EXAMINATIONS

INVESTMENT MANAGEMENT — 1996 EXAMINATIONS
SPECIALIST LEVEL — ONE PAPER

Answer all 7 Questions

QUESTION 1 — 10 MARKS

What are the advantages and disadvantages of using the standard deviation of returns (volatility) as a measure of investment risk for a portfolio ? Suggest some alternatives.

(10 marks)

QUESTION 2 — 15 MARKS

You are an asset consultant for a superannuation fund with assets of $20 million dollars. At present the fund investments are split between three balanced pooled fund managers.

One of the Trustee Directors has been taken out to lunch by a fund manager. The fund manager has shown her an investment performance survey for balanced fund managers, which shows that this fund manager has the highest ranking of all fund managers included in the survey, over the last three years. The Trustee Director has suggested that the fund should be entirely invested with this fund manager, who is clearly superior to the current fund managers according to the survey.

(i) Draft your report to the Board of Trustee Directors in relation to this proposal. Include comments on the criteria which should be considered when choosing fund managers.

(11 marks)

(ii) You note that in the investment performance survey, one fund manager has achieved a one-year return which is 5% above the average returns over the last year for all the other balanced fund managers included in the survey. What is your reaction ? Why ?

(4 marks)

QUESTION 3 — 15 MARKS

You are advising the Trustee Directors of a large superannuation fund. The Board of Trustees is reviewing the management of the fund’s fixed interest portfolio.

(a) The Board has asked your advice on setting a benchmark to assess the performance of the investment manager. What matters would you discuss with the Trustee Directors and the investment manager before providing this advice ?

(5 marks)

(b) The Board has selected an active investment manager for the fixed interest portfolio, and the manager has been given a mandate to out-perform a Commonwealth Bank Bond Index by at least 1% per annum each year. How would an active manager seek to achieve this objective?

(5 marks)

(c) A specialist overseas fixed interest manager has been selected to manage the fund's overseas fixed interest assets. An appropriate benchmark has been set. Describe the guidelines and restrictions that you may wish to consider when devising manager guidelines for an overseas fixed interest manager.

(5 marks)

QUESTION 4 14 MARKS

(a) The board of directors of an industrial company is concerned about the investment manager's trading in derivatives. They have asked you to provide advice on the measures which should be taken to manage the risks associated with derivatives. Draft your response.

(8 marks)

(b) As a result of your report, the board has decided to allow the use of derivatives. They want to receive regular reports of the exposure to different asset classes, allowing for the physical position underlying the derivative position.

The underlying asset exposure can be calculated using "delta-weighting". Explain what we mean by "delta-weighting". As an example work out the exposure to each class based on the following data, after allowing for purchase of the options.

(6 marks)

At the end of the first reporting period, the fund has the following assets:

Asset Class	**Market Value**
Australian Equities	$4,000,000
Overseas Equities	$1,500,000
Property	$1,500,000
Australian Fixed Interest	$2,000,000
Cash	$1,000,000
Total	$10,000,000

It is intended to apply some of the cash to buy options. The options are put options for 100,000 shares of an Australian company, XYZ Ltd. The current price of XYZ shares is $1.20. The strike price of the put option is $1.10. The risk free rate of interest is 6% p.a. effective. The term of the options is three months from the valuation date. No dividends are due during the next three months. The value of a call option on one share, with the same strike price and exercise date, is 12.5121 cents and the delta for this call option is .85674.

QUESTION 5 10 MARKS

(a) Bond A and Bond B have the same duration but Bond A has a higher convexity than Bond B. Which bond would you prefer to own when you expect an increase or a decrease in the interest rate ? Justify your answer mathematically.

(4 marks)

(b) For a particular superannuation fund, the assets used to provide pensions in the course of payment are held in a segregated portfolio. You have been given the task of managing a bond portfolio for this purpose, and a duration target of 2.5 years has been provided as a benchmark measure of the duration of the liabilities. It has been suggested that you adopt an immunised position in relation to this benchmark as one possible strategy.

Two alternative approaches have been suggested for this immunisation strategy - either

(1) a zero coupon bond investment of 2.5 years maturity, issued by a semi-government authority, or

(2) a combination of Treasury Bills and Treasury Bonds of an appropriate maturity such that the weighted average duration of the portfolio is 2.5 years.

State your opinion of these two strategies, referring to any risks that you may perceive in one strategy versus the other. State any necessary qualifications.

(6 marks)

QUESTION 6 12 MARKS

You are working for a newly established fund management company. The size of assets under management is relatively small, about $10 million, but rapidly growing, due to the excellent marketing skills of the marketing manager. The Board has appointed a new investment manager, Bob Smith, to be responsible for fund management.

(a) Mr Smith is a strong advocate of mean-variance techniques (i.e. Modern Portfolio Theory) for choosing asset allocations. The expected means, variances and covariances are recalculated on a monthly basis, based on historical data over the last five years. The model provides asset allocations for up to five asset classes in any combination. The asset allocations are revised quarterly in line with the output from the model.

However, the actual returns earned on the portfolio are consistently lower than expected according to the model. Explain how this might occur, and then suggest some methods which may be used to improve the performance of the model. State which of these methods you would recommend.

(8 marks)

(b) Disillusioned, the fund manager decides that he will no longer rely on mathematical models for investment. Instead, decisions will be made at a monthly meeting, where a group of investment advisers will make decisions based on recent economic reports and forecasts, and feedback from dealers and traders who are in touch with the market sentiment. What are some potential problems which may arise from this process ?

(4 marks)

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QUESTION 7 — 24 MARKS

(a) Provide a time series formula for the following. Define any symbols used in the time series formulae.

(3 marks)

(i) Random walk with drift

(ii) Mean reversion with a trend

(iii) Exponentially weighted moving averages (exponential smoothing)

(b) The senior actuary in your company (a life office) is interested in the application of time series modelling to the company's planning process. He has asked you to prepare a briefing paper. Set out your paper, describing the steps you would follow in developing an ARIMA time series model suitable for asset liability modelling; pointing out problems which may be encountered in practice.

(12 marks)

(c) Briefly describe the Wilkie Model and compare and contrast this with other models.

(9 marks)

END OF PAPER