



FN 201 BUSINESS FINANCE

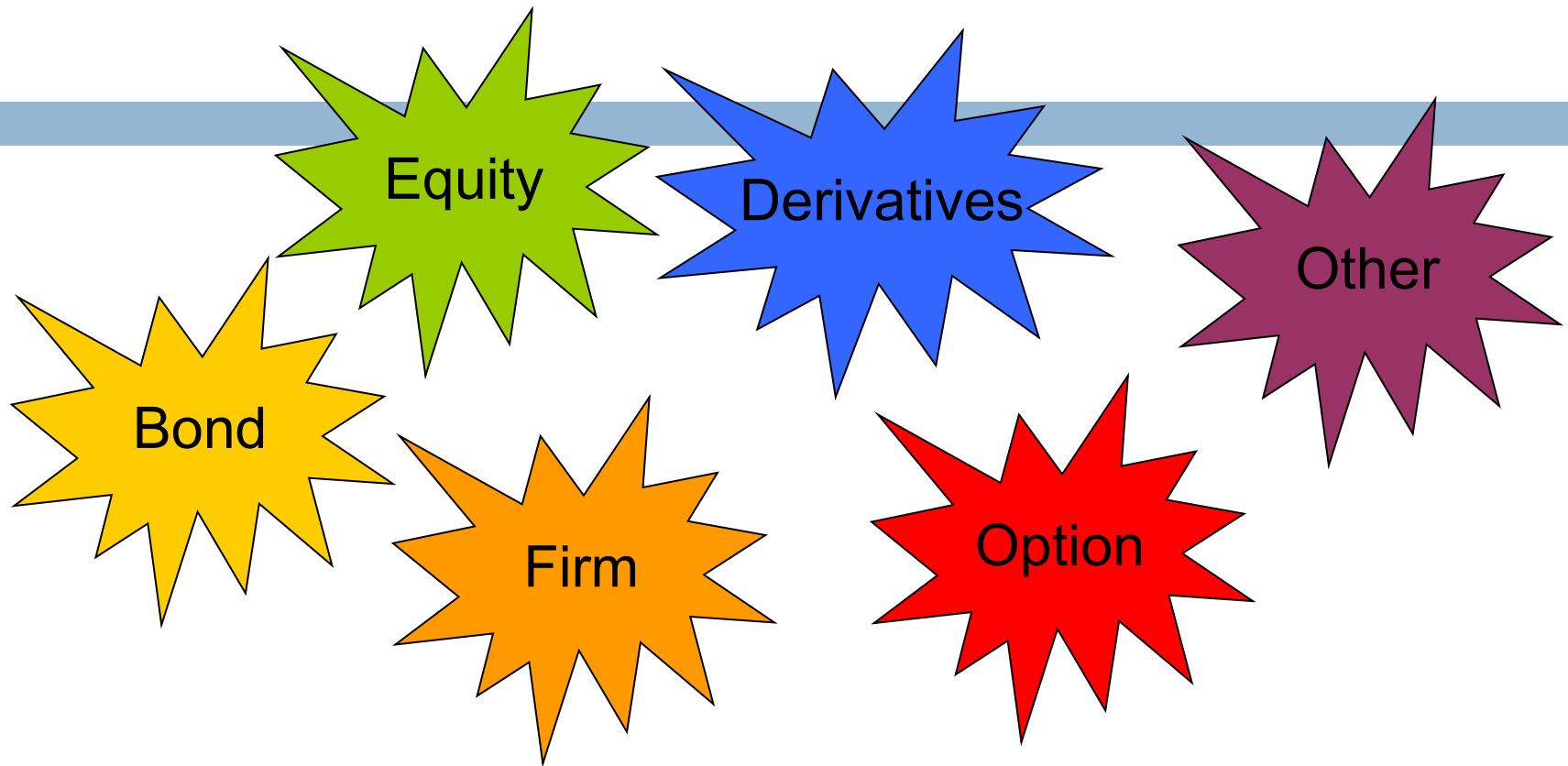


Lecture 7
Asset Valuation



Agenda

- ▣ Concept – Asset Valuation
- ▣ Equity Valuation
- ▣ Bond Valuation



(Any) Financial products are valued as sum of discounted
(expected) cash flow

Concept

- ▣ Any financial assets are valued as a sum of discounted (expected) cash flows
 - PV (equity) = PV (expected future dividends)
- ▣ Usually return from stock occurs in 2 forms :
 - Dividends & Capital gains (losses)
- ▣ Expected return from investing in the stock

$$\text{Expected return} = r = \frac{DIV_1 + P_1 - P_0}{P_0}$$

- DIV_1 = expected dividend per share at the end of the year
- P_1 = expected price at the end of the year

Concept 2

□ Today's Price

- ▣ Given investor's forecasts of dividend and price, we can rearrange the equation to obtain today's stock price

$$\text{Price} = P_0 = \frac{DIV_1 + P_1}{1+r}$$

$$\text{Price} = P_0 = \frac{DIV_1 + P_1}{1+r}$$

□ Next Year price.....

