**UNIVERSITY OF BRADFORD**


**ASSET PRICING (MSc)**


**MAN4260M**


<u>**07 May 2013**</u>                                                              <u>**16:00 – 17:00 hours**</u>


*Main*


This is a **CLOSED BOOK** examination


You should answer **ALL** questions from **Part A** and
**ONE** of the three questions from **Part B**.


Should you choose to answer more than one questions in Part B, then the mark of your highest
scoring question will be used.

Always fully explain your answers

The notation throughout this exam is consistent with that in the lecture notes.

Non-programmable calculators are permitted.

**Part A**

**Answer all questions in this section.   All questions are equally weighted.  Put your answers in the answer sheet provided.**

The following information is applied to Q1 and Q2. You have been given this probability distribution for the holding-period return for KMP stock:

| State of the Economy | Probability | HPR |
|---|---|---|
| Boom | .30 | 18% |
| Normal growth | .50 | 12% |
| Recession | .20 | - 5% |

Q1. What is the expected holding-period return for KMP stock?
A. 10.40%
B. 9.32%
C. 11.63%
D. 11.54%
E. 10.88%

(2.5%)

Q2. What is the expected standard deviation for KMP stock?
A. 6.91%
B. 8.13%
C. 7.79%
D. 7.25%
E. 8.85%

(2.5%)

Q3. Which of the following statements regarding risk-averse investors is **true**?
A. They only care about the rate of return.
B. They accept investments that are fair games.
C. They only accept risky investments that offer risk premiums over the risk-free rate.
D. They are willing to accept lower returns and high risk.
E. They only care about the rate of return and accept investments that are fair games.

(2.5%)

Q4. In the mean-standard deviation graph an indifference curve has a _____ slope.
A. negative
B. zero
C. positive
D. northeast
E. cannot be determined

(2.5%)

Q5. You invest $1000 in a risky asset with an expected rate of return of 0.17 and a standard deviation of 0.40 and a T-bill with a rate of return of 0.04.

The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
A. 0.325.
B. 0.675.
C. 0.912.
D. 0.407.
E. Cannot be determined.

(2.5%)

Q6. Which of the following statements is (are) **true** regarding the variance of a portfolio of two risky securities?
A. The higher the coefficient of correlation between securities, the greater the reduction in the portfolio variance.
B. There is a linear relationship between the securities' coefficient of correlation and the portfolio variance.
C. The degree to which the portfolio variance is reduced depends on the degree of correlation between securities.
D. The higher the coefficient of correlation between securities, the greater the reduction in the portfolio variance and there is a linear relationship between the securities' coefficient of correlation and the portfolio variance.
E. The higher the coefficient of correlation between securities, the greater the reduction in the portfolio variance and the degree to which the portfolio variance is reduced depends on the degree of correlation between securities.

(2.5%)

Q7. Which one of the following portfolios **cannot lie** on the efficient frontier as described by Markowitz?

| Portfolio | Expected Return | Standard Deviation |
|-----------|-----------------|--------------------|
| W | 9% | 21% |
| X | 5% | 7% |
| Y | 15% | 36% |
| Z | 12% | 15% |

A. Only portfolio W cannot lie on the efficient frontier.
B. Only portfolio X cannot lie on the efficient frontier.
C. Only portfolio Y cannot lie on the efficient frontier.
D. Only portfolio Z cannot lie on the efficient frontier.
E. Cannot tell from the information given.

(2.5%)

Q8. The risk that can be diversified away in a portfolio is referred to as _____.
I) diversifiable risk
II) unique risk
III) systematic risk
IV) firm-specific risk
A. I, III, and IV
B. II, III, and IV
C. III and IV
D. I, II, and IV
E. I, II, III, and IV

(2.5%)

Q9. As diversification increases, the total variance of a portfolio approaches _____.
A. 0
B. 1
C. the variance of the market portfolio
D. infinity
E. -1

(2.5%)

Q10. The single-index model
A. greatly reduces the number of required calculations, relative to those required by the Markowitz model.
B. enhances the understanding of systematic versus nonsystematic risk.
C. greatly increases the number of required calculations, relative to those required by the Markowitz model.
D. greatly reduces the number of required calculations, relative to those required by the Markowitz model and enhances the understanding of systematic versus nonsystematic risk.
E. enhances the understanding of systematic versus nonsystematic risk and greatly increases the number of required calculations, relative to those required by the Markowitz model.

(2.5%)

Q11. The risk-free rate and the expected market rate of return are 0.06 and 0.12, respectively. According to the capital asset pricing model (CAPM), the expected rate of return on security X with a beta of 1.2 is equal to.
A. 0.06.
B. 0.144.
C. 0.12.
D. 0.132.
E. 0.18.

(2.5%)

Q12. Which statement is **not** true regarding the market portfolio?
A. It includes all publicly traded financial assets.
B. It lies on the efficient frontier.
C. All securities in the market portfolio are held in proportion to their market values.
D. It is the tangency point between the capital market line and the indifference curve.
E. it lies on a line that represents the expected risk-return relationship.

(2.5%)

Q13. According to the Capital Asset Pricing Model (CAPM), underpriced securities
A. have positive betas.
B. have zero alphas.
C. have negative betas.
D. have positive alphas.
E. have negative alphas.

