

UNIVERSITY OF BRADFORD

ASSET PRICING (MSc)

MAN4260M

15<sup>th</sup> May 2014

16:00 – 17:00 hours

*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	0.3	20%
Normal growth	0.5	11%
Recession	0.2	-8%

Q1. What is the expected holding-period return for KMP stock?

- A. 9.90%
- 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. 9.76%
- 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 risk premiums.

(2.5%)

Q4. In a return-standard deviation space, which of the following statements is (are) true for risk-averse investors? (The vertical and horizontal lines are referred to as the expected return-axis and the standard deviation-axis, respectively.)

- I) An investor's own indifference curves might intersect.
  - II) Indifference curves have negative slopes.
  - III) In a set of indifference curves, the highest offers the greatest utility.
  - IV) Indifference curves of two investors might intersect.
- A. I and II only
  - B. II and III only
  - C. I and IV only
  - D. III and IV only
  - E. II and IV only

(2.5%)

Q5. Assume an investor with the following utility function:  $U = E(r) - 3/2(s^2)$ .

To maximize her expected utility, she would choose the asset with an expected rate of return of \_\_\_\_\_ and a standard deviation of \_\_\_\_\_, respectively.

- A. 12%; 20%
- B. 10%; 15%
- C. 10%; 10%
- D. 8%; 10%
- E. 10%; 12%

(2.5%)

Q6. According to the mean-variance criterion, which one of the following investments dominates all others?

- A.  $E(r) = 0.15$ ; Variance = 0.20
- B.  $E(r) = 0.10$ ; Variance = 0.20
- C.  $E(r) = 0.10$ ; Variance = 0.25
- D.  $E(r) = 0.15$ ; Variance = 0.25
- E.  $E(r) = 0.12$ ; Variance = 0.35

(2.5%)

Q7. Market risk is also referred to as

- A. systematic risk, diversifiable risk.
- B. systematic risk, nondiversifiable risk.
- C. unique risk, nondiversifiable risk.
- D. unique risk, diversifiable risk.
- E. firm-specific risk.

(2.5%)

Q8. The Capital Allocation Line provided by a risk-free security and N risky securities is

- A. the line that connects the risk-free rate and the global minimum-variance portfolio of the risky securities.
- B. the line that connects the risk-free rate and the portfolio of the risky securities that has the highest expected return on the efficient frontier.
- C. the line tangent to the efficient frontier of risky securities drawn from the risk-free rate.
- D. the horizontal line drawn from the risk-free rate.
- E. the line that connects the risk-free rate and the global maximum-variance portfolio of the risky securities.

(2.5%)

Q9. Which one of the following portfolios cannot lie on the efficient frontier as described by Markowitz?

Portfolio	Expected Return	Standard Deviation
A	10%	12%
B	5%	7%
C	15%	20%
D	12%	25%

- A. Only portfolio A cannot lie on the efficient frontier.
- B. Only portfolio B cannot lie on the efficient frontier.
- C. Only portfolio C cannot lie on the efficient frontier.
- D. Only portfolio D cannot lie on the efficient frontier.
- E. Cannot tell from the information given.

(2.5%)

Q10. As diversification increases, the firm-specific risk of a portfolio approaches \_\_\_\_\_.

- A. 0
- B. 1
- C. infinity
- D.  $n-1 * n$
- E. -1

(2.5%)

Q11. The Security Characteristic Line (SCL)

- A. plots the excess return on a security as a function of the excess return on the market.
- B. allows one to estimate the beta of the security.
- C. allows one to estimate the alpha of the security.
- D. plots the excess return on a security as a function of the excess return on the market, allows one to estimate the beta of the security, and allows one to estimate the alpha of the security
- E. allows one to estimate the gamma of the security.

(2.5%)

Q12. According to the Capital Asset Pricing Model (CAPM) a well diversified portfolio's rate of return is a function of

- A. systematic risk.
- B. unsystematic risk.
- C. unique risk.
- D. reinvestment risk.
- E. interest rate risk.

(2.5%)

Q13. Which statement is **not** true regarding the Capital Market Line (CML)?

- A. The CML is the line from the risk-free rate through the market portfolio.
- B. The CML is the best attainable capital allocation line.
- C. The CML is also called the security market line.
- D. The CML always has a positive slope.
- E. The risk measure for the CML is standard deviation.

