

**Actuarial Society of South Africa**

**EXAMINATION**

**18 May 2018**

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

**EXAMINER'S REPORT**

## QUESTION 1

Overall Question 1 was most poorly answered of all three questions with a significantly lower average score compared to Question 2 and 3.

### i) Set out the points you would make to the Trustees.

Poorly answered by most candidates. Candidates appear not to have read the question correctly and focused narrowly on a high level comparison of annuity products to an in-fund pension. The key to the question was not the annuity product but rather the issues around giving an option to members.

- Allowing retirees to transfer out does introduce the risk of anti-selection with those in poorer health electing to take the transfer value.
- Could potentially allow for this by underwriting new retirees in some form.
- Unlikely in practice.
- Not clear if the option would extend to disability retirement.
- Which would present additional complications in determining a suitable capital value.
- Further, retirees may opt for an outside annuity for other reasons e.g. don't need the spouse's pension as spouse also has income or they may feel they can do better under a living annuity.
- May need to reconsider both the valuation mortality assumption (solvency reserve) and perhaps have a different annuity capitalisation basis.
  
- Need to make sure that if the fund provides contingent pensions (e.g. spouse's pension), that the retiree understands this.
- Good practice to require the spouse to agree to the retirement benefit transfer so that the spouse can assess their financial position as well (e.g. if transfer value is applied for a single life annuity outside the fund).
- Maximum  $1/3^{\text{rd}}$  commutation amount in fund may be less than  $1/3^{\text{rd}}$  of capitalised value of pension (if contingent pensions are not commuted).
- Existing maximum commutation amounts should continue to apply.
- Even if less than  $1/3^{\text{rd}}$  of capitalised pension to prevent members opting out simply to access a greater lump sum.
- Investment strategy for active members set up assuming everyone retires in fund.
- If member moves out, there are cashflow implications and there is no requirement for Growth Portfolio assets when in retirement.
- Active member split to Secure Portfolio relative to Growth Portfolio would probably need to increase if intention is to match liabilities closely.

- However, will depend on actual proportion of active members take the transfer option which is unknown.
- Retiring members leaving the fund will reduce the long-term risk of the fund to the employer.
- Giving retiring members a choice places an onus on the Trustees to communicate the choice, and its impact, clearly.
- Risk of members making, or being sold, a poor decision by intermediaries.
- Almost certain that the fund pension will be a more cost-effective benefit for the majority of retirees.
- In particular if there is a surplus in the Pensioner Account.
- Unless future investment returns, and resulting pension increases, are poor.

**ii) Discuss the merits of this proposal.**

Poorly answered by most candidates. Again the question was too narrowly answered and not sufficient analysis of the proposal was offered.

- The monthly pension payment is a relatively stable regular amount.
- By disinvesting this each month, the risk of disinvesting at inopportune times is averaged out (Rand cost averaging in reverse).
- To move 24 months' pension payments into cash would most likely require a significant once-off disinvestment which actually increases the investment risk if done at an inopportune time.
- The mechanism for topping up the cash balance over time is not set out. If it is topped up monthly, then the disinvestment risk is no different than if no cash balance was held.
- 24 months of pension payments is likely to be about 10% to 15% of the pensioner liability (some reasonable figure here).
- Likely to be a similar percentage to the total Pensioner Account assuming it is not significantly over or under funded.
- This would amount to between 20% to 30% of the Secure Portfolio assets.
- How does this compare to the current cash and short-term bond allocation in the Secured Portfolio?
- Likely that the cash percentage of the portfolio will increase substantially.
- Need to consider if the 4% PRI is still attainable and if not, may need to increase the percentage in the Growth Portfolio to still attain the 4% PRI (if possible).

- Strategy might make sense if intention is to invest in less liquid assets (e.g. more risky credit) for a period of time and thereby enhance returns on the non-cash investments.
- Might make the Pensioner Account investments too risky.
- If retiring members can purchase annuities outside of the fund, the disinvestment risk is likely to be larger under the active member assets as the cashflows are larger and likely to be irregular.

**iii) Set out what further options relating to the proposal you would consider.**

On average the most poorly answered question of the paper. Likely that the poor responses followed the poor response to the previous question. A lack of complete analysis in the question above resulted in a lack of consideration around the further options that may be available. No candidates considered the option of retaining the current strategy.

