

Actuarial Society of South Africa

EXAMINATION

17 May 2024

**Subject F204 - Pensions and Other Benefits
Specialist Applications**

EXAMINER'S REPORT

Overall this exam gave sufficient opportunity for candidates to demonstrate mastery of the subject matter, and there were many marks available, allowing for candidates to score well.

QUESTION 1

This question should have been straightforward but was poorly answered. It was particularly surprising, given that parts (iii) and (iv) were simple return calculations.

i. **Discuss the points you would make in response to the Trustee's question.** [11]

- Nothing wrong with monthly interest basis.
- Will be expected to have larger investment mismatching profits and losses but this can be managed through appropriate reserve.
- Most administration software, and as a result most defined contribution funds, are now administered on a daily priced basis.
- In theory this will lead to tighter investment matching between assets and liabilities.
- In practice this is only the cases if the administration is accurate to begin with.
- In effect any errors will be reflected in real-time with daily pricing.
- Can the current administration system used by Fund Y handle daily pricing?
- If not, consider cost of new administration system
- And cost retraining administration staff on new system
- Can Fund Y's investment reporting structure produce daily investment portfolio prices?
- If not, consider cost of new investment system
- Unlisted investment are illiquid and are difficult enough to price monthly. Daily pricing will be even more difficult.
- Given that the illiquid assets are 12.5% of total assets (i.e. material), will need to ensure an equitable pricing mechanism.
- Will either keep the price of these assets constant and only review monthly / quarterly / annually etc or use some form of interim adjustment between valuation dates.
- Could consider moving to listed funds specialising in unlisted assets. But this will change the characteristics of the underlying investments. It will also take some time to implement due as need to sell illiquid assets.
- Most external investment managers should be able to provide daily pricing of their portfolios, but worth checking

- Debatable whether for a standalone fund, daily pricing is worth the additional cost and complexity
- ii. **Explain the investment characteristics of unlisted debt and unlisted equity, in the context of retirement funds in general.** [6]
- With the increasing correlation of most investment markets, there has been a shift by many retirement funds towards alternative asset classes like unlisted equity and debt that are less correlated with traditional investment classes.
 - Both asset classes can offer attractive risk adjusted returns.
 - Both asset classes should provide a liquidity risk premium.
 - These characteristics make them ideal for reducing risk (diversification) while not detracting from expected returns in a portfolio.
 - However, both asset classes do have some unique risks that need to be managed:
 - Liquidity. Both asset classes are illiquid, especially when compared to traditional investments. For this reason they should only be a small percentage of the Fund's assets (in any event limited by Regulation 28)
 - Expertise / governance budget. In part due to their illiquidity, need to do substantial research and due diligence in selecting unlisted investments. Comes at a cost in terms of time and money.
 - Most retirement funds access these asset classes through pooled unlisted investment vehicles. This removes some of the liquidity risk and governance cost but does alter the risk / return profile as well.
 - Important to monitor these assets closely over time as there is less external oversight than applies to listed investments.

- iii. **Determine the monthly return for May 2024 for each of Portfolio A, Portfolio B and the Low Equity Portfolio. State any assumptions you make.**

[5]

Can use XIRR in Excel or any other method.

Portfolio A

$$241\,323\,100 \cdot (1+i) + 70\,000\,000 \cdot (1+i)^{(27/31)} - 194\,746 = 319\,546\,543$$

Implies i about 2.78%

Portfolio B

$$865\,100\,201 \cdot (1+i) + 32\,000\,000 \cdot (1+i)^{(27/31)} - 56\,000\,000 \cdot (1+i)^{(9/31)} = 838\,602\,303$$

Implies i about -0.28%

Low Equity B

$$1\,106\,423\,301 \cdot (1+i) + 102\,000\,000 \cdot (1+i)^{(27/31)} - 56\,000\,000 \cdot (1+i)^{(9/31)} - 194\,746 = 1\,158\,148\,846$$

Implies i about 0.49%

- iv. **Set out a reconciliation of the calculated and the stated investment return for Portfolio A. Comment on your results.**

[5]

- The stated return is determined based on the unit prices i.e. $2\,410.34 / 2\,305.61 - 1 = 4.54\%$
- The two reasons for the differences are the fee and cashflow timing
- Fee = $194\,746 / (194\,746 + 319\,546\,543) = 0.06\%$
- Cashflow timing = $4.54\% - 0.06\% - 2.78\% = 1.70\%$
- Cashflow impact is large as the cashflow is about 30% of the opening value of the portfolio
- And is a detractor from the return as it is invested at a higher unit price than the closing unit price as at 31 May 2024
- Fee is about 0.72% per annum. Not unusual for an externally managed portfolio, assuming a typically balanced type of fund.

v. **Set out the points you would make to the Trustees and provide suggestions on how to alter the cost structure.** [11]

- Charging for investment costs using basis points is common.
- The overall cost structure is very competitive compared to most retirement funds. The overall level of the costs is not an issue.
- Although, 25 basis points for a money market portfolio might be on the high side but this depends on the amount of assets in the portfolio.
- The concern that the money market portfolio costs more than the high equity portfolio, and only slightly less than the low equity portfolio, is valid
- Especially as the high equity portfolio (and possibly the low equity portfolio) have exposure to d unlisted investments which tend to have higher costs.
- One would expect the investment management cost for the high equity > low equity > money market.

