



**CORPORATE INVESTMENT APPRAISAL**

MASTERS IN FINANCE

**EXAM**

**5 JANUARY 2015**

**2 HOURS + 15minutes**

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:**

<b>GROUP</b>	<b>GRADE</b>	<b>COMMENT</b>
<b>I</b>		
<b>II</b>		
<b>III</b>		
<b>IV</b>		
<b>V</b>		
<b>TOTAL</b>		

**GROUP I (4 points)**

Firm SOUTHF is analyzing a new investment project, called OILY. The following table shows forecasts of **annual earnings** for the firm in two scenarios: the Current Scenario (without the project), and the Scenario with Project OILY:

<b>Current Scenario (without Project OILY)</b>	<b>Years 1 to 3</b>	<b>Scenario with Project OILY</b>	<b>Years 1 to 3</b>
Revenues	€ 900 000	Revenues	€ 1 750 000
Operating Costs	€ 500 000	Operating Costs	€ 600 000
Depreciation	€150 000	Depreciation	€ 650 000
Interest Expenses	€ 110 000	Interest Expenses	€ 110 000
Net Income	€ 98 000	Net Income	€ 273 000

Project OILY requires immediate investment of € 1 500 000 in capital expenditures, and there is no working capital. We also know that the appropriate discount rate to use is 12%.

(I.a) (1 point) Compute the free cash flow of project OILY. Show your computations.

(I.b) (1 points) Compute the discounted payback period of project OILY. Explain and briefly comment.

(I.c) (1 point) Read the statement: "OILY's IRR is certainly inferior to 12%, for which reason we should invest in this project". Do you agree with this statement? Explain your answer.

(l.d) (1 point) Would you prefer project OILY or an alternative project named STICKY, which requires investment in a machine with a useful life of 2 years, a cost of capital of 13%, and generates a net present value of € 80 000? Explain.

**GROUP II (6 points)**

Firm SOUTHF considers investing in new project RANCH (same industry as usual for the company), for which the free cash flows have already been estimated:

t	0	1	2
FCF <sub>t</sub>	-1000	730	440

We know that SOUTHF is financed with a ratio  $D/E=0.5$ , the beta of its shares is 1.1, and the firm is subject to corporate taxation at rate 35%. The firm's debt has an annual cost of 3%, which is 2% points higher than the risk-free interest rate, and the market risk premium is 4.5%.

(II.a) (1.5 points) Assuming the project is financed with the same target capital structure as the firm, should the company invest in it? Show your computations and explain your answer.

(II.b) (1.5 points) If the company decided to finance the project with a higher target ratio of leverage  $D/E = 1.0$ , the beta of debt would increase by 20%. What would happen to the NPV of the project? Explain and show your computations.

(II.c) (1.5 points) Assuming the company chooses to use the capital structure of question (II.a), what is the present value of the interest tax shield of the project? Explain.

(II.d) (1.5 points) Considering the capital structure of question (II.a), apply the flow-to-equity method to confirm the valuation of the project. Explain.



**GROUP III (3 points)**

Read the following statement: “As firms get more and more debt, creditors share the risks with the equity-holders, and, therefore, equity-holders become less demanding”. Do you agree with this statement? Explain your answer.

#### **GROUP IV (4 points)**

Company SOUTHF has just announced a warrants issue. 600 000 warrants are immediately placed in the market for a unit price of €0.33. Each warrant is convertible into one new share in 4 years time, when it is expected that company SOUTHF will raise € 1 200 000 with the exercise of the warrants. The current share price of SOUTHF is € 2.0, with a market cap of € 8 000 000. The company currently is unlevered. The volatility of its assets has been estimated as 20%, and the annual risk-free rate is 1% (in continuous time).

(IV.a) (2.5 points) Once they are issued, what is the fair price at which you think the warrants should be traded and what would happen to the stock price? Explain your estimates and comment your results.

(IV.b) (1.5 points) If the firm were to hire an investment bank to guarantee firm commitment (i.e., exercise of the warrants even if out of the money at maturity) what would the fair price of such a service be? Explain.

**GROUP V (3 points)**

In the framework of Merton's model, consider the following data for company SOUTHF: Equity has a market cap of 30 and a volatility of 40%. In 2 years' time, a loan of 250 reaches its maturity (ignore intermediate cash flows). Additionally we know that the risk-free interest rate is 1% per year (continuous time). You are told that the value of SOUTHF's Assets follows a binomial model.

(V.a) (1 point) Suppose that the binomial tree of the value of the assets is the following one:

TODAY	Year 1	Year 2
275.0740	284.8578	294.9896
	265.6262	275.0740
		256.5029

What would the market value of SOUTHF's debt be? Explain your steps.

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

**ADDITIONAL SPACE TO ANSWER ANY QUESTION, IF REQUIRED**

## SCRAP PAPER

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