CHAPTER 9 Valuing Stocks

NOTATION

P_t	stock price at the end of year t
r_E	equity cost of capital
N	terminal date or forecast horizon
g	expected dividend growth rate
Div_t	dividends paid in year t
EPS_t	earnings per share on date t
PV	present value
$EBIT$	earnings before interest and taxes
FCF_t	free cash flow on date t
V_t	enterprise value on date t
τ_c	corporate tax rate
r_{wacc}	weighted average cost of capital
g_{FCF}	expected free cash flow growth rate
$EBITDA$	earnings before interest, taxes, depreciation, and amortization

ON JANUARY 16, 2006, FOOTWEAR AND APPAREL MAKER Kenneth Cole Productions, Inc., announced that its president, Paul Blum, had resigned to pursue "other opportunities." The price of the company's stock had already dropped more than 16% over the prior two years, and the firm was in the midst of a major undertaking to restructure its brand. News that its president, who had been with the company for more than 15 years, was now resigning was taken as a bad sign by many investors. The next day, Kenneth Cole's stock price dropped by more than 6% on the New York Stock Exchange to $26.75, with over 300,000 shares traded, more than twice its average daily volume. How might an investor decide whether to buy or sell a stock such as Kenneth Cole at this price? Why would the stock suddenly be worth 6% less on the announcement of this news? What actions can Kenneth Cole's managers take to increase the stock price?

9.1 The Dividend-Discount Model

The Law of One Price implies that to value any security, we must determine the expected cash flows an investor will receive from owning it. Thus, we begin our analysis of stock valuation by considering the cash flows for an investor with a one-year investment horizon. We then consider the perspective of investors with longer investment horizons. We show that if investors have the same beliefs, their valuation of the stock will not depend on their investment horizon. Using this result, we then derive the first method to value a stock: the *dividend-discount model*.

A One-Year Investor

There are two potential sources of cash flows from owning a stock. First, the firm might pay out cash to its shareholders in the form of a dividend. Second, the investor might generate cash by choosing to sell the shares at some future date. The total amount received in dividends and from selling the stock will depend on the investor's investment horizon. Let's begin by considering the perspective of a one-year investor.

When an investor buys a stock, she will pay the current market price for a share, P_0. While she continues to hold the stock, she will be entitled to any dividends the stock pays. Let Div_1 be the total dividends paid per share of the stock during the year. At the end of the year, the investor will sell her share at the new market price, P_1. Assuming for simplicity that all dividends are paid at the end of the year, we have the following timeline for this investment:

Of course, the future dividend payment and stock price in the timeline above are not known with certainty; rather, these values are based on the investor's expectations at the time the stock is purchased. Given these expectations, the investor will be willing to buy the stock at today's price as long as the NPV of the transaction is not negative—that is, as long as the current price does not exceed the present value of the expected future dividend and sale price. Because these cash flows are risky, we cannot compute their present value using the risk-free interest rate. Instead, we must discount them based on the equity cost of capital, r_E, for the stock, which is the expected return of other investments available in the market with equivalent risk to the firm's shares. Doing so leads to the following condition under which an investor would be willing to buy the stock:

$$P_0 \le \frac{Div_1 + P_1}{1 + r_E}$$

Similarly, for an investor to be willing to sell the stock, she must receive at least as much today as the present value she would receive if she waited to sell next year:

$$P_0 \geq \frac{Div_1 + P_1}{1 + r_E}$$

But because for every buyer of the stock there must be a seller, *both* equations must hold, and therefore the stock price should satisfy

$$P_0 = \frac{Div_1 + P_1}{1 + r_E} \tag{9.1}$$

In other words, as we discovered in Chapter 3, in a competitive market, buying or selling a share of stock must be a zero-NPV investment opportunity.

