

# CHAPTERS 7: STOCK VALUATION

Business Finance 3220

### Estimating Dividends: 3 Cases

- Constant dividend:  $P_0 = D / r_E$  like constant perpetuity
  - The firm will pay a constant dividend forever
  - This is like preferred stock (not common/small area of inve)
- Constant dividend growth:  $P_0 = \frac{D_0(1+g)}{r_E - g} = \frac{D_1}{r_E - g}$ 
  - The firm will increase the dividend by a constant percent every period
- Supernormal growth
  - Dividend growth is not consistent initially, but settles down to constant growth eventually

like constant perpetuity  
not common/small area of inve

not realistic/accurate

not constant fast at beginning then taper off

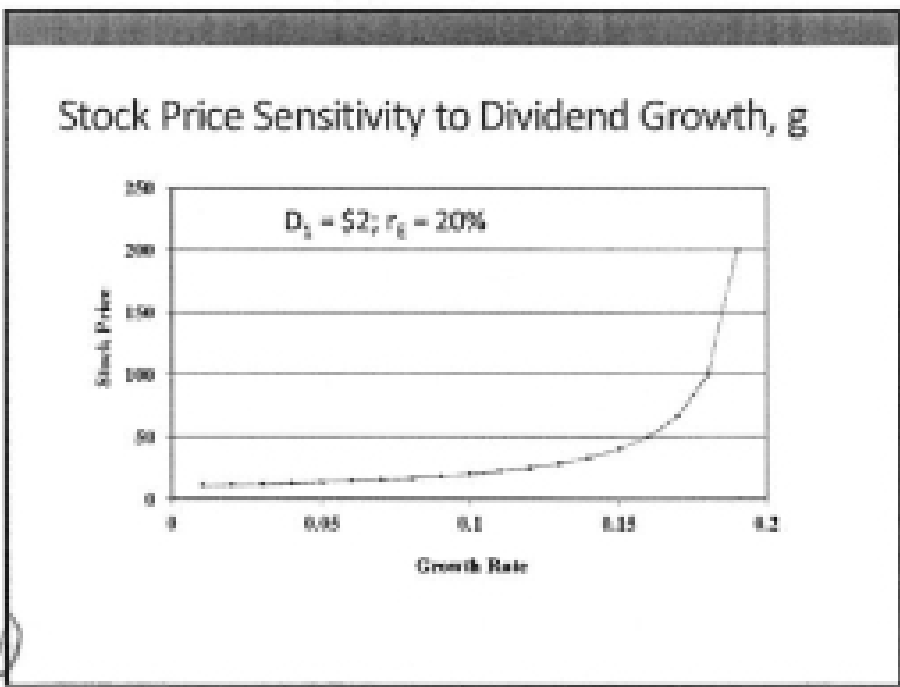
Retention Rate = rate at which we retain it  
tradeoff of it pay out or keep \$

we need next periods dividend ( $D_1$ ) not this period  
- anything already occurred  $D_0$   
- anything about to occur  $D_1$

### Estimating g

- $g = \text{Retention Rate} \times \text{Return on New Investment}$ 
  - Return on New Investment sometimes called Return on Equity (ROE)
- The more a company retains/reinvests, the higher g will be.
- Retention / Reinvestment only good as long as Return on New Investment > Equity Cost of Capital ( $r_E$ )
  - I.e. Shareholders will be satisfied with foregoing dividends if the company is able to reinvest at a higher rate of return than the shareholders are demanding
  - If  $r_E = 15\%$ , but a new project has an expected return of 20%, shareholders will be willing to let the company invest in the new project rather than giving the shareholders the cash.

Reinvesting will add more value in future (don't pay out div)



as g gets close to  $r_E$  diffn gets small

- overall average of what % return want to see out of a company

$D_1 = 2, r_E = 0.2$   
 $g = .18, g = .19$   
 $\frac{2}{.2 - .19} = 200, \frac{2}{.2 - .18} = 100$  } as g and  $r_E$  get closer cause problems (200 vs 100)

### Using the DGM to Find R

- Start with the DGM:

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

rearrange and solve for R

$$r_E = \frac{D_0(1+g)}{P_0} + g = \frac{D_1}{P_0} + g$$

div yield      capital gains yield

### Finding the Required Return - Example

- Suppose a firm's stock is selling for \$10.50. They just paid a \$1 dividend and dividends are expected to grow at 5% per year.
  - What is the required return?  $r_E = \frac{D_1 = D_0(1+g)}{P_0} = \frac{1(1.05)}{10.50} = 15\%$
  - What is the dividend yield?  $1(1.05) / 10.50 = 10\%$
  - What is the capital gains yield?  $g = 5\%$

LR avg return of 15%

Always expect returns will be positive

- div. yield % expression of how much made each yr.  
dividend should grow by rate of g (expected capital gains growth) if  $r_E$  stays same

dividends  $\rightarrow$  ordinary income/taxed higher  
 - people more interested in share repurchase (less tax)

10/8/2012

market value equity =  
 price per share  $\times$  # of shares

What if the company doesn't pay dividends?