- Make an assessment of the interest, coupons, bond maturities under the Secure Portfolio in the Pension Account.
- Might be enough to cover all or part of R8 million per month (on average).
- Can instruct investment managers to pay proceeds to fund as segregated portfolios.
- If not, then might add cash to meet the balance.
- Consider a shorter period to cover the expected pension payments for (say 12 months).
- 24 month holding in cash will detract from returns over the longer term.
- If cash holding is required, consider a dynamic top up strategy from other Secure Portfolio (or even Growth Portfolio) assets.
- E.g. if the relevant portfolio performs below its investment benchmark for a quarter, transfer nothing. If it performs between 100% and 130% of benchmark transfer 3 months of pensions. If it exceeds 130% transfer 6 months of pensions (any reasonable example).
- Could also consider a cashflow swap with an investment bank (the fund exchanges some of its assets, typically bonds, for a series of cashflows).
- Or alternatively a liability driven investment strategy with an investment manager (some of the cash and bond assets in the Pensioner Account are restructured to provide a series of cashflows).
- In both cases the term is likely to have to be more than 24 months (probably 5 years or more).
- The investment return earned on the cashflow swap or LDI strategy should however exceed a cash return (even after fees).

- Either strategy would probably only be based on current level of pension for existing pensioners.
- Would need to be adjusted regularly (annually most likely) for pension increases and new retirees.
- Of course, doing nothing is also an option given the disinvestment risk is automatically reduced by the regular pension payments.

**iv) Setting out your reasoning, state whether you agree or disagree with the Trustee.**

Poorly answered in that while most candidates stated their agreement or disagreement they did not attempt to justify and set out their reasoning as requested by the question.

*{Broad range of sensible answers is possible so marks given for valid range}*

- Assume passive real long terms returns as follows:
  - Local and global equity: 6.0%
  - Property: 5.0%
  - Nominal bonds: 3.0%
  - Inflation linked bonds: 2.5%
  - Cash: 1.0%
- Assume Growth Portfolio is 20% property and 80% local and global equities.
- Expected real return from Growth Portfolio is 5.8% p.a.
- Assume Secure Portfolio is 45% nominal bonds, 45% inflation linked bonds and 10% cash.
- Expected real return from Secure Portfolio is 2.35% p.a.
- Overall expected real return on the Pensioner Account is about 4.1% per annum (50% Secure and 50% Growth Portfolio).
- Assume active management cancels out fees.
- Would disagree with Trustee.
- To expect 3.0% per annum would mean a real return of 3.65% per annum on the Growth Portfolio which is very pessimistic.

- v) **Discuss the implications for the fund, employer, pensioners and members if the valuation assumption was changed to assume a real return of 3.0% per annum. You do not need to do any calculations.**

Marginally the better answered of all Question 1 sub questions although overall generally still poorly answered. Most candidates understood the impact of the change on liabilities in particular but did not discuss the wider implications of how those changes in liability would affect the various stakeholders.

- Pensioner liability will increase by around 10%.
  - Will reduce surplus in Pensioner Account, possibly in deficit.
  - Will expect employer to make good any deficit and possibly restore funding level in full depending on how Pensioner Account is set out in the rules / managed in practice?
  - If investment strategy remains unchanged then surplus will emerge over time if actual real return of 4.0% is earned.
  - But not if assets are restructured to target real return of 3.0%.
  - Worst case for existing pensioners / best case for employer is:
    - Existing Pensioner Account surplus is used to fund the change in PRI; and
      - Investments are restructured to earn real 3% per annum.
      - Pensioners don't benefit from surplus and get same targeted increases (perhaps less volatile).
  - Best case for existing pensioners / worst case for employer is:
    - Employer meets full cost of PRI reduction (ESA?); and
    - Investments are left as is.
    - Pensioners benefit from surplus and get 1% higher expected increases.
  - Final outcome likely to be a compromise between the two e.g. Employer pay cost of PRI reduction but investment restructured to target real return of 3%.
- 
- The past service liability for active members will increase.
  - As will the prescribed minimum benefits and the actual cost of benefits where the PMB applies.
  - The increase in liability will be offset by a reduction in the solvency reserve.
  - The required employer contribution rate will increase.
  - This could potentially be met from the ESA.
  - It could also potentially be met by members if a cost-to-company remuneration basis applies.

