely held corporation is offered to the public for the first time, the company is said to be **going public.** The market for stock that is just being offered to the public is called the **initial public offering (IPO) market.**
- The **value of a share of stock** is calculated as the **present value of the stream of dividends** the stock is expected to provide in the future.
- The equation used to find the **value of a constant growth stock** is:

$$\hat{P}_0 = \frac{D_1}{k_s - g}.$$

- The **total rate of return** from a stock consists of a **dividend yield** plus a **capital gains yield.** For a constant growth firm, both the expected dividend yield and the expected capital gains yield are constant.
- The equation for $\hat{k}_s$, the **expected rate of return on a constant growth stock,** can be expressed as follows:

$$\hat{k}_s = \frac{D_1}{P_0} + g.$$

- A **zero growth stock** is one whose future dividends are not expected to grow at all, while a **supernormal growth stock** is one whose earnings and dividends are expected to grow much faster than the economy as a whole over some specified time period and then to grow at the "normal" rate.
- To find the **present value of a supernormal growth stock,** (1) find the dividends expected during the supernormal growth period, (2) find the price of the stock at the end of the supernormal growth period, (3) discount the dividends and the projected price back to the present, and (4) sum these PVs to find the current value of the stock, $\hat{P}_0$.
- The **corporate value model** can be used to find the value of a company that does not pay dividends. The value of the company's operations is the present value of all expected future free cash flows, discounted at the company's overall cost of capital. The total value of the corporation is equal to the value of operations plus the value of any nonoperating assets, such as marketable securities. The value of common stock is the value of the corporation minus the value of its debt and preferred stock.
- The **Efficient Markets Hypothesis (EMH)** holds (1) that stocks are always in equilibrium and (2) that it is impossible for an investor who does not have inside information to consistently "beat the market." Therefore, according to the EMH, stocks are always fairly valued ($\hat{P}_0 = P_0$), the required return on a stock is equal to its expected return ($k = \hat{k}$), and all stocks' expected returns plot on the SML.
- Differences can and do exist between expected and realized returns in the stock and bond markets—only for short-term, risk-free assets are expected and actual (or realized) returns equal.
- When U.S. investors purchase foreign stocks, they hope (1) that the stock prices will increase in the local market and (2) that the foreign currencies will rise relative to the U.S. dollar.
- **Preferred stock** is a hybrid security having some characteristics of debt and some of equity.
- Most preferred stocks are **perpetuities,** and the value of a share of perpetual preferred stock is found as the dividend divided by the required rate of return:

$$V_{ps} = \frac{D_{ps}}{k_{ps}}.$$

- **Preferred stock scheduled to mature** is evaluated with a formula that is identical in form to the bond value formula.

Questions

9-1 Define each of the following terms:

a. Proxy; proxy fight; takeover
b. Preemptive right
c. Classified stock; founders' shares
d. Closely held corporation; publicly owned corporation
e. Over-the-counter (OTC) market; organized security exchange
f. Secondary market; primary market
g. Going public; initial public offering (IPO) market
h. Intrinsic value ($\hat{P}_0$); market price (P_0)
i. Required rate of return, k_s; expected rate of return, $\hat{k}_s$; actual, or realized, rate of return, $\bar{k}_s$
j. Capital gains yield; dividend yield; expected total return
k. Zero growth stock
l. Normal, or constant, growth; supernormal, or nonconstant, growth
m. Corporate value model
n. Equilibrium

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The Level and Persistence of Growth Rates

LOUIS K. C. CHAN, JASON KARCESKI, and JOSEF LAKONISHOK*

ABSTRACT

Expectations about long-term earnings growth are crucial to valuation models and cost of capital estimates. We analyze historical long-term growth rates across a broad cross section of stocks using several indicators of operating performance. We test for persistence and predictability in growth. While some firms have grown at high rates historically, they are relatively rare instances. There is no persistence in long-term earnings growth beyond chance, and there is low predictability even with a wide variety of predictor variables. Specifically, IBES growth forecasts are overly optimistic and add little predictive power. Valuation ratios also have limited ability to predict future growth.

