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**GOODMAN SCHOOL OF BUSINESS
BROCK UNIVERSITY
Department of Finance, Operations, and Information Systems (FOIS)
FNCE 3P93, Corporate Finance II
Fall 2016 Midterm Examination
November 5, 2016 (9:00a to 12:00p)
16 Pages**

Name: _____

Student Number: _____

Please check the box next to your section:

1 – G. Hoover (M 14:00-15:30 / R 12:30-14:00)

2 – G. Hoover (T/F 15:30-17:00)

3 – Y. Wang (T/R 9:30-11:00)

4 – G. Hoover (M 14:00-15:30 / R 12:30-14:00)

5 – Y. Wang (T/R 14:00-15:30)

6 – G. Hoover (M 17:00-20:00)

7 – G. Hoover (T 19:00-22:00)

Answer all questions on the examination paper and hand it in at the completion of the examination. No examination aids other than those specified are permitted. Use or possession of unauthorized materials will automatically result in the award of a zero grade for this examination.

Question	Marks	Awarded
1	15	
2	14	
3	10	
4	9	
5	8	
6	6	
7	10	
8	17	
9	11	
Total	100	

Question 1 (15 Marks)

Circle the correct answer for each of the following questions.

- A. The dilution of the market price per share is attributable to funding projects:
- (a) using a cash offer.
 - (b) with negative net present values.**
 - (c) when the market-to-book value is less than 1.
 - (d) using a rights offer.
 - (e) for which existing shareholders opt not to participate.
- B. The theory that a change in the capital structure weights is exactly offset by the change in the cost of equity is known as:
- (a) homemade leverage.
 - (b) financial leverage.
 - (c) the targeted capital structure theory.
 - (d) M&M Proposition I.
 - (e) M&M Proposition II.**
- C. The primary function of dividend policy is to establish the:
- (a) ex-dividend date once the date of record has been set.
 - (b) declaration date.
 - (c) amount of the current dividend versus the amount of the future dividends.**
 - (d) residual amount that can be paid out in dividends.
 - (e) guidelines for dividend reinvestments.
- D. Which one of the following statements is correct concerning the relationship between a capital structure with debt and one without debt? Assume there are no taxes.
- (a) When a firm is operating at a point where the actual earnings before interest and taxes (EBIT) exceed the break-even level, then adding debt to the capital structure will increase the earnings per share (EPS).**
 - (b) The earnings per share will equal zero when EBIT is zero for a levered firm.
 - (c) The advantages of leverage primarily occur when EBIT is just barely positive.
 - (d) The firm's EPS will always be higher if the firm uses leverage.
 - (e) EPS are more sensitive to changes in EBIT when a firm is unlevered.
- E. The beginning of the period when stock trades in the market without a recently declared right is called the:
- (a) pre-issue date.
 - (b) aftermarket.
 - (c) declaration date.
 - (d) holder-of-record date.
 - (e) ex-rights date.**
- F. The financing of short-term assets with short-term debt is known as:
- (a) relative cash funding.
 - (b) restrictive financing.
 - (c) seasonal funding.
 - (d) flexible financing.
 - (e) maturity hedging.**

G. The use of personal borrowing to change the overall amount of financial leverage to which the individual is exposed is called:

- (a) **homemade leverage.**
- (b) dividend recapture.
- (c) the weighted average cost of capital.
- (d) private debt placement.
- (e) a privileged subscription offer.

H. Which of the following is NOT true about bankruptcy and its costs?

- (a) **As the debt/equity ratio falls, the probability that a firm will be able to meet the promised payments on bonds decreases.**
- (b) If a firm is economically bankrupt, then an ensuing legal bankruptcy will likely result in the bondholders receiving less than what they are owed.
- (c) The amount of debt a firm can raise decreases as the probability of bankruptcy increases.
- (d) A firm is economically bankrupt when the value of its assets is less than the value of its debt.
- (e) Direct bankruptcy costs are a disincentive to debt financing.

I. When a firm buys shares of their own company in the marketplace the firm is doing a:

- (a) reverse IPO.
- (b) reverse stock split.
- (c) **share repurchase.**
- (d) liquidating transaction.
- (e) homemade dividend transaction.

J. The optimal capital structure is the mixture of debt and equity which:

- I. maximizes the value of the firm.
- II. minimizes the firm's weighted average cost of capital.
- III. maximizes the market price of the firm's bonds.

