

## Portfolio Management: Test I

**Time: 10:15-11:45 Friday, 9 May 2014 (retake)**

**Place: Maxen**

Maximum points: 10

Calculator allowed.

ALL calculations and/or explanations in ALL questions must be shown! Just the final answer, even if it is correct, might yield zero points.

### **Question 1.1** [3 points.]

There are two assets with the following end-of-period distribution of returns. Compute the expected return and volatility of the minimum variance portfolio of securities *A* and *B*.

$R_A$	$R_B$	Probability
-3%	7%	25%
2.5%	-3%	50%
5.5%	5%	25%

### **Question 1.2** [3 points.]

Suppose the stock market (benchmark) return is 10% with a volatility 15%. The expected return for bonds is 5% with a volatility of 4%. The correlation between stocks and bonds is 0.15. As an experienced fund manager, you observe the risk aversions of your three clients, namely Mr. Henry, Mrs. Lee and Mr. Smith, are 1.5, 5 and 10 respectively. What is your investment advice to Mr. Henry, Mrs. Lee and Mr. Smith if they invest only in stocks and long bonds? (the formula is given)

### **Question 1.3** [4 points.]

Suppose your company has a project X that needs an initial investment of 150 million EUR, one year later the market value of project X will be 175 million EUR and at the same time your company will invest an additional 100 million EUR into project X. Two years later, the total value of project X will be 350 million EUR. However, the financial manager of your company is still somewhat dizzy after Vappu, so your boss asks you to calculate

a) geometric return ("time weighted return") [1 points]

b) internal rate of return ("dollar weighted return"). [1 points]

c) Suppose the additional investment will be 1000 million EUR, not 100 million EUR, and that the final value will be 1800 million EUR, not 350 million EUR. How would the answer have changed? [2 points]

Good luck!

Please, do not cheat. The consequences of cheating are severe.

## Portfolio Management: Test II

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**Place: Maxen**

Maximum points: 10

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### **Question 2.1** [4 points.]

True or false? Answers without motivation/calculation/explanation yield no points.

- The coefficient of relative risk aversion for Mr X is  $A = 2$ . The corresponding coefficient for Mrs Y is  $A = 7$ . Statement: Because of the higher coefficient of risk aversion, Mrs Y is willing to invest a larger amount of her wealth in risky assets than Mr X.
- At the moment you own only some money on a bank account. However, you are planning to make an investment in one of three mutual funds. The Sharpe ratios are 1.5, 2.6, and 2.0, while the Treynor measures are 0.09, 0.15, and 0.16, respectively. Statement: You should make your additional investment into fund C.
- The famous Fama–French (1993) empirical three-factor model has the following factors: the market factor, a small-company factor, and a momentum factor. True or false?
- A security is overvalued if it lies above the Security Market Line (SML).

### **Question 2.2** [3 points.]

Assume that you are in a CAPM-world. Calculate the missing items in the table. After you have finished, make a clear and easy-to-read summary table of your results.

Stock	Expected	Standard Deviation	Beta	Residual Variance
A	9 %	10 %	(5)	0
B	12 %	(2)	2	0.49
C	(1)	(3)	1	0
D	4 %	(4)	0	0.36

### **Question 2.3** [3 points.]

Assume that both the CAPM and an APT two-factor model hold simultaneously. Compute the beta coefficients of assets A and B given the following information.

Asset	$\beta_{i1}$	$\beta_{i2}$
A	0.8	0.90
B	1.20	0.60

$$\text{Var}(R_M) = 360, \text{COV}(F_1, R_M) = 180, \text{COV}(F_2, R_M) = 612.$$

Good luck!

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