Muhlenberg College

Notes 7

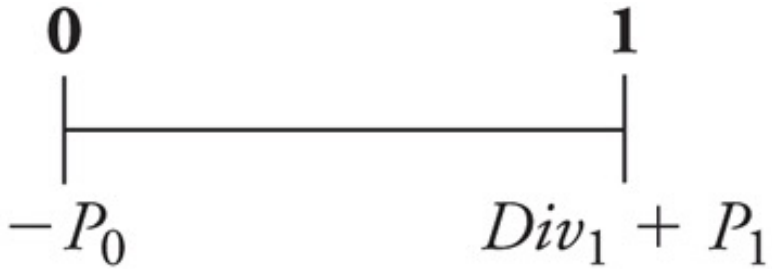
CHAPTER 7: VALUING STOCKS

Motivation

- How do we value the price of a stock?
- The price today, should be equal to the present value of the cash flows associated with the stock.
- In this chapter, we learn the following models used to evaluate a stock:
  1. The dividend discount model.
  2. The dividend growth model also known as the Gordon growth model.

The Dividend-Discount Model

- **A One-Year Investor**: a model in which the investor buys the stock today and sells it one year/period after.
- **Potential Cash Flows**: Dividend, Sale of Stock
- Timeline for One-Year Investor



- Since the cash flows are risky, we must discount them at the equity cost of capital.

The Dividend-Discount Model

- Timeline for One-Year Investor

- The price today is equal to the present value of the cash flows:

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

Definition – *Equity Cost* r_E

The rate of return that equity could be expected to earn in an alternative investment of equivalent risk.

The Dividend-Discount Model

- $$P_0 = \frac{Div_1 + P_1}{1 + r_E}$$
- P_0 is also known as the "intrinsic value of the share." This value may or may no be the same as the market value of the share!
- If the current stock price were less than this amount, expect investors to rush in and buy it, driving up the stock's price.
- If the stock price exceeded this amount, selling it would cause the stock price to quickly fall.

The Dividend-Discount Model

- $$P_0 = \frac{Div_1 + P_1}{1 + r_E}$$
- If we rearrange the formula and isolate r_E

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

- The expected total return of the stock should equal the expected return of other investments available in the market with equivalent risk.

The Dividend-Discount Model - Example

- XYZ just paid a dividend of $4.50 per share. You expect the stock price will be $178.50 and the dividend to be 5% higher by the end of the year. Investments with equivalent risk have an expected return of 11%. Based on the Dividend-Discount Model, what would you pay today for XYZ stock?

The Dividend-Discount Model - Example

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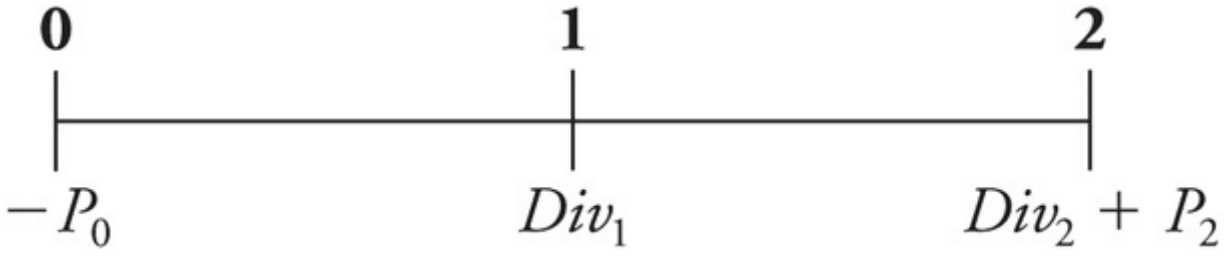
- Note the $Div_1 = \$4.5 * (1 + 5\%) = \$4.725$.
- $P_0 = \frac{Div_1 + P_1}{1 + r_E} = \frac{\$4.725 + \$178.5}{1.11} = \$165.07$

The Dividend-Discount Model – Multiple years

- What is the price if we plan on holding the stock for two years?

