

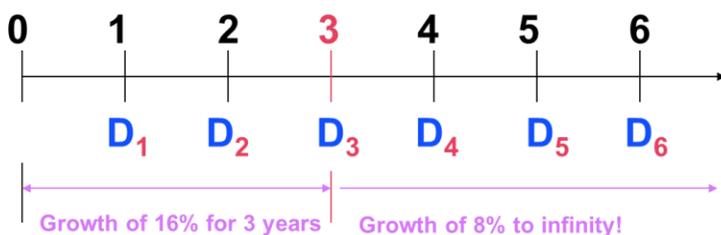
BUAD 340 Principles of Finance Fall 2018/Dr. Minor Time Valuation Handout 181012

Van Horne Chapter 4. The Valuation of Long-Term Securities (continued)

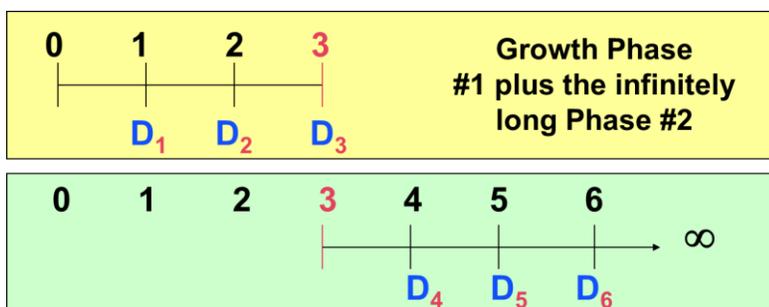
Growth Phases Model. The growth phases model assumes that dividends for each share will grow at two or more *different* growth rates.

Example 4.40. Stock GP has an expected growth rate of 16% for the first 3 years and 8% thereafter. Each share of stock just received an annual \$3.24 dividend per share. The appropriate discount rate is 15%. What is the value of the common stock under this scenario?

Step 1. Draw a time line.



Step 2. Separate the time line into two parts.



Step 3. Calculate the FV of the dividends. Note: g = growth rate.

$D_0 = \$3.24$ (Given and is already a PV)

$$D_1 = D_0(1 + g_1)^1 = \$3.24(1.16)^1 = \$3.76$$

$$D_2 = D_0(1 + g_1)^2 = \$3.24(1.16)^2 = \$4.36$$

$$D_3 = D_0(1 + g_1)^3 = \$3.24(1.16)^3 = \mathbf{\$5.06}$$

$$D_4 = D_3(1 + g_2)^1 = \mathbf{\$5.06}(1.08)^1 = \$5.46$$

Step 4. Calculate the PV of the FV of the dividends.

$$PV(D_1) = D_1(PVIF_{15\%, 1}) = \$3.76 (0.870) = \mathbf{\$3.27}$$

$$PV(D_2) = D_2(PVIF_{15\%, 2}) = \$4.36 (0.756) = \mathbf{\$3.30}$$

$$PV(D_3) = D_3(PVIF_{15\%, 3}) = \$5.06 (0.658) = \mathbf{\$3.33}$$

$$\mathbf{P_3 = \$5.46 / (0.15 - 0.08) = \$78 \text{ [Constant Growth Model]}}$$

$$PV(P_3) = P_3(PVIF_{15\%, 3}) = \$78 (0.658) = \mathbf{\$51.32}$$

Step 5. Add all the PV cash flows. You'll also find the *intrinsic value*.

$$V = \$3.27 + \$3.30 + \$3.33 + \$51.32 = \$61.22$$

Calculating Rates of Return (Yields)

Example 4.53. Julie Miller want to determine the yield to maturity (YTM) for an issue of outstanding bonds at Basket Wonders (BW). BW has an issue of 10% annual coupon bonds with 15 years left to maturity. The bonds have a current market value of \$1,250. What is the YTM?

Nper = 15
PV = -\$1250
PMT = \$100 annual interest payment (10% x \$1000 face value)
FV = \$1000 (investor receives face value in 15 years)
Rate = **7.22%**

Example 4.61. Julie Miller want to determine the YTM for another issue of outstanding bonds. The firm has an issue of 8% semiannual coupon bonds with 20 years left to maturity. The bonds have a current market value of \$950. What is the YTM?

Nper = 20-year semiannual bond (20 x 2 = 40)
PV = -\$950
PMT = \$40 annual interest payment (8% x \$1000 = \$80 face value/2)
FV = \$1000 (investor receives face value in 15 years)
Rate = **4.26%**

Bond Price – Yield Relationship

Discount Bond – The market required rate of return exceeds the coupon rate ($P_0 > \text{Par}$).

Premium Bond – The coupon rate exceeds the market required rate of return ($P_0 > \text{Par}$).

Par Bond – The coupon rate equals the market required rate of return ($P_0 = \text{Par}$).

When interest rates *rise*, then the market required rates of return *rise* and bond prices will *fall*.

Example 4.68. Assume that the required rate of return on a 15-year, 10% annual coupon paying bond *rises* from 10% to 12%. What happens to the bond price?

1. Calculate the interest payment: $.10 * \$1000 = \mathbf{\$100}$
2. Calculate the PV of an annuity for \$100 for 15 years at 10%. **\$760.61**
3. Calculate the PV of a U.S. bond for 15 years at 10%. **\$239.39**
4. Add the two values. **\$1000**
5. Repeat steps 2-4 for 12%. **\$681.09 + \$182.70 = \$863.79**

Therefore, the bond price has fallen from \$1,000 to \$864.

When interest rates *fall*, then the market required rates of return *fall* and bond prices will *rise*.

Example 4.71. Assume that the required rate of return on a 15-year, 10% annual coupon paying bond *falls* from 10% to 8%. What happens to the bond price?

1. Calculate the interest payment: $.10 * \$1000 = \mathbf{\$100}$
2. Calculate the PV of an annuity for \$100 for 15 years at 10%. **\$760.61**
3. Calculate the PV of a U.S. bond for 15 years at 10%. **\$239.39**
4. Add the two values. **\$1000**
5. Repeat steps 2-4 for 8%. **\$855.95 + \$315.24 = \$1171.19**

Therefore, the bond price has *risen* from \$1000 to \$1171.

The Role of Bond Maturity and Coupon Rate and Determining Yield on Preferred and Common Stocks

Next Class