MSIN0149 Corporate Finance

Examination Paper / LSA Examination Paper

2021/22

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Upload window	20-minute upload window is available at the end of the standard exam duration.
Reasonable adjustments	If you have a Summary of Reasonable Adjustments or Special Assessment Arrangements in place which include additional writing time or rest breaks, the additional time will be added to the standard exam duration at the top of page 2. SORA students are also entitled to the 20-minute upload window.

Exam Length	**TWO (2)** hours
Number of Sections	There are **TWO (2)** sections to the examination paper.
Question/Mark Distribution	There are **TWO (2)** sections to the examination paper. **Section A** consists of **TWO (2)** questions on Part I of the module. This section is worth **FIFTY (50)** marks. **Section B** consists of **TWO (2)** questions on Part II of the module. This section is worth **FIFTY (50)** marks. **You are advised to allocate your time between the two sections in proportion to the marks available.**
Additional Materials	N/A
Handwritten answers permitted?	Yes
If yes, where are handwritten answers permitted	ALL
Other notes	If you are unclear on any part of the question, state your assumptions in your answers
Module Leader:	Profs Frederic Malherbe / Alex Gorbenko
Internal Assessor:	Prof Ming Yang

TURN OVER

SECTION A

QUESTION 1: CAPITAL STRUCTURE PROBLEM WITHOUT FRICTIONS

This section is worth **TWENTY-FIVE (25)** marks

IMPORTANT: maximum **250 words**

There are two firms, A and B. They each operate a project. Each project requires an investment of £1,000 and pays a single, terminal payoff after a year. With 50% probability, the economy does well and both projects succeed and they generate a £1.200 payoff.

You know the following about Firm A:

- Its project payoff if the economy does not well is £900.
- It is financed with £800 in debt and the rest in equity.
- The unlevered required return on equity is 5%.
- Its required return on equity is 17%.

a) What is the risk-free rate? **[15 marks]**

You know the following about Firm B:

- It is financed by with £950 of *risky* debt and the rest in equity.

b) Compute the market value of Firm B's cash flows as a function of its project payoff when the economy does not well. **[10 marks]**

QUESTION 2: CAPITAL STRUCTURE PROBLEM WITH FRICTIONS

This section is worth **TWENTY-FIVE (25)** marks

IMPORTANT: maximum **200 words**

Investors face a firm that has no debt and wants to sell 100% of its equity (divided in 1m shares). There is uncertainty about the firm payoffs and there are two types of investors: 50 normal investors, and 10 smart-money investors. All investors are risk neutral and they each have a maximum of £200,000 to invest.

- All investors initially believe that the firm cash flow will be £13m with probability *p*, and £7m otherwise.
- All investors initially know that $p = 0.4$ or $p = 0.6$ with equal probabilities.
- The normal investors have no additional information and their best estimate is therefore $p = 0.5$.
- Smart-money investors have access to additional information just before the IPO.
    - In 80% of the case, this information is useless and they work with the same estimate $p = 0.5$.
    - But in 20% of the cases, they learn the true value of p.

a) Compute the valuation of smart-money investors, in all possible cases valuations **[5 marks]**

Assume that the IPO procedure goes as follows: the firm (or its representative investment bank) sets a price. All investors simultaneously bid for the amount they would like to buy at such a price. Given investors budget constraints, the bids must be in between zero and £200,000. If the IPO is oversubscribed, investors are rationed pro-rata of their bid.

b) If the firm sets the price at £10 per share. What will happen? **[12 marks]**

c) What is the maximum price at which the firm can be sure to sell all its equity? **[8 marks]**

SECTION B

QUESTION 3

This section is worth **TWENTY (20)** marks

Multi-State Trucking (MST) maintains debt-to-assets ratio of 0.60. Under this financial strategy, the firm debt beta is 0.20 and its equity beta is 1.40. MST faces a 40% corporate income tax rate. In its capital budgeting, MST uses a risk-free rate of 3% and a market risk premium of 6%. MST is considering the acquisition of new lift-trucks. The trucks will cost $20 million and generate cash flow of $3 million next year. The trucks have a use-life of 10 years in total. During the life of the trucks, cash flow will grow at 2% per year.

a) What is the appropriate approach to value MST? What is the appropriate discount rate to discount MST's cash flow? **[7 marks]**

b) What is the project's value? **[8 marks]**

c) Discuss (informally) potential benefits and costs of a levered recapitalization that would bring MST's debt-to-assets ratio to 90%. **[5 marks]**

QUESTION 4

This section is worth **THIRTY (30)** marks

Today is date 0. UCL Partners, a newly formed private equity firm, is planning to buy Company A. This will be UCL Partners' only investment. Company A is expected to generate the annual free cash flow of $20 million in perpetuity. Its cost of assets is 20%. UCL Partners is planning to sell the company (or "exit") and close down shop in 5 years (at date 5).

UCL Partners' general partner (GP) collects an annual management fee equal to 2% of the investment amount until the firm closes shop. More specifically, if the GP puts limited partners' (LP) cash to work immediately (at date 0), he/she collects the first management fee at the end of the first year (at date 1). However, if the GP puts LPs' cash to work with a delay (as an example, at date 1), his/her management fees are delayed until the end of the investment year (continuing the example, the first management fee is delayed until date 2) and are paid together with the investment year's management fee (continuing the example, the GP collects 4% of the investment amount at date 2).

a) What is the value of Company A at date 0 and at "exit"? **[5 marks]**

b) One investment plan UCL Partners is considering is to finance the purchase of Company A at date 0 with 100% equity (in other words, 100% of the investment will be paid for by LPs) and to distribute the free cash flow over the duration of the investment in the form of dividends. What is the IRR of this investment plan for LPs? **[5 marks]**

c) An alternative investment plan UCL Partners is considering is to finance the purchase of Company A at date 0 with 10% equity and 90% bank loan. The loan has a 10% annual interest. Additionally, the GP is planning to use all the after-interest Company A's free cash flow to pay down the balance on the loan, keeping the dividend at zero (this strategy is called a "cash sweep"). What is the IRR of this investment plan for LPs? **[7 marks]**

d) Yet another investment plan UCL Partners is considering is to take out a subscription credit line secured against LPs' committed capital. The credit line has a 20% annual interest paid out of Company A's free cash flow. The credit line will be used to finance the purchase of Company A at date 0 and will have to be repaid in full in two years (at date 2). To achieve this, at date 2 UCL Partners is planning to implement the same capital structure as in part c) of the problem: 10% equity and 90% bank loan. Finally, the GP is still planning to do a cash sweep. What is the IRR of this investment plan for LPs? **[8 marks]**

e) Which of the above three restructuring plans is more valuable to the LPs? State all the assumptions you have made to answer this question. **[5 marks]**

END OF PAPER