- ▣ Recursive valuation

$$\text{Price} = P_1 = \frac{DIV_2 + P_2}{1+r}$$

$$\text{Price} = P_2 = \frac{DIV_3 + P_3}{1+r}$$

Concept 3

□ Recursive Valuation

▣ We obtain

$$P_0 = \sum_{t=1}^H \frac{DIV_t}{(1+r)^t} + \frac{P_H}{(1+r)^H}$$

▣ As H approaches infinity, the PV of the terminal price will approach zero

$$P_0 = \sum_{t=1}^{\alpha} \frac{DIV_t}{(1+r)^t} ****$$



Put your thoughts into it

- What does the formula tell us about equity valuation?
 - ▣ Equity is valued at sum of discounted expected dividend

- Where is the terminal value (P_H)?
 - ▣ As firm approaches infinity, the PV of the terminal price will approach zero

- Do we ignore capital gain?
 - ▣ No, because formula was derived from the assumption that price in any period is determined by expected dividends and capital gains over the next period

Ex 1

- 1.1 Company BE-TU's stock is selling for \$100 per share today. It is expected that this stock will pay a dividend of 6 dollars per share, and then be sold for \$114 per share at the end of one year. Calculate the expected rate of return for the shareholders.
a. 20% b. 15% c. 10% d. 25%

- 1.2 The value of a common stock today depends on:
 - a. Number of shares outstanding and the number of shareholders
 - b. The expected future dividends and the discount rate
 - c. The Wall Street analysts
 - d. Present value of the future earnings per share

Ex 2

- 2.1 Stockholders expect to receive a year-end dividend of \$5 per share and then be sold for \$115 dollars per share. If the required rate of return for the stock is 20%, what is the current value of the stock?
a. \$100 b. \$122 c. \$132 d. \$110

- 2.2 Company expects to pay a dividend of \$2 per share at the end of year-1, \$3 per share at the end of year -2 and then be sold for \$32 per share. If the required rate on the stock is 15%, what is the current value of the stock?
a. \$28.20
b. \$32.17
c. \$32.00
d. None of the given answers

Ex 3

- 3.1 Company is expected to pay a dividend of \$3 per share at the end of year-1 (D_1) and these dividends are expected to grow at a constant rate of 6% per year forever. If the required rate of return on the stock is 18%, what is current value of the stock today?
a. \$25 b. \$50 c. \$100 d. \$54

- 3.2 Company is expected to pay a dividend of \$2 per share at the end of year -1 (D_1) and the dividends are expected to grow at a constant rate of 4% forever. If the current price of the stock is \$20 per share calculate the expected return or the cost of equity capital for the firm:
a. 10%
b. 4%
c. 14%
d. None of the above

Ex 4

- 4.1 Company has just now paid a dividend of \$2.83 per share (D_0); the dividends are expected to grow at a constant rate of 6% per year forever. If the required rate of return on the stock is 16%, what is the current value on stock, after paying the dividend?
- a. \$30 b. \$56 c. \$70 d. \$48

Ex. 5 g not containat

- 5.1) The In-Tech Co. has just paid a dividend of \$1 per share. The dividends are expected to grow at 25% per year for the next three years and at the rate of 5% per year thereafter. If the required rate of return on the stock is 18%(APR), what is the current value of the stock?
a. \$12.97 b. \$11.93 c. \$15.20 d. None of the above

- 5.2) R&D Technology Corporation has just paid a dividend of \$0.50 per share. The dividends are expected to grow at 24% per year for the next two years and at 8% per year thereafter. If the required rate of return in the stock is 16% (APR), calculate the current value of the stock.
a. \$1.11 b. \$7.71 c. \$8.82 d. None of the above

