

# EXAMINATION

3 April 2006 (am)

## Subject SA6 — Investment Specialist Applications

*Time allowed: Three hours*

### **INSTRUCTIONS TO THE CANDIDATE**

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt both questions, beginning your answer to each question on a separate sheet.*
6. *Candidates should show calculations where this is appropriate.*

### **AT THE END OF THE EXAMINATION**

*Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.*

*In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.*

- 1 You are the Chief Investment Officer of a non-life captive insurance company operating multiple lines of insurance, with approximately similar amounts of short, medium and long tailed sterling-based liabilities (99% of claims settled within 3, 7 and 20 years respectively). The assets of the company are £500m and the liabilities are £520m on a best estimate basis and £650m on a 95<sup>th</sup> percentile basis (discounted at a risk free rate).

The Board of Management responsible for investing the funds backing the liabilities has a policy that bonds are used to match closely long term liabilities and other assets are held to maximise return for a given tracking error relative to short and medium term liabilities. Risk budgeting and efficient frontier methods have been used to construct the portfolio. As a consequence of this policy, the assets are currently allocated as follows:

UK equity	15%
Global ex-UK equity	15%
European private equity	5%
Property	5%
Commodities	5%
UK investment grade corporate bonds	30%
Index-linked gilts	20%
Cash	5%

Global equity currency exposures are approximately 75% hedged but no hedging is undertaken in respect of any other asset classes. The Board of Management have asked you to undertake a review of their current investment policy and whether it remains appropriate.

- (i) (a) Describe how to construct a portfolio of assets that will cashflow match the liabilities. [5]
- (b) Give reasons why the insurer may not have followed this approach. [4]
- (ii) Explain the risk budgeting process and how it might be used to compare different asset strategies for the insurer's assets. [10]
- (iii) Discuss why the insurer might have chosen to hedge only 75% of currency exposures arising from global equities and what benefits and problems may arise in hedging currency exposures for other asset classes. [10]

The Finance Director has queried why you have selected asset classes that neither maximise expected return nor minimise volatility under your asset model.

- (iv) Outline the points you would make in your reply. [5]

Two years later the parent company advises the Board of Management that there is little benefit in continuing the operations of the captive insurance company. Rather than attempting to wind up the captive insurance company and buy out the remaining liabilities, it is agreed to run off the business since it is felt that reinsurers are taking a somewhat cautious view of future investment returns and future claims experience. Claim and expense payments have totalled £150m over the intervening two year period. You may assume that risk free interest rates have been stable at 5% per

annum and that no new information has been gathered that could be used to improve the liability estimates from two years ago.

- (v) (a) Calculate an estimate of the liability value at the current time, stating all assumptions you have used.
  - (b) Recommend with reasons an appropriate asset allocation using only the asset classes mentioned earlier in the question. [12]
  - (vi) (a) Describe with reasons how the asset allocation should evolve over the next ten years. [4]
  - (b) Based on your suggestion, recommend a target asset allocation to apply at the end of the ten year period. [2]
- [Total 52]

**2** A UK charity uses the income from its investment fund to meet its expenditure on administration and projects as it receives no new funding. The costs of managing the fund are 0.2% of assets plus £100,000 per annum. The current expenditure of the charity after allowing for these expenses is £3.5 million. Historically expenditure has risen 50% in line with inflation and 50% in line with earnings reflecting the mix between materials and labour.

The investment fund is distributed currently as follows:

	<i>£m</i>	<i>Historic Yield</i>
UK Equities	90	3.6%
Overseas Equities	5	1.0%
UK Gilts	10	4.5%
Cash	2	4.0%
Total	107	

- (i) (a) Analyse and comment on the financial situation that the charity finds itself in. [6]
- (b) Outline any additional information that you would need to confirm your analysis. [2]
- (ii) Explain the options the charity has available to its investment fund to improve its financial situation, assuming no other asset classes are available to it. [7]

A trustee of the charity has suggested that a part of the fund should be invested in property.

- (iii) (a) Outline the reasons why this proposal is worth considering. [3]
- (b) Suggest a level of investment that might be appropriate. [1]
- (c) Indicate the impact this might have on the charity's finances. [2]

After some discussion, it has been agreed that as a first step, £10 million will be invested in property and the following portfolio has been proposed.

<i>Property</i>	<i>Amount £m</i>	<i>No of Tenants</i>	<i>Rental Income £ '000</i>	<i>Occupancy</i>	<i>Next Rent Review</i>
Office block (3 floors)	2.5	5	140	80%	06/2007
Shopping Mall (2 floors)	4.0	22	170	95%	Various 2006–2010
Warehouse	1.25	1	100	100%	12/2008
Child Care Nurseries (4 properties)	2.25	1	150	100%	06/2010

- (iv) Comment on the proposed portfolio highlighting the additional information that you would require to complete a report to the trustees. [9]

A property manager has suggested that 60% of the purchase should be funded using a bank loan.

- (v) Outline the points you would make to the trustees on the effect of this mortgage proposal. Give a recommendation with reference to the proposal. [8]

One of the trustees has seen reports that pension funds have been using hedge funds and structured products to reduce their risk and enhance returns.

- (vi) Explain the nature of such investments and illustrate how they might be used in the context of the charity's objectives. [10]

[Total 48]

**END OF PAPER**