2020 EXAMINATIONS

Lancaster University

PART II (SECOND AND FINAL YEAR)

ACCOUNTING AND FINANCE

AcF 302 CORPORATE FINANCE

(Duration: available for 24 hours)

It is recommended that you attempt to complete the exam within 3 hours

---

Answer **ALL** questions from Section A using the answer template provided.

Answer **ONE** question from Section B. Answer **ONE** question from Section C.

A table with the cumulative probabilities of the standard normal distribution is included at the end of the examination paper.

This exam is open-book.

Section A

Section A consists of Questions 1 to 10. Answer **ALL** questions in this section.

---

1) Which of the following statements is FALSE?

A) A target leverage ratio means that the firm adjusts its debt proportionally to the project's market value.
B) Debentures usually contain clauses restricting the company from issuing new debt with equal priority to existing debt.
C) The hurdle rate rule raises the bar on accepted projects by using a higher discount rate to discount projects' cash flows.
D) In the flow-to-equity valuation method, the project's free cash flows are discounted using the equity cost of capital.

2) Which of the following statements is FALSE?

A) The private debt market is larger than the public debt market.
B) When we relax the assumption of a constant debt-to-equity ratio, the WACC for a project will change as the debt-to-equity ratio changes.
C) If the embedded warrant in a convertible bond is deep in-the-money, the convertible bond's value will be much lower than the value of an otherwise identical straight bond.
D) In-the-money real options should be exercised immediately when the option to delay is worth less than the NPV of undertaking the investment today.

3) Which of the following mechanisms that a firm can use to go public offers the original investors of the firm the highest flexibility to trade their stocks after the company goes public?

A) Firm commitment IPO.
B) Best efforts IPO.
C) Direct listing.
D) Auction IPO.

4) Which of the following statements is FALSE?

A) With a constant interest coverage policy, the value of the interest tax shield is proportional to the project's levered value.
B) Bond covenants exist to reduce the agency conflict between shareholders and debtholders.
C) When a firm has permanent debt, we can discount the interest tax shields using the cost of debt.
D) The lower the volatility of a project's future cash flows, the less attractive the option to wait becomes.

5) Which of the following statements is FALSE?

A) Eurodollar bonds are bonds that European companies can issue in the U.S. bond market.
B) Private companies usually issue preferred stock when they sell equity for the first time to outside investors.
C) With a constant interest coverage policy, we can calculate the interest tax shield without knowing the debt capacity.

D) At-the-money real options have value.

6) Which of the following statements regarding leases and bankruptcy is FALSE?

A) Operating and true tax leases are generally viewed as true leases by the courts, whereas capital and non-tax leases are more likely to be viewed as a security interest.
B) If the lease is classified as a true lease in bankruptcy, then the lessee retains ownership rights over the asset.
C) By retaining ownership of the asset, the lessor has the right to repossess it if the lease payments are not made, even if the firm seeks bankruptcy protection.
D) If a lease contract is characterized as a true lease in bankruptcy, the lessor is in a somewhat superior position than a lender if the firm defaults.

7) Which of the following statements is FALSE?

A) In a factoring of accounts receivable arrangement, the firm sells receivables to the lender (i.e., the factor), and the lender agrees to pay the firm the amount due from its customers at the end of the firm's payment period.
B) Businesses can also obtain short-term financing by using secured loans, which are loans collateralized with short-term assets—most typically the firm's accounts receivables or inventory.
C) If a factoring arrangement is with recourse, the factor will pay the firm the amount due regardless of whether the factor receives payment from the firm's customers.
D) Both the interest rate and the factor's fee vary depending on such issues as the size of the borrowing firm and the dollar volume of its receivables.

8) Which of the following statements is FALSE?

A) The board of directors has a clear fiduciary duty to protect the interests of both the owners of the firm (the shareholders) and the interests of other stakeholders in the firm (such as the employees).
B) The shareholders as a group elect a board of directors to monitor managers. The directors themselves, however, have the same conflict of interest—monitoring is costly and in many cases directors do not get significantly greater benefits than other shareholders from monitoring the managers closely.
C) In principle, the board of directors hires the executive team, sets its compensation, approves major investments and acquisitions, and dismisses executives if necessary.
D) When the ownership of a corporation is widely held, no one shareholder has an incentive to bear the cost of monitoring, because she bears the full cost of monitoring but the benefit is divided among all shareholders.