Growth & Income Stocks

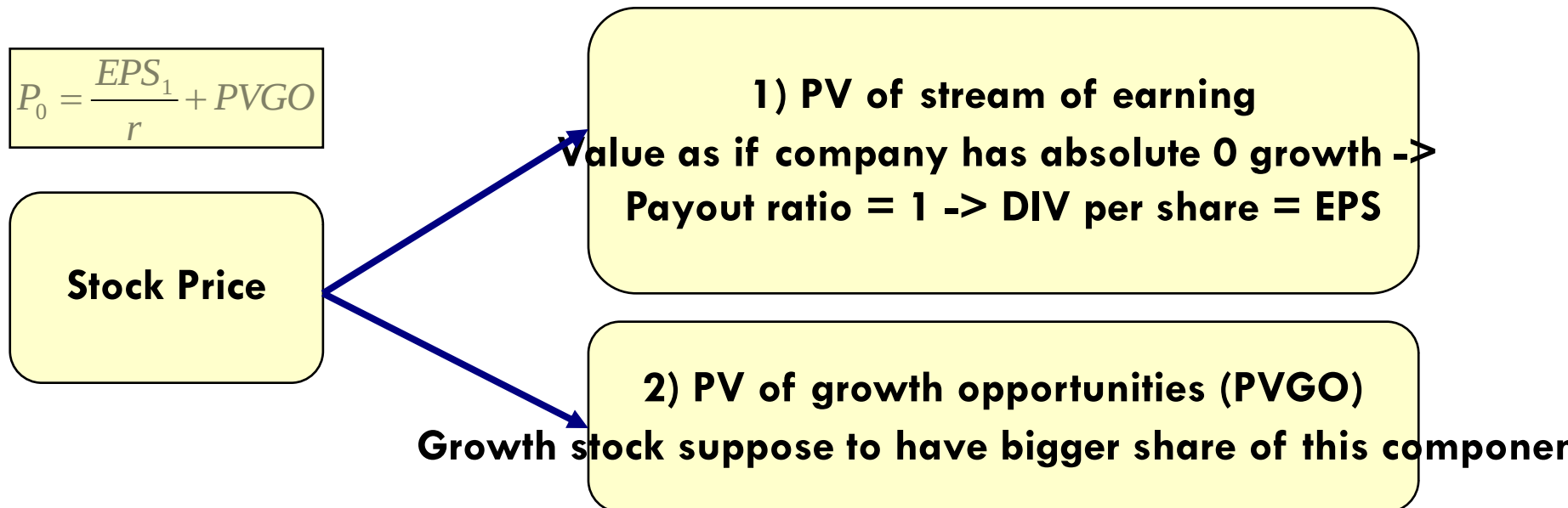
- What does growth stock mean?
 - ▣ Shares in a company whose earnings are expected to grow at an above-average rate relative to the market.
 - ▣ A growth stock usually does not pay a dividend, as the company would prefer to reinvest retained earnings in capital projects.
 - Most technology companies are growth stocks
 - ▣ Majority of its returns come from.....

Growth & Income Stocks (2)

- What does income stock mean?
 - ▣ An equity that pays regular, often steadily increasing dividends
 - ▣ Most income stocks have lower levels of volatility than the overall stock market, and offer higher-than-market dividend yields
 - ▣ Have limited future growth options, thereby requiring a lower level of ongoing capital investment.
 - The excess cash flow from profits can therefore be directed back toward investors on a regular basis
 - Most energy, utility companies are income stocks
- ▣ Majority of its returns come from.....

Can we quantify value of growth prospect of the stock?

- Can we quantify value of growth-component for the growth stock ?
- Yes, there is a way
- 1st step: calculate value of this stock as if there is no future growth
- 2nd step: the difference between value in 1) and market price is the value of potential growth or present value of growth opportunity (PVGO)



Ex 6 US Growth stock

Stock	Stock Price	EPS	Cost of Equity r	PVGO $P - EPS/r$	PVGO % of P
Income Stocks					
Cummins (\$)	118.18	12.03	0.157	41.56	35.2%
Dow Chemical (\$)	39.9	4.11	0.125	7.02	17.6%
Unilever (EU)	14.16	0.896	0.091	4.31	30.5%
Growth Stocks					
Microsoft (\$)	29.86	1.57	0.123	17.10	57.3%
Starbucks (\$)	35.42	0.985	0.092	24.71	69.8%
Logica (EU)	1.85	0.111	0.159	1.15	62.3%

- Note that PVGO accounts for well over 50% of value of growth stocks
- Investors expect these companies to invest heavily, grow rapidly and earn returns well above their cost of capital

Ex. 7 PVGO

- 7.1) Summer Co. is expected to pay a dividend of \$4.00 per share out of earnings of \$7.50 per share. If the required rate of return on the stock is 15% and dividends are growing at a current rate of 10% per year, calculate the present value of the growth opportunity for the stock (PVGO).
a. \$80 b. \$30 c. \$50 d. \$26

- 7.2) Parcel Corporation is expected to pay a dividend of \$5 per share next year, and the dividends pay out ratio is 50%. If the dividends are expected to grow at a constant rate of 8% forever and the required rate of return on the stock is 13%, calculate the present value of the growth opportunity.
a. \$100
b. \$76.92
c. \$23.08
d. None of the above

Valuation methodologies

1. One-period valuation model

2. Generalized dividend valuation model

3. Gordon growth model

4. Price earnings valuation model

Stock prices

1. One-period valuation model

$$P_0 = \frac{Div_1}{(1 + k_e)} + \frac{P_1}{(1 + k_e)}$$

P_0 = Current stock price

Div_1 = Dividend paid at end of year 1

k_e = Required return on equity investment

P_1 = Stock price at end of year 1: assumed sales price of stock

Should you buy this stock??

