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

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 CF0 = 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 CF0 = 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 all 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
  - P0 = D0 / 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?
  - P0 = .50 / (.1 / 4) = .50 / .025 = $20

Dividend Growth Model

- Dividends are expected to grow at a constant percent per period.
  - P0 = D0 / (1+R) + D1 / (1+R)^2 + D2 / (1+R)^3 + ...
  - P0 = D0(1+g) / (1+R) + D0(1+g)^2 / (1+R)^2 + D0(1+g)^3 / (1+R)^3 + ...
- 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?
  - P0 = .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?
  - \[ P_0 = \frac{2}{0.2 - 0.05} = $13.33 \]
  - Why isn’t the $2 in the numerator multiplied by \((1.05)\) in this example?

Stock Price Sensitivity to Dividend Growth, g

Stock Price Sensitivity to Required Return, R

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?
    - \[ P_0 = \frac{4}{0.16 - 0.06} = $40 \]
    - 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?
  - \[ P_4 = \frac{D_4(1 + g)}{(R - g)} = \frac{D_5}{(R - g)} \]
  - \[ P_4 = \frac{4(1+.06)^4}{(0.16 - .06)} = 50.50 \]
- What is the implied return given the change in price during the four-year period?
  - \[ 50.50 = 40(1+\text{return})^4; \text{return} = 6\% \]
  - \[ PV = -40; FV = 50.50; N = 4; CPT I/Y = 6\% \]
  - 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
  • \( P_2 = D_3 / (R - g) = $1.449 / (0.2 - 0.05) = $9.66 \)
• 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?
  • \( R = \frac{$1(1.05)/$10.50} + .05 = 15% \)
• What is the dividend yield?
  • \$1(1.05) / $10.50 = 10% \)
• What is the capital gains yield?
  • \( g = 5\% \)

Table 7.1

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Voting Rights</td>
<td>- Share proportionally in declared dividends</td>
</tr>
<tr>
<td>Proxy voting</td>
<td>- Share proportionally in remaining assets during liquidation</td>
</tr>
<tr>
<td>Classes of stock</td>
<td>- Preemptive right – first shot at new stock issue to maintain proportional ownership if desired</td>
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Features of Common Stock
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?