





3. 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 = \$400	Liabilities = \$0
	Equity = \$400

The firm had \$28.00 in EBIT last year. The firm has 80 shares outstanding. The firm expects this same return for the foreseeable future. The firm is a zero growth firm, that pays out all excess earnings as dividends. Any time the firm changes its capital structure, it changes only the debt/equity mix and does not change its total assets. The firm's liabilities consists entirely of perpetual debt. The firm's debt is risk-less, perpetual, selling at par, and has a 4% yield. If the firm were to change its capital structure, new debt would still have a 4% yield. The expected return on the market is 8%. Given this information, answer the following questions:

a. (3 points) What is the firm's return on equity?  
**7%**

b. (3 points) What is the firm's current weighted average cost of capital.  
**7%**

c. (3 points) What is the current price per share?  
**\$5.00**

Now assume that the above firm issues \$200 in debt and uses the funds to repurchase equity. This change in capital structure reveals no new information about future firm prospects.

d. (3 points) What is the beta of the firm's levered equity?  
**Do E 1<sup>st</sup> then use CAPM 1.5=Beta**

e. (3 points) What is the overall firm's new return on levered equity?  
**Two ways, using income statement 20/200=10%**  
**Using WACC, 7%=200/400\*7% + 200/400\*rs, implies rs = 10%**

f. (2 points) What is the firm's new Weighted Average Cost of Capital?  
**7%, by theory.**

4. (4 points) Dandy Product's overall weighted average required rate of return is 9 percent. Its yogurt division is riskier than average, its fresh produce division has average risk, and its institutional foods division has below-average risk. Dandy adjusts for divisional by adding or subtracting 2 percentage points and project risk by adding or subtracting 3 percentage points. Thus, the maximum adjustment is 2 + 3 percentage points. What is the risk adjusted required rate of return for a low-risk project in the yogurt division?  
**8%**

5. 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 = \$ 250	Liabilities = \$150
	Equity = \$100

The firm had \$25 in EBIT last year. The firm has 20 shares outstanding. The firm expects the same return/profits for the foreseeable future. The firm a is a zero growth firm, that pays out all excess earnings as dividends. 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, 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%. Given this information, answer the following questions:

a. (2 points) What is the value of the firm's perpetual debt tax shield?  
**\$60**

b. (3 points) What is the current weighted average cost of capital (WACC)?  
**6.0%**

Now assume the firm redeems \$150 in debt and issues \$150 in equity.

c. (3 points) Write out the firm's new balance sheet after all of the changes.  
**190=0+190**

d. (3 points) What is the firm's Weighted Average Cost of Capital?  
**15/190=7.9%**

e. (3 points) What is the firm's unlevered equity beta?  
Skip, as return on market was not given, could not be calculated.

Now assume the firm can change its capital structure to be any combination of debt and equity, but that the level of fixed assets cannot be changed.

f. (3 points) Write out the balance sheet that corresponds with the maximum firm value?

Two answers,  $25/.06=416.66$  implies balance sheet of  $416.66 = 416.66 + 0.000001$

**VL=VU+TD implies TD=  $416.66*.4=166.64 + 190$  (Value Unlevered) implies  $354.64 = 354.64+0.000001$**

6. (3 points) The DJH Corporation just paid a of \$2.68. It expects its cash dividends to grow 4.1% per year forever. DJH has a debt ratio of  $L = 33\%$ . Its borrowing rate is  $r_d = 8.0\%$ . DJH pays corporate taxes at the rate of 30%,  $r_f = 4.2\%$ ,  $r_M = 9.9\%$ , and DJH's common stock is currently selling for \$22 per share. What is DJH's expected cost of stock?  
**16.78%**