



SII MASTERS DECEMBER 2008 EXAMINATION

PORTFOLIO CONSTRUCTION THEORY

DATE OF EXAM	Friday 5 December 2008
3 HOURS	10.00 am – 1.00 pm
RUBRIC	SECTION A – answer ALL parts of the question in this section SECTION B – answer ALL parts of the question in this section SECTION C – answer TWO questions in this section SECTION D – answer ALL parts of the question in this section SECTION E – answer TWO questions in this section

Candidates are reminded that no marks will be awarded for illegible work

NOTES TO CANDIDATES

1. Please insert your Candidate Number on each of the Answer Book covers. *Do not insert your name.* Please use **Answer Book 1** for Sections A, B and C. Please use **Answer Book 2** for Sections D and E.
 2. Show *all* workings in your Answer Book.
 3. Candidates may attempt the sections in any order. Please indicate clearly in your Answer Book which questions you are answering.
 4. Please insert in the box provided on the cover of your Answer Book the numbers of the questions you have attempted in the order in which they appear in the Answer Book.
 5. You may use the calculator provided or one approved by the Securities & Investment Institute.
 6. You must hand your Answer Book to an invigilator before you leave the Examination Hall. *Failure to do so will result in disqualification.*
 7. The decision of the Securities and Investment Institute is final and no correspondence will be entered into concerning the grade awarded.
 8. Once submitted, the examination scripts become the property of the Securities & Investment Institute and will not be returned to candidates.
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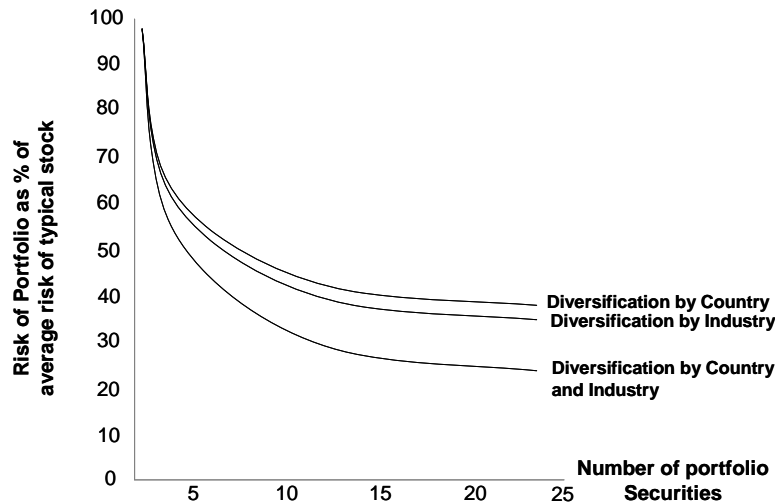
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PLEASE TURN OVER WHEN INSTRUCTED

Answer ALL parts of the question in this section.

1 The chart below illustrates the relationship between portfolio risk and diversification:



Source: Cavaglia, S; Brightman, C; and Aked, M (2000). Financial Analysts Journal, September-October p41-54

- What principal outcomes about risk and diversification can be observed from the chart? *(3 marks)*
- List three reasons for a positive relationship between the value of portfolio costs and the number of portfolio securities. *(3 marks)*
- If the correlation coefficient for two securities, A and B, is 0.27, which of the following 4 portfolio risk formulas is most correct and why?

$$\text{i. } \sigma_{a+b} = \sqrt{p_a^2 \sigma_a^2 + p_b^2 \sigma_b^2 + 2p_a p_b \text{Cov}_{ab}}$$

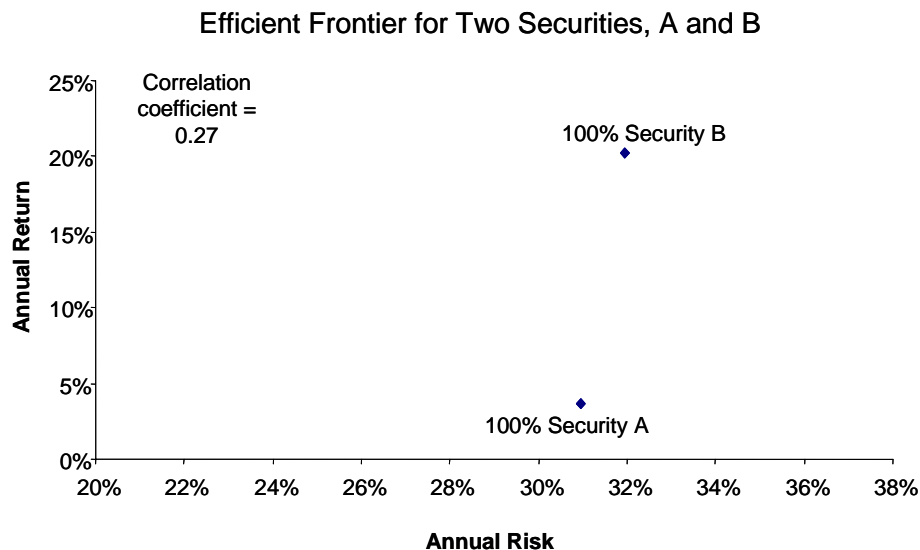
$$\text{ii. } \sigma_{a+b} = \sqrt{p_a^2 \sigma_a^2 + p_b^2 \sigma_b^2 \text{Cov}_{ab}}$$

