Exam Portfolio Theory, Dep. of Economics, Stockholm University 2015-03-16

Course name: **Portfolio Theory**
Course code: **EC7211**
Examiner: **Bo Larsson**
Number of credits: **7.5 credits**
Date of exam: **Monday, March 16, 2015**
Examination time: **3 h, 09.00-12.00**
Location: **Brunnsvikssalen, Södra huset, hus A**

Write your identification number (the number stated in the upper right hand corner on your exam cover) along with the number of the question on each paper and cover sheet. Do not write answers to more than one question in the same cover sheet. Explain notions/concepts and symbols. You should provide clear, readable, and correct solutions, along with elaborate explanations (unless stated otherwise) in order to be granted full score on the questions. If you think that a question is vaguely formulated: specify the conditions used for solving it.

Exam consists of 3 questions awarding 20 points each and 1 question rewarding 25 points summing to a total of 85 points. The total score will be added to your score for the assignments, which results in a maximum score of 100 points.

Grades will be given according to the following scale of minimum scores, A: 88, B: 75, C: 63, D: 50, E: 45 points. Students who receive a score below 45 points fail the exam with a grade of F.

Results will be posted on mitt.su.se, three weeks after the exam, at the latest.

Good luck!

Bo & Emilio

Q1, Black CAPM, 20 points

   a) With no risk free asset, what is the relationship between the market and the zero-beta portfolio?
   b) If there exist a possibility to deposit your wealth at a low risk-free rate and a possibility to borrow to invest in stocks but at a higher interest rate what would be the locus of the market portfolio and zero beta portfolio?

Q2 Timing, 20 points

What could be potential problem regarding the measured risk when measuring performance of managers that are market timers?

How could you test for market timing, what is the interpretation?

Q3 Diversification 20 points

Assume that the average variance of return for an individual security is 50 and that the average covariance is 10. What are the expected variances of portfolios composed of 5, 10, 20, 50, and 100 securities?

What is the reason for this feature in asset portfolios?

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Q4 Mean variance 25 points

Make a short statement/justification on why you choose a specific answer.

i.   The CAPM implies that
        a.   investors may invest in assets with expected returns lower than the riskless interest rate.
        b.   no investor should invest in the risk-free asset.
        c.   the only relevant measure of risk is standard deviation.
        d.   the expected return on an efficient portfolio may be lower than the riskless interest rate.

ii.   The beta of an efficient portfolio
        a.   must be 1 since an efficient portfolio is perfectly positively correlated with the market portfolio.
        b.   is proportional to 1, depending on the proportion invested in the market portfolio.
        c.   is equivalent to the portfolio's standard deviation, since standard deviation is the measure of risk for an efficient portfolio.
        d.   is always less than 1.

iii.   Assume that the risk-free rate is 9% and that the market portfolio has an expected return of 17% and a standard deviation of 20%. Under equilibrium conditions as described by the CAPM, what would be the expected return for a portfolio having no diversifiable risk and a standard deviation of 15%?
        a.   17%
        b.   9%
        c.   20%
        d.   15%

iv.   Assume that the risk-free rate is 9% and that the market portfolio has an expected return of 17%. What expected return would be consistent with the CAPM for a security with a beta of 1.5?
        a.   13%
        b.   21%
        c.   25.5%
        d.   17%

v.   Which statement of the following statements is true?
        a.   In equilibrium, every security and combination of securities lies on the Capital Market Line.
        b.   In equilibrium, every security and combination of securities lies on the Security Market Line.
        c.   Only efficient portfolios lie on the Security Market Line.