(2.5%)

Q14. An underpriced security will plot

- A. on the Security Market Line.
- B. below the Security Market Line.
- C. above the Security Market Line.
- D. either above or below the Security Market Line depending on its covariance with the market.
- E. either above or below the Security Market Line depending on its standard deviation.

(2.5%)

Q15. Assume that a security is fairly priced and has an expected rate of return of 0.17. The market expected rate of return is 0.11 and the risk-free rate is 0.04. The beta of the stock is \_\_\_\_.

- A. 1.25.
- B. 1.86.
- C. 1.
- D. 0.95.
- E. 2.04.

(2.5%)

Q16. An investor will take as large a position as possible when an equilibrium price relationship is violated. This is an example of \_\_\_\_\_.

- A. a dominance argument
- B. the mean-variance efficiency frontier
- C. a risk-free arbitrage
- D. the capital asset pricing model
- E. the SML

(2.5%)

Q17. Consider the multifactor APT with two factors. Stock A has an expected return of 17.6%, a beta of 1.45 on factor 1 and a beta of .86 on factor 2. The risk premium on the factor 1 portfolio is 3.2%. The risk-free rate of return is 5%. What is the risk-premium on factor 2 if no arbitrage opportunities exist?

- A. 9.26%
- B. 3%
- C. 4%
- D. 7.75%
- E. 9.75%

(2.5%)

Q18. Consider a one-factor economy. Portfolio A has a beta of 1.0 on the factor and portfolio B has a beta of 2.0 on the factor. The expected returns on portfolios A and B are 11% and 17%, respectively. Assume that the risk-free rate is 6% and that arbitrage opportunities exist. Suppose you invested \$100,000 in the risk-free asset, \$100,000 in portfolio B, and sold short \$200,000 of portfolio A. Your expected profit from this strategy would be \_\_\_\_\_.

- A. -\$1,000
- B. \$0
- C. \$1,000
- D. \$2,000
- E. \$1,600

(2.5%)

Q19 If you believe in the \_\_\_\_\_ form of the EMH, you believe that stock prices reflect all relevant information including historical stock prices and current public information about the firm, but not information that is available only to insiders.

- A. semistrong
- B. strong
- C. weak
- D. semistrong, strong, and weak
- E. hard

(2.5%)

Q20. Studies of negative earnings surprises have shown that there is

- A. a negative abnormal return on the day negative earnings surprises are announced.
- B. a positive drift in the stock price on the days following the earnings surprise announcement.
- C. a negative drift in the stock price on the days following the earnings surprise announcement.
- D. both a negative abnormal return on the day negative earnings surprises are announced and a positive drift in the stock price on the days following the earnings surprise announcement.
- E. both a negative abnormal return on the day negative earnings surprises are announced and a negative drift in the stock price on the days following the earnings surprise announcement.

(2.5%)

(Total 50%)

**Part B**

**Answer ONE question 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. If an investor's desired return is 12%, show the weights of her portfolio with and without risk-free asset. Calculate the standard deviations of these two portfolio. Briefly discuss the effect of risk-free asset in portfolio management. (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	0.25	1.5	0.56
Stock B	0.20	1.6	0.70
Stock C	0.15	0.5	0.61
Stock D	0.11	1.2	0.54

**Macro Forecasts**

Asset	Expected Return	Standard Deviation
T-bills	0.07	0
Passive equity portfolio	0.11	0.18

- 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. Discuss the advantages of the single-index model over the Markowitz model in terms of numbers of variable estimates required and in terms of understanding risk relationships. (15%)
- (Total 50%)

**Question 3**

a) Discuss the advantages of arbitrage pricing theory (APT) over the capital asset pricing model (CAPM) relative to diversified portfolios.

(18%)

b) Name three variables that Chen, Roll, and Ross used to measure the impact of macroeconomic factors on security returns. Briefly explain the reasoning behind their model.

(18%)

c) Security A has a beta of 1.0 and an expected return of 12%. Security B has a beta of 0.75 and an expected return of 11%. The risk-free rate is 6%. Explain the arbitrage opportunity that exists; explain how an investor can take advantage of it. Give specific details about how to form the portfolio, what to buy and what to sell.

(14%)

(Total 50%)