Dividend Yields, Capital Gains, and Total Returns

We can reinterpret Eq. 9.1 if we multiply by $(1 + r_E)$, divide by P_0, and subtract 1 from both sides:

Total Return (9.2)

$$r_E = \frac{Div_1 + P_1}{P_0} - 1 = \underbrace{\frac{Div_1}{P_0}}_{\text{Dividend Yield}} + \underbrace{\frac{P_1 - P_0}{P_0}}_{\text{Capital Gain Rate}}$$

The first term on the right side of Eq. 9.2 is the stock's **dividend yield**, which is the expected annual dividend of the stock divided by its current price. The dividend yield is the percentage return the investor expects to earn from the dividend paid by the stock. The second term on the right side of Eq. 9.2 reflects the **capital gain** the investor will earn on the stock, which is the difference between the expected sale price and purchase price for the stock, $P_1 - P_0$. We divide the capital gain by the current stock price to express the capital gain as a percentage return, called the **capital gain rate**.

The sum of the dividend yield and the capital gain rate is called the **total return** of the stock. The total return is the expected return that the investor will earn for a one-year investment in the stock. Thus, Eq. 9.2 states that the stock's total return should equal the equity cost of capital. In other words, *the expected total return of the stock should equal the expected return of other investments available in the market with equivalent risk.*

EXAMPLE 9.1 **Stock Prices and Returns**

Problem

Suppose you expect Walgreen Company (a drugstore chain) to pay dividends of $0.44 per share and trade for $33 per share at the end of the year. If investments with equivalent risk to Walgreen's stock have an expected return of 8.5%, what is the most you would pay today for Walgreen's stock? What dividend yield and capital gain rate would you expect at this price?

Solution

Using Eq. 9.1, we have

$$P_0 = \frac{Div_1 + P_1}{1 + r_E} = \frac{0.44 + 33.00}{1.085} = \$30.82$$

At this price, Walgreen's dividend yield is $Div_1/P_0 = 0.44/30.82 = 1.43\%$. The expected capital gain is $33.00 − $30.82 = $2.18 per share, for a capital gain rate of 2.18/30.82 = 7.07%. Therefore, at this price, Walgreen's expected total return is 1.43% + 7.07% = 8.5%, which is equal to its equity cost of capital.

The Mechanics of a Short Sale

If a stock's expected total return is below that of other investments with comparable risk, investors who own the stock will choose to sell it and invest elsewhere. But what if you don't own the stock—can you profit in this situation?

The answer is yes, by short selling the stock. To short sell a stock, you must contact your broker, who will try to borrow the stock from someone who currently owns it.* Suppose John Doe holds the stock in a brokerage account. Your broker can lend you shares from his account so that you can sell them in the market at the current stock price. Of course, at some point you must close the short sale by buying the shares in the market and returning them to Doe's account. In the meantime, so that John Doe is not made worse off by lending his shares to you, you must pay him any dividends the stock pays.**

	Date 0	Date t	Date 1
Cash flows from buying a stock	$-P_0$	$+Div_t$	$+P_1$
Cash flows from short-selling a stock	$+P_0$	$-Div_t$	$-P_1$

When you short sell a stock, first you receive the current share price. Then, while your short position remains open, you must pay any dividends made. Finally, you must pay the future stock price to close your position. These cash flows are exactly the reverse of those from buying a stock.

Because the cash flows are reversed, if you short sell a stock, rather than receiving its return, you must *pay* its return to the person you borrowed the stock from. But if this return is less than you expect to earn by investing your money in an alternative investment with equivalent risk, the strategy has a positive NPV and is attractive[1] (We will discuss such strategies further in Chapter 11.)

In practice, short sales typically reflect a desire of some investors to bet against the stock. For example, in July 2008, Washington Mutual stood on the verge of bankruptcy as a result of its exposure to subprime mortgages. Even though its stock price had fallen by more than 90% in the prior year, many investors apparently felt the stock was still not attractive—the **short interest** (number of shares sold short) in Washington Mutual exceeded 500 million, representing more than 50% of Washington Mutual's outstanding shares.