Suggestions

- Communicate current charges to members, explaining the reasons for the different charges. Especially important where members are considering switch out of the High Equity
- Could look for a cheaper MM portfolio – unlikely to effectively reduce fee by 50%
- Care should be taken not to harm the expected investment return outcomes in order to save a few basis points in fees.
- Could try internalising more investments.
- Will result in additional costs as,
- Will need to recruit additional investment staff (else would presumably have internalised assets already)
- Size of portfolio might not justify this extra expense (e.g. if MM is relatively small)
- Can keep current investment structure and managers but alter the cost allocation to each of the HE, LE and MM portfolios
- Do this by requesting the external investment managers to not deduct their fee from their investment portfolios but rather invoice the Fund directly
- The Fund can then add this cost to its internal investment costs and recover this across all portfolios either by
 - Charging the same basis point fee to all 3 portfolios; or

- Allocating the fee by asset class (highest unlisted, lowest cash) on some sliding basis and then deducting it from each of the 3 portfolios (results in a more “expected” investment management charge by portfolio)
- The impact will be to raise the HE fee and reduce the LE and MM fee
- Any other reasonable suggestions to be given credit

QUESTION 2

This question focused on projections in retirement funds. It was the question the candidates scored the best in in the paper, which is not unexpected, however, candidates didn't do as well as expected, given that the question had a number of bookwork elements to it.

i. Outline the purpose of benefit projections in the context of a retirement fund. [3]

- Provide member's information on their current and projected benefits in their retirement funds
 - Includes retirement, withdrawal and any death or disability
 - Show what benefits they can expect when they retire
- Assist with retirement planning
 - Encourage behaviour change if members are not saving sufficiently in retirement
 - Accountability to trustees, administrators and other service providers
 - Members can compare their savings records against their own contribution records
 - Members will put pressure on trustees and service providers in the case of poor investment performance, or high levels of fees

ii. Outline the proposed requirements set out in the draft. [3]

- A benefit projection should be provided annually (during the accumulation phase, and also if the member is retired and drawing a pension from a living annuity),
 - and also when a member joins and withdraws from a fund
- Benefits should be projected relative to total cost to company and not of pensionable salary
- A projected monthly pension should be provided in current day money terms and should be compared to cost to company
- With regard to a living annuity, the projection should reflect the period until the future income starts to reduce in real terms and the period until the member's savings start to decline below the current level

iii. List the requirements set out in the draft with regards to the methodology to be used for projections in a defined contribution fund. [4]

For a DC fund:

- the current contribution rate (net of costs) must be used,
- the assumptions for investment return and inflation are based on bond yields plus a risk premium subject to prescribed limits
- the conversion of share of fund to pension at retirement should be based in the fund's pension increase policy

- a “poor scenario” illustration must also be provided (investment return at least 2% lower than best estimate)
- an optimistic scenario may be given provided that the real rate assumed may not exceed 5% per annum.
 - Different assumptions may be used to reflect individual investment choices
 - A valuator should sign off the assumptions used at least every three years, but the
 - responsibility for the assumptions used remains with the board.

iv. Express this retirement projection in a way that will assist the member to understand it. [4]

Convert the R20m to real value

Assuming inflation is 5% per annum for 35 years

Assuming salary inflation is inflation plus 2%

$20 \times 0.0936629 = R3\ 625\ 805$ lump sum in today's salary terms

Convert to an income

Assuming an annuity rate of 18 at retirement

Annual income in today's salary terms = R104 070

Expressed as a percentage of her current salary = she is projected to replace 35% of current salary at retirement

v. Outline three factors that influence retirement outcomes in each of the following categories: [9]

a. Within the retiree's control

- a. Level of contributions made – higher contributions lead to higher benefits (all else equal)
- b. Standard of living / spending levels (pre- and post retirement) – influences savings pre retirement and how long savings may last after retirement
- c. Level of risk benefits – assuming there is an option – lower benefits higher amounts can be allocated to retirement
- d. Preservation – whether the retiree has preserved savings when changing jobs

b. Retiree has some influence

- a. Investments chosen – assuming individual investment choice – may be some restrictions, also Reg 28
- b. Timing of retirement – later will mean higher income levels in retirement
- c. Part time work in retirement – subsidise retirement income and make it last longer
- d. Health and resulting lifespan – fixed retirement savings fund income for remaining lifetime in retirement – higher risk of it running out the longer the retiree lives

c. Outside the retiree's control

- a. Market performance – in the accumulation phase and post retirement
- b. Levels of mortality – subsequent effect on annuity rates