$$\text{iii. } \sigma_{a+b} = p_a \sigma_a + p_b \sigma_b$$

$$\text{iv. } \sigma_{a+b} = \sqrt{p_a^2 \sigma_a^2 + p_b^2 \sigma_b^2}$$

Where P = weight of security and σ = standard deviation *(3 marks)*

- d) The chart below illustrates the annual risk and return for two securities, A and B, and their correlation coefficient.



- Draw a rough copy of the chart in your exam answer book. Draw the locus of points that you would expect the efficient frontier to comprise for combinations of the two securities. Justify the shape of the efficient frontier you have drawn. *(4 marks)*
- e) In the example above, d), suppose there exists a third security, C, which is a risk-free asset with an annualised return of 2.5%. Suppose also that Securities A, B and C are the only assets in the market and that investors can borrow without limit at the risk-free rate. On the same chart used to answer d) above:
- i. draw the capital market line
 - ii. in words justify the shape of the capital market line you have drawn
 - iii. annotate on the chart and explain where you would expect to find investors located and not located? *(4 marks).*
- f) If the risk of security A is 31 percent, the risk of security B 32 percent, and the correlation between securities A and B is 0.27, what is their covariance? Assume that risk is measured as standard deviation. *(3 marks)*
- g) What are the principal reasons why an investor might select a portfolio from the opportunity set that does not reside on the efficient frontier? *(4 marks)*

Parts h) to j) refer to the paragraph below:

Peter Shrew owns a small engineering company. He is setting up a trust based defined contribution occupational pension scheme for his employees. He has selected you as fund manager for the pension scheme's assets. Prior to his first meeting with you, Peter performs an Internet search on the legislative background surrounding corporate governance and responsible investment. Peter takes the results of three Internet searches to his meeting with you in order to receive comment on them.

h) The result of the first search is:

Statutory Instrument 1999 No. 1849

Trustees of occupational pension schemes are to disclose in the Statement of Investment Principles:

'The extent (if at all) to which social, environmental and ethical considerations are taken into account in the selection, retention and realisation of investments'

Advise Peter whether this is legislative or voluntary, and what investment action the pension scheme needs to take. (4 marks)

i) The result of the second search is:

The Combined Code of Corporate Governance (2008)

Section E.1 of the 2008 Combined Code on Corporate Governance states that:

'Institutional shareholders should enter into a dialogue with companies based on the mutual understanding of objectives [and] apply the principles set out in the Institutional Shareholders' Committee's "The Responsibilities of Institutional Shareholders and Agents – Statement of Principles", which should be reflected in fund manager contracts.'

Advise Peter whether this is legislative or voluntary, and what the ISC Principles require fund managers to do. (4 marks)

j) The result of the third search is:

The 2007 Institutional Shareholders' Committee's "The Responsibilities of Institutional Shareholders and Agents – Statement of Principles"

On voting, The Principles state that:

'Institutional shareholders and/or agents should vote all shares held directly or on behalf of clients wherever practicable to do so.'

Advise Peter whether this is legislative or voluntary, and in what instances shares might not be practicable to vote? (4 marks)

k) Describe the principal agent relationship that motivates the initiatives associated with the role of institutional shareholders in the corporate governance process.

