

SEAT NUMBER: ROOM:

FAMILY NAME.....

OTHER NAMES.....

STUDENT NUMBER.....

This question paper must be returned. Candidates are not permitted to remove any part of it from the examination room.



FIRST SUPPLEMENTARY SESSION 1 EXAMINATIONS 2012

Unit: AFIN253: Financial Management

Time Allowed: 2 hours plus 10 minutes reading time.

Total Number of Questions: 6 Short Answer Questions plus 10 full response questions.

Instructions:

- PART A (18 marks):** There are 6 short answer questions worth 3 marks each. Attempt all questions. Show all workings. Write answers in the spaces provided, or circle the best answer where appropriate. Illegible handwriting risks loss of marks.
- PART B (102 marks):** There are 10 questions worth 102 marks in total. Attempt all questions. Show all workings. Write answers in the spaces provided. Illegible handwriting risks loss of marks.

Materials Allowed:

- No dictionaries are permitted.
- A non-programmable calculator (no text retrieval capacity) is permitted.
- Financial calculators may be used.
- Mobile telephones must be turned off and left at the front of the room.

Question:	A	1	2	3	4	5	6	7	8	9	10	Total
Out of:	18	7	6	7	12	18	16	8	10	8	10	120
Mark:												

PART A (18 Marks)

There are **SIX (6)** short answer choice questions. Each question in Part A is worth **3** marks.

Question 1: A stock has a beta of 2 and a total standard deviation of 160%. The market's standard deviation is 30%. What is the stock's idiosyncratic standard deviation?

Question 2: A company issues a large amount of **equity** to raise money for new projects of similar risk to the company's existing projects. Assume a classical tax system. Circle what will happen to the firm's **after tax WACC**?

(Circle the correct answer).

Increase,

Decrease,

Stay the same

Question 3: A company issues a large amount of **debt** to raise money for new projects of similar risk to the company's existing projects. Assume a classical tax system. Circle what will happen to the firm's **pre tax WACC**? (Circle the correct answer).

Increase,

Decrease,

Stay the same

Question 4: Name two different assets or portfolios of assets that have zero idiosyncratic risk.

Question 5: Stocks A and B have a correlation of returns of zero. Is diversification possible? If so, which risks are reduced, idiosyncratic or systematic?

Question 6: A company has 200 million shares outstanding. The market price of one share is currently \$2. The company's debentures are publicly traded and their market price is equal to 93% of its face value. The debentures have a total face value of \$50,000,000 and the current yield to maturity of corporate debentures is 12% per annum. The risk-free rate is 8.50% and the market return is 13.7%. Market analysts estimated that the company's stock has a beta of 0.90. The corporate tax rate is 30%. What is the company's after-tax weighted average cost of capital (WACC) under the classical tax system?

PART B (102 Marks)

Answer each of the following questions in the space provided below the questions. Mark allocations are noted next to each question.

Question 1:

Three years ago you bought an apartment for **\$315,000**.

You currently live in the apartment.

You just paid for a professional real estate valuer to appraise your apartment and she valued it at **\$450,000**.

You've been offered **\$520,000** to sell the property. The investor who made the offer is very reliable and has the money ready to pay you right away.

A person wanting to rent the apartment has offered you **\$2,700** per month.

Assume that the rent is paid in advance (at the start of the month), that the rent will be constant every month, that it will be paid forever, and that there will be no vacancy or costs of renting. The discount rate is 1% per month given as an effective rate.

Question 1a (3 marks): What is the NPV of renting the apartments? You may ignore taxes.

Question 1b (2 marks): In the previous question, what implicit assumption did you make about the capital growth rate (price growth) of the apartment?

Question 1b (2 marks):

Calculate the payback period of renting the apartments. Give your answer in years.

Question 2 (6 marks): In the context of capital budgeting, the cost of goods sold (COGS) is subtracted from pre-tax net income, using the following formula:

$$NI = (Rev - COGS - FC - Depr - IntExp)(1 - t_c)$$

COGS includes the cost of raw materials.