- c. Tax on benefits – tax regime may change after retirement (or before which may influence retirement projections)

Also

- d. Fund expenses
- e. Risk rates

The examiner's accepted any reasonable answer with justification

QUESTION 3

This question was poorly answered overall, with the candidates not being able to generate sufficient marks – though this should have been achievable if candidates mentioned all six types of reserve account, and commented on these.

i. **Describe six reserve accounts that may be required within a defined contribution fund and explain their purpose. [14]**

- Investment (Smoothing) Reserve
 - Reserve account for smoothing investment returns declared to members
 - Minimum benefits requires that a share of this reserve is payable on exit from the Fund
 - This makes the reserve administratively challenging to manage
 - And as such many funds have done away with this
 - However, some funds still make use of the reserve in an attempt to protect members from large fluctuations or negative return declarations
- Processing Error Reserve
 - Reserve aimed at managing the potential processing errors associated with investment return declarations
 - Processing errors can include provision for mismatching and timing differences in the actual investment or disinvestment of moneys from the times when they are deemed to have occurred in the calculation of benefits compared to when earned or accrued
- Data Reserve or Data Error Reserve
 - Reserve to provide for data errors within the fund records
 - Dependent on the assessed quality of the data
 - Provides buffer to the fund where historic records may be inaccurate and reduces risk of having to adjust all member benefits in order to correct any data errors
- Expense Reserve
 - A reserve to manage the expenses of the fund
 - Typically in DC fund expenses can be dealt with as a direct debit against member records
 - This is simple to apply for regular fixed and per member per month or percentage of assets type costs, generally administration, consulting investment consulting etc
 - Other ad-hoc costs, example, audit, actuarial, board of trustees, levies, communication and roadshows are not regular monthly costs
 - Allocation is therefore made to the expenses reserve based on budget
 - Expense reserve then smooths the collection of contributions for these purposes against the ad-hoc payment
 - Provides a buffer to allow Boards time to adjust allocations
- Risk Reserve including risk fluctuations or volatility reserve (may note as one or separate)
 - A risk reserve generally established if the fund carries all or part of the death and disability risks
 - Would be appropriate where the benefit is paid for on a current cost basis and has not been funded for in the liabilities of the fund.

- The fund may maintain a risk reserve financed by contributions, defined specifically in the rules for this purpose, being the difference between a fixed percentage of payroll and past actual insurance premiums, even if the death and disability benefits are fully insured.
- (This could not be established at surplus apportionment but can be maintained after)
- Surplus Apportionment Cost Reserve
 - Reserve for meeting the costs of the historic / ongoing surplus exercises
 - Could argue not an ongoing risk
 - There is risk that the original budget plus investment income may be greater than required costs and needs to be dealt with
 - Vice-versa costs could ultimately exceed the reserve
- Employer and/or Member Surplus Account
 - Not technically a reserve to manage risk
 - Albeit that the member and employer surplus can be called upon in event of deficit (mark allocation only if this aspect is noted)

ii. Explain how these reserve account balances could be set and how they could be managed over time. [18]

Investment (Smoothing) Reserve

- There may be various ways to determine the intended target
- Asset liability modelling may provide insight into the risk/volatility in the current investment strategy
- Board can determine a level of reserve that reduces the expected risk of having to declare a return of less than some target (0% etc)
- Could be set by applying a discount valuation methodology to the assets of the fund and comparing to market value (actuarial value of assets)
- Could be maintained at a fixed target percentage based on prior analysis
- Interim returns declared may be greater or less than actual returns and would then be met from investment reserves
- Final returns or bonuses would then be set with a view to restoring the investment reserve balance towards its target level
 - i. Subject to the declared returns being within the funds targets

Processing Error Reserve

- The magnitude of the reserve must be motivated with reference to the past experience of the fund; or
- a statistical model which is relevant to the fund.
- In the case of defined contribution liabilities, FSCA would accept a reserve of up to 2% of the value of those liabilities
- Ongoing maintenance and the assessment of ongoing balance will be monitored through the analysis of surplus or account build-up at each valuation
- Could apply a method that considers the variance of the positive or negative mismatches over time
- A method that looks at a multiple (eg. 2 x) highest past mismatch
- Adjusted as the Fund's process or systems adjust
 - i. Example moving from monthly to daily pricing