- The cash flows is :



$$P_0 = \frac{Div_1}{1+r_E} + \frac{Div_2+P_2}{(1+r_E)^2}$$

The Dividend-Discount Model – Multiple years

- Current forecasts are for ABC Company to pay dividends of $3 and $3.24 over the next two years, respectively. At the end of two years you anticipate selling your stock at a market price of $94.48. What is the price of the stock given a 12% expected return?

The Dividend-Discount Model – Multiple years

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$$P_0 = \frac{Div_1}{1+r_E} + \frac{Div_2+P_2}{(1+r_E)^2} = \frac{3}{1.12} + \frac{3.24+94.48}{1.12^2} = \$80.58$$

The Dividend-Discount Model – Multiple years

- What is the price if we plan on holding the stock for **N years**?

$$P_0 = \frac{Div_1}{1+r_E} + \frac{Div_2}{(1+r_E)^2} + \cdots + \frac{Div_N + P_N}{(1+r_E)^N}$$

- The price of any stock is equal to the present value of the expected future dividends it will pay.

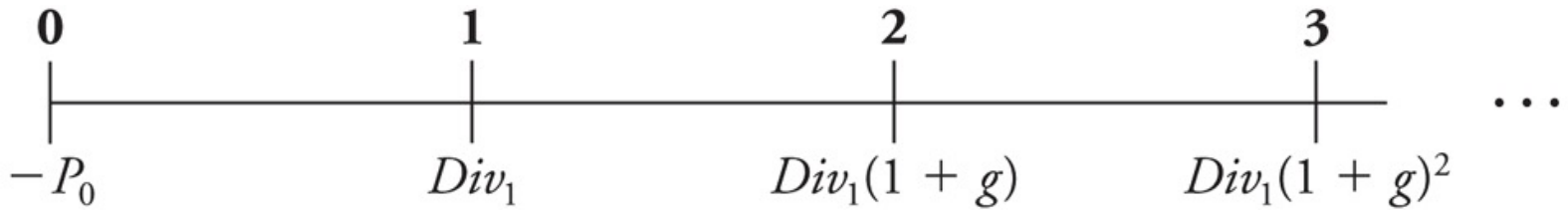
The Dividend-Discount Model – Multiple years

- In the dividend discount model, the cash flows is constant at Div_1 each period. That is, it's a perpetuity. The present value is then:

$$P_0 = \frac{Div_1}{r_E}$$

The Dividend/Gordon Growth Model

- The simplest forecast for the firm's future dividends states that they will grow at a constant rate, g, forever.



$$P_0 = \frac{Div_1}{r_E - g}$$

$$r_E = g + \frac{Div_1}{P_0}$$

The Dividend/Gordon Growth Model - Example

- AT&T plans to pay $1.44 per share in dividends in the coming year. Its equity cost of capital is 8%. Dividends are expected to grow by 4% per year in the future. Estimate the value of AT&T's stock.

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$$P_0 = \frac{Div_1}{r_E - g} = \frac{\$1.44}{0.08 - 0.04} = \$36.00$$

The Dividend/Gordon Growth Model - Example

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- If the same stock is selling for $40 in the stock market, what might the market be assuming about the growth in dividends?

The Dividend/Gordon Growth Model - Example

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- If the same stock is selling for $40 in the stock market, what might the market be assuming about the growth in dividends?
- $\$40 = \frac{1.44}{0.08 - g}$

$$g = 4.4\%$$

Dividend Payout Ratio

Definition – *Dividend Payout Ratio*

The percentage of earnings paid to shareholders in dividends, and is calculated as

$$Dividend\ Payout\ Ratio = \frac{Dividend}{Net\ Income}$$

$$Div_t = \underbrace{\frac{Net\ Earnings_t}{\#shares\ outstanding}}_{EPS_t} \times Dividend\ Payout\ Ratio$$