When calculating Cash Flow From Assets (CFFA), the increase in Net Working Capital ($\uparrow NWC$) is subtracted, using the following formula:

$$CFFA = NI + Depr - CapEx - \uparrow NWC + IntExp$$

The increase in NWC is calculated as follows:

$$\uparrow NWC = (CA_{now} - CL_{now}) - (CA_{before} - CL_{before})$$

When 'raw materials' are purchased, their cost will increase NWC since raw materials are a current asset (CA), usually as part of inventory. When raw materials are used in production, the inventory account will be reduced which will lead to a decrease in NWC.

Your friend argues that because the cost of the raw materials is included in both COGS and $\uparrow NWC$, the cost of raw materials is double-counted. and should not be included in both COGS and $\uparrow NWC$.

Do you agree with your friend? Explain your answer clearly and succinctly in 2 sentences.

Question 3: A \$15 stock just paid its annual dividend of \$1, which is expected to increase by 3% every year forever. The correlation of the stock's returns with the market portfolio is 0.5, the market's standard deviation is 30% and the stock's standard deviation is 40%. The risk free rate is 5% and the market return is 8%.

Question 3a (2 marks): What is the cost of equity using the Dividend Discount Model?

Question 3b (3 marks): What is the cost of equity using the CAPM (or SML)?
Hint: Remember to use the formulas in the back of the exam.

Question 3c (2 marks): The correlation of the stock with the market was the historical correlation, calculated from past returns. If you think that the future correlation will be higher, what would be the effect on the cost of equity calculated in the previous question? Circle whether the cost of equity should be:

unaffected, higher, or lower?

Question 4a (9 marks): Using the dividend discount model, give **three** reasons why the **capital growth rate** of the stock may fall. Explain your answer. (Hint: specify 3 things and whether they must increase or decrease for the capital growth rate to fall).

Question 4b (3 marks): Do you believe that the Dividend Discount Model is a good equity valuation tool? Explain.

Question 5: Your friend is betting on the poker machines (also called slot machines or pokies) at the casino. For every \$1 put into a poker machine, on average \$0.85 is paid back. Answer the following:

Question 5a (3 marks): What is the NPV of betting on the poker machines? Circle whether it is:

Positive, Zero, or Negative.

Question 5b: Risk can be measured as the variance or standard deviation of returns above and below the expected return. According to the CAPM there are two types of risk: systematic and idiosyncratic.

Poker machines have risk since the amount of money that the machine gives back varies.

Question 5bi (5 marks): Does your friend take on idiosyncratic risk when he bets on the poker machines? Can your friend diversify this risk? Explain your answer with one sentence.

Question 5bii (5 marks): Does your friend take on systematic risk when he bets on the poker machines? Can your friend diversify this risk? Explain your answer with one sentence.

Question 5c (5 marks): You try to convince your friend that betting on the poker machines is a bad idea and that he should bet on stocks instead since they tend to **increase in value**. But your friend says that stocks are also risky and that they have **zero NPV**. Assume that markets are efficient, (therefore stocks are fairly priced) and that there are no transaction costs.

Is it true that stocks have zero NPV and that their prices tend to rise?
Explain your answer clearly using one sentence.

Question 6: A firm is considering a project which is of similar risk to the rest of the firm's business. Assume a classical tax system (no franking credits).

The firm has the following details, and all rates are effective annual rates:

- A target debt-to-equity ratio of 80%.
- A beta on equity of 2.5.
- Existing debt which yields 11%.
- A corporate tax rate of 30%.
- Also, the risk free rate is 5% and the market rate of return is 10%.

Question 6a (3 marks): Calculate the **cost of equity**.

Question 6b (3 marks): Calculate the **pre-tax WACC** (sometimes called the opportunity cost of capital, or the required return on assets, r_A).

Question 6c (3 marks): Calculate the **after-tax WACC**.

Question 6d (4 marks): This firm has a high debt-to-equity ratio. Outline 2 costs that this is likely to be causing for the firm.