Given information:

- $P_0 = \$50$; Expected dividend \$0.16; Predicted $P_1 = 60$

Analysis:

- Assuming required return = 12%

Calculated $P_0 = \$53.71 \rightarrow$ Undervalued stock!!! $\rightarrow$ BUY!!!

Stock prices

2. Generalized dividend valuation model

$$P_0 = \frac{Div_1}{(1 + k_e)} + \frac{Div_2}{(1 + k_e)^2} + \frac{Div_3}{(1 + k_e)^3} + \dots + \frac{Div_n}{(1 + k_e)^n} + \frac{P_n}{(1 + k_e)^n}$$

$$P_0 = \sum_{t=1}^{\infty} \frac{Div_t}{(1 + k_e)^t} + \cancel{\frac{P_n}{(1 + k_e)^n}}$$

Stock prices

3. Gordon growth model

$$P_0 = \frac{D_0 \times (1 + g)^1}{(1 + k_e)} + \frac{D_0 \times (1 + g)^2}{(1 + k_e)^2} + \dots + \frac{D_0 \times (1 + g)^\infty}{(1 + k_e)^\infty}$$

$$P_0 = \frac{D_0 \times (1 + g)}{(k_e - g)} = \frac{D_1}{(k_e - g)}$$

D_0 = Most recent dividend paid

g = expected constant growth rate in dividend

k_e = Required return on equity investment

ASSUMPTIONS:

- Dividends are growing at a constant rate forever
- Growth rate is assumed to be less than the required return on equity

Stock prices

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Stock markets

4. Price earnings valuation model

A measure of how much the market is willing to pay for \$1 of earnings from a firm

High P/E ratio means

- **Market expects earnings to rise in the future**
- **Market feels the firm's earnings have very low risk and is willing to pay a premium for them**

$$\frac{P}{E} \times E = P$$

**Firm's expected earnings eg.
EPS@\$1.13**

Industry P/E ratio eg. 23



Determine the key ingredient

Estimating the discount rate

- As you can see, valuation of equity depends on significantly on the discount rate (r)
- The next (natural) question is how to obtain r .
- Discount rate r is defined as “the expected return on other securities with the same risk as this stock”
- 2 approaches (1) Obtain from current market price / balance sheet
(2) Use risk and return model

Ex 8 Toyota Homework

$$P_0 = \frac{DIV_1}{r - g}$$

$$r = \frac{DIV_1}{P_0} + g$$

- ▣ Recall Gorgon Growth model
- ▣ To obtain formula for r , rearrange equation gives
 - ▣ $DIV_1 / P_0 \rightarrow$ dividend yields $\rightarrow$ easy to obtain
 - ▣ $g \rightarrow$ expected rate of growth in dividend
- ▣ Toyota Motor Company made a profit of \$1.38 billion for year 20011; a reliable research said the profit is expected to grow 15% per year forever.
- ▣ Given, there are 50 million shares outstanding
- ▣ And the whole annual profit is paid as cash dividend to shareholders at the end of year
 - ▣ Current price at 30 Dec 2012 is 634.8
 - ▣ Estimate r

Ex 8 Toyota Homework (2)

- Unfortunately, on 30 Dec 2012, Toyota has to recall its sold cars from customers because of some errors in production. However, it costs \$ 500 million to Toyota on 30 Dec 2015 and there is no additional cost for other years.
- Suddenly, the current stock price drops to \$ 600 per share.
 - As rational investor, should you buy Toyota stock at this price?
 - Why?

Ex 9. T or F

- 1) The return that is expected by investors from a common stock is also called cost of equity capital.
- 2) All securities in an equivalent risk class are priced to offer the same expected return.
- 3) The only payoff to the owners of common stocks is in the form cash dividends.
- 4) It is not possible to value a firm with supernormal (variable) growth rate for the first few years of its life.
- 5) A large percentage of the total value of a growth stock comes from the growth opportunity
- 6) The discounted-cash-flow formulas that is used to value common stocks can also be used to value entire businesses