

AFM 372 Fall 2007
Midterm Examination
Friday, October 26

Student name: _____

Student number: _____

Instructor: Alan Huang

Duration: 2 hours

This exam has 11 pages including this page. A separate formula sheet will be provided.

Important Information:

1. You **must** answer all questions. Answers must be legible. If I cannot read it, I cannot mark it.
2. In cases where returns/rates are to be calculated, if you are using percentage points round off to two decimal places (12.24%), and if you are not using percentage points, round off to four decimal places (0.1224). In all other cases, round off your answers to two decimal places.
3. **Use the back of the page if there is not enough space.**

MARKING SCHEME:

Section	Question	Score
I. Multiple Choice	(25 points)	
II. Short answer	1 (3 point)	
	2 (4 point)	
III. True/False	1 (3 points)	
IV. Calculation	1 (18 points)	
	2 (16 points)	
	3 (8 points)	
	4 (15 points)	
	5 (8 points)	

I. Multiple choice questions: Circle one answer that is the best. (2.5 points each)

1. An investor discovers that for a certain group of stocks, large positive price changes are always followed by large negative price changes. This finding is a violation of the:

- A) moderate form of the efficient market hypothesis.
- B) semi-strong form of the efficient market hypothesis.
- C) strong form of the efficient market hypothesis.
- D) weak form of the efficient market hypothesis.
- E) none of the above.

2. If the weak form of efficient markets holds, then:

- A) technical analysis is useless.
- B) stock prices reflect all information contained in past prices.
- C) stock prices follow a random walk.
- D) all of the above.
- E) none of the above.

3. The shareholders of the Unicorn Company need to elect 3 new directors. There are two million shares outstanding. If I have 250,001 shares I can be guaranteed to elect one director if

- A) The firm has straight voting.
- B) The firm has cumulative voting.
- C) Both A) and B).
- D) Neither A) nor B). I need at least 500,001 shares under cumulative voting.
- E) Neither A) nor B). I need one million shares under straight voting.

4. A firm has a debt-to-equity ratio of 1.30. If it had no debt, its cost of equity would be 15%. Its cost of debt is 10%. What is its cost of equity if there are no taxes or other imperfections?

- A) 21.5%. B) 19.5%. C) 15%. D) 10%. E) None of the above.

5. Consider two corporations, G and H, that have exactly the same risk. They both have a current stock price of \$60. Corporation G pays no dividend and will have a price of \$66 one year from now. Corporation H pays dividends and will have a price of \$63 one year from now after payment of a dividend. Corporations pay no income taxes. Investors pay no taxes on capital gains, but they pay a 30% income tax on dividends. What is the value of the dividend that investors expect Corporation H to pay?

- A) \$4.29.
- B) \$3.00.
- C) \$3.15.
- D) \$3.30.
- E) It is impossible to calculate expected dividend without the discount rate.

6. The straight debt of RBC is yielding 6.50% per annum. You find that a debenture maturing on April 26, 2011 of RBC is offering a yield of 8.20% per annum. What can be a possible reason?

- (A) The debenture is callable.
- (B) The debenture is backed by assets.
- (C) The debenture is retractable.
- (D) The debenture is convertible.

7. The Telescoping Tube Company is planning to put a manufacturing facility in place to build observatory quality but recreational scale telescopes. The initial investment cost is \$2,000 and the expected year-end EBIT is \$500 in perpetuity starting from year 1. Assume the firm is in distress prior to doing the project—it has \$3,000 in debt liability but its assets, all in the form of fixed assets, are worth only \$2,000 and can not be liquidated. The firm's cost of equity is 20%. An all-equity firm which is otherwise identical to The Telescoping Tube would have a cost of equity of 10%. Debt holders are not willing to finance the project; therefore, the project has to be financed by equity only. Will the equityholders of the firm do the project?

- (A) Yes. Because the project has a positive NPV of \$500.
- (B) Yes. Because the project has a positive NPV of \$3,000.
- (C) Indifferent. Doing the project or not makes the shareholder equally well off.
- (D) No. Because the firm is in distress and doing the project creates negative \$500 NPV net of the wealth transfer to the bondholders.
- (E) Yes. Because although the firm is in distress, doing the project creates \$2,000 NPV net of the wealth transfer to the bondholders.

8. Today is June 20, 2007. Manulife Financial Group (NYSE:MFC) just announced today that it will pay a \$0.82 cash dividend per share to shareholders on record as of Aug. 20, 2007 (which is a Monday). There is no holiday in August. Which of the following best describes the stock market reaction?

