

M.I.T.
Sloan School of Management

15.415-Fall 1998
Professor Denis Gromb

Problem Set 4

- Please, work in a team (3 to 5 students) and hand in only one homework per team
- To ease and speed up grading, please:
 - Answer one question per page following the questions' order
 - Staple all pages of the problem set together (use staples, not paper clips)
 - Write the names of all team members very clearly

Question 1 (BKM 18.21)

- a) A company has a market capitalization rate of 15%, a constant growth rate of 10% and a dividend payout ratio of 45%. What should its P/E be?
- b) A stock is not paying any dividends until three years from now. The dividend is expected to be \$2 per share, the dividend payout ratio is expected to be 40% and the return on equity is expected to be 15%. If the cost of equity is 12%, what is the value of the stock today?

Question 2 (BKM 18.11)

The stock of Nogro Corporation is currently selling for \$10 per share. Earnings per share in the coming year are expected to be \$2. The company has a policy of paying out 50% of its earnings each year in dividends. The rest is retained and invested in projects that earn a 20% rate of return per year. The situation is expected to continue indefinitely.

- a) Assuming that the DDM applies, what is Nogro Corp's cost of equity?
- b) By how much its value exceed what it would be if all earnings were paid as dividends and nothing were reinvested?
- c) If Nogro Corp. were to cut its dividends to 25% of earnings, what would happen to its stock price?
- d) What if Nogro eliminated its dividends?

Question 3

Starship Enterprises (SE) is currently selling for \$100 per share. Their dividends are growing at 7% per year under their policy of plowing back 20% of earnings into the company. Earnings next year are expected to be \$30 per share.

- a) What is the return on equity and the market capitalization rate for S.E.?
- b) The hostile takeover genius, Darth Raider, vows to take over the company and raise its plowback ratio to 80%. If the takeover is expected to occur immediately, what is the effect on SE's price?

Question 4

The common stock of General Dynamics (GD) is currently selling for \$94.50 per share. The stock's current dividend is \$2.40 per share (assume that this will be paid in one year). The firm's P/E ratio is 8. Assume that GD's cost of equity is 12%.

- a) Using the Gordon model, what is GD's dividend growth rate?
- b) What is its ROE?

Question 5 (BKM 18.17)

The Duo Growth Company (DGC) just paid a dividend of \$1 per share. The dividend is expected to grow at a rate of 25% per year for the next three years and then to level off to 5% per year for ever. You think that the appropriate market capitalization rate is 20% per year.

- a) What is, according to you, the value of the stock?
- b) If the market price is indeed equal to this value, what is DGC's expected dividend yield?
- c) What do you expect its price to be one year from now? Is the implied capital gain consistent with your estimate of the dividend yield and the market capitalization rate?