

Stock valuation

STOCK - Ownership shares in a publicly held corporation.

PRIMARY MARKET - Market for newly-issued securities, sold by the company to raise cash.

INITIAL PUBLIC OFFERING (IPO) - First offering of stock to the general public.

SECONDARY MARKET - Market in which already issued securities are traded among investors.

DIVIDEND - Periodic cash distribution from the firm to its shareholders.

PRICE-EARNINGS (P/E) MULTIPLE - Ratio of stock price to earnings per share.

BOOK VALUE - Net worth of the firm according to the balance sheet.

LIQUIDATION VALUE - Net proceeds that would be realized by selling the firm's assets and paying off its creditors.

MARKET-VALUE BALANCE SHEET - Financial statement that uses the market value of all assets and liabilities. Market value is the amount that investors are willing to pay for the shares of the firm. This depends on the earning power of today's assets and the expected profitability of future investments.

Expected (rate of) return

The cash payoff to owners of common stocks comes in two forms: (1) cash dividends and (2) capital gains or losses. Usually investors expect to get some of each. Suppose that the current price of a share is P_0 , that the expected price a year from now is P_1 , and that the expected dividend per share is DIV_1 . The subscript on P_0 denotes time zero, which is today; the subscript on P_1 denotes time 1, which is 1 year hence. We simplify by assuming that dividends are paid only once a year and that the next dividend will come in 1 year. The rate of return that investors expect from this share over the next year is the expected dividend per share DIV_1 plus the expected increase in price $P_1 - P_0$, all divided by the price at the start of the year P_0 :

$$\text{Expected return} = r = \frac{Div_1 + P_1 - P_0}{P_0}$$

Expected rate of return = expected dividend yield + expected capital gain

$$\text{Expected rate of return} = \frac{Div_1}{P_0} + \frac{P_1 - P_0}{P_0}$$

We can also explain the market value of the stock in terms of investors' forecasts of dividends and price and the expected return offered by other equally risky stocks. This is just the present value of the cash flows the stock will provide to its owner:

$$\text{Price today} = P_0 = \frac{\text{Div}_1 + P_1}{1+r}$$

DIVIDEND DISCOUNT MODEL - Discounted cash-flow model of today's stock price which states that share value equals the present value of all expected future dividends.

We have managed to explain today's stock price P_0 in terms of the dividend DIV_1 and the expected stock price next year P_1 . But future stock prices are not easy to forecast directly, though you may encounter individuals who claim to be able to do so. A formula that requires tomorrow's stock price to explain today's stock price is not generally helpful.

As it turns out, we can express a stock's value as the present value of all the forecast future dividends paid by the company to its shareholders without referring to the future stock price. This is the dividend discount model:

$$P_0 = \frac{\text{Div}_1}{1+r} + \frac{\text{Div}_2}{1+r^2} + \dots + \frac{\text{Div}_n + P_n}{1+r^n}$$

In words, the value of a stock is the present value of the dividends it will pay over the investor's horizon plus the present value of the expected stock price at the end of that horizon.

THE DIVIDEND DISCOUNT MODEL WITH NO GROWTH

The dividend discount model says that these no-growth shares should sell for the present value of a constant, perpetual stream of dividends. We learned how to do that calculation when we valued perpetuities earlier. Just divide the annual cash payment by the discount rate. The discount rate is the rate of return demanded by investors in other stocks of the same risk:

$$P_0 = \frac{\text{Div}_1}{r}$$

THE CONSTANT-GROWTH DIVIDEND DISCOUNT MODEL

The dividend discount model requires a forecast of dividends for every year into the future, which poses a bit of a problem for stocks with potentially infinite lives. Unless we want to spend a lifetime forecasting dividends, we must use simplifying assumptions to reduce the number of estimates. The simplest simplification assumes a no-growth perpetuity which works for no-growth common shares.

Here's another simplification that finds a good deal of practical use. Suppose forecast dividends grow at a constant rate into the indefinite future. If dividends grow at a steady rate, then instead of forecasting an infinite number of dividends, we need to forecast only the next dividend and the dividend growth rate.

Although there is an infinite number of terms, each term is proportionately smaller than the preceding one as long as the dividend growth rate g is less than the discount rate r . Because the present value of far-distant dividends will be ever-closer to zero, the sum of all of these terms is finite despite the fact that an infinite number of dividends will be paid. The sum can be shown to equal:

$$P_0 = \frac{Div_1}{r - g} = \frac{Div_0 + g}{r - g}$$

ESTIMATING EXPECTED RATES OF RETURN

Economists argue about which statistical models give the best estimates. There are nevertheless some useful rules of thumb that can give sensible numbers.

