Chapter 7

Equity Markets and Stock Valuation

Key Concepts and Skills

- Understand how stock prices depend on future dividends and dividend growth
- Be able to compute stock prices using the dividend growth model
- Understand how corporate directors are elected
- Understand how stock markets work
- Understand how stock prices are quoted

Chapter Outline

- Common Stock Valuation
- Some Features of Common and Preferred Stocks
- The Stock Markets

Cash Flows to Stockholders

- If you buy a share of stock, you can receive cash in two ways
  - The company pays dividends
  - You sell your shares either to another investor in the market or back to the company
- As with bonds, the price of the stock is the present value of these expected cash flows

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One-Period Example

- Suppose you are thinking of purchasing the stock of Moore Oil, Inc. You expect it to pay a $2 dividend in one year, and you believe that you can sell the stock for $14 at that time. If you require a return of 20% on investments of this risk, what is the maximum you would be willing to pay?
  - Compute the PV of the expected cash flows
  - Price = (14 + 2) / (1.2) = $13.33
  - Or FV = 16; I/Y = 20; N = 1; CPT PV = -13.33

Two-Period Example

- Now, what if you decide to hold the stock for two years? In addition to the $2 dividend in one year, you expect a dividend of $2.10 and a stock price of $14.70 both at the end of year 2. Now how much would you be willing to pay?
  - PV = 2 / (1.2) + (2.10 + 14.70) / (1.2)^2 = 13.33
  - Or CF_0 = 0; C01 = 2; F01 = 1; C02 = 16.80; F02 = 1; NPV; I = 20; CPT NPV = 13.33

Three-Period Example

- Finally, what if you decide to hold the stock for three periods? In addition to the dividends at the end of years 1 and 2, you expect to receive a dividend of $2.205 and a stock price of $15.435 both at the end of year 3. Now how much would you be willing to pay?
  - $PV = 2 / 1.2 + 2.10 / (1.2)^2 + (2.205 + 15.435) / (1.2)^3 = 13.33$
  - Or $CF_0 = 0$; $C01 = 2$; $F01 = 1$; $C02 = 2.10$; $F02 = 1$; $C03 = 17.64$; $F03 = 1$; NPV; $I = 20$; CPT NPV = 13.33

Developing The Model

- You could continue to push back when you would sell the stock
- You would find that the price of the stock is really just the *present value of <u>all</u> expected future dividends*
- So, how can we estimate all future dividend payments?

Estimating Dividends: Special Cases

- Constant dividend
  - The firm will pay a constant dividend forever
  - This is like preferred stock
  - The price is computed using the perpetuity formula
- Constant dividend growth
  - The firm will increase the dividend by a constant percent every period
- Supernormal growth
  - Dividend growth is not consistent initially, but settles down to constant growth eventually

Zero Growth

- If dividends are expected at regular intervals forever, then this is like preferred stock and is valued as a perpetuity
- $P_0 = D / R$
- Suppose stock is expected to pay a $0.50 dividend every quarter and the required return is 10% with quarterly compounding. What is the price?
  - $P_0 = .50 / (.1 / 4) = .50 / .025 = \$20$

Dividend Growth Model

- Dividends are expected to grow at a constant percent per period.
  - $P_0 = D_1 /(1+R) + D_2 /(1+R)^2 + D_3 /(1+R)^3 + \ldots$
  - $P_0 = D_0(1+g)/(1+R) + D_0(1+g)^2/(1+R)^2 + D_0(1+g)^3/(1+R)^3 + \ldots$
- With a little algebra, this reduces to:

$$P_0 = \frac{D_0(1+g)}{R - g} = \frac{D_1}{R - g}$$

DGM – Example 1

- Suppose Big D, Inc. just paid a dividend of $.50. It is expected to increase its dividend by 2% per year. If the market requires a return of 15% on assets of this risk, how much should the stock be selling for?
- $P_0 = .50(1+.02) / (.15 - .02) = \$3.92$

DGM – Example 2

- Suppose TB Pirates, Inc. is expected to pay a $2 dividend in one year. If the dividend is expected to grow at 5% per year and the required return is 20%, what is the price?
  - $P_0 = 2 / (.2 - .05) = \$13.33$
  - Why isn't the $2 in the numerator multiplied by (1.05) in this example?

Stock Price Sensitivity to Dividend Growth, g

$D_1 = \$2; R = 20\%$
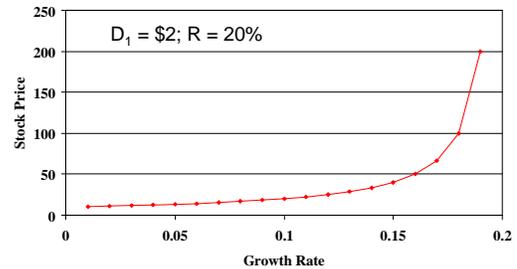
Stock Price Sensitivity to Required Return, R

$D_1 = \$2; g = 5\%$
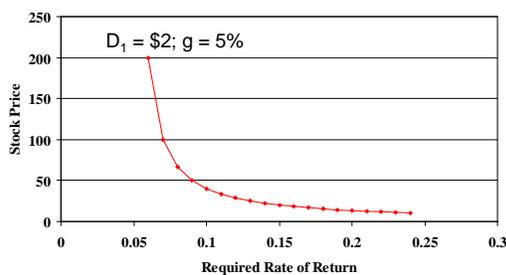
Example 7.3 Gordon Growth Company - I