THE EXPECTED RATE of growth in future cash flows (usually proxied by accounting earnings) plays a pivotal role in financial management and investment analysis. In the context of aggregate market valuation, for example, projections about future growth are instrumental in predicting the equity risk premium. Much current controversy surrounds the appropriate level of the equity risk premium, as well as whether recent market valuation levels (at least as of year-end 1999) can be justified (Asness (2000), Welch (2000), Fama and French (2002)). Debate also revolves around how much of the performance of equity asset classes, such as large glamour stocks, can be attributed to changes in profitability growth (Fama and French (1995), Chan, Karceski, and Lakonishok (2000)). When applied to the valuation of individual stocks, projected growth rates have implications for the cross-sectional distribution of cost of capital estimates (Fama and French (1997), Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001)), as well as widely followed valuation ratios like price-to-earnings and price-to-book ratios.

Common measures of expected growth in future earnings, such as valuation ratios and analysts' growth forecasts, vary greatly across stocks. In the case of price-to-earnings multiples for the IBES universe of U.S. firms, for example, at

*Chan is with the Department of Finance, College of Commerce and Business Administration, University of Illinois at Urbana-Champaign; Karceski is with the Department of Finance, Warrington College of Business Administration, University of Florida; and Lakonishok is with the Department of Finance, College of Commerce and Business Administration, University of Illinois at Urbana-Champaign, and NBER. We thank the editor, Rick Green; Cliff Asness; Kent Daniel; Ken French; an anonymous referee; and seminar participants at Dartmouth, Duke University, the London School of Economics Financial Markets Group, the NBER Behavioral Finance Fall 2000 workshop, the University of Illinois, Washington University, and the Western Finance Association 2001 meetings.

year-end 1999, the distribution of the stock price relative to the consensus forecast of the following year's earnings has a 90th percentile of 53.9, while the 10th percentile is 7.4, yielding a difference of 46.5. Firms with a record of sustained, strong past growth in earnings are heavily represented among those trading at high multiples. Security analysts issue positive recommendations for these stocks and forecast buoyant future prospects. Other stocks with a history of disappointing past growth are shunned by the investment community. They are priced at low multiples and analysts are unexcited about their outlook. Putting aside the possibility of mispricing, one reason for the disparity in multiples is differences in risk. At the level of individual stocks, however, the relation between risk and expected return is weak (Fama and French (1992)). It is thus unlikely that the large dispersion is driven primarily by risk (the evidence in Beaver and Morse (1978) also supports this view). Rather, if the pricing is rational, most of the cross-sectional variation reflects differences in expected growth rates. A more direct measure of the market's expectations, security analysts' forecasts of long-term growth in earnings, also displays large differences across stocks. For example, the 90th percentile of the distribution of IBES five-year forecasts is 40 percent as of year-end 1999, compared to the 10th percentile of 8.9 percent. If analysts and investors do not believe that future earnings growth is forecastable, they would predict the same growth rate (the unconditional mean of the distribution) for all companies, and it is unlikely that the dispersion in forecasts or price–earnings ratios would be as large as it actually is.

Based on market valuations and analysts' forecasts, then, there is a widespread belief among market participants that future earnings growth is highly predictable. However, economic intuition suggests that there should not be much consistency in a firm's profitability growth. Following superior growth in profits, competitive pressures should ultimately tend to dilute future growth. Exit from an unprofitable line of business should tend to raise the remaining firms' future growth rates. Some support for this logic comes from Fama and French (2002). Their evidence for the aggregate market suggests that while there is some short-term forecastability, earnings growth is in general unpredictable.

In short, there may be a sharp discrepancy between share valuations along with analysts' predictions on the one hand, and realized operating performance growth on the other. The discrepancy may reflect investors' judgmental biases or agency distortions in analysts' behavior. In any event, the divergence is potentially large, judging from current market conditions. For instance, take a firm with a ratio of price to forecasted earnings of 100. Such cases are by no means minor irregularities: based on values at year-end 1999, they represent about 11.9 percent of total market capitalization. To infer the growth expectations implicit in such a price earnings ratio, we adopt a number of conservative assumptions. In particular, suppose the multiple reverts to a more representative value of 20 in 10 years, during which time investors are content to accept a rate of return on the stock of zero (assume there are no dividends). A multiple of 20 is conservative, since Siegel (1999) argues that a ratio of 14 may not be an unreasonable long-term value. Further, an adjustment period of 10 years is not short, in light of the fact that many of the largest firms at year-end 1999 did not exist 10 years ago. These