- Many small and/or young companies do not pay dividends—what then?
- Dividend discount models are out, unless you can anticipate when the company will pay a dividend in the future (good luck).
- If the company does share repurchases, the value of the repurchase is effectively the same as a cash dividend.
- Since dividends are a proxy for equity cash flows, we can substitute another estimate, such as free cash flow
- This is what is commonly done in the industry, but requires much more information and expertise to forecast. Intuition is the same, however.

Total Payout: Dividends plus Repurchases

- Say a company has 5 shares outstanding that are worth \$100 each. Market value of equity =  $5 \times \$100 = \$500$ .
- Value is \$100 because expected dividend is \$10 and  $r_E$  is 10%.
- If they decided to pay a \$10/share dividend, investors then would have \$10 in cash and share price remains \$100.
- What if instead of paying a cash dividend, the company decided to pay \$125 to buy back one share of stock?
  - Company is still worth \$500 total, because the \$125 cash was used to buy a share of stock which the firm now owns.
  - Now share price will increase:  $\$500/4 = \$125/\text{share}$   $\rightarrow$  500 divided among few shares
  - Rough example, but the point is that investors can get payouts multiple ways.
  - Share price may increase more if investors think current share price is undervalued, and vice versa. (Signaling by management)

once buy shares new price for all shares should be equal to how much made repurchase for.

don't want to use current market price - need to off premium (more than market price) to repurchase the shares  $\rightarrow$  repurchase done at right price comp value overall should remain same

retaining - paying to other way

Constant growth: Problem 13

- Laurel Enterprises expects earnings next year of \$4/share and has a 40% retention rate, which it plans to keep constant. Its equity cost of capital is 10%, which is also its expected return on new investment. Its earnings are expected to grow forever at a rate of 4%/year. If its next dividend is due in one year, what do you estimate the firm's current stock price to be?
- Note: I think the solution to this problem is incorrect.

$E_1 = \$4$   $g = \text{retention} \times \text{return} = .40 \times .10 = .04$   
 $D_1 = 4 \times 0.60 = 2.40$   
 $P_0 = \frac{2.40}{.10 - .04} = \$40$

To retain more or less?: Problem 14

- DFB, Inc. expects earnings this year of \$5/share, and it plans to pay a \$3 dividend/share. DFB will retain \$2/share to reinvest in new projects that have an expected return of 15%/year. Suppose DFB will maintain the same retention rate and return on new investments and will not change its number of outstanding shares.

A. What is the growth rate of earnings?  $.06$   
 B. If the cost of equity capital is 12%, what is the stock price?  $50$   
 C. Suppose they decided to pay a \$4 dividend and retain only \$1/share. If they maintain this new payout policy, what is the price of the stock now? Should they follow this new policy?

$E_1 = \$5$   $g = \frac{2}{5} \times .15 = .06$   $P_0 = \frac{3}{.12 - .06} = 50$   
 $E_1 = \$5$   $g = \frac{1}{5} \times .15 = .03$   $P_0 = \frac{4}{.12 - .03} = 44.44$

retention ratio =  $\frac{2}{5}$

retention ratio =  $\frac{1}{5}$

return  $>$   $r_E$   
 $.15 > .12$  so comp could retain earn

choice to pay out more in div hurts because stock price goes down

Supernormal growth: Problem 17

- Colgate-Palmolive Company just paid an annual dividend of \$0.96. Analysts are predicting an 11%/year growth rate in earnings over the next five years. After that, Colgate's earnings are expected to grow at the current industry average of 5.2%/year. If Colgate's equity cost of capital is 8.5%/year and its dividend payout ratio remains constant, for what price does the dividend-discount model predict Colgate stock should sell?

$g_{1-5} = 11\%$   $\leftarrow$  PV of DIV = 5.142  
 $g_{6-\infty} = 5.2\%$   $\leftarrow$  PV = 34.40  
 $r_E = 8.5\%$   
 $D_0 = .96$

Total Payout: Problem 21

- Suppose Cisco Systems pays no dividends but spent \$5B on share repurchases last year. If Cisco's equity cost of capital is 12%, and if the amount spent on repurchases is expected to grow by 8% per year, estimate Cisco's market capitalization. If Cisco has 6B shares outstanding, what should the stock price be?

Repurchase $_0 = 5B$   $g = 8\%$   $MV(\text{Equity}) = \frac{5.4B}{.12 - .08} = 135B$   
 $RP_1 = 5B \times 1.08 = 5.4B$   $\frac{135B}{6B} = 22.50$

$$P_0 = \frac{D_0}{r_E - g} = \frac{0.96}{.085 - .11} = 34.30$$

|                         | 1      | 2                  | 3                  | 4                  | 5                  |
|-------------------------|--------|--------------------|--------------------|--------------------|--------------------|
| $D_t$                   | 1.0656 | 1.1828             | 1.3129             | 1.4573             | 1.6177             |
| $\frac{D_t}{(1.085)^t}$ | 1.085  | 1.085 <sup>2</sup> | 1.085 <sup>3</sup> | 1.085 <sup>4</sup> | 1.085 <sup>5</sup> |

or express as PV(growing annuity)  
 $= \frac{1.0656}{.085 - .11} \left(1 - \left(\frac{1.11}{1.085}\right)^5\right) = 5.142$