9) Which of the following statements regarding risk arbitrage is FALSE?

A) Traders known as risk-arbitrageurs, who believe that they can predict the outcome of a deal, take positions based on their beliefs.
B) Once a tender offer is announced, the uncertainty about whether the takeover will succeed reduces the volatility of the stock price. This uncertainty creates an opportunity for investors to speculate on the outcome of the deal without bearing the risk of volatility.

C) A potential profit arises from the difference between the target's stock price and the implied offer price, and is referred to as the merger-arbitrage spread.
D) It is not true arbitrage because there is a risk that the deal will not go through. If the takeover did not ultimately succeed, the risk-arbitrageur would eventually have to unwind his position at whatever market prices prevailed.

10) Agency costs are best defined as:

A) the costs imposed on a corporation through the laws and regulations that control corporations.
B) the costs a corporation incurs as the result of fraud.
C) the costs associated with compensating managers when ownership and control are separated in a firm.
D) the costs that arise when there are conflicts of interest between a firm's stakeholders.

(3 marks for each question)

(Total 30 marks)

Section B

Answer **EITHER** Question 11 **OR** Question 12.

Answer all parts of the chosen question.

Question 11

a) Globas Industries adjusts its debt so that its free cash flow is constantly five times its interest expenses. Globas is considering a project that will generate free cash flows of £2.48 million this year which are expected to grow at a rate of 4.5% per year from then on. Suppose Globas' unlevered cost of capital is 9.6% and its marginal corporate tax rate is 36%.

REQUIRED:

I. What is the levered value of the project?

(4 marks)

II. If Globas pays 4.1% interest on its debt, what is the amount of debt it will take on initially for the project?

(2 marks)

III. Show that the levered value of the project using the WACC method matches the result you obtained in part (I).

(3 marks)

b) As the CFO of Mina Labs, you are considering an R&D project with mutually dependent phases. Explain how you can evaluate the project and which factors you should consider.

(8 marks)

c) A project has a life of six years. You want to calculate the present value of the final-year interest tax shield. When would the formula below be used to calculate the present value of the interest tax shield? Explain the rationale for using this formula.

$$PV\ (ITS_6) = \frac{ITS_6}{(1 + R_U)^5\ (1 + R_D)}$$

(6 marks)

d) Dynamic Industries is considering a new project. The project may begin today or in exactly two years. The project will cost £11.5 million to start today. The cost of starting the project in two years is £13 million. You expect the project to generate £1,200,000 in free cash flow per year forever. The risk-free rate is 4%. The expected return on the market is 8%, and beta for projects of similar risk is 1.5. The variance of the project's cash flows is 12.25%.

REQUIRED:

I. What is the value of the option to wait until year 2 to start the project?

(10 marks)

II. Should you begin the project today or wait for two years?

(2 marks)

(Total 35 marks)

Question 12

a) Suppose that in addition to common stock, your firm raised £9 million in Series A financing with a 1.5x liquidation preference and a £15 million post-money valuation, £13 million in Series B financing with a 2.0x liquidation preference and a £36 million post-money valuation, and £20 million in Series C financing with a 2.5x liquidation preference and a £50 million post-money valuation. Series C investors have the highest seniority followed by Series B and then Series A. None of the financing rounds offered investors participation rights. If the firm is sold after the Series C financing round,

REQUIRED:

I. What will Series B investors receive if the firm is sold for £62 million?

(1 mark)

II. What is the minimum sale price such that common shareholders receive at least £10 million?

(3 marks)

III. What is the minimum sale price at which Series A, B and C investors are all willing convert their shares? What will Series A, B, C and common shareholders receive at that price?

(7 marks)

b) Explain why going public through a direct listing does not lead to ownership dilution like a traditional IPO.

(4 marks)

c) When would a real option to invest in a project be out-of-the-money? Explain whether you should discard the project in that case.

(6 marks)

d) Do convertible bonds have a higher or lower yield than otherwise identical bonds without the option to convert? Why?