Data Reserve or Data Error Reserve

- Dependent on the valuator's assessed quality of the data through
 - i. Analysis of data for valuation purposes

- ii. Past data corrections
 - iii. Recent or past member rebuild exercises
 - iv. actuarial adjustments needed to adjust liabilities
 - v. administration systems
- Data reserve would earn investment income allowing some growth
- Data adjustments or data correction exercises could inform the required ongoing balance
- Excesses could be released to members or other reserves
- Shortfalls could be funded from other reserves or from debits to members as may be justified

Expense Reserve

- Dependent on how allocation to ad-hoc expenses are set
- Based on budget and expected payroll allows fund to determine an expected allocation
- Variations in budget, membership or payroll can be tested to determine impact on actual expenses versus funding for expenses
- Reserve set to absorb expected fluctuations
- Reserve balance should consider timing of budgeted expenses,
 - i. large ad-hoc expenses may need to be paid early in the contribution or financial year cycle where expenses contributions may not have been sufficient to cover the required cashflow
 - ii. cashflow analysis therefore allows fund to plan the ad-hoc expenses
- reserve should be maintained to be sufficient to meet the cashflow requirements over the Fund's annual cycle
- Changes in expenses or budget over the period may require adjustments to allocations
 - i. Adjustments take time
 - ii. Need board approval
 - iii. Administrator implementation
 - iv. Reserve needs to be able to provide sufficiently for the expected period of time to correct
- Combination of above would be translated into percentage of total budget or as a multiple of average monthly costs

Risk Reserve including risk fluctuations or volatility reserve (may note as one or separate)

- A risk reserve without the risk fluctuations/volatility or solvency margin may then be treated like an expense reserve with a buffer for a portion of annual costs
- Perhaps based on statistical model looking at past variance
- Risk fluctuation /solvency element could be considered in number of ways:
- Typically accepted by FSCA to apply previous actuarial standard PGN 104 to determine the CAR
- Alternatively some other statistical model may provide a guide for the minimum CAR or solvency margin required
- Valuator would usually recommend a multiple of the minimum
- Could consider a combination of the minimum together with a margin for expected variance such that any generally expected variance does not result in the depletion of the reserve below the required minimum
- Account could be taken for changes or intended changes in benefits
- Past profits or excesses from self-insured arrangements
- Margins based on quality of data or reporting delays

Surplus Apportionment Cost Reserve

- Would have been established at SAD

- Ongoing maintenance generally more like an account with credits and debits but at regular points (typically statutory valuations) an assessment of the likely future costs relative to past experience could be made
- May result in adjustments to the reserve, releases may be added to surplus accounts, additional funding may be difficult to obtain depending on nature of the Fund's surplus scheme and current surplus account balances

Negative balances

- Consider setting up the reserves (except the processing reserve) to automatically remove negative reserve balances. This will allow a fund to apply for valuation exemption.

iii. Provide a sample rule structure for one of the potential reserves described above.
[7]

Processing Error Reserve

- *May include a short definition in definition section*
- *Set out introduction or purpose statement*

Example:

of the Processing Error Reserve is to provide for mismatching and timing differences in the investment and disinvestments of the assets of the FUND and shall reflect the impact of any mismatching of investments and disinvestments, of asset management fees payable and deducted, of interim investment declarations, non-interest bearing debtors and creditors, sundry expenses and miscellaneous mismatches which arise in the day to day administration of the FUND.

- *Ongoing management clause:*

Example:

The balance in the Processing Error Reserve shall be reviewed from time to time by the VALUATOR and the following transactions shall be recorded in the Processing Error Reserve:

- *Propose a reasonable debit and credit structure plus note on how the balance would earn interest or returns*

Example:

(a) Credits

- (i) an opening balance as determined by the TRUSTEES after consultation with the VALUATOR as at the SURPLUS APPORTIONMENT DATE;
- (ii) distributions from the Investment Reserve in terms of the RULES;
- (iii) any transfers from the Member Account in terms of Rules.
- (iv) any transfers from the Risk Reserve in terms of Rules.

- (b) Debits
- (i) such amounts as may be required from time to time on the advice of the VALUATOR, having regard to the purpose of this account in terms of the introductory paragraph;
- (ii) transfers to other accounts of the FUND from time to time if so decided by the TRUSTEES on the advice of the VALUATOR.
- (c) The amount standing to the credit of the Processing Error Reserve shall be increased or decreased by the INVESTMENT RETURN on the portfolio in which the assets in the Processing Error Reserve are invested.

(Format was not important to obtain marks)