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

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

**Non-Zero Coupon Paying Bond**
A non-zero coupon-paying bond is a coupon paying bond with a finite life.

**$V = I (PVIFA_{kd, n}) + MV (PVIF_{kd, n})$ or V = PV (Interest Payments) + PV (MV)**

PVIF = present value interest factor
V = value; I = interest payment; MV = maturity value
**kd** = discount rate; n = number of periods

**Example 4.14.** Bond C has a $1,000 face value and provides an 8% annual coupon for 30 years. The appropriate discount rate is 10%. What is the value of the *coupon bond*?

1. Calculate the annual coupon payment: $1000 * .08. **$80**
2. Find the PV of an $80 annuity for 30 periods at 10%. **$754.16**
3. Find the PV of a bond with a MV of $1000 in 30 periods discounted at 10%. **$57.00**
4. Add the two PVs: **$754.16 + $57.00 = $811.16**

**Zero-Coupon Bond**
A **zero-coupon bond** is a bond that pays no interest but sells at a deep discount from its face value; it provides compensation to investors in the form of price appreciation.

**Example 4.17.** Bond Z has a $1,000 face value and a 30-year life. The appropriate discount rate is 10%. What is the value of the *zero-coupon bond*?

1. Find the PV of a bond with a MV of $1000 in 30 years discounted at 10%. **$57.00**

**Semiannual Coupon Bond**
Most bonds in the US pay interest twice a year (1/2 of the annual coupon).

**Example 4.21.** Bond C has a $1,000 face value and provides an 8% semi-annual coupon for 15 years. The appropriate discount rate is 10% (annual rate). What is the value of the *coupon bond*?

1. Calculate the annual coupon payment: $1000 * .08. **$80**
2. Divide the annual payment and discount rate by 2: **$40, 5%**
3. Find the PV of an $40 annuity for 30 periods at 5%. **$614.92**
4. Find the PV of a bond with a MV of $1000 in 30 periods discounted at 5%. **$231.00**
5. Add the two PVs: **$614.92 + $231.00 = $845.92**

**Preferred Stock**
Preferred Stock is a type of stock that promises a (usually) fixed dividend, but at the discretion of the board of directors. Preferred Stock has preference over common stock in the payment of dividends and claims on assets.

**Example 4.28.** Stock PS has an 8%, $100 par value issue outstanding. The appropriate discount rate is 10%. What is the value of the preferred stock**?**

Dividend = $Div_P$ = $100 ( 8% ) = $8.00. Discount rate of the preferred stock = $k_P$ = **10%.**
Value = V = $Div_P / k_P$ = $8.00 / 10% = **$80**

## Common Stock

Common stock represents a residual ownership position in the corporation.
- ☐ Pro rata share of future earnings after all other obligations of the firm (if any remain).
- ☐ Dividends *may* be paid out of the pro rata share of earnings.

What cash flows will a shareholder receive when owning shares of common stock?
(1) Future dividends (PV of an annuity)
(2) Future sale of the common stock shares (PV of a FV)

There are three stock growth models: constant growth, zero growth, and growth phase models.

**Constant Growth Model**
The constant growth model assumes that dividends will grow forever at the rate g.

$$\frac{D_1}{(k_e - g)}$$

$D_1$: Dividend paid at time 1.
g : The constant growth rate.
$k_e$: Investor's required return.

**Example 4.35.** Stock CG has an expected dividend growth rate of 8%. Each share of stock just received an annual $3.24 dividend. The appropriate discount rate is 15%. What is the value of the common stock?
$D_1$ = $3.24 ( 1 + 0.08 ) = **$3.50**
$V_{CG} = D_1 / ( k_e - g ) = \$3.50 / (0.15 - 0.08 ) = \$3.50 / .07 =$ **$50**

**Zero Growth Model**
The zero-growth model assumes that dividends will grow forever at the rate g = 0.

$$\frac{D_1}{k_e}$$

$D_1$: Dividend paid at time 1.
$k_e$: Investor's required return.

**Example 4.37.** Stock ZG has an expected growth rate of 0%. 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?

$D_1$ = $3.24 ( 1 + 0 ) = **$3.24**
$V_{ZG} = D_1 / ( k_e - 0 ) = \$3.24 / (0.15 - 0 ) = \$3.24 / .15 =$ **$21.60**

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

Next Class