Question 6e (3 marks): The company has calculated the CFFA for each year in the project's life, assuming that the project is all-equity financed. That is, there are no debt payments included in the CFFA. Considering this, which discount rate should the company use to discount its CFFA? Circle **one** of the following:

Risk-free rate, Cost of debt, Cost of equity, Pre-tax WACC, After-tax WACC

Question 7: The market portfolio (M) and a stock (A) have the following returns:

Year	r_M	r_A
2007	0.2	0.4
2008	0.04	-0.2
2009	-0.1	-0.3
2010	0.18	0.5

Question 7a (1 marks): What is the average return of each?

Question 7b (3 marks): What is the standard deviation of returns for each?

Question 7c (4 marks): What is the Beta of stock A using the CAPM?

Question 8

Question 8a (2 marks): A firm has identified a new project that will last for 1 year and is estimated to have a significantly positive NPV. The project is announced at mid-day to shareholders and the share prices rises from \$2 before the announcement to \$2.20 after the announcement. Over that time, the ASX200 (the market portfolio) was unchanged. The firm has 5 million shares outstanding. What was the NPV of the project? Assume that markets are efficient.

Question 8b: Due to the value created by the new project, the firm decides to pay out more cash to equity holders.

Note that the project has a short life. Assume that the firm has no other positive NPV projects on the horizon, and shareholders know this. You may ignore taxes.

Question 8bi (2 marks): Out of the following options, what would be more suitable? Conducting a **share repurchase**, a **share dividend**, or are they equivalent? (Note: a share dividend is not the same as a cash dividend). Explain succinctly in two sentences or less.

Question 8bii (3 marks): Out of the following options, what would be more suitable? Paying a **special cash dividend**, **increasing the regular cash dividend**, or are they equivalent? Explain succinctly in two sentences or less.

Question 8biii (3 marks): Out of the following options, what would be more suitable? Conducting a **share repurchase**, paying a **cash dividend**, or are they equivalent? Explain succinctly in two sentences or less.

Question 9: An investor has \$5 million to invest in shares A, B and C. She wants to buy exactly \$1 million worth of stock C, but doesn't care how much of stocks A and B are bought. She desires an expected annual return of 8%. All of the stocks are fairly priced.

Share A has an expected annual return of 5%.

Share B has an expected annual return of 8%.

Share C has an expected annual return of 10%.

Question 9a (4 marks): How much **money** should she invest in shares A and share B respectively?

Question 9b (2 marks): If the risk free rate is 5% and the market return is 10% pa, what will be the beta of the portfolio?

Question 9c (1 marks): Circle the correct answer. Compared to the market portfolio, the portfolio of stocks A, B and C will have a **systematic** variance that is:

Higher than, lower than, the same as the market's.

Question 9d (1 marks): Circle the correct answer: Compared to the market portfolio, the portfolio of stocks A, B and C will have an **idiosyncratic** variance that is:

Higher than, lower than, the same as the market's.

Question 10 (10 marks):

Project Data	
Project life	2 yrs
Initial investment in equipment	\$8m
Depreciation of equipment per year	\$4m
Unit sales per year	3m
Sale price per unit	\$10
Variable cost per unit	\$6
Fixed costs per year, paid at the end of each year	\$2m
Tax rate	30%

Note 1: Due to the project, current assets will grow by \$1m initially (at $t = 0$), and then grow by \$0.5m one year later (at $t = 1$), and then they will fall by \$0.5m the year after (at $t=2$). Current liabilities will not be affected by the project. At the end of the project, the current assets accumulated due to the project can be sold for **60%** of the price for which they were bought. Keep in mind that this loss will be tax-deductible.

Find the three Cash Flow From Assets (CFFA) at times $t=0, 1, 2$. You DO NOT need to find NPV.

Spare Scribble Sheet

Formulas

$$PV(\text{single cash flow}) = V_0 = \frac{C_t}{(1 + r_{eff})^t}$$

$$PV(\text{annuity}) = V_0 = \frac{C_1}{r_{eff}} \left(1 - \frac{1}{(1 + r_{eff})^T} \right)$$

$$PV(\text{perpetuity}) = V_0 = \frac{C_1}{r_{eff} - g_{eff}}$$

$$r_{eff,annual} = (1 + r_{eff,monthly})^{12} - 1$$

$$r_{eff,monthly} = \frac{r_{APR,comp\ monthly}}{12}$$

$$Price_{bill} = V_0 = \frac{F_t}{\left(1 + r_{simple} \times \frac{t}{365} \right)}$$

