

**Actuarial Society of South Africa**

**EXAMINATION**

6 October 2009 (pm)

**Subject SA4RSA — Pension and Other  
Benefits Applications**

**EXAMINER'S REPORT**

## QUESTION 1

*This topical question had not been tested before, but should not have come as a surprise. Students did well, and better than expected, although some lost mark scoring opportunities in part (ii) because they criticised individual fund design (e.g. low withdrawal benefits) as opposed to the shortfalls of the private system vs. a national fund (e.g. not enough people saving). Parts (i) and (v) were well done.*

- (i) Contrast the two main systems of funding, and suggest why one might be better.
- Funded vs. Pay as You Go
  - Funded provides greater security for members since assets have accumulated to meet liabilities
  - But this places strain on an economy in the process of becoming fully funded
  - Because new pensioners will need to receive the guaranteed minimum pension, which will not have been funded
  - And due to high poverty, unemployment and other calls on government funds
  - Increased longevity of pensioners and declining fertility increases the dependency ratios of pensioners to contributors
  - making DB provision on a funded basis expensive
  - HIV/AIDS and high unemployment bring about similar trends
  - Funded schemes help with the development of capital markets
  - But need robust admin systems
  - Most European countries provide state pensions on a pay as you go basis
  - Benefits paid as they fall due, funded by current workforce
  - Problematic for an ageing workforce (point made above)
  - PAYG better suited to stable economies and populations
  - And the possibility of a future government reducing benefits (political risk)
  - Providing benefits on a pay as you go basis will provide little security in the current (and medium term) demographic and economic climate
  - The benefit outgo is only a true reflection of the cost of benefits when the system is in equilibrium. At the outset politicians may equate costs with the initial benefit outgo and therefore not understand the true cost of benefits
  - Given unstable demographics this government should aim to (partially) fund state provision over the medium term so as to reduce economic stress
  - And consider phasing in the guaranteed minimum pension over a period (e.g. 3 or 5 years)
  - While phasing out other social security programmes (e.g. old age grant)

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

(ii) Describe how it can achieve these goals.

Not enough people saving / Increase the number of savers:

- by compelling all income earners and their employers to contribute
- to a national fund
- at least in respect of a minimum amount of earnings
- Facilitate this by using tax incentives
- And wage subsidies for low income earners
- who otherwise couldn’t afford to contribute
- this will also encourage job creation

Insufficient savings / Increase the amount of savings by stipulating contribution rates:

- Enforce preservation until retirement
- But allow access to funds for retrenched employees pre-retirement, and possibly for housing and education
- Encourage further savings (via tax incentives) above the compelled minimum
- But cap incentives to avoid unnecessary tax relief at high salaries
- Transitional arrangements must enable existing funds to adapt
- or transfer to the national fund
- but efforts to save must be protected where possible (e.g. by retaining those benefit structures)

High costs / Reduce the costs associated with pension provision:

- By simplifying scheme design through standardised benefits and contributions
- Limiting benefit payments since there isn’t an expensive process when changing employment
- And via economies of scale, by bulking administration, risk benefits, investment management and governance
- Consider outsourcing to, or partnering with, the private sector
- Where skills, experience and systems are in place
- But service providers would need to meet required (service and reporting) standards and be accredited
- Use the revenue services tax infrastructure to collect contributions

Lack of a minimum income / Guarantee a (reasonable) minimum pension:

- Linked to salary at retirement or near retirement
- Or preferably, a fixed amount, increased with average earnings increases every year, which is more friendly to low income earners.
- If initial guarantee is based on current level of social pension a subsidy from Government might be required to fund the minimum pension

Immediate needs / Provide cover for these (e.g. death and disability):

- And retrenchment (mentioned above)
- Provide risk cover more affordably due to self-insured large risk pool
- By making the scheme compulsory and not allowing “good lives” to contract out
- Benefits/structure must complement existing social programmes (e.g. unemployment benefits and social grants)
- To avoid duplication / ensure appropriate benefit package
- and streamline service delivery, further reducing costs

