FN 201: Lecture Note 6
Bond and Common Stock Valuation

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Outline

Bond Valuation

- How bond prices
- Maturity and prices
- Yield To Maturity

Common Stock Valuation

- Expected rate of return on common stocks
- Valuing common stocks

Preferred stocks

Bond Valuation

Bond

= A long-term debt instrument in which a borrower agrees to make payments of principal and interest, on specific dates, to the holders of the bond.

Key features of Bond

- Par value – face amount of the bond, which is paid at maturity.
- Coupon interest rate – stated interest rate (generally fixed) paid by the issuer.
- Maturity date – years until the bond must be repaid.
- Issue date – when the bond was issued.
- Yield to maturity - rate of return earned on a bond held until maturity.

Bond Price

$$PV = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \ldots + \frac{Par + C_N}{(1+r)^N}$$

Example: If today is October 1, 2007, what is the value of the following bond? An IBM Bond pays $115 every September 30 for 5 years. In September 2012 it pays an additional $1000 and retires the bond. The bond is rated AAA (YTM is 7.5%)

Bond Price – Example

- A Microgates Industries bond has a 10 percent coupon rate and a $1,000 face value. Interest is paid annually, and the bond has 20 years to maturity. If investors require a 12 percent yield, what is the bond's value?
  - If interest is paid semiannually, what is the bond price?

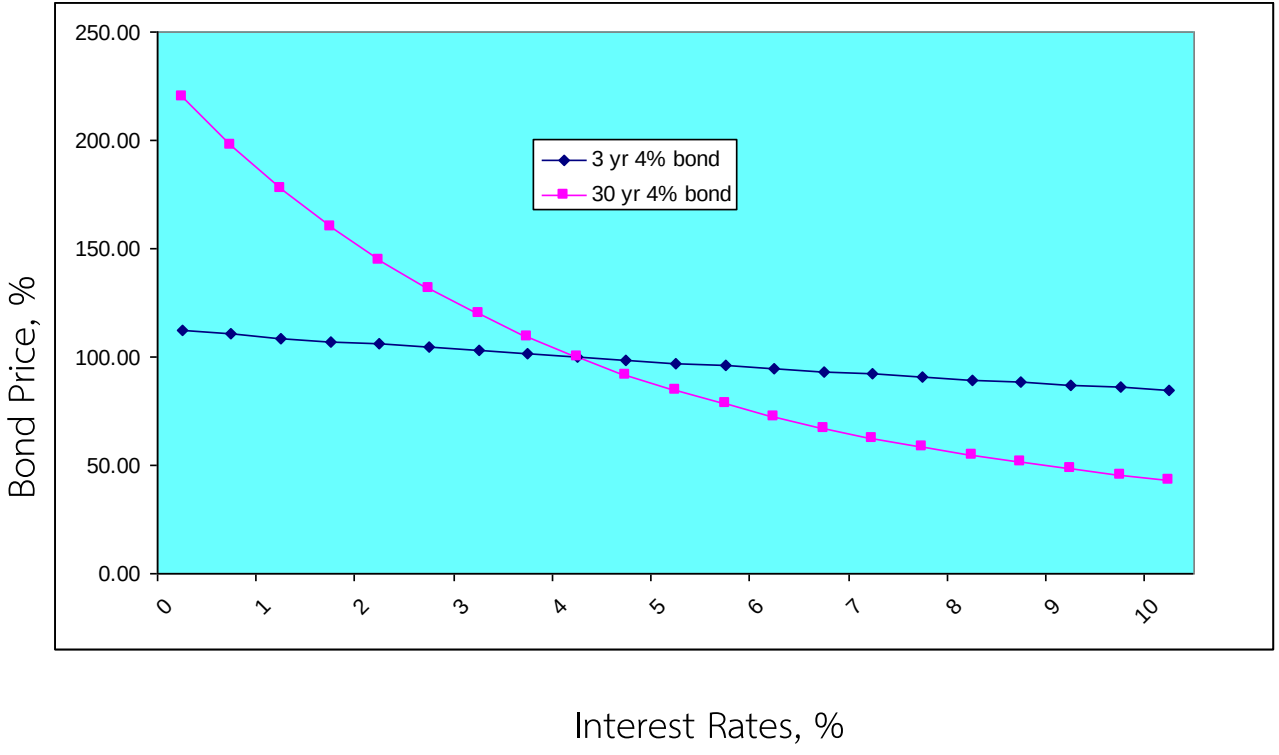
- A Macrohard Corp. bond carries an 8 percent coupon, paid semiannually. The par value is $1,000, and the bond matures in six years. If investors require a 6 percent yield, what is the bond's value?

