

EXAMINATION

29 May 2015 (am)

Subject F105 — Finance and Investment Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

- 1. Use the instructions and password provided at the examination center to log in.*
- 2. Submit your answers in Word format only using the template provided.*
- 3. Save your work regularly throughout the examination on the supplied computers' hard drive.*
- 4. 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.*
- 5. You must not start typing your answers until instructed to do so by the supervisor.*
- 6. Mark allocations are shown in brackets on exam papers.*
- 7. Attempt all nine (9) questions, beginning your answer to each question on a new page.*
- 8. Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in this question paper.

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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QUESTION 1

Define the five main categories of financial risk faced by an institutional investor.

[5]

QUESTION 2

A domestic barometer property index is the only available domestic property index in a country. The country also has a comprehensive set of domestic equity indices calculated according to the FTSE methodology. An asset manager who invests directly in property is considering using either the listed property index or the barometer property index as a benchmark.

Contrast the advantages and disadvantages of each type of index as a benchmark for the direct property asset manager.

[6]

QUESTION 3

A financial institution has liabilities of R100 million payable in one year and R200 million payable in four years that are to be met with assets consisting of two zero-coupon bonds with maturity values of R125 million in two years and R225 million in seven years. Liquidity risk is of key concern to the institution's board, and one of the board members has asked you to calculate the institution's liquidity risk elasticity (LRE), a measure familiar to him from his background in banking.

The zero-coupon yield curve used by the institution to value its assets and liabilities includes the following yields, continuously compounded:

Duration	Annual yield
1	2.0%
2	2.5%
4	3.0%
7	3.5%

- i. Calculate the institution's liquidity duration, or liquidity risk elasticity (LRE), given a 0.25% per annum increase in the cost of funds.
- ii. Outline the key feature(s) of the institution's asset-liability structure that you would discuss in an analysis of its liquidity risk, and suggest possible actions which the institution could take to reduce its liquidity risk.

[5]

[3]

[Total 8]

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QUESTION 4

- i. Outline the key reasons that make fixed income derivatives more difficult to value than equity derivatives. [2]
- ii. Determine the price of a 5 month European call option using Black's model on a long dated bond with a face value of R1000. Assume that:
- The current bond price is R980;
 - The strike price is R1050; and
 - The volatility of the forward bond price in 5 months is 12% p.a.

The bond pays a coupon of 5% p.a., paid half-yearly, and the next coupon payment is expected in 3 months. Assume that the 3-month and 5-month risk-free zero-coupon bond interest rates are 3% p.a. and 3.5% p.a. compounded continuously respectively.

[8]

[Total 10]

QUESTION 5

An investment consultant proposes that a financial derivative strategy be implemented which entails buying call options on a suitable equity index and on treasury bonds. Financing is available to fund the immediate cash outlay that would be required to pay for the calls, the cost of which could be substantial. This financing, however, would incur a significant interest cost.

- i. Explain 'in-the-money' and motivate why its impact could be substantial. [2]
- ii. Discuss the considerations of implementing the proposed financial derivative. [6]
- iii. Evaluate the proposal. [3]
- [Total 11]

QUESTION 6

You are the Statutory Actuary of a life assurer whose only business is a closed book of inflation-linked life annuities. Your investment options consist of domestic equities, domestic cash and domestic inflation-linked bonds, and you intend to build an asset-liability model (ALM) to assist in determining both your investment strategy and the amount of economic capital the company will be required to hold to withstand adverse experience. One of the actuaries in your team has proposed the 5% Value at Risk (VaR) at a one-year horizon as an appropriate criterion for the choice of both investment strategy and level of economic capital requirement.

- i. Outline the main stages in the ALM process, highlighting considerations which are important for this particular exercise. [7]
 - ii. Explain briefly how the ALM results could be used to inform your economic capital requirement. [2]
 - iii. Evaluate the proposed VaR criterion for each of its intended purposes, suggesting alternatives where appropriate. [3]
- [Total 12]

QUESTION 7

The investment management community in a country is self-regulated and has developed performance presentation standards (PPS), which include details about performance calculations.

- i. Define self-regulation and discuss its advantages and disadvantages for the investment management community. [5]
 - ii. Outline the potential goals that the PPS aim to meet. [3]
 - iii. The PPS require that performance results are calculated on a time-weighted basis. Compare the time-weighted basis with two other rate of return bases. [3]
 - iv. Outline the major complication that convertible securities may introduce in the performance calculations and suggest a way to address these. [3]
- [Total 14]

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QUESTION 8

An equity portfolio manager uses fundamental analysis to make stock and sector selection decisions. The manager is considering extending their fundamental valuation techniques to cover venture capital from private equity.

- i. Define 'venture capital' investment and briefly outline three other main forms of private equity. [4]
- ii. Outline the general factors that a fundamental analyst would consider, in addition to the basic financials, when predicting the future performance of a venture company. [7]

The equity portfolio manager is frustrated that his discounted cashflow valuation models are overly complex, and a colleague suggested using relative valuation methods instead.

- iii. Discuss the advantages and disadvantages of the colleague's proposal. [4]

[Total 15]

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QUESTION 9

A platinum mining company, Platco, and a domestic bank, Finit, are entering into a merger.

- i. State the key investment characteristics of the industries under which these companies would be classified. [3]
- ii. Classify, with reasons, the type of merger between Platco and Finit. [2]

The platinum sector has been struggling for the past five years as a result of depressed platinum prices and labour unrest over wages. The country has a classical taxation system. Platco carries a deferred tax asset on its balance sheet.

- iii. Discuss the likely effects on Platco's income statement over the past five years that created the deferred tax asset. [6]

Finit has created a new structured product that it believes will dominate the market and drive extraordinary profits over the next few years.

- iv. Explain how the combination of Platco's deferred tax asset and Finit's expected profits may provide a rationale for the merger. [4]
 - v. Briefly explain why the country's central bank will want to be informed by Finit about the merger. [4]
- [Total 19]

END OF PAPER