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

Ensure sound and responsible investments:

- By employing a passive investment strategy, which government is likely to prefer, which may cost less but yield lower net-of-fee returns
- This could be resolved by outsourcing some of the asset management
- Or by allowing members of a certain group (e.g. income > X) to opt-out and save through an accredited fund, on the excess
- although this will leave the fund with lower income poorer risks, negating the pooling benefits and economies of scale

A single state fund could mean improved corporate governance:

- Government could accredit fewer providers (e.g. that meet certain cost requirements)
- Private providers will achieve cost effectiveness through large umbrella or union funds

Poor admin / A single administrator might better manage all income and outgo:

- E.g. the tax revenue collector
- which will maintain individual contributor records
- Ensuring that contributions are paid on time
- Contributions would cover all state benefits
- But a single administrator concentrates the admin risk
- Outsourcing certain aspects may be sensible

(iii) Evaluate the government’s proposal.

5 year final average salary

- With high inflation, final average salary becomes eroded and pensions become less meaningful
- But it will keep the cost of benefits down
- Recommend that indexing be introduced
- As the scheme’s funding improves
- Or that a lower averaging period be used, e.g. 3 years
- Or career averaging with indexation, which is tantamount to DC with “returns” equal to salary inflation
- the definition of pensionable salary should be chosen carefully and may exclude some perks which are employment related

10% contribution rate

- Who is going to contribute 10% - government, members, employers or what is the split?
- 10% cannot be a fixed rate; this is a DB fund
- 10% is unlikely to be sufficient for a standard package of benefits
- Is the cost of varying death, disability, admin etc. over and above
- If so, then it could be viable at outset, but will change with experience
- If it is inclusive, then a higher initial rate will be necessary

## Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

### Cap on pensionable earnings and opt-out option (for contributions above specified amount)

- Cap on tax relief unlikely to affect high-income savings patterns, since these individuals are more concerned about decent standard of living post-retirement and can afford to save for it
- Assuming current tax relief applies to full earnings, cap on tax relief means government “saves” on high-income earners to help subsidise tax subsidies for low income earners
  
- Opt-out option removes some of the healthier lives’ savings and risk contributions
- Which increases the admin cost as a % of contributions in the scheme
- And the risk costs per member because the scheme is smaller
- And because the wealthier lives are likely to be the healthier lives
- On the other hand, removing some of the healthier longer-living pensioners, reduces the cost of pensions
- Theoretically, the scheme would reduce costs as a % of contribution by not having a cap and by not permitting opt-outs
- But this must be compared to broader economic needs (retaining a private industry)
- And individuals’ needs (desire for control and flexibility)
- And the available skills and expertise in the private industry

### Retirement age of 62

- This may be too young for members to have earned a sufficient replacement ratio
- And too expensive (high annuity rates), given that pensioners are living longer
- Recommend 65 or incentivising late retirement
- Developed countries are increasing their retirement ages
- Then the accrual rate could be reduced (to achieve the same replacement ratio at retirement)
- From an economic point of view, given high unemployment, a lower retirement age is good, but given skills shortages, a lower retirement age is not so good
- Early (and late) retirement factors should be chosen so as to be broadly actuarially neutral

### Lump sum death and disability benefits

- Necessary/valuable benefit before retirement, since many will not reach retirement age
  
- Income based death and disability benefits (e.g. spouse's and/or children's pensions) may be more suited, especially if there is a single central administrator managing all social security programmes
- And in an HIV/AIDS environment as younger dependants may need assistance
- But may be too expensive
- Need to take care with impact of HIV/AIDS (e.g. consider reserving for it)
- Could reduce benefits to what can be covered by a fixed percentage
- Could all the risk be retained to improve the risk pool?