Maturity and Prices

Both Bond Sam and Bond Dave have 8 percent coupons, make semiannual payments, and are priced at par value. Bond Sam has 2 years to maturity, whereas Bond Dave has 15 years to maturity. Currently, investors require 10 percent yield. If interest rates suddenly rise by 2 percent, what is the percentage change in the price of Bond Sam? Of Bond Dave? If rates were to suddenly fall by 2 percent instead, what would the percentage change in the price of Bond Sam be then? Fill in the following table:

8 percent coupon bonds	Price @ 10%	Price @ 12%	Price @ 8%	% change (+)	% change (-)
Bond Sam – 2 years					
Bond Dave – 15 years					

Maturity and Prices



Yield To Maturity (YTM)

- All interest bearing instruments are priced to fit the term structure
- This is accomplished by modifying the asset price
- The modified price creates a New Yield, which fits the Term Structure
- The new yield is called the Yield To Maturity (YTM)

Yield to Maturity

Example

- A $1000 treasury bond expires in 5 years. It pays a coupon rate of 10.5%. If the market price of this bond is 1058.345, what is the YTM?

C0	C1	C2	C3	C4	C5
-1058.345	105	105	105	105	1105

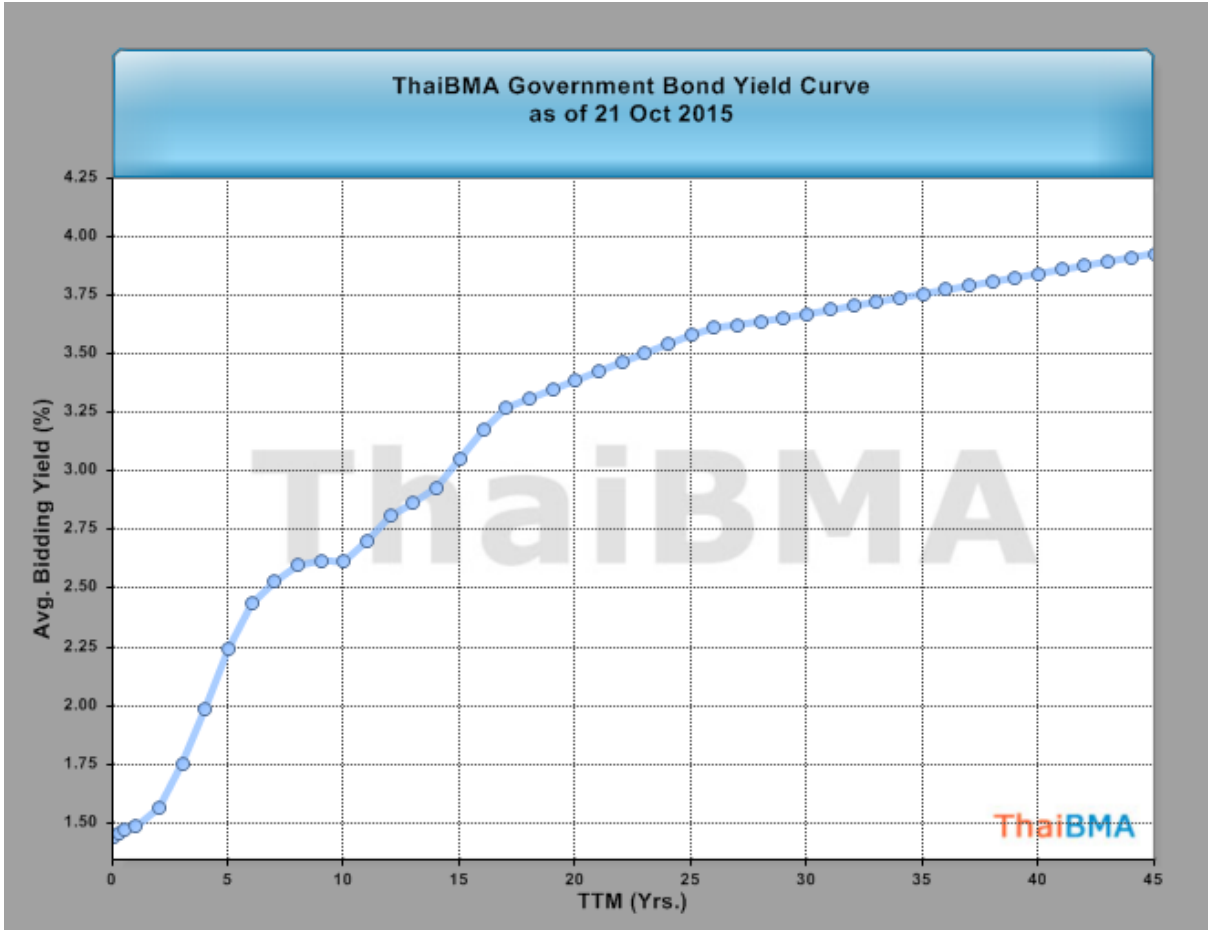
Yield to Maturity

- Macrohard Corp. bond carries an 8 percent coupon. The par value is $1,000, and the bond matures in six years. If the bond currently sells for $911.37, what is its yield to maturity?
- Giles Co. wants to issue new 20-year bonds for some much-needed expansion projects. The company currently has 7 percent coupon bonds on the market that sell for $1,062, and mature in 20 years. What coupon rate should the company set on its new bonds if it wants them to sell at par?
- The Brownstone Corporation's bonds have 5 years remaining to maturity. Interest is paid annually, the bonds have a $1,000 par value, and the coupon interest rate is 9%.

    a. What is the yield to maturity at a current market price of (1) $829 or (2) $1,104?

    b. Would you pay $829 for one of these bonds if you thought that the appropriate rate of interest was 12%—that is, if rd = 12%? Explain your answer.

Yield Curve


ThaiBMA Government Bond Yield Curve
as of 21 Oct 2015
Avg. Bidding Yield (%)
4.25
4.00
3.75
3.50
3.25
3.00
2.75
2.50
2.25
2.00
1.75
1.50
0
5