- (a) I only
- (b) III only
- (c) **I and II only**
- (d) I and III only
- (e) I, II, and III

K. Costs of the firm that fall with increased levels of investment in its current assets are called _____ costs.

- (a) carrying
- (b) **shortage**
- (c) debt
- (d) equity
- (e) payables

L. The unlevered cost of capital is:

- (a) the cost of capital for a firm with no equity in its capital structure.
- (b) **the cost of capital for a firm with no debt in its capital structure.**
- (c) the interest tax shield times pretax net income.
- (d) the cost of preferred stock for a firm with equal parts debt and common stock in its capital structure.
- (e) equal to the profit margin for a firm with some debt in its capital structure.

- M. A company procedure whereby the firm maintains a relatively high ratio of current assets to sales is called a _____ policy.
- (a) cash-out
 - (b) restrictive
 - (c) low inventory
 - (d) flexible**
 - (e) stock-out
- N. As the debt-equity ratio of a firm rises, the:
- (a) cost of debt declines.
 - (b) cost of equity declines.
 - (c) weighted average cost of capital increases, at least initially.
 - (d) equity risk also rises.**
 - (e) capital structure of the firm remains constant.
- O. The cash cycle can be defined as the operating cycle:
- (a) minus the accounts receivable period.
 - (b) plus the accounts receivable period.
 - (c) minus the accounts payable period.**
 - (d) plus the accounts payable period.
 - (e) plus the inventory period.

Answer the following questions in the space provided. Show all your work. No credit will be given for answers obtained using a financial calculator without the supporting formula and steps leading to the final answer.

Question 2 (14 Marks)

A company with 2 million shares outstanding and no debt currently has net income of \$3.2 million. The company is considering a project that will cost \$4 million and be financed with a new equity issue. The project is expected to increase net income by \$200,000. The company's stock sells for \$16 per share and its book value per share is \$18. Assume a constant price-earnings ratio.

(a) What is the current market-to-book ratio? (1 mark)

$$\text{Current Market - to - Book} = \frac{16}{18} = .89$$

(b) What will be the company's expected book value per share if it invests in the project? (3 marks)

$$\text{New Book Value} = 18(2,000,000) + 4,000,000 = \$40,000,000$$

$$\text{New Shares Outstanding} = 2,000,000 + \frac{4,000,000}{16} = 2,250,000$$

$$\text{New Book Value per Share} = \frac{40,000,000}{2,250,000} = \$17.78$$

- (c) What will be the company's expected market value per share be if it invests in the project?
(5 marks)

$$\text{Current EPS} = \frac{3,200,000}{2,000,000} = \$1.60$$

$$\text{Current PE} = \frac{16}{1.60} = 10$$

$$\text{New Net Income} = 3,200,000 + 200,000 = \$3,400,000$$

$$\text{New EPS} = \frac{3,400,000}{2,250,000} = \$1.51$$

$$\text{New P} = 10(1.51) = \$15.11$$

- (d) What is the expected NPV of the project? (3 marks)

$$\text{Current Market Value} = 16(2,000,000) = \$32,000,000$$

$$\text{New Market Value} = 15.11(2,250,000) = \$34,000,000$$

$$\text{NPV} = -4,000,000 + (34,000,000 - 32,000,000) = -\$2,000,000$$

- (e) Will accounting dilution take place if the company takes on the project? Briefly explain why or why not? (1 mark)

Yes, accounting dilution will occur ($\$17.78 < \18) because new shares will be issued when the market – to – book ratio is less than 1.

- (f) Will market value dilution take place if the company takes on the project? Briefly explain why or why not? (1 mark)

Yes, market value dilution will occur ($\$15.11 < \16.00) because the project has a negative NPV.

Question 3 (10 Marks)

Company A and Company B are identical in every respect except Company B has \$2 million of perpetual debt with an interest rate of 3% while Company A is unlevered. The cost of equity for Company A is 12%. Company B stock is worth \$3.5 million. EBIT for both firms is expected to remain at \$600,000 indefinitely, with all earnings immediately paid out as dividends. Investors are able to borrow at 3% per year. Assume all the M&M assumptions are satisfied. Use the M&M arbitrage argument to show how an investor owning 5% of Company B equity could increase their wealth without changing their future annual cash flows.