(4 marks)

(Total 40 marks)

SECTION B**TOTAL 20 MARKS****Answer ALL parts of this question**

- 2 Describe the efficient market hypothesis and the classic forms it takes. For each of the classic forms of market efficiency, which investment styles listed in a) and b) below are most appropriate and why?
- a) Active investment styles:
- i) Growth
 - ii) Value based on informational inefficiency
 - iii) Value based on corporate inefficiency
 - iv) Small capitalisation securities
 - v) Large capitalisation securities
- b) Passive index investment style

*(20 marks)***SECTION C****TOTAL 10 MARKS****Answer ANY TWO questions in this section. Each question carries 5 marks**

- 3 A UK investor is considering the investment suitability of a Yen-denominated Japanese bond. The current exchange rate is 150 Yen to 1 Pound Sterling. Inflation in Japan is 0 percent and interest rates are 2 percent. Inflation in the U.K. is 3 percent and interest rates are 5 percent. The investor expects that over the next 12 months interest rates and inflation will not change from the rates above and that whilst the nominal exchange rate will change, the real exchange rate will remain constant. Assume no coupon payment.
- a) Will the Yen appreciate or depreciate and by what percent over the next 12 months?
- b) What is the local currency Yen return on the Japanese bond?
- c) What is the U.K. Pound Sterling return to the investor from purchasing and holding the Japanese bond?

(5 Marks)

4 Sheila Timsbury-Higgins plans to retire in 10 years' time. Her retirement income will be the annuity she purchases with the proceeds of her personal pension after she has taken the 25% cash allowance. Her personal pension is currently 100 percent invested in equities. She asks for your advice about an appropriate path for the asset allocation (sometimes referred to a 'flight path' or 'glide path') of her pension given her annuity and cash allowance aspirations.

a) Copy the table below in your exam answer book. Propose and input a percent allocation to the various assets as retirement approaches. For example, you could choose a stable equal weighted allocation and input 33.33% in each cell. Each row should sum to 100 percent.

Asset Allocation for Sheila Timsbury-Higgins			
Years to Retirement	Equities	Bonds	Cash
10			
8			
6			
4			
2			
0			

b) Explain the principal motivations for the asset allocation path you have selected for Sheila. (5 marks)

5 a) What is the beta of a stock if the covariance of the stock with the market portfolio is 0.25, and the standard deviation of the market returns is 0.3? Show all workings.

b) What is the total risk (standard deviation) of a portfolio if its systematic risk (standard deviation) is 19 percent and unsystematic risk (standard deviation) 6 percent? Show all workings.

c) The recent financial crisis emphasises that many single stock and market return distributions tend to exhibit leptokurtosis and negative skewness. How does this empirical finding caution against the reliance of standard deviation as a measure of the dispersion of stock returns? (5 marks)

Answer ALL parts of the question in this section.

- 6 Gerry is a self-employed musician and received income from working in an orchestra in the year of £40,000. In addition he received overseas income from two sources. He received £5,000 from a concert he played in Germany; this was after tax deductions of £5,000. He received £2,000 from a Mozart concert he played in Austria; this was after tax deductions of £200. Gerry is single and has two sisters, Kate and Amanda. Gerry wants you to calculate his UK tax liability for the year.

Gerry has also come to you for some inheritance tax advice and is keen to purchase a 100 acre farm in Shropshire. He would also like to make maximum use of his inheritance tax exemptions and reliefs and to receive some basic inheritance tax planning advice. He has heard of the terms “potentially exempt transfers” and “exempt lifetime transfers” and enquires about their meaning. Gerry’s sisters are his only relatives.

- a) Calculate Gerry’s UK income tax liability for the year. *(4 marks)*

- b) Explain self-assessment and payments on account to Gerry. *(4 marks)*

- c) Explain the terms “potentially exempt transfer” and “exempt lifetime transfers”, giving examples. *(4 marks)*

- d) List the main inheritance tax exemptions and reliefs that may be of interest to Gerry. *(4 marks)*

- e) Give Gerry some basic inheritance tax planning ideas, given that his sisters are his only relatives. *(4 marks)*

(Total 20 marks)

Answer ANY TWO questions in this section. Each question carries 5 marks.

- 7 James is single and has a salary of £20,000. He also receives gross interest income of £7,000 and dividends with a gross value of £33,000.

Calculate his total tax liability. *(5 Marks)*

- 8 Catherine bought 2,500 shares in the Harvis company for £25,000 in November 1990. In April 1992, there was a 1 for 5 rights issue at a subscription price of £8 per share. Catherine subscribed for the 500 shares to which she was entitled. Subsequently, Catherine sold 2,000 shares for £30,000 in May 1997.

The RPI details were as follows:

November 1990	130.0
April 1992	138.8
May 1997	156.9

Calculate the gain on the disposal of the shares (assuming they are non-business assets). *(5 Marks)*

- 9 Explain the concepts of “residence”, “ordinary residence” and “domicile” and their relevance for UK tax purposes to individuals. *(5 Marks)*