10
15
20
25
30
35
40
45
TTM (Yrs.)
ThaiBMA
ThaiBMA

Common Stock Valuation

Expected Return on Common Stocks

Expected Return - The percentage yield that an investor forecasts from a specific investment over a set period of time. Sometimes called the ***market capitalization rate***.

The formula can be broken into two parts.

Dividend Yield + Capital Gain or Loss

Expected Return on Common Stocks

Example: If Fledgling Electronics is selling for $100 per share today and is expected to sell for $110 one year from now, what is the expected return if the dividend one year from now is forecasted to be $5.00?

Example: You purchase an ownership share in the Indianapolis Colts for $50,000, who just won the Super Bowl. In one year you expect the Colts to repeat as Super Bowl champions and pay you a dividend of $3,000. You think you will be able to sell your share for $58,000 at that time. What is your expected return?

Valuing Common Stocks

- Dividend discounted model
- Constant growth model (Gordon Growth Model)
- Nonconstant growth model

Valuing Common Stocks - Dividend Discount Model

Computation of today's stock price which states that share value equals the present value of all expected future dividends.

Valuing Common Stocks - Dividend Discount Model

Example

Current forecasts are for XYZ Company to pay dividends of $3, $3.24, and $3.50 over the next three years, respectively. At the end of three 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?

$$PV = \frac{3.00}{(1+.12)^1} + \frac{3.24}{(1+.12)^2} + \frac{3.50+94.48}{(1+.12)^3}$$

$$PV = \$75.00$$

Valuing Common Stocks - Dividend Discount Model

Example:

- Mary Czech is considering the purchase of stock X at the beginning of the year. The dividend at year-end is expected to be $3.25, and the market price by the end of the year is expected to be $25. If she requires a rate of return of 12 percent, what is the value of the stock?
- The Ohm Company paid a $2.50 dividend per share at the end of the year. The dividend is expected to grow by 10 percent each year for the next 3 years, and the stock's market price per share is expected to be $50 at the end of the third year. Investors require a rate of return of 14 percent. At what price per share should the Ohm stock sell?