## QUESTION 2

On average across all candidates this was the best answered of the 3 questions.

- i) **Describe the changes to the legislation and explain the process the fund would have to go through to affect changes to allow for this revised legislation.**

This question was well answered and candidates showed a good broad understanding of the issues raised. This was largely book work and should not be surprising.

### **Legislation changes**

- The relevant section of the Act came into effect on 1 March 2016
- Prior to act being passed tax treatment of pension and provident funds were different – member contributions were tax deductible up to 7.5% of pensionable salary in a pension fund.
- No tax deductibility on contributions in a provident fund previously. The TLAA now allows for tax deductibility of contributions up to 27.5% of total remuneration.
- Benefits paid from provident fund now taxed as per pension funds – except any contributions previously not tax deductible, will be added to the retirement benefits coming out of the provident fund.
- No differentiation between employer and employee contributions
- Overall limit on tax deductible contributions of R350000 per year.

### **Process**

- Although tax limits changed through legislation, fund rules would need to be changed
- The fund trustees would need to approve any rule changes
- The employer would be deducting the revised contributions from members' salaries, so would need to approve any changes
- Once all approvals were received, the revised fund rules would need to be drafted
- Submitted to the FSB and SARS for approval
- Only once FSB and SARS approvals are received can the changes be implemented
- Process likely to take 4-6 months

- ii) Assuming investment returns of 11% per annum, salary increases of 6% per annum and general inflation of 5% per annum, show the expected change in Member A and Member B's lump sum benefits at a retirement age of 65 assuming they both intend to maximise their tax incentives. You should assume that any legislated monetary limits increase with general inflation. State any other assumptions that you make.

A mixture of very good and very poor responses. Many appeared to not take account of the relationship between pensionable salary and total package as far as the application of the new limits was concerned. Few considered the cost of risk benefits as a percentage of pensionable salary would not change in rand terms when compared to total package.

- Only interested in the future
- Assume salaries increase continuously
- Assume risk and expense allocation percentages remain the same

	Member A	Member B
<b>Expected benefits on current cons</b>		
• Years to retirement	37	13
• Salary pa	100 000	1 200 000
• Current con rate to retirement	$17.5\% - 1.2\% - 2.5\% = 13.8\%$	
• Current monthly contributions	$= 100000 \cdot .138/12 = 1150$	$= 100000 \cdot .138/12 = 13800$
• Monthly interest rate	$= 1.11^{(1/12)} - 1 = 0.873459382\%$ (i)	
• Monthly salary increase rate	$= 1.06^{(1/12)} - 1 = 0.486755057\%$ (s)	
• Monthly inflation rate	$= 1.05^{(1/12)} - 1 = 0.407412400\%$ (p)	
• Number of future cons	444	156
• FV contributions	$= 1150 \times (1+s)^{444} \times S444$	$= 13800 \times (1+s)^{156} \times S156$
	$\text{at } (1+i)/(1+s) - 1 = 0.384831141\%$	
	$= 1150 \cdot 8.63608712 \cdot 1170.2345257$	$= 13800 \times 2.13292826 \times 213.245028158$
	$= 11\ 622\ 184$	$= 6\ 276\ 742$
• Expected benefits on new contributions		
• Total potential cons p.a.	$= 100000 / .75 \cdot .275 = 36\ 666.67$	$= 1200000 / .75 \cdot .275 = 440000$ - limit to R350 000
• Less contributions to risk and expenses	$= (2.5\% + 1.2\%) \cdot 100000 = 3700$	$= (2.5\% + 1.2\%) \cdot 1200000 = 44400$
• Value of R350 000 limit		$= 350\ 000 / 12 \cdot (1+p)^{156} \times S156$
		$\text{at } (1+i)/(1+p) - 1 = 0.46415600\%$
		$= 12\ 552\ 728$

• Value of risk and expenses		$=44\,400/12 * 6\,276\,742 / (13\,800 * 12)$
		$=1\,682\,895$
• Total monthly cons to retirement	$(36666.67 - 3700) / 12 = 2747.22$	
• New FV contributions	$=11\,622\,184 / 1150 * 2747.22 = 27\,764\,107$	
• Increased lump sum caused by higher contributions	$=27\,764\,107 - 11\,622\,184 = 16\,141\,923$	$=12\,552\,728 - 1\,682\,895 - 6\,276\,742 = 4\,593\,091$