- Gordon Growth Company is expected to pay a dividend of $4 next period and dividends are expected to grow at 6% per year. The required return is 16%.
- What is the current price?
  - $P_0 = 4 / (.16 - .06) = \$40$
  - Remember that we already have the dividend expected next year, so we don't multiply the dividend by 1+g

Example 7.3 – Gordon Growth Company II

- What is the price expected to be in year 4?
  - $P_4 = D_4(1 + g) / (R – g) = D_5 / (R – g)$
  - $P_4 = 4(1+.06)^4 / (.16 - .06) = 50.50$
- What is the implied return given the change in price during the four-year period?
  - $50.50 = 40(1+return)^4$; return = 6%
  - PV = -40; FV = 50.50; N = 4; CPT I/Y = 6%
- The price grows at the same rate as the dividends

Nonconstant Growth Problem Statement

- Suppose a firm is expected to increase dividends by 20% in one year and by 15% in two years. After that, dividends will increase at a rate of 5% per year indefinitely. If the last dividend was $1 and the required return is 20%, what is the price of the stock?
- Remember that we have to find the PV of *all* expected future dividends.

Nonconstant Growth – Example Solution

- Compute the dividends until growth levels off
  - $D_1 = 1(1.2) = \$1.20$
  - $D_2 = 1.20(1.15) = \$1.38$
  - $D_3 = 1.38(1.05) = \$1.449$
- Find the expected future price
  - $P_2 = D_3 / (R - g) = \$1.449 / (.2 - .05) = \$9.66$
- Find the present value of the expected future cash flows
  - $P_0 = \$1.20 / (1.2) + (\$1.38 + 9.66) / (1.2)^2 = \$8.67$

Quick Quiz: Part 1

- What is the value of a stock that is expected to pay a constant dividend of $2 per year if the required return is 15%?
- What if the company starts increasing dividends by 3% per year beginning with the next dividend? The required return stays at 15%.

Using the DGM to Find R

- Start with the DGM:

$$P_0 = \frac{D_0(1 + g)}{R - g} = \frac{D_1}{R - g}$$

rearrange and solve for R

$$R = \frac{D_0(1 + g)}{P_0} + g = \frac{D_1}{P_0} + g$$

Finding the Required Return - Example

- Suppose a firm's stock is selling for $10.50. It just paid a $1 dividend and dividends are expected to grow at 5% per year. What is the required return?
  - $R = [\$1(1.05)/\$10.50] + .05 = 15\%$
- What is the dividend yield?
  - $\$1(1.05) / \$10.50 = 10\%$
- What is the capital gains yield?
  - $g = 5\%$

Table 7.1

I. **The general case**
In general, the price today of a share of stock, P_0, is the present value of all of its future dividends, $D_1, D_2, D_3, \ldots$:

$$P_0 = \frac{D_1}{(1 + R)^1} + \frac{D_2}{(1 + R)^2} + \frac{D_3}{(1 + R)^3} + \cdots$$

where R is the required return.

II. **Constant growth case**
If the dividend is constant and equal to D, then the price can be written as:

$$P_0 = \frac{D}{R}$$

If the dividend grows at a steady rate, g, then the price can be written as:

$$P_0 = \frac{D_1}{R - g}$$

This result is called the *dividend growth model*.

III. **The required return, R, can be written as the sum of two things:**

$$R = D_1/P_0 + g$$

where D_1/P_0 is the *dividend yield* and g is the *capital gains yield* (which is the same thing as the growth rate in dividends for the steady growth case).

Features of Common Stock

- Voting Rights
- Proxy voting
- Classes of stock
- Other Rights
  - Share proportionally in declared dividends
  - Share proportionally in remaining assets during liquidation
  - Preemptive right – first shot at new stock issue to maintain proportional ownership if desired

Dividend Characteristics

- Dividends are not a liability of the firm until a dividend has been declared by the Board
- Consequently, a firm cannot go bankrupt for not declaring dividends
- Dividends and Taxes
  - Dividend payments are not considered a business expense; therefore, they are not tax-deductible
  - Dividends received by individuals have historically been taxed as ordinary income
  - Dividends received by corporations have a minimum 70% exclusion from taxable income

Features of Preferred Stock

- Dividends
  - Stated dividend that must be paid before dividends can be paid to common stockholders
  - Dividends are not a liability of the firm and preferred dividends can be deferred indefinitely
  - Most preferred dividends are cumulative – any missed preferred dividends have to be paid before common dividends can be paid
- Preferred stock does not generally carry voting rights

Stock Market

- Dealers vs. Brokers
- New York Stock Exchange (NYSE)
  - Members
  - Operations
  - Floor activity
- NASDAQ
  - Not a physical exchange, but a computer-based quotation system
  - Large portion of technology stocks

Reading Stock Quotes

- Sample Quote

55.93 44.40 38.60 HarleyDav .84f 1.50 16 24726 54.25 1.18

- What information is provided in the stock quote?

Quick Quiz: Part 2

- You observe a stock price of $18.75. You expect a dividend growth rate of 5% and the most recent dividend was $1.50. What is the required return?
- What are some of the major characteristics of common stock?
- What are some of the major characteristics of preferred stock?

Comprehensive Problem

- XYZ stock currently sells for $50 per share. The next expected annual dividend is $2, and the growth rate is 6%. What is the expected rate of return on this stock?
- If the required rate of return on this stock were 12%, what would the stock price be, and what would the dividend yield be?