Hint: Remember to show annual cash flows before and after.

$$V_A = \frac{600,000}{.12} = \$5,000,000$$

Alternative #1

Proceeds From Selling 5% of Company B Equity = .05(3,500,000) = \$175,000

Proceeds From Borrowing 5% of the Amount of Company B Debt = .05(2,000,000) = \$100,000

Cost to Buy 5% of Company A Equity = .05(5,000,000) = (\$250,000)

Profit = 175,000 + 100,000 - 250,000 = \$25,000

Alternative #2

$$D/E_B = \frac{2,000,000}{3,500,000} = .57$$

Proceeds From Selling Company B Equity = .05(3,500,000) = \$175,000

Amount to Borrow = .57(175,000) = \$100,000

Cost to Buy 5% of Company A Equity = .05(5,000,000) = \$250,000

Profit = 175,000 + 100,000 - 250,000 = \$25,000

Cash Flow Before as Company B Shareholder = .05[600,000 - .03(2,000,000)] = \$27,000

Cash Flow After as Company A Shareholder = .05(600,000) - .03(100,000) = \$27,000

Question 4 (9 Marks)

A company wants to raise \$10 million via a rights offering with a per-share subscription price of \$40. Four rights are needed to buy one share. The company's stock currently sells for \$50 per share.

(a) How many shares are currently outstanding (before the offering)? (3 marks)

$$\text{New Shares to be Issued} = \frac{10,000,000}{40} = 250,000$$

$$\text{Shares Outstanding}_0 = 4(250,000) = 1,000,000$$

(b) What is the theoretical value of a right when the stock is selling rights-on? (2 marks)

Alternative #1

$$M_e = \frac{4(50) + 40}{4 + 1} = \$48$$

$$R_e = 50 - 48 = \$2$$

Alternative #2

$$R_o = \frac{50 - 40}{4 + 1} = \$2$$

Alternative #3

$$M_e = \frac{4(50) + 40}{4 + 1} = \$48$$

$$R_e = \frac{48 - 40}{4} = \$2$$

(c) Assume that immediately following the ex-rights date the rights are selling for \$1 each. Show how you could create an immediate profit. (4 marks)

$$M_e = 50 - 2 = \$48$$

$$\text{Buy 4 Rights} = 4(1) = (\$4)$$

$$\text{Exercise Rights to Buy 1 Share} = 1(40) = (\$40)$$

$$\text{Sell 1 Share} = \$48$$

$$\text{Profit} = -4 - 40 + 48 = \$4$$

Question 5 (8 Marks)

A company that follows a strict residual dividend policy expects earnings for the coming year will be \$500,000. The company has 300,000 shares outstanding and a target debt-equity ratio of 1.25.

- (a) What is the maximum amount of capital spending possible for the coming year without issuing new equity? (1 mark)

$$\text{Maximum Capital Spending} = 500,000 + 1.25(500,000) = \$1,125,000$$

For parts (b) and (c), assume the company's planned capital expenditures for the coming year are \$800,000.

- (b) What will be the dividend per share? (4 marks)

$$\text{Equity Financing} = \left(\frac{1}{2.25}\right) 800,000 = \$355,555.56$$

$$\text{Total Dividends} = 500,000 - 355,555.56 = \$144,444.44$$

$$\text{DPS} = \frac{144,444.44}{300,000} = \$0.48$$

(c) How much new debt will be needed? (2 marks)

Alternative #1

$$\begin{aligned} \text{Debt Financing} &= \left(\frac{1.25}{2.25}\right) 800,000 \\ &= \$444,444.44 \end{aligned}$$

Alternative #2

$$\begin{aligned} \text{Debt Financing} &= 1.25(355,555.56) \\ &= \$444,444.44 \end{aligned}$$

Alternative #3

$$\begin{aligned} \text{Debt Financing} &= 800,000 - 355,555.56 \\ &= \$444,444.44 \end{aligned}$$

(d) Assume the company plans no capital expenditures for the coming year. What will be the dividend per share? (1 mark)

$$DPS = \frac{500,000}{300,000} = \$1.67$$

Question 6 (6 Marks)

An all-equity company with 100,000 shares outstanding is considering a \$4 million debt issue with a 6% interest rate. The proceeds would be used to repurchase shares of stock resulting in 75,000 shares outstanding.

