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EE431 Economics of Financial Markets and Institutions Problem Set 6

Please submit at the BE office, 5th floor department of Economics building.

Deadline of submission : Tuesday 10 November, 2015, before 15.00 hrs.

PART I. Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT)

1. Use the following information to answer all parts. Assume that all assumptions of CAPM hold

Assets	Expected Return (%)	Standard Deviation (%)
Market Portfolio	7	10
Risk-free Asset	1	

- **Market portfolio consists of 0.7 of risky asset X and 0.3 of risky asset Y.**

- (a) Suppose Stefan has 200US\$ and he wants 4% rate of return. How much should the investor invest his fund on risk free asset, asset X and asset Y ?

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- (b) What is the standard deviation of the portfolio in quation (a)?

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- (c) Suppose Stefanie has 100US\$ and she wants 10% rate of return. How much should she invest her fund on risk free asset, asset X and asset Y ?

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- (d) What is the standard deviation of the portfolio in quation (c)?

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- (e) Write down CML equation.

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- (f) Indicate Stefan's choice and Stefanie's choice, riskfree asset and market portfolio on CML. Grapically illustrate.

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2. $ER_A = 0.05 + 0.5F_1$; asset A has $\beta_{A1} = 0.5$.

$ER_B = 0.02 - 0.25F_1$; asset B has $\beta_{B1} = -0.25$.

Notation: β_{j1} and β_{j1} for $j = A; B$ denote the responses of the rates of return on assets A and B to the factor 1 (F_1).

- (a) Determine the portfolio weights you need to place on A and B in order to construct a portfolio which has zero exposure to the factor 1 (F_1) (a risk-free portfolio). What is the expected return of the risk-free portfolio?

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- (b) From (a), is there any abritrage opportunity exist if the market risk-free interest rate is 1%? If yes, explain how an investor can make an arbitrage profit.

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- (c) Determine the portfolio weights you need to place on A and B in order to construct a portfolio which has a unit exposure to the factor 1 (F_1). What is the expected return of the portfolio which has a unit exposure to the factor 1?

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- (d) Derive an equation for the equilibrium expected rate of return of an asset K which has $\beta_{K1} = b_K$.

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PART II. Financial Institutions

1. The bank you own has the following balance sheet:

Assets		Liabilities	
Reserves	\$75 million	Deposits	\$500 million
Loans	\$255 million	Bank Capital	\$100 million

- (a) If the bank suffers a deposits outflow of \$20 million with a required reserve ratio on deposits of 10%, does the bank has enough reserves to meet the reserve requirement?

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- (b) If the bank suffers a deposits outflow of \$50 million (in stead of \$20 million in question a) with a required reserve ratio on deposits of 10%, does the bank have enough reserves to meet the reserve requirement?

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2. Suppose that you are the manager of a bank whose \$75 million of asset have an average modified duration of 4, while its \$75 million of liabilities have an average modified duration of 6. Conduct a duration analysis for the bank and show what will happen to the net worth of the bank if interest rate rise by 2%.

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3. Suppose that you are the manager of a bank that has \$15 million of fixed-rate assets, \$30 million of rate-sensitive assets, \$25 million of fixed rate liabilities and \$20 million of rate-sensitive liabilities. Conduct a gap analysis for the bank, and show what will happen to bank profits if interest rate rises by 5%.

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