(3 marks)

e) Your research and development division has just invented a new type of screen for smartphones; you have given the go ahead to try to produce it commercially. It will take five years to find out whether the screen is commercially viable, and you estimate that the probability of its success is 30%. Development will cost £7 million per year, paid at the beginning of each year. If development is successful and you decide to produce the screen, a factory extension will be built immediately. The factory will cost £1,500 million to put in place and will generate profits of £90 million at the end of every year in perpetuity. Assume that the current five-year risk-free interest rate is 9.2% per year, and the yield on a perpetual risk-free bond will be 10.0%, 9.0%, 8.0%, 7.0%, or 4.0% in five years. Assume that the risk-neutral probability of each possible rate is the same.

REQUIRED:

I. What is the value of this project in year 4?

(5 marks)

II. What is the value of this project today? Should you undertake the project?

(2 marks)

III. Suppose that you can sell the screen prototype to a competitor for £50

million in year 5. This option is available regardless of whether the development stage succeeds or not. Explain whether you should undertake the project in that case.

(4 marks)

(Total 35 marks)

Section C

Answer **EITHER** Question 13 **OR** Question 14.

Answer all parts of the chosen question.

Question 13

a) Explain briefly how does a corporate raider make money with a levered buyout (LBO).

(5 marks)

b) You are evaluating a potential buyout of Claxon Inc. Claxon's stock price is £16.5, and it has 4 million shares outstanding. You believe that if you buy the company and replace its dismal management team, its value will increase by 50%. You are planning on doing a levered buyout of Claxon and will offer £22 per share for control of the company.

REQUIRED:

Assuming you get 50% control, what will be your gain from the transaction? (show all your calculations).

(5 marks)

c) You work for a sanitary garment company. Your firm needs to decide if it is more convenient to lease or to buy a sewing machine to meet the additional demand of medical gowns and face masks. The purchase price of the machine is £95,000 and if purchased, the equipment will be depreciated on a straight-line basis over five years, after which it will be worthless. On the other hand, if you lease the sewing machine, annual payments will be £16,700, with the first of four payments due today. The firm's pre-tax borrowing cost is 8% and the effective tax rate is 24%.

REQUIRED:

I. If this is a true tax lease, decide if the firm should buy or lease the sewing machine. Show all your calculations (including the lease equivalent loan) and explain your decision.

(6 marks)

II. If this were a non-tax lease, should the firm buy or lease the sewing machine? Show all your calculations and explain your decision.

(3 marks)

d) TechPharma is a new Tech-Health company currently specialized in using AI to create personalized over-the-counter medicine. This company is about to become public. Big 4 Accounting LP is in charge of the accounting and auditing and New Britain Bank is the investment bank dealing with the IPO and also the main investor of the firm. Part of the success of the IPO depends on giving a strong signal of good governance to potential shareholders. You need to advise the composition of the future board of directors. You are given the following list of directors and their main bio.

- Mark Smith. Founder of the firm. PhD in Chemistry with extensive experience in lab innovation. Had the initial idea of a chemical component that could be adapted and created the main product of the firm in 1993. Company actually started in a home-lab in his garage.
- Linda Solo. Engineer. CEO of Environment UK (an NGO promoting environmental efficiency in the production of chemical products).
- Tim Jones. First partner of the firm. PhD Chemistry. Recruited by Mark Smith to contribute to the development of the product in the early nineties.
- Richard Lando. CEO of the company. MBA Lancaster University (1999). Entered the firm in June 2001 and has been working over two decades in the firm developing the commercial and production growth. His previous appointments include COO of a food manufacturing company and VP of AgroLanc (a medium sized agrochemical private company). Currently serves as a director at LongTransport CO.
- Vikram Napal. CEO of LongTransport Co. with over 15 years of experience in Logistics and retail transport.
- VP of Big4 Accounting LP.
- VP Young Investments at New Britain Bank. Over 30 years of experience accelerating young firms.
- Former CEO of SuperSupermarkets. 67 years old. Over 40 years of experience in retail, has served as a Director at over 7 boards in his lifetime. Has mentored several successful younger CEOs including Richard Lando.
- Matti Aalto. AI serial entrepreneur with various technological start-ups in Latvia and Finland. Currently sits at 2 boards around the world.
- Robert Dash. MBA Lancaster University ('99). Founder and CEO of the largest FinTech in the UK.
- Xi Li Lando. MBA Stanford. VP Amazing.com (biggest online retailer in the world) with ample experience in retail and product placement.
- Stephanie Macron. MBA NYU – Stern. VP Marketing at Avon since 2008. 10 years of experience in the beauty – pharma sector with several successful campaigns for cutting edge rejuvenating products at top tier companies such as Revlon and Lancome.