(a) What is the current market price per share? (2 marks)

$$P = \frac{4,000,000}{100,000 - 75,000} = \$160$$

(b) What is the break-even level of EBIT? (4 marks)

$$EPS^U = EPS^L$$

$$\frac{EBIT}{100,000} = \frac{EBIT - .06(4,000,000)}{75,000}$$

$$EBIT = \$960,000$$

Question 7 (10 Marks)

You own \$9,000 worth of stock in a company that is expected to pay a dividend of \$1 per share in one year and a liquidating dividend of \$15 per share in two years. The required return on the stock is 20%. Your preference is to receive exactly \$500 in dividends at the end of the first year. What will your homemade dividend be at the end of the second year?

$$P = \frac{1}{1 + .2} + \frac{15}{(1 + .2)^2} = \$11.25$$

$$\text{Number of Shares Currently Owned} = \frac{9,000}{11.25} = 800$$

$$\text{Surplus (Shortfall)}_1 = 1(800) - 500 = \$300$$

$$P_1 = \frac{15}{(1 + .2)} = \$12.50$$

$$\text{Number of Shares to Buy}_1 = \frac{300}{12.50} = 24$$

$$\text{Total Dividends}_2 = 15(800 + 24) = \$12,360$$

Question 8 (17 Marks)

An unlevered firm's cost of equity is 16%. EBIT is expected to be \$100,000 every year forever. The firm is considering borrowing \$60,000 and using the proceeds to repurchase shares. The firm can borrow at 6%.

For parts (a) to (c), assume all the Modigliani and Miller (M&M) assumptions are satisfied.

- (a) According to M&M Proposition I without taxes, what is the value of the firm with no debt? (2 marks)

$$V_U = \frac{100,000}{.16} = \$625,000$$

- (b) According to M&M Proposition I without taxes, what is the value of the firm with \$60,000 debt? (1 mark)

$$V_L = V_U = \$625,000$$

- (c) According to M&M Proposition II without taxes, what is the WACC for the firm with \$60,000 debt? (1 mark)

$$R_E^A = WACC^A = 16\% = WACC^B$$

For parts (d) to (f), assume all the Modigliani and Miller (M&M) assumptions are satisfied except the corporate tax rate is 35%.

- (d) According to M&M Proposition I with taxes, what is the value of the firm with no debt? (2 marks)

$$V_U = \frac{100,000(1 - .35)}{.16} = \$406,250$$

- (e) According to M&M Proposition I with taxes, what is the value of the firm with \$60,000 debt?
(2 marks)

$$V_L = 406,250 + .35(60,000) = \$427,250$$

- (f) According to M&M Proposition II with taxes, what is the WACC for the firm with \$60,000 debt?
(5 marks)

$$E = 427,250 - 60,000 = \$367,250$$

$$R_E = .16 + (.16 - .06) \left(\frac{60,000}{367,250} \right) (1 - .35) = 17.06\%$$

$$WACC = \left(\frac{367,250}{427,250} \right) \cdot 17.06 + \left(\frac{60,000}{427,250} \right) (.06)(1 - .35) = 15.21\%$$

For parts (g) and (h), assume all the Modigliani and Miller (M&M) assumptions are satisfied except the corporate tax rate is 35% and personal tax rates are 26% on debt income and 18% on equity income.

- (g) According to M&M Proposition I with taxes, what is the value of the firm with no debt? (2 marks)

$$V_U = \frac{100,000(1 - .35)(1 - .18)}{.16} = \$333,125$$

- (h) According to M&M Proposition I with taxes, what is the value of the firm with \$60,000 debt?
(2 marks)

$$V_L = 333,125 + \left[1 - \frac{(1 - .35)(1 - .18)}{(1 - .26)} \right] 60,000 = \$349,908.78$$

Question 9 (11 Marks)

A company is able to borrow up to \$10 million from its line of credit at any time but is required to maintain a 2% compensating balance on any funds actually borrowed, which is deposited in a non-interest bearing account. The current interest rate is .62% per month. Assume compound interest is used.

(a) What is the effective annual interest rate? (3 marks)

$$EAR = \frac{1[(1 + .0062)^{12} - 1]}{1(1 - .02)} = 7.86\%$$

(b) Assume the company needs \$8 million today and plans to repay it entirely in one year. If the company can negotiate a lower interest rate of .55% per month, how much interest would be saved? Assume a 2% compensating balance on any funds actually borrowed is still required. (8 marks)

$$\text{Amount to Borrow} = \frac{8,000,000}{1 - .02} = \$8,163,265.31$$

$$\text{Interest}_{.62\%} = 8,163,265.31[(1 + .0062)^{12} - 1] = \$628,491.52$$

$$\text{Interest}_{.55\%} = 8,163,265.31[(1 + .0055)^{12} - 1] = \$555,376.00$$

$$\text{Savings} = 628,491.52 - 555,376.00 = \$73,115.52$$