Valuing Common Stocks - Dividend Discount Model

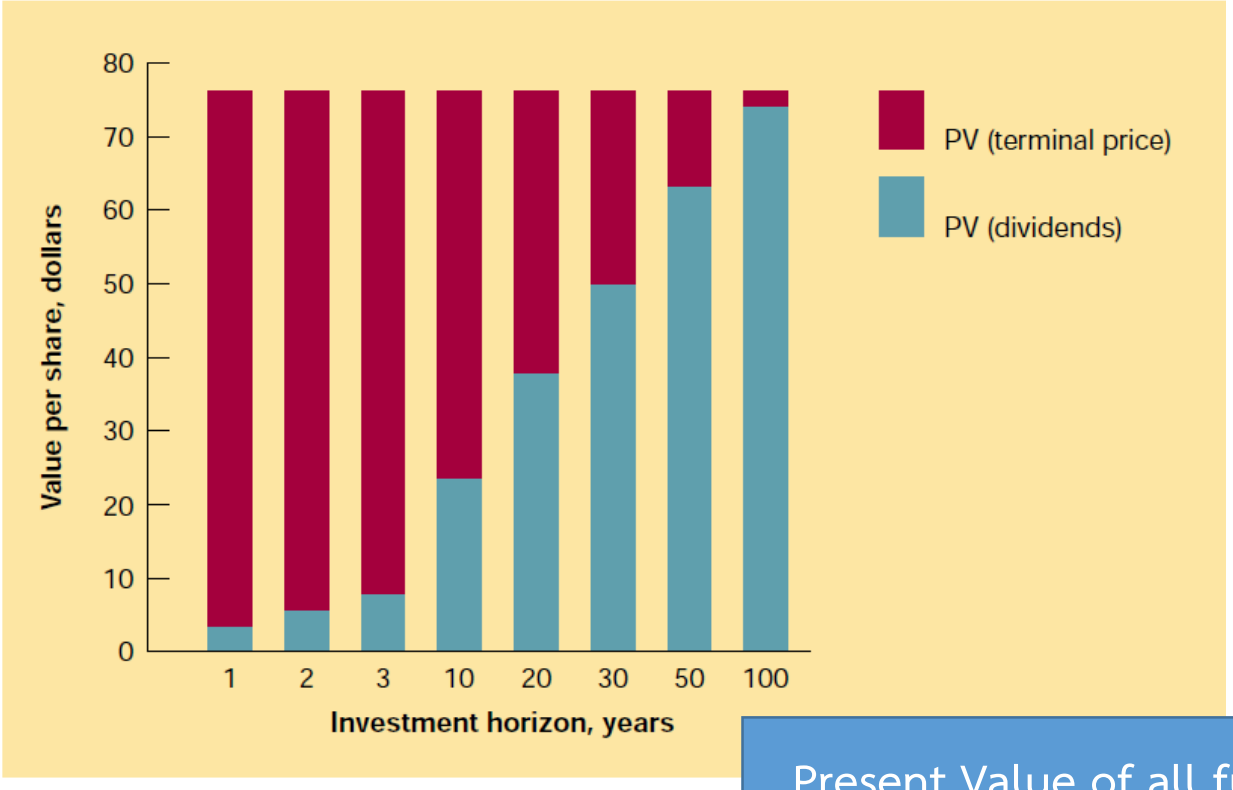
You buy a share of The Ludwig Corporation stock for $21.40. You expect it to pay dividends of $1.07, $1.1449, and $1.2250 in Years 1, 2, and 3, respectively, and you expect to sell it at a price of $26.22 at the end of 3 years.

a. Calculate the growth rate in dividends.

b. Calculate the expected dividend yield.

c. Assuming that the calculated growth rate is expected to continue, you can add the dividend yield to the expected growth rate to obtain the expected total rate of return. What is this stock's expected total rate of return?

Valuing Common Stocks - Dividend Discount Model



If H approaches infinity:

$$P_0 = \sum_{t=1}^{\infty} \frac{Div_t}{(1+r)^t}$$

Present Value of all future dividend per share

Valuing Common Stocks - Constant Growth DDM

Constant Growth DDM

A version of the dividend growth model in which dividends grow at a constant rate *(Gordon Growth Model)*.

$$
\begin{aligned}
P_0 &= \frac{Div_0(1+g)}{(1+r)^1} + \frac{Div_0(1+g)^2}{(1+r)^2} + \ldots + \frac{Div_0(1+g)^\infty}{(1+r)^\infty} \\
&= Div_0 \sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+r)^t} \\
&= \frac{Div_0(1+g)}{r-g} \qquad = \frac{Div_1}{r-g}
\end{aligned}
$$

Valuing Common Stocks - Constant Growth DDM

- You believe that the Non-stick Gum Factory will pay a dividend of $2 on its common stock next year. Thereafter, you expect dividends to grow at a rate of 6 percent a year in perpetuity. If you require a return of 12 percent on your investment, how much should you be prepared to pay for the stock?
- Arts and Crafts, Inc., will pay a dividend of $5 per share in 1 year. It sells at $50 a share, and firms in the same industry provide an expected rate of return of 14 percent. What must be the expected growth rate of the company's dividends?
- The Brigapenski Co. has just paid a cash dividend of $2 per share. Investors require a 16 percent return from investments such as this. If the dividend is expected to grow at a steady 8 percent per year:
  - what is the current value of the stock?
  - What will the stock be worth in five years?