$$Price_{bond} = PV(\text{annuity of coupons}) + PV(\text{principal})$$

$$= \frac{C_1}{r_{eff}} \left(1 - \frac{1}{(1 + r_{eff})^T} \right) + \frac{Face}{(1 + r_{eff})^T}$$

$$CapEx = NFA_{now} - NFA_{before} + Depreciation$$

$$\uparrow NWC = (CA_{now} - CL_{now}) - (CA_{before} - CL_{before})$$

$$CFFA = NI + Depr - CapEx - \uparrow NWC + IntExp$$

$$CFFA = CF \text{ to equity holders} + CF \text{ to creditors}$$

$$r_{0-1} = \frac{p_1 - p_0}{p_0} = \frac{p_1}{p_0} - 1$$

$$\bar{r} = \frac{\sum_{i=1}^n (r_i)}{n} = \frac{r_1 + r_2 + \dots + r_n}{n}$$

$$var(r) = \sigma^2 = \frac{\sum_{i=1}^n [(r_i - \bar{r})^2]}{n - 1}$$

$$cov(r_1, r_2) = \sigma_{1,2} = \frac{\sum_{i=1}^n [(r_{1,i} - \bar{r}_1)(r_{2,i} - \bar{r}_2)]}{n - 1}$$

$$correl(r_1, r_2) = \rho_{1,2} = \frac{cov(r_1, r_2)}{sd(r_1) \cdot sd(r_2)} = \frac{\sigma_{1,2}}{\sigma_1 \cdot \sigma_2}$$

$$\bar{r} = \sum_{i=1}^n (p_i \cdot r_i) = p_1 \cdot r_1 + p_2 \cdot r_2 + \dots + p_n \cdot r_n$$

$$var(r) = \sigma^2 = \sum_{i=1}^n [p_i (r_i - \bar{r})^2]$$

$$cov(r_1, r_2) = \sigma_{1,2} = \sum_{i=1}^n [p_i (r_{1,i} - \bar{r}_1)(r_{2,i} - \bar{r}_2)]$$

$$r_P = x_1 \cdot r_1 + x_2 \cdot r_2 + \dots + x_n \cdot r_n = \sum_{i=1}^n (x_i \cdot r_i)$$

$$x_1 + x_2 + \dots + x_n = 1$$

$$\sigma_P^2 = x_1^2 \cdot \sigma_1^2 + x_2^2 \cdot \sigma_2^2 + 2 \cdot x_1 \cdot x_2 \cdot \sigma_{1,2}$$

$$\sigma_{1,2} = \rho_{1,2} \cdot \sigma_1 \cdot \sigma_2$$

$$\mu_i = r_f + \beta_i (\mu_M - r_f)$$

$$\beta_i = \frac{\sigma_{i,M}}{\sigma_M^2} = \frac{cov(r_i, r_M)}{var(r_M)}$$

$$\sigma_{i,total}^2 = \beta_i^2 \cdot \sigma_M^2 + \sigma_{i,\varepsilon}^2$$

$$\beta_P = x_1 \beta_1 + x_2 \beta_2 + \dots + x_n \beta_n$$

$$r_{WACC \text{ after tax}} = \frac{D}{V} \cdot r_D (1 - t_c) + \frac{E}{V} \cdot r_E$$

$$r_{WACC \text{ before tax}} = r_A = \frac{D}{V} \cdot r_D + \frac{E}{V} \cdot r_E$$

$$V = D + E$$

$$r_{total} = r_{capital} + r_{income}$$

$$r_{0-T} = \left((1 + r_{0-1})(1 + r_{1-2})(1 + r_{2-3}) \dots (1 + r_{(T-1)-T}) \right)^{\frac{1}{T}} - 1$$

$$(1 + r_{0-T})^T = (1 + r_{0-1})(1 + r_{1-2})(1 + r_{2-3}) \dots (1 + r_{(T-1)-T})$$

$$P_{ex-rights} = \frac{n \times P_{cum-rights} + P_{subscription}}{n + 1}$$