### Guaranteed minimum pension

- Achieves a minimum bread and butter benefit / avoids destitution
- May be expensive in early years, whilst fund builds up, and before members have accrued much service; may need some phasing in then

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner's Report

(iv) Further details required

- There isn't sufficient information to properly evaluate the proposal
- What will the accrual rate be?
- And post-retirement dependant pensions?
- What will the levels / form of the death and disability benefits be?
- And hence the risk costs?
- Is there an indication of administration and governance costs?
- And likely investment strategy and hence return?
- How much will be commuted and at fixed or neutral rates?
- This will enable an actuary to determine a suitable contribution rate
- To achieve an appropriate replacement ratio via the accrual rate
- Who underwrites the shortfalls?
- Will it be via higher contributions (and then by whom)? Higher NRA? Reduced benefits? Future generations?
- What does government guarantee or contribute?
- How will the Fund be phased in? Benefits only for contributory periods, but how will the minimum pension then apply?
- How will non-contributory periods of membership be dealt with (unemployment, disability)?
- Will preservation be compulsory?
- Recommend that these issues be debated, further calculations be done, and rules be drafted to cover these issues
- Various questions about the details pertaining to the cap

(v) Draft a list of threats and opportunities, explaining how these might affect the business of the life office.

- The private industry will be left with supplementary provision only and possibly with running down existing funds
- Retirement annuities will see a decline in revenue
- Since employees who previously did not have an employer sponsored fund had to make their own provision, part of which will now go to a national fund
- And may be less attractive if high-end tax incentives are removed
- Counter to this, is that a number of funds may close down (especially if most of their members are low earners) on the basis that the state provision is cheap and good enough and it is not worthwhile to continue running a separate scheme. Members with higher incomes will then be forced to make their own additional provision – hence an increased demand for RA's.
- Also for higher earners, tax incentives may not be that important and sufficient provision is more of a motivation. And members are likely to be suspicious of any national fund and would rather go to a private arrangement.
- Costs may need to come down to compete with the government scheme.
- But not necessarily an issue, because members are likely to value the additional flexibility in private provision more than some additional cost. Costs are even likely to go up, because a portion of future fund contributions will be removed to a national fund, leaving management expenses to be spread over a smaller contribution base.
- Reduced costs would be achieved by offering larger amalgamated group funds (e.g. union fund)
- Although unions may well be quite happy to only belong to a state scheme
- Or promoting umbrella arrangements for the supplementary provision

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

- It is likely that government may only accredit low cost / better governed schemes
- There will be increased competition to attract these smaller funds
- Which means reduced margins
- But also reduced operating expenses
- The state fund may outsource some of its functions (e.g. admin, investments). This will be an opportunity.
- There may be other opportunities to partner with or even advise government
- Small insured funds with many variations are unlikely to be popular; but they also aren’t profitable
- The impact on the life office depends on the final design of the state scheme and especially the contracting out conditions
- Will most probably require design of totally new fund type which could fit around the final structure of the national fund
- The life office would most likely have an asset management arm. Revenues could shrink due to reduced assets under management

## QUESTION 2

*This numerical question was fairly well answered by the candidates that passed but poorly answered by those that didn’t. A number of candidates over-complicated the numerical parts missing simpler solutions. The last sub-part was insufficiently explored.*

- (i) Estimate the fund’s financial position. State any assumptions that you make.

### Value of assets

- Assume zero net cash flow during the year
- Hence contributions and investment income received are equal to benefit payments and expenses
- Assume the Fund’s equities are invested in similar assets as the All Share Index. Per above assumption, dividend income used to pay benefits [½] Equity value: = 65% x R90m x (1-30%) = 40.95
- Assume the duration of the bond portfolio remained unchanged, hence the capital value did not change. Per first assumption, coupon used to pay benefits
- Bond value = 25% x R90m = 22.50
- Cash value = 10% x R90m = 9.00
- Estimated asset value = R72.45 million
- (alternative – assume contributions = benefit payments plus expenses, hence add investment income to asset value. Assume dividend yield and coupon and add to above asset value. Also allow for interest on cash) –