(2.5%)

Q14. The risk premium on the market portfolio will be proportional to
A. the average degree of risk aversion of the investor population.
B. the risk of the market portfolio as measured by its variance.
C. the risk of the market portfolio as measured by its beta.
D. both the average degree of risk aversion of the investor population and the risk of the market portfolio as measured by its variance.
E. both the average degree of risk aversion of the investor population and the risk of the market portfolio as measured by its beta.

(2.5%)

Q15. In equilibrium, the marginal price of risk for a risky security must be
A. equal to the marginal price of risk for the market portfolio.
B. greater than the marginal price of risk for the market portfolio.
C. less than the marginal price of risk for the market portfolio.
D. adjusted by its degree of nonsystematic risk.
E. unrelated to the marginal price of risk for the market portfolio.

(2.5%)

Q16. Which pricing model provides no guidance concerning the determination of the risk premium on factor portfolios?
A. The CAPM
B. The multifactor APT
C. Both the CAPM and the multifactor APT
D. Neither the CAPM nor the multifactor APT
E. No pricing model currently exists that provides guidance concerning the determination of the risk premium on any portfolio.

(2.5%)

Q17. Consider the multifactor APT with two factors. Stock A has an expected return of 16.4%, a beta of 1.4 on factor 1 and a beta of .8 on factor 2. The risk premium on the factor 1 portfolio is 3%. The risk-free rate of return is 6%. What is the risk-premium on factor 2 if no arbitrage opportunities exit?
A. 2%
B. 3%
C. 4%
D. 7.75%
E. 6.89%

(2.5%)

Q18. Proponents of the EMH typically advocate
A. an active trading strategy.
B. investing in an index fund.
C. a passive investment strategy.
D. an active trading strategy and investing in an index fund
E. investing in an index fund and a passive investment strategy

(2.5%)

Q19. If you believe in the _____ form of the EMH, you believe that stock prices only reflect all information that can be derived by examining market trading data such as the history of past stock prices, trading volume or short interest.
A. semistrong
B. strong
C. weak
D. semistrong, strong, and weak
E. None of these are correct.

(2.5%)

Q20. Basu (1977, 1983) found that firms with low P/E ratios
A. earned higher average returns than firms with high P/E ratios.
B. earned the same average returns as firms with high P/E ratios.
C. earned lower average returns than firms with high P/E ratios.
D. had higher dividend yields than firms with high P/E ratios.
E. None of these are correct.

(2.5%)
(Total 50%)

**Part B**

**Answer ONE questions from the three available. All questions are equally weighted. You must answer every part of each question that you attempt.**

**Question 1**

The Universe of available securities includes two risky stock funds, A and B, and T-bills, the data are as follows:

|  | Expected Return | Standard Deviation | Correlation Coefficient between A and B |
|---|---|---|---|
| A | 8.00% | 12.00% | -0.1000 |
| B | 13.00% | 20.00% | |
| T-Bill | 5.00% | 0.00% | |

a. Tabulate and draw the opportunity set of funds A and B using investment proportions for Stock fund A of zero to 100% in increments of 20%.

(20%)

b. Find the (tangency) optimal risk portfolio, P, and its expected return and standard deviation

(15%)

c. Find the slope of CAL supported by T-bills and portfolio P.

(5%)

d. Discuss some reasons why an investor with a long time horizon might choose to invest in common stocks, even though they have historically been riskier than government bonds or T-bills.

(10%)
(Total 50%)

**Question 2**

A portfolio manager summarizes the input from the macro and micro forecasters in the following table:

**Micro Forecasts**

| Asset | Forecasted Return | Beta | Residual Standard Deviation |
|---|---|---|---|
| Stock A | 0.24 | 1.4 | 0.58 |
| Stock B | 0.19 | 1.7 | 0.71 |
| Stock C | 0.16 | 0.6 | 0.6 |
| Stock D | 0.13 | 1.1 | 0.55 |

**Macro Forecasts**

| Asset | Expected | Standard Deviation |
|---|---|---|
| T-bills | 0.08 | 0 |
| Passive equity | 0.16 | 0.22 |

a. Calculate alpha values, and residual variance for these stocks.

(10%)

b. Construct the optimal risky portfolio (produce the weights of investment in the active portfolio and the passive equity portfolio) given that short selling is allowed.

(25%)

c. What is Sharpe's measure for the optimal portfolio and how much of it is contributed by the active portfolio

(5%)

d. Critically evaluate the benefit using the above approach (index model) for portfolio selection.

(10%)
(Total 50%)

## Question 3

a) Discuss two of the assumptions of the capital asset pricing model, and how these assumptions relate to the "real world" investment decision process.

(18%)

b) Critically evaluate the advantages of the multifactor APT over the single factor APT and the CAPM. What is one shortcoming of the multifactor APT and how does this shortcoming compare to CAPM implications?

(18%)

C)
The following information is provided:

| Asset | Expected Return | Standard Deviation |
|---|---|---|
| **Period one** | | |
| T-bills | 0.08 | 0 |
| Optimal Risk | 0.12 | 0.21 |
| | | |
| **Period two** | | |
| T-bills | 0.03 | 0 |
| Optimal Risk | 0.11 | 0.17 |

If your risk-aversion coefficient is A=4, what fraction of your portfolio should be allocated to T-bills and the optimal risky portfolio respectively for period one and period two respectively? Explain what drives the difference between the periods one and two allocations.

(14%)
(Total 50%)