INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

29 September 2017 (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 must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*

4. *Mark allocations are shown in brackets.*

5. *Attempt all three questions, beginning your answer to each question on a new page.*

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 from the approved list.

1 One of the notable developments in investment and financial markets in recent years has been the emergence and influence of the monetary policy tool known as Quantitative Easing by central banks around the world.

(i) Describe how Quantitative Easing operates. [5]

(ii) State TWO ways, giving examples, in which central banks have broadened their use of Quantitative Easing in recent years beyond buying government bonds. [3]

(iii) Explain the impact, including the secondary effects, that Quantitative Easing is likely to have on the:

(a) bond market.

(b) equity market.

[10]

(iv) Explain why Quantitative Easing might lead to an asset price bubble. [4]

(v) Suggest, with reasons, how such an asset bubble might burst. [3]

[Total 25]

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2 The government of an industrialised nation wants to encourage private investors to provide capital for the construction of nuclear power stations. A key concern of investors is uncertainty regarding decommissioning costs at the end of a nuclear power station's working life. To address this concern, the government has created the Nuclear Decommissioning Fund for new nuclear power stations. The Fund will take on the decommissioning liabilities of power stations at the end of their working lives, and will be funded by a levy on revenues during their operational phase. Levies are based on estimated liabilities discounted at government bond yields plus 2% p.a., and levies are revised each year.

After 5 years, the Fund's assets have grown to $1bn and the Fund will be cashflow positive for a number of years due to levy income. It is expected that the Fund will begin to start spending on decommissioning costs in 35 years' time. Currently the assets are invested in 40% global equities, 30% global corporate bonds and 30% domestic government bonds.

The Board of the Fund has asked you to develop a revised investment strategy. The Board would like the strategy to maximise the long-term investment return on the Fund, subject to avoiding excessive volatility of future levies.

(i) Describe the factors to be considered in determining the level of investment risk that should be adopted by the Fund over the next few years, including the impact of each. [6]

Having considered your proposals the Board has agreed to migrate the portfolio to a diversified portfolio of public and private assets with an interest rate and inflation swap overlay. The hedging target is to ensure the duration and inflation sensitivity of the assets is equal to that of decommissioning liabilities funded to date.

(ii) Describe a swap based approach to hedging the interest rate and inflation risks of a set of liabilities. [7]

(iii) Explain why it may be preferable to hedge interest rates using swaps rather than government bond repos even if government bond yields are higher than swap yields. [6]

(iv) Discuss the key factors that could lead to the Fund's solvency deteriorating in the future. [8]

(v) Describe the advantages and disadvantages of building an internal investment team for the Fund rather than employing a fiduciary manager to manage the strategy. [8]

[Total 35]

3 A large pension scheme in a small developed country holds a significant proportion of its assets in index-linked government bonds denominated in the local currency. The market value of the bonds has increased significantly in recent years. However, as the liabilities are valued at a discount rate related to the yield on the bonds, the value of the liabilities has also increased significantly due to the lower yields. This has resulted in a deteriorating funding position for the pension scheme. Additionally the liabilities increase in line with the Consumer Prices Index, which the bonds also use as a reference index.

The trustees and the sponsor of the scheme consider that index-linked bond yields are abnormally low from a long-term perspective and believe there is a possible bubble in the bond market. They are also concerned that the Quantitative Easing policies of central banks will eventually result in higher price inflation that could result in significantly higher bond yields, increasing the risk of a significant fall in the value of the scheme's index-linked bond portfolio.

The trustees and the sponsor are interested to explore options for selling some of their index-linked bonds and purchasing suitable alternative investments for the pension scheme.

One alternative investment suggested at the last trustee meeting was forestry investment, as it is a real asset and is likely to perform better in times of higher price inflation. It is also likely to provide some matching for the liabilities as it returns a series of real cashflows like the index-linked government bonds.

(i) Suggest, with reasons, how diversification might be achieved within a forestry investment portfolio. [5]

(ii) Discuss the characteristics of forestry investment and its suitability as a pension scheme investment. [23]

(iii) Compare investment in index-linked bonds with investment in forestry in terms of: suitability as a matching asset; risks arising; and potential merit. [12]

[Total 40]

END OF PAPER

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