REQUIRED:

I. Using the information provided, classify each director by type and provide a brief explanation of main advantages and disadvantages (conflicts of interest) if any.

(6 marks)

II. Form your ideal Board for this company selecting 5 members from the previous list. Explain your criteria to select each director, who should be the Chairman and why you think these directors would form a good Board.

(6 marks)

e) Consider alternative types of firms experiencing short term financial needs from negative cash flow shock because of the Covid-19 crisis.

REQUIRED:

I. Provide two examples of a firm experiencing a negative cash flow shock. Explain the short-term financial need.

(2 marks)

II. Provide two examples of a firm experiencing a positive sales shock that might initially create a short-term financial need and hence a negative cash flow shock. Explain.

(2 marks)

(Total 35 marks)

Question 14

a) GrandeCo has earnings per share of £2. It has 11 million shares outstanding and is trading at £17 per share. GrandeCo is thinking of buying ChicoCo, which has earnings per share of £1.25, 7.3 million shares outstanding, and a price per share of £12.75. GrandeCo will pay for ChicoCo by issuing new shares. There are no expected synergies from the transaction. If GrandeCo offers an exchange ratio such that, at current pre-announcement share prices for both firms, the offer represents a 25% premium to buy ChicoCo.

REQUIRED:

I. Calculate the price per share of the combined corporation after the merger.

(4 marks)

II. What is the price per share of GrandeCo immediately after the announcement?

(1 marks)

III. What is the price per share of the target company immediately after the announcement?

(1 marks)

IV. What is the actual premium the bidder will pay? Is this different from the premium originally offered? Explain why or why not.

(1 mark)

b) Iron LP has an average accounts payable balance of £375,000. Its annual cost of goods sold is £8,320,000, and it receives terms of 3/15, net 30 from its suppliers. Iron LP chooses to forgo this discount. Is Iron LP managing its accounts payables well? Explain showing all your calculations.

(3 marks)

c) Your company is experiencing extreme short term financial needs due to the Covid-19 lockdown. You need £4,290,000 to cover rent, utilities and salary of key employees that have been retained during the 4 months you expect to be affected by the lockdown.

After making some phone calls, you've been able to get the following offers as sources of funding:

- Bank X is offering £4,290,000 for four months at a stated annual rate of 1.85%, using inventory stored in a field warehouse as collateral. The warehouse charges a £20,000 fee, payable at the end of the four months.
- Bank Y can facilitate borrowing up to £1,000,000 for four months at an APR of 3.2%.
- Bank Z offers £4,500,000 for four months at an APR of 1.85. The bank will require to maintain a (no-interest) compensating balance of 10% of the face-value of the loan and will charge a 0.05% loan origination fee.

REQUIRED:

What would be the best financial strategy that would tide you over the following 4 months? Explain your proposal and show all your calculations.

(8 marks)

d) Lancaster Publishing is considering to lease a printer at a purchase price of £90,000. Its residual value in four years is certain to be £15,000, and there is no risk that the lessee will default on the lease. Assume that capital markets are perfect and the risk-free interest rate is 6% APR with monthly compounding.

REQUIRED:

I. Calculate the monthly lease payments for a four-year lease of the printer.

(2 marks)

II. Suppose that instead of leasing the printer, Lancaster Publishing is considering purchasing a printer outright by borrowing the purchase price using a four-year annuity loan. Calculate the monthly loan payments for a four-year loan to purchase the printer.

(2 marks)

III. Compare your answers in parts I) and II). What are the advantages and disadvantages of each arrangement? Are the monthly payments similar or different? Explain why should they differ or not.

(4 marks)

e) Consider the following questions related to take-over defenses.

REQUIRED:

I. Explain what is the purpose of a take-over defense and how do Recapitalization and Poison pill work.

(5 marks)

II. Provide an example of a firm where having a take-over defense would work in the best interest of both shareholders and management. Explain.

(2 marks)

III. Provide an example of a company where the anti-take over defense would benefit management but not shareholders. Explain the mechanism or type of contract that shareholders can put in place to avoid this situation.

(2 marks)

(Total 35 marks)

END OF PAPER

Cumulative probability [$N(d)$] that a normally distributed variable will be less than d standard deviations above the mean.

d	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952