**iii) Explain the limitations in showing the impact of maximising contributions as a lump sum benefit at retirement., and state, with reasons, an alternative way of expressing the impact at retirement of the change in contributions.**

Good attempt by most candidates

#### **Limitations**

- ‘Telephone’ lump sum numbers at retirement have no meaning now
- The further from retirement, the less useful.
- Does not show how the lump sum is impacted by inflation
- Therefore does not give any information about the change in purchasing power
- Does not show relative change – example younger member goes up by much more in rand terms but that is hard to interpret
- Does not take into account tax at retirement

#### **Alternative**

- Can use a net replacement ratio
- Converts the lump sum at retirement into the income that the lump sum is expected to buy at retirement, and expresses this as a percentage of future salary at retirement
- More useful as it expresses the retirement benefit in terms of how much income at retirement it can replace
- However, estimates the conversion from lump sum at retirement, as this cannot be known in advance
- But can give a sense of the target replacement ratio for the fund for trustees to assess the likely outcomes for members
- But only provides information at retirement date – does not say anything about future income into retirement

- iv) Using your calculations in part ii) above, show the expected impact of maximising their tax incentive using this alternative method. Assume an annuity rate of 17.5 at age 65. Comment on the results of your calculations

Poorly answered in general. While many carried forward the calculations from the previous section most did not provide reasonable comment on their results. Time appears to have been a factor in this question with a few candidates not answering.

	Member A	Member B
Increase in income at retirement	$=16141923/17.5 = 922396$	$=4593091/17.5 = 262462$
Estimated salary at retirement	$=100000 \times (1.06)^{37} = 863609$	$=1200000 \times (1.06)^{13} = 2559514$
Increase in NRR	$=922396/863609 = 106.8\%$	$=262462/2559514 = 10.3\%$

### Comments

- The younger member has an increase in NRR of over 100% - does not need to increase contributions to the max
- Result of longer period over which higher contributions are paid and longer time for compounding of investment returns
- Although lower paid employees may need higher NRRs as less space to reduce expenditure at retirement
- The older member's NRR increases only by 10.3% - as fewer years of higher contributions and less time to grow with investment returns
- Have no information about the current expected NRR of the members
- Suggests not all members should be treated the same when it comes to accommodating the tax amendments
- NRR calculations are pre-tax at retirement, so would need to take that into account

- v) Set out the comments you would make in your advice to the employer.

Reasonably answered by those who managed to attempt the question. Few candidates considered the full range of options and instead touched on a few items at a high level.

### Recommendations

- Members can be given the option to increase their contributions to the fund – so don't need to make it compulsory
- The rules could be amended to allow flexibility of contributions – members could be given an opportunity every year to change their contribution rates
- Increased complexity of design could lead to increased confusion
- But members would probably value the choice

- Communication would be needed to help members make appropriate choices
- Possibly individual consultations, but these are expensive
- At least some high level communication highlighting the impact of increased contributions – at different ages etc.
- There is the risk that member's reduce contributions
- so would need to choose available options that are made available carefully
- Can have overall minimums and maximums
- Which had been designed with a specific target outcome for an average member in mind
- Flexibility would accommodate younger members needs such as housing etc. when they do not have as much disposable income to spend on retirement savings
- Risk that they do not increase contributions when they are able to
- Any option would have administration impact – which may increase fund costs
- Possible impact on the employer if members make poor choices and are unable to support themselves in retirement
- An alternative would be to design a 'stepped' structure which increasing as members age – such that over the lifetime of the membership, each member reaches a target NRR
- Or have minimum contribution rates at different ages

### QUESTION 3

- i) **Describe the factors that might have resulted in a change in the fund's financial position since the last valuation report and set out the information you would request to estimate the impact of these factors.**

Reasonably answered by most candidates. Broadly most recognized the main potential causes but few expanded on the points and considered all the information that may be needed to assess the impact. In respect of demographic factors they focused on mortality rather than demographic factors in general. Not many of the "other" points were noted.

Each bullet and sub-bullet is a ½ mark

- Actual investment returns not in line with assumptions  
Would need:
  - the financial statements since the last valuation
  - a current listing of all investments
  - the latest investment strategy document
  - details of any major investment transactions (e.g. pensioner buyout etc).
  - details of significant changes in the ILG/EY yields since the last valuation as this impact on PMBs.
  