- A) Stock price is most likely to decline more than \$0.82 on Aug. 20, 2007.
- B) Stock price is most likely to decline less than \$0.82 on Aug. 20, 2007.
- C) Stock price is most likely to decline more than \$0.82 on Aug. 18, 2007.
- D) Stock price is most likely to decline less than \$0.82 on Aug. 18, 2007.
- E) Stock price is most likely to decline more than \$0.82 on Aug. 16, 2007.
- F) Stock price is most likely to decline less than \$0.82 on Aug. 16, 2007.

9. When graphing firm value against debt levels, the debt level that maximizes the value of the firm is the level where:

- A) the increase in the present value of distress costs from an additional dollar of debt is greater than the increase in the present value of the debt tax shield.
- B) the increase in the present value of distress costs from an additional dollar of debt is equal to the increase in the present value of the debt tax shield.
- C) the increase in the present value of distress costs from an additional dollar of debt is less than the increase of the present value of the debt tax shield.
- D) distress costs as well as debt tax shields are zero.
- E) distress costs as well as debt tax shields are maximized.

10. Aspen Ski Resorts, Inc., borrows \$50,000 for two years. There is a 90% chance of repayment. There is a 10% chance of bankruptcy, which can happen only at the end of year 1. If bankruptcy occurs, the firm's assets can be sold for \$30,000 and the bankruptcy costs are \$5,000. Suppose the bank charges interest so to earn an average return of 10% from similar companies. How much interest rate (yield) should the bank charge Aspen Ski Resorts?

- A) 10%.
- B) 13.28%
- C) 16.67%.
- D) 15.56%.
- E) Less than 10%.

II. Short answer questions

1. You just read this on Reuters news:

“SAN FRANCISCO - Intel (NSDQ: INTC) posted a 43 percent rise in quarterly profit on strong demand for its microprocessors, and gave a better-than-expected outlook. Its shares rose 5 percent in after-hours trading Tuesday.”

What does this tell you about market efficiency? (3 points)

2. Do the following observations appear to indicate market efficiency? Use one sentence to explain why or why not. Your answer should clarify whether the efficiency/inefficiency is weak, semi-strong, or strong.

(i) One could make excess returns by buying stocks with high book to market equity ratio and selling stocks with low book to market equity ratio. (2 points)

(ii) In any year, approximately 50% of pension funds outperform the market (but the rest does not). (2 points)

III. True/False, or uncertain? All marks are based on the quality of your argument. (3 pts)

“Firms with higher earnings volatility tend to have higher leverage ratio. This is consistent with the pecking order theory.”

IV. Calculations (Show your process to get partial credit).

Question 1. (18 points)

ABC Inc., is an unlevered firm with expected annual earnings before taxes (EBIT) of \$30 million in perpetuity. The required return on the firm’s unlevered equity is 15%, and the firm distributes all of its earnings as dividends at the end of each year. ABC has 1 million shares of common stock outstanding and is subject to a corporate tax rate of 30%.

The firm is planning a recapitalization under which it will issue \$50 million of perpetual debt and use the proceeds to buy back shares. The annual cost of debt is 10%. Assume that there is no issuing cost and that the firm is operating under perfect capital markets but with corporate tax.

(a). Calculate the value of ABC before the recapitalization plan is announced. What is the price per share? (3 points)

(b). Calculate the value of ABC after the recapitalization plan is announced. What is the price per share right after the announcement? (3 points)

(c). How many shares will be repurchased (assume shares are perfectly divisible, i.e. can take fractional shares)? (2 points)

Question 1 cont'd:

(d). How will your answer to (c) change if the debt issuing cost is 1% of the \$50 million of the amount issued? Note that the tax code says that the debt issuing costs are amortized over the life the debt or 5 years, whichever is less. (6 points)

(e) **Continuing with (b)**, now assume that debt is risky. The yield of the risky debt equals the Treasury bond yield plus a yield spread. The yield spread depends on the firm's credit rating, which in turn is determined by the interest coverage ratio. Also, there is a cost of 25% of firm value in the case the bankruptcy—the probability of which also depends on a firm's credit rating. The current Treasury-bond yield is 4%. The bonds are issued at par with annual interest payment. The following is the rating table:

If the interest coverage ratio is	Credit rating	Yield Spread	Default Probability
$+\infty$ to 5.0000001	A	1%	1%
5 to $-\infty$	B	3%	10%

What will the new share price be? (4 points)

Question 2 (16 points)

BlueJays Inc. has 200,000 shares outstanding. Earnings will be \$500,000 at the end of year 1 and \$800,000 at the end of year 2. An investment outlay of \$200,000 at the end of year 1 (using the earnings of year 1) has already been decided upon. BlueJays is all-equity financed with a required rate of return of 16%. The firm will be liquidated after 2 years. Assume that the firm operates in a world with perfect capital markets without taxes. The firm's policy is to pay out any surplus cash as dividends.

