

Each question is all or none on grading. To receive credit you must show each percent answer to 2 decimal places (e.g., 12.24%) and each price answer to the nearest \$.01 (e.g., \$5.16).

1. Use the following information for the next several questions. Consider a world of Perfect Capital Markets. This world has no corporate or personal taxes, all investors have homogeneous expectations, no bankruptcy costs, and M&M's no-tax theory of capital structure is true. Company Y is financed has the following market value balance sheet:

Assets = \$500
Liabilities = \$250
Equity = \$250

The firm had \$50.00 in EBIT last year, and has just paid its annual dividend. The firm has 50 shares outstanding. The firm expects these same returns for the foreseeable future. The firm is a zero growth firm that pays out all excess earnings as a once per year end of year dividend. Any time the firm changes its capital structure, it changes only the debt/equity mix and does not change its total physical assets. The firm's liabilities consist entirely of perpetual debt with annual interest payments. The firm's debt is riskless, selling at par, and has a 5% current yield. If the firm were to change its capital structure, new debt would still have a 5% yield. The expected return on the market portfolio is 13%. Given this information, answer the following questions:

- a. (1 point) What is the firm's WACC? 10%
- b. (1 point) What is the firm's Earnings Per Share? $.75$
- c. (1 point) What is the firm's Dividends Per Share? $.75$
- d. (1 point) What is the firm's current stock price? $\$5$
- e. (1 point) What is the firm's Return on Equity? 15%
- f. (1 point) What is the Beta of the firm's levered equity? 1.25
- g. (1 point) What is the Beta of the firm's assets? $(.5)(1) + (.5)(1.25) = .625$

Now assume that the above firm redeems \$250 in debt and uses the funds to issue equity. This change in capital structure reveals no new information about future firm prospects.

- h. (1 point) What is the new beta of the firm's equity? $.625$
- i. (1 point) What is the new return on equity? 10%
- j. (1 point) What is the firm's new Weighted Average Cost of Capital? 10%
- k. (1 point) What is the firm's new stock price? $\$5$

l. (1 points) Now assume that you are at the end of 10 years, just before paying the annual dividend, write out (with labels) the firm's expected balance sheet:
 $550 = 250 + 300$ (Assets = 550, Debt = 250, Equity = 300)

2. Now consider a DIFFERENT COMPANY in a world that of perfect capital markets, with one change. CORPORATE TAXES DO EXIST. This world has no personal taxes, all investors have homogeneous expectations, no bankruptcy costs, and M&M's with corporate taxes theory of capital structure is true. Company Y is financed has the following market value balance sheet:

Assets = \$300
Liabilities = \$0
Equity = \$300

The firm had \$50 in EBIT last year, and has just paid its annual dividend. The firm has 50 shares outstanding. The firm expects the same return/profits for the foreseeable future. The firm is a zero growth firm that pays out all excess earnings as a once per year end of year dividend. Any time the firm changes its capital structure, it changes only the debt/equity mix and does not change its physical/fixed assets. Liabilities consist only of the firm's debt. The debt is riskless, perpetual, selling at par, has annual payments and has a 6% pre-tax yield. If the firm were to change its capital structure, new debt would still have a 6% pre-tax yield. The firm's tax rate is 40%. The market risk premium is 4%. Given this information, answer the following questions:

- a. (1 point) What is the firm's Dividends Per Share? $.60$
- b. (1 point) What is the firm's current stock price? $\$6.0$
- c. (1 point) What is the firm's Return on Equity? $30/300 = 10\%$
- d. (1 point) What is the Beta of the firm's equity? 1.0
- e. (1 point) What is the Beta of the firm's assets? 1.0
- f. (1 point) What is the current weighted average cost of capital (WACC)? 10%

Now assume the firm issues \$150 in debt and redeems \$150 in equity. $\Rightarrow \$60$ tax shield

- g. (1 point) Write out the firm's new Balance Sheet, with labels. $360 = 150 + 210$
- h. (1 point) What is the firm's Dividends Per Share? $\$4.28$
- i. (1 point) What is the firm's new stock price? 7.20
- j. (1 point) What is the firm's Weighted Average Cost of Capital? 8.32%
- k. (1 point) What is the Beta of the firm's new debt? 0
- l. (1 point) What is the new Beta of the firm's equity? 1.17
- m. (1 point) What is the new Beta of the firm's assets? $.58$

$(\frac{150}{360})(0) + (\frac{210}{360})(1.17) = .83$
 $8.32 = 6 + B(4) \Rightarrow B = .58$