Valuing Common Stocks - Constant Growth DDM

Example

If a stock is selling for $100 in the stock market with $3 dividend, what might the market be assuming about the growth in dividends?

Valuing Common Stocks - Constant Growth DDM

Note for dividend growth (g):

Example: A stock sells for $40. The next dividend will be $4 per share. If the rate of return earned on reinvested funds is 15 percent and the company reinvests 40 percent of earnings in the firm, what must be the discount rate?

Valuing Common Stocks - Constant Growth DDM

Example: Here are data on two stocks, both of which have discount rates of 15 percent:

	Stock A	Stock B
Return on equity	15%	10%
Earnings per share	$2.00	$1.50
Dividends per share	$1.00	$1.00

a. What are the dividend payout ratios for each firm?

b. What are the expected dividend growth rates for each firm?

c. What is the proper stock price for each firm?

Valuing Common Stocks - Constant Growth DDM

Example: Metatrend's stock will generate earnings of $5 per share this year. The discount rate for the stock is 15 percent and the rate of return on reinvested earnings also is 15 percent.

a. Find both the growth rate of dividends and the price of the stock if the company reinvests the following fraction of its earnings in the firm: (i) 60 percent; (ii) 40 percent. What are the common stock's values from case (i) and (ii)?

b. Redo part (a) now assuming that the rate of return on reinvested earnings is 20 percent.

Valuing Common Stocks - Nonconstant Growth

The formula is:

$$P_0 = \frac{Div_1}{(1+r)^1} + \frac{Div_2}{(1+r)^2} + \ldots + \frac{Div_H}{(1+r)^H} + \frac{P_H}{(1+r)^H}$$

PV of dividends from Year 1 to horizon

PV of stock price at horizon

Valuing Common Stocks - Nonconstant Growth

- North Side Corporation is expected to pay the following dividends over the next four years: $8, $7, $5, and $2. Afterward, the company pledges to maintain a constant 5 percent growth rate in dividends forever. If the required return on the stock is 11 percent, what is the current share price?
- Rizzi Co. is growing quickly. Dividends are expected to grow at a 25 percent rate for the next three years, with the growth rate falling off to a constant 7 percent thereafter. If the required return is 13 percent and the company just paid a $3.10 dividend, what is the current share price?
- Storico Co. just paid a dividend of $2.75 per share. The company will increase its dividend by 20 percent next year and will then reduce its dividend growth rate by 5 percentage points per year until it reaches the industry average of 5 percent dividend growth, after which the company will keep a constant growth rate forever. If the required return on Storico stock is 13 percent, what will a share of stock sell for today?

Valuing Common Stocks - Nonconstant Growth

- A company currently pays a dividend of $2 per share (D0 = $2). It is estimated that the company's dividend will grow at a rate of 20% per year for the next 2 years, then at a constant rate of 7% thereafter. If investors require rate of return 12%, what is your estimate of the stock's current price?
- Assume that the average firm in your company's industry is expected to grow at a constant rate of 6% and that its dividend yield is 7%. Your company is about as risky as the average firm in the industry, but it has just successfully completed some R&D work that leads you to expect that its earnings and dividends will grow at a rate of 50% [D1 = D0(1 + g) = D0(1.50)] this year and 25% the following year, after which growth should return to the 6% industry average. If the last dividend paid (D0) was $1, what is the value per share of your firm's stock?

Special Issues:

Preferred Stocks

Valuing Preferred Stocks

The formula is:

Example:

(1) What is the rate of return on a preferred stock with a $100 par value, a stated dividend of 8% of par, and a current market price of (a) $60, (b) $80, (c) $100, and (d) $140?

(2) Nick's Enchiladas Incorporated has preferred stock outstanding that pays a dividend of $5 at the end of each year. The preferred sells for $50 a share. What is the stock's required rate of return?

(3) Several years ago, Rolen Riders issued preferred stock with a stated annual dividend of 10% of its $100 par value. Preferred stock of this type currently yields 8%. Assume dividends are paid annually.

a. What is the value of Rolen's preferred stock?

b. Suppose interest rate levels have risen to the point where the preferred stock now yields 12%. What would be the new value of Rolen's preferred stock?

Question?