



CORPORATE INVESTMENT APPRAISAL

MASTERS IN FINANCE

EXAM

10 JANUARY 2017

2 HOURS + 15 minutes

INSTRUCTIONS TO READ BEFORE STARTING ANSWERING THE QUESTIONS

1. Please fill in your name and student number.
2. The exam has 5 groups of questions, with marks clearly indicated.
3. You may use one A4 sheet of paper with notes.
4. The cumulative Normal distribution table is attached at the end.
5. You may un-staple the Normal table, and the scrap paper. Nothing else.

Good Luck!

Name _____ No. _____

PROFESSOR CLARA RAPOSO'S VIP AREA:

GROUP	GRADE	COMMENT
I (4.5 points)		
II (5 points)		
III (3 points)		
IV (4.5 points)		
V (3 points)		
TOTAL (20)		

GROUP I (4.5 points)

Prince Industries is considering investing in a machine that will cost \$1,200,000 and will last for three years. The company has been studying this business opportunity for over 2 years now, and already spent \$500,000 last year in a marketing study. The machine will generate revenues of \$1,300,000 each year and the cost of goods sold will be 50% of sales. The project will also involve an annual fixed administrative expense of \$200,000. At the end of year 3 the machine will be sold for \$150,000. The annual net working capital of the project is 8% of each year's sales. The appropriate cost of capital is 10% and *Prince Industries* is in the 35% tax bracket.

(I.a) (1.25 points) Compute the annual free cash flows of the project. Show your computations.

(I.b) (1.25 points) Would you invest in this project? Explain.

(I.c) (1 point) **Without making further computations**, what can you say about the Internal Rate of Return of this project? Explain.

(I.d) (1 point) How does this project compare with an alternative machine priced at \$900,000 that would generate an annual free cash flow of \$600,000 for 2 years, and with a discount rate of 10%? Show your computations and explain your answer.

GROUP II (5 points)

Consider the following financial information regarding *Dave&Bow Corporation*:

Dave&Bow Co. Market Value Balance Sheet (\$ Millions) and Cost of Capital					
Assets		Liabilities		Cost of Capital	
Cash	250	Debt	650	Debt	7%
Other Assets	1200	Equity	800	Equity	14%
				τ_c	35%

The company is now analyzing a new project with estimated cash flows:

Dave&Bow Co.'s New Project Free Cash Flows (\$ thousands)				
Year	0	1	2	3
Free Cash Flows	(\$250)	\$75	\$150	\$100

Assume that this new project is of average risk for *Dave&Bow Co.* and that the firm wants to hold constant its debt to equity ratio. Currently the risk-free interest rate is 5.5% and the market risk premium is 6%.

(II.a) (1.25 points) Should *Dave&Bow Co.* invest in the new project? Explain.

(II.b) (1.25 points) *Dave&Bow Co.*'s CEO wants to reduce the financial risk of the company, in order to lower as much as possible its cost of debt. The CEO has determined that this is possible if the firm lowers its ratio of debt-to-value to 0.1. What would the value of the project be in this case? Show your computations and explain.

(II.c) (1.25 points) Assume again the target capital structure of question (II.a). *Dave&Bow Co.*'s CEO just realized that the new project diversifies its business, and it should be classified in a different line of business. For the only competitor company operating in this new industry, the CEO found the following information:

Equity Beta	Debt Beta	Debt-Equity Ratio
1.8	0.4	1.5

Does your investment decision change with this new information? Explain.

(II.d) (1.25 points) Consider again the scenario of financing of question (II.a), with the additional information that the personal tax rate on equity securities is 15% and the personal tax rate on debt securities is 20%. What is your estimate of the present value of the interest tax shield (after personal taxes) associated with the new project? Show all your computations.

GROUP III (3 points)

Remember the asymmetric information problem (the “*lemons*”) of Myers and Majluf (1984) seen in class, regarding a company that needs to raise more equity via a seasoned equity offering.

Consider there are two scenarios for the possible value of company *Leonard&Co*: a more optimistic scenario (“High”) and another more pessimistic scenario (“Low”), both with probability $\frac{1}{2}$. In scenario “High” the equity of the company will be worth 300, while in scenario “Low” its value is 100. To simplify, consider a zero discount rate. The shares of the company currently have a total market capitalization of 200.

A new project arrives requiring an investment of 150, which needs to be raised in the market. Assume that asymmetric information exists, and the manager already knows in which state/scenario the company is.

(III.a) (1.5 points) Assume the new project has an NPV of 70 (in both scenarios). Under what circumstances will the equity offering take place? Show your computations and comment.

(III.b) (1.5 points) For what value X of NPV of the new project would the *lemons* problem of underinvestment arise? Explain by showing your computations.

GROUP IV (4.5 points)

Firm *GeorgMike Inc.* currently has no debt and its market capitalization is € 80,000,000 with a stock price of € 8. The annual volatility of *GeorgMike Inc.*'s assets has been estimated at 20%. The CEO has just announced a new issue of convertible bonds. 5000 bonds will be placed in the market at their nominal value, which is € 1000 per bond. The bonds promise to pay an annual coupon of 8%, with annual payments, during 2 years. Each bond may be converted into shares at maturity (in 2 years' time) for an implied exercise price of €10 per share. The risk-free interest rate is 3% (continuous compounding) and the yield-to-maturity (continuous time) of the straight bonds issued by companies similar to *GeorgMike Inc.* is 8%.

(IV.a) (1 point) What would be the value of the convertible bonds that *GeorgMike Inc.* is issuing, if these bonds were "simple", without the conversion feature? Show all your computations.

(IV.b) (2 points) Considering the Black-Scholes model, what is the value of the convertible bonds issue at the time of its announcement? Explain your assumptions and show your computations.

(IV.c) (1.5 points) What is your estimate of the value of the shares of *GeorgMike Inc.* after the convertible bonds are issued? Explain.

GROUP V (3 points)

In the framework of Merton's model, consider the following data of company LostMUSIC: Equity has a market cap of 9.6 and a volatility of 60.5%. In 2 semesters' time, a loan of 250 reaches its maturity (ignore intermediate cash flows). Additionally, we know that the risk-free interest rate is 2% per year (continuous time).

You are told that the value of LostMUSIC's Assets follows a binomial model, for which we were given the following information:

TODAY	Semester 1	Semester 2
255	258.0736056	261.1842585
	251.9630004	255
		248.9621709

(V.a) (2 points) Is it credible to you that the Tree for the Value of the Assets of company LostMUSIC is the one in the previous table? Show your computations and explain your answer.

(V.b) (1 point) **For this question, assume that the tree given above for the assets is correct and that there is a fixed bankruptcy cost K when (and if) liquidation takes place.** If you are told that the market value of the bonds of LostMUSIC is 244 today ($t=0$), what would your estimate of the fixed bankruptcy cost, K , be?

ADDITIONAL SPACE TO ANSWER ANY QUESTION, IF REQUIRED

SCRAP PAPER

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