

Actuarial Society of South Africa

EXAMINATION

22 October 2018

Subject F205 - Investment

Fellowship Applications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

- 1. Follow log in and saving instructions issued to you at the exam venue.*
- 2. Save your work throughout the exam.*
- 3. You are required to submit your answers in Word format only using the template provided. You MAY NOT use any other computer program (e.g. Excel) during the examination.*
- 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 invigilator/supervisor.*
- 6. Mark allocations are shown in brackets.*
- 7. Attempt all 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

**Check that you have saved your work as per instructions given to you.
Hand in your question paper with any additional sheets firmly attached.**

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.
--

QUESTION 1

A small South African local municipality defined contribution retirement fund has membership comprising mainly young, low-wage earners. Staff turnover has been high and benefit preservation within the fund, when members have left employment, has been very low. The fund offers individual investment choice to its members. For new members, their contributions are allocated to a money market portfolio until such time as an investment selection is made.

A new regulation in the Pension Funds Act has been promulgated requiring that every fund have a default investment portfolio into which members' investments will be placed, should they not explicitly select an investment portfolio from those on offer. This portfolio will need to satisfy certain investment criteria, as laid out in the revised regulation.

i. Using the Actuarial Control Cycle, outline the steps the trustees should follow in developing the portfolio.

[5]

ii. Discuss the main considerations the trustees should incorporate when deciding on the investment strategy for this portfolio.

[15]

The fund has hired a consultant who suggests that the fund adopt a balanced strategy for the default portfolio comprising 60% local equities and 40% local fixed interest. He further suggests that the management of the equity component is outsourced to a range of smart beta managers on a fund of funds basis.

iii. a. Outline four smart beta strategies which could be implemented within the fund of funds; and

b. Discuss the relative advantages of the proposal to outsource to a range of smart beta managers on a fund of funds basis.

[11]

One of the trustees is uncomfortable with the degree of volatility involved in the proposed strategy. At his request an insurance company has been invited to present their "smoothing only" capability to be used as an overlay to the default investment strategy. The trustees have asked the consultant to consider this proposal and provide a recommendation.

iv. Discuss the main considerations he would include in his response.

[7]

REMEMBER TO SAVE

PLEASE TURN OVER

The trustees elected to adopt the smoothed overlay to the strategy while using the smart beta approach for the equity component. After some years the trustees notice that the fund has underperformed a composite benchmark and would like to understand why.

- v. a. List the desired characteristics of an appropriate benchmark; and
- b. Describe possible reasons for underperformance and suggest, with reasons, two alternative benchmarks (other than a composite benchmark) that could have been used and which may be more appropriate.

[9]

[Total 47]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 2

You are the product development actuary at ABC life, a South African life insurance company. You have been approached by ABC's marketing director who describes a competitor's investment product to you. In return for a lump sum upfront investment, the product offers a guaranteed return, over the five year period, of 10% in total. If, over this period, a chosen equity index (there is a choice of 5 indices and the price index is used) is up by more than 10% in total, the product will pay the index return, subject to an overall cap of CPI + 3% p.a. The product's fees are built into this structure and there are no additional fees.

- i. Explain why a retail investor would invest in such a product while also highlighting the drawbacks of such a product. [6]
- ii. Explain how the underlying investments would be structured to provide the product's return profile as described above, highlighting potential challenges. [4]

The table below shows the gross value of R100 invested for 5 years in each of the underlying FTSE-JSE price indices proposed for the product, as well as the value of R100 increasing by CPI + 3% p.a. for the last seven five-year periods (based on complete calendar years).

Five-year Period	ALSI40	CAPI40	SWIX40	RAFI40	Equal Weighted 40	CPI+3% p.a.
2008-2012	115.93	121.19	121.05	127.41	127.25	169.85
2009-2013	122.10	132.55	133.35	141.80	150.05	167.53
2010-2014	231.94	235.67	233.89	222.59	221.11	159.39
2011-2015	198.08	201.88	214.57	175.72	185.79	156.20
2012-2016	161.02	164.26	175.56	141.18	155.07	159.26
2013-2017	153.26	153.14	158.31	136.14	129.44	159.41
2014-2018	146.97	142.74	148.70	140.45	114.17	158.09

- iii. Comment on the difference in performance between the various periods for each of the indices as well as for CPI+3%. Also comment on the reasons for the differences in performance between the various indices within the same periods. [10]

REMEMBER TO SAVE

PLEASE TURN OVER

- iv. Compare how a local investor would generally be taxed on his investment return if he invested in an insurance company investment policy or via a unit trust.

[4]

The local tax authority has issued a tax amendment for comment. The proposal suggests a significant change to current practice for unit trust investors. It aims to distinguish between the capital gains on underlying financial instruments based on how long they have been held by the unit trust. Gains on instruments that are bought and sold by the unit trust manager within a twelve month period will be treated as income for tax purposes, whereas gains on instruments held for longer than twelve months will be treated as capital.

- v. Discuss the rationale for and the disadvantages of this proposal.

[7]

[Total 31]

**REMEMBER TO SAVE
PLEASE TURN OVER**

QUESTION 3

A large South African corporate has previously agreed to sponsor staff medical scheme premiums through retirement for those members reaching retirement age while employed by the company. This employee benefit has been removed with immediate effect and existing active staff have been offered a settlement value in lieu of the post-retirement medical aid benefit. The company still has a large liability in respect of existing pensioners. This liability is carried on the company balance sheet at a prescribed actuarial value. The company has made available a pool of assets (equivalent in value to the actuarial value of the liability) to be invested in a ring-fenced account.

You have been appointed to advise on an appropriate investment strategy for these ring-fenced assets. The company does not want to be called upon to make additional contributions to fund this liability in future and therefore wishes to follow a low risk investment strategy, while at the same time ensuring that liabilities continue to be met in full, including future medical scheme contribution increases.

You have recommended that they invest in a range of fixed income investments and adopt a liability driven investment (LDI) strategy for the assets.

- i. Using the above scenario, explain what is meant by LDI. [3]
- ii.
 - a. With regard to bond markets, explain what breakeven inflation means and how breakeven inflation can be calculated.
 - b. Discuss how this measure could be used to decide whether to invest in inflation-linked or nominal bonds and discuss any other considerations in making this decision. [4]

The company's financial director has asked that the proposal be implemented as soon as possible as he believes that local bond yields are set to increase in the near future.

- iii. Explain why he may have this expectation. [3]

The decision has been taken to invest in a range of local inflation-linked bonds of varying duration in order to immunize against interest rate changes. The company has subsequently been invited by an investment bank to subscribe for a debt instrument issued by a consortium which is developing a wind farm.

REMEMBER TO SAVE

PLEASE TURN OVER

The wind farm will sell power into the national power grid at an agreed rate per Kw of power supplied. They have a ten year contract with the national provider. The consortium is issuing both debt and equity. The debt has the following features.

- CPI linked debt
 - Twenty year term
 - Equal real quarterly payments comprising capital and interest for the term of the loan
 - The debt will be listed and will carry a credit rating
 - Pricing of the debt is expected to be at comparable government bond yields plus 100bp
- iv. Compare this debt instrument with the original proposal of investing in government issued inflation-linked bonds in order to match the medical scheme funding liability.

[8]

- vi. List further issues which should be considered by the company before investing in the infrastructure project.

[4]

[Total 22]

[Grand Total 100]

REMEMBER TO SAVE

END OF EXAMINATION