One rule of thumb is based on the constant-growth dividend discount model. Remember that it forecasts a constant growth rate g in both future dividends and stock prices. That means forecast capital gains equal g per year.

We can calculate the expected rate of return by rearranging the constant-growth formula as:

$$r = \frac{Div_1}{P_0} + g = \text{dividend yield} + \text{growth rate}$$

NONCONSTANT GROWTH

Many companies grow at rapid or irregular rates for several years before finally settling down. Obviously we can't use the constant-growth dividend discount model in such cases. However, we have already looked at an alternative approach. Set the investment horizon (Year H) at the future year by which you expect the company's growth to settle down. Calculate the present value of dividends from now to the horizon year. Forecast the stock price in that year and discount it also to present value. Then add up to get the total present value of dividends plus the ending stock price. The formula is:

$$P_0 = \frac{Div_1}{1+r} + \frac{Div_2}{1+r^2} + \dots + \frac{Div_n}{1+r^n} + \frac{P_n}{1+r^n}$$

Growth Stocks and Income Stocks

PAYOUT RATIO – Fraction of earnings paid out as dividends.

PLOWBACK RATIO - Fraction of earnings retained by the firm.

$$g = \text{return on equity} * \text{plowback ratio}$$

PRESENT VALUE OF GROWTH OPPORTUNITIES (PVGO) - Net present value of a firm's future investments.

SUSTAINABLE GROWTH RATE – Steady rate at which firm can grow;
return on equity \times plowback ratio.

Growth rates calculated as $g = \text{return on equity} \times \text{plowback ratio}$ are often referred to as sustainable growth rates.

Problems

A.1. Company X is increasing next year's dividend to \$5.00 per share. The forecast stock price next year is \$105. Equally risky stocks of other companies offer expected rates of return of 10 percent. What should Company X common stock sell for?

A.2. Assume that Company's X dividend and share price are expected to grow at a constant 5 percent per year. Calculate the current value of Company X stock with the dividend discount model using a 3-year horizon. You should get the same answer as in A.1..

A.2. Moonshine Industries has produced a barrel per week for the past 20 years but cannot grow because of certain legal hazards. It earns \$25 per share per year and pays it all out to stockholders. The stockholders have alternative, equivalent-risk ventures yielding 20 percent per year on average. How much is one share of Moonshine worth? Assume the company can keep going indefinitely.

A.3. Copper can grow at 5 percent per year for the indefinite future. It's selling at \$100 and next year's dividend is \$5.00. What is the expected rate of return from investing in Mining common stock? Copper and Mining shares are equally risky.

A.4. Suppose that another stock market analyst predicts that United Bird Seed will not settle down to a constant 5 percent growth rate in dividends until after Year 4, and that dividends in Year 4 will be \$1.73 per share. What is the fair price for the stock according to this analyst?

A.5. Suppose that instead of plowing money back into lucrative ventures, Blue Skies's management is investing at an expected return on equity of 10 percent, which is below the return of 12 percent that investors could expect to get from comparable securities.

a. Find the sustainable growth rate of dividends and earnings in these circumstances. Assume a 60 percent payout ratio.

b. Find the new value of its investment opportunities. Explain why this value is negative despite the positive growth rate of earnings and dividends.

c. If you were a corporate raider, would Blue Skies be a good candidate for an attempted takeover?

A.6. Favored stock will pay a dividend this year of \$2.40 per share. Its dividend yield is 8 percent. At what price is the stock selling?

A.7. Waterworks has a dividend yield of 8 percent. If its dividend is expected to grow at a constant rate of 5 percent, what must be the expected rate of return on the company's stock?

A.8. Steady As She Goes, Inc., will pay a year-end dividend of \$2.50 per share. Investors expect the dividend to grow at a rate of 4 percent indefinitely.

a. If the stock currently sells for \$25 per share, what is the expected rate of return on the stock?

b. If the expected rate of return on the stock is 16.5 percent, what is the stock price?

A.9. Integrated Potato Chips paid a \$1 per share dividend yesterday. You expect the dividend to grow steadily at a rate of 4 percent per year.

a. What is the expected dividend in each of the next 3 years?

b. If the discount rate for the stock is 12 percent, at what price will the stock sell?

- c. *What is the expected stock price 3 years from now?*
- d. *If you buy the stock and plan to hold it for 3 years, what payments will you receive? What is the present value of those payments? Compare your answer to (b).*

A.10. *You expect a share of stock to pay dividends of \$1.00, \$1.25, and \$1.50 in each of the next 3 years. You believe the stock will sell for \$20 at the end of the third year.*

- a. *What is the stock price if the discount rate for the stock is 10 percent?*
- b. *What is the dividend yield?*

Sursa bibliografica:

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