Advanced Financial Theory (1741)

Fall - 2011

First Exam: 22.10.2011 | Time allowed: 4 hours

Examiner: Syed Mujahid Hussain | Closed book/ Calculator allowed

Please attempt all question as they carry equal marks. **Good Luck!**

Question 1: Please briefly explain the following:

- The connection between bankruptcy and liquidation
- How non-financial stakeholders may affect the capital structure of a firm.
- The pecking order of financing choices
- The Agency problem

Question 2: You are given the following information:

	Payoff		
Asset	State 1	State 2	at t=0
J	€12	€20	$p_j = €22$
K	30	10	$p_k = 20$

a. What are the prices of pure security 1 and pure security 2?
b. What is the initial price of a third security *i*, for which the payoff in state 1 is €6 and the payoff in state 2 is €10?

Note: Please show the calculations

Question 3: You are given the following joint distribution:

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Probability	**Return X**	**Return Y**
0.1	-0.1	0.15
0.8	.5	.0.15
0.1	.5	1.65

a. Compute the means, variances and the covariance of returns for the two securities.

b. Plot the feasible mean - standard deviation $[E(R), \sigma]$ combinations, assuming, that the two securities are the only investment vehicles available, and identify the mean-variance efficient set.

Note: Please show the calculations

Hints:

i. You can generate different combinations by assuming weights such as:

[100 % in X & 0% in Y, 75 % in X & 25% in Y, 50 % in X & 50% in Y, 25 % in X & 75% in Y, 0 % in X & 100% in Y]

ii. You can solve for the optimal percentage to invest in X in order to obtain the minimum variance portfolio using the following formula:

$$a^* \doteq \frac{\sigma_y^2 - r_{xy}\sigma_x\sigma_{yx}}{\sigma_x^2 + \sigma_y^2 - 2r_{xy}\sigma_x\sigma_{yx}}$$

where $r_{xy}\sigma_x\sigma_{yx} = cov(x, y)$

iii. The formula for the portfolio return and variance is:

$$E(R_p) = aE(\tilde{X}) + bE(\tilde{Y})$$

$$\sigma_p^2 = a^2VAR(\tilde{X}) + b^2VAR(\tilde{Y}) + 2abCOV(\tilde{X}, \tilde{Y})$$

Question 4: Please answer the following question:

- You are the manager of a company that produces motor vehicles. A union contract will come up for renegotiation in two months and you wish to increase your firm's bargaining power prior to hearing the union's initial demands. The union is likely to ask for a 25% increase from existing wage levels of €20 per hour for the 1,000 workers at your company. Workers typically work 2,000 hours per year. The firm has €100 million of debt outstanding at an interest rate of 10 per cent annually, and an equity market value of €200 million. Income before interest is €20 million per year. Assume no taxes. What specific investment strategies would you implement and why?

Question 5: Please answer the following questions:

a. Why might a firm choose to increase its debt level in response to favourable information about its future prospects?
b. Why might a manager close to retirement select a higher debt ratio than a manager far from retirement?