- (a) What is the current share price of BlueJays' stock? (3 points)
- (b) Margaret owns 10% of BlueJays Inc. and wants an income from the firm of \$20,000 at the end of year 1. Show how she can achieve this (without a change in the firm's dividend policy). What percentage of the firm will she own after the end of year 1 if she follows this strategy? (5 points)
- (c) What does part (b) imply about the relevance of dividend policy? Support your answer with the value of Margaret's holdings before and after her decision. (4 points)

Question 2 cont'd:

(d) Now assume that the firm can continue for another 5 years at the end of year 2 but has no more positive NPV projects. There are two types of taxes—corporate tax rate at 35% and a universal personal tax rate of 28%. The firm is contemplating about whether to retain the \$800,000 year 2 earnings within the firm or to distribute part or all of it to investors at the end of year 2. If the firm keeps the money, it can invest in a puttable preferred stock with an annual yield of 3% and can sell the preferred back at the purchase price any time. The investors can invest the money in the T-bill with an annual yield of 4%. Would investors prefer the firm to retain the earnings or distribute dividend at the end of year 2? What does this imply about the relevance of dividend policy? (4 marks)

Question 3: (8 points)

GrabbaaJava Corp. has established a joint venture with GrabbaCurry to set up cafeterias in Canadian universities. The set-up costs are estimated to be \$5 million and will incur at the beginning of the first year. Net revenue collection from the cafeterias is projected to be \$1 million per annum for 10 years starting from the end of the first year. The applicable corporate tax rate is 20 percent. The required rate of return for an all-equity firm is 12 percent and the annual cost of debt is 8 percent. The federal government will subsidize the project with a \$3 million, 5-year loan at an interest rate of 5 percent a year, applied to the set-up costs.

(a) What is the NPV of the project? (6 points)

(b) There are three approaches to evaluating the NPV of a levered project: APV, FTE or the WACC. You just used one in (a). Could you have used the other two in answering this question? Why or why not? (2 points)

Question 4 (15 points)

Timberland Corporation, a furniture manufacturer, is considering installing a milling machine for \$40,000 to be used for 2 years. The machine has a CCA rate of 20% and will have an economic residual of 50% after two years. Assume that the asset pool is terminated after two years. Timberland has been financially distressed and thus the company does not expect to get tax shields over the next five years.

Canadian Leasing Company, a highly profitable firm, has offered to lease the machine over the next 2 years with a residual guarantee by Timberland of 50%. The corporate tax rate is 35%. The appropriate before-tax interest rate is 6% for both firms. Lease payments occur at the beginning of the year. Also assume that the asset pool is terminated after two years for Canadian Leasing.

Bean Counter Inc. is hired to evaluate this leasing. They have determined that the leasing is an operating leasing. They suggest a lease payment of \$11,000 a year. Is this lease payment acceptable to Timberland and Canadian Leasing? Please base your analysis using the incremental cashflow approach.

Question 5 (8 points)

The Appalachian Company expects earnings before interest and taxes (EBIT) of \$4 million per year in economic good times and EBIT of \$2 million in economic bad times forever. Economic good times and bad times are equally likely. Assume there are no taxes and no financial distress costs. The firm's all-equity discount rate (r_0) is 15%. The firm has \$10 million debt in its capital structure with an interest rate of 10% per annum. It has 1 million shares outstanding.

- (a) What is Appalachian's firm value? (3 points)
- (b) You observe that The Rocky Mountain Company generates exactly the same cashflow as The Appalachian Company. However, Rocky Mountain is an all equity firm. Both firms have 100% dividend payout policy. You notice that Rocky Mountain's firm value is \$40 million with 2 million shares outstanding. Assume that you can borrow and lend at the same rate as Appalachian, which is 10%. Is there an arbitrage opportunity? If yes, please design one and show it works. (5 points)