- Salary increases not in line with the general salary increase assumption plus promotional scale assumption.  
Would need:
  - total pensionable salary roll
  - details of general inflationary increases given since the last valuation
  - details of any salary band adjustment exercise
  - details of increases given to in respect of major liability categories (e.g. executives)
  
- Pension increases not in line with the pension increase assumption.  
Would need:
  - total pension roll
  - details of pension increases given since the last valuation
  - details of any bonus pension payments made (e.g. 13<sup>th</sup> cheque)
  - details of any ad-hoc pension increase or catch-up pension increases
  
- Actual contributions paid versus required contributions.

- required contribution rate toward funding, expenses and risk premiums from previous valuation report
  - actual contributions received from financials and, if not sufficient detail, monthly contribution reports
  - details of any changes in risk premiums
  - details of actual expenses
  - If using attained age method, estimate contribution surplus
- Change in fund benefits.
    - get current rules plus all rule amendments
    - details of any discretionary benefits granted since last valuation (e.g. bonus service)
    - consider any legislative changes that are not yet reflected in rules
- Demographic experience.
    - Consider if death, ill-health, early retirement and withdrawal benefits have a significant impact on the funding level
    - After allowing for insurance benefits
    - If yes, the get details of relevant exits
    - More relevant for smaller membership where 1 or 2 exits can have large impact
    - Compare pensioner deaths (from AFS say) to expected deaths based on valuation report
    - Obtain details of any significant transfers out of the fund and compare the transfer value basis to the valuation basis
    - Similarly, for transfers in
    - And any pensioner annuity purchases
- Other
    - Consider changes in investment market conditions
    - And any resulting changes in the valuation basis (particularly where a bond basis is used)
    - In particular, would the previous valuation basis still comply with the FSB's prescribed valuation bases?
    - Would the change in bases reflect in a changing funding level or in a change in contingency reserves?
    - Consider if pensioner mortality assumption, and allowance for improvements, is appropriate.
    - Details of any labour disputes that might impact on the benefits provided by the fund.
    - Recent Trustee meeting minutes
    - Legislative changes (benefits, funding, investments).

**ii) Discuss the options available to Company X.**

Poorly answered by most candidates. Most candidates missed the points regarding the initial analysis to ensure a full understanding. Generally noted an option or two at a high level without expanding and discussing the options and the variations around those options.

Each bullet and sub-bullet is a ½ mark

- First assess level of risk that the fund presents
- If large ESA and full solvency reserves; or
- ESA and funded on bond basis; and
- Pension increases are not guaranteed
- Then risk is far lower than if no reserves / ESA and underfunded
- Best / easiest option to follow would then depend on what the above reveals
  
- Liquidate the fund
- Will remove all defined benefit risks permanently
- Check fund rules first to see if any further obligations on employer on liquidation
- Might result in immediate cash injection being required by employer
- If assets are insufficient to meet PMB liabilities
- Can allow for cash injection in Company Y purchase price
  
- Create a DC category for all new members
- Could convert all existing members to DC, but may be costly if a forced conversion.
- Voluntary conversion may not result in sufficient take-up to reduce risk significantly
- Could convert to DC for future service of existing members with past service remaining DB
- Or cap future pensionable salary increases in some way
- But need to check employment contracts
- And weigh up the cost of loss of staff morale

- Ask trustees to review investment strategy
  - Too match assets and liabilities more closely
  - Might have sufficient ESA / reserves to permit a more conservative matched investment strategy
  - Alternatively, if ESA and reserves are sufficient to meet most funding volatility (especially on an IAS19 basis)
  - Then adopt a riskier investment strategy
  - To reduce the long terms costs of the fund to the employer
  - Can also secure annuities to reduce / remove the mortality and investment risk for annuities in payment
  - But will cost money as insurers will charge for the risk taken on
  - And for expenses and profit loadings
  - Ultimately, employer still faces the pensioner risk if insurer defaults; unless
  - Annuities are secured in the name of the retirees (more complicated and possibly expensive process)
- 
- Consider whether all death and disability risks are fully insured
  - With emphasis on the insurer's maximum benefit versus the benefits provided by the fund (mainly on disability)
  - Only insure value of benefit above PMB
- 
- Make sure that the fund has proper governance procedures and policies in place
  - In particular, that it meets the requirements of King IV and PF130