### Members’ liability

- Since the membership statistics remained unchanged, it is reasonable to assume that the liability would only have changed by the salary increase during the year and adjust for the change in discount rate
- Hence assume interest on liability plus retirement contributions equal benefit payments, one year service accrual and new member liabilities
- Assume average age given is salary and service weighted
- Assume gender split did not change and hence that the average annuity rate is unchanged
- Liability = R84 million x (1+12%) x ((1.09)/(1.10)) 65-35

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

- = R71.5 million
- (alternative liability: assuming no decrements = number of members x average salary x accrual rate x average service x age 65 annuity rate x discounted at net rate for average period to retirement
- =  $500 \times 125\,000 \times 1.12 \times 2\% \times 10 \times 14.7 \times (1.062/1.1)^{65-35} = R71.7$  million)

Minimum individual reserve / benefits

- Number of members x average salary x accrual rate x average service x age 65 annuity rate x discounted at ILG+0.05% for average period to retirement
- =  $500 \times 125\,000 \times 1.12 \times 2\% \times 10 \times 14.7 \times 1/(1.03)^{65-35} = R84.8$  m

Surplus = R72.45 million – R71.5 million = R0.95 million

and funding level 101%

(per stated valuation method; MIR not used)

Required retirement contribution rate

- Assume the salary weighted average age of the membership remained unchanged, hence only adjust for the change in the discount rate
- $13.5\% \times ((1.09)/(1.10))^{65-35} = 10.26\%$
- (alternative:  $2\% \times 14.7 \times (1.062/1.10)^{65-35}$ )

(ii) Estimate the main sources of the change in the financial position.

- Expected surplus = opening surplus plus expected interest
- =  $R6.0 \times 1.09 = R6.54$
- Actual surplus = R0.95 million
- Hence explain R5.6 million loss
- Investment loss = Value of assets x (expected return – actual return)
- =  $90 \times 1.09 - 72.45 = R25.65$  million loss
- Salary increase loss
  - New liability x (expected increase – actual increase) / (1 + actual increase)
  - $71.5 \times (6.2\% - 12\%) / (1 + 12\%) = R3.7$  million loss
- Change in basis
  - Actual salary increases already accounted for above, so base analysis on reserve with expected salary increases
  - Liability =  $R71.5 \text{ million} \times 1.062 / 1.12 \times (1 - ((1.10)/(1.09))^{65-35})$
  - = R21.4 million profit
- Other: unexplained changes
  - Unexplained = actual profit / loss – (investment profit / loss + salary increase profit / loss + change in basis profit)
  - $-5.6 - (-25.65 - 3.7 + 21.4) = 2.35$  million
  - Not enough data to analyse this further
  - but will be due to actual member movements and actual vs. expected benefit payments
  - and contributions vs. actual benefit accrual (new members and remaining members)

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

(iii) Financial implications for the employer, the members and the fund.

(a) *Should the fund be liquidated*

Financial implications

- Minimum individual reserves have to be provided for, hence the liability increases to R84,8 million
- Deficit of at least R9,7 million
- Plus provision for liquidation expenses
- A full valuation should be undertaken to confirm the financial position before making a decision on liquidation

Employer

- Any deficit in the fund at liquidation becomes a debt to the employer
- Can the employer afford the capital expense at this stage?
- No future contributions are payable after the liquidation date
- No further management time or IAS 19 valuations required
- Consider the provisions of employment contracts / labour legislation
- Employees are left without retirement provision, which is not the norm in most industries - retention of staff problem
- No possibility of benefiting from a future recovery in investment markets and the financial position of the fund (deficit locked in)
- Should the employer’s finances recover, there would be expenses to starting a fund again

Members

- No future retirement accrual, so they will have to make their own provision
- They will get the option to receive their liquidation benefits in cash,
- but liquidations take time

Fund

- Consider the provisions of the rules
- Reconsider the investment strategy to avoid further investment losses
- However, liquidations take time so the investment period to consider may be up to 2 years.
- Balance this against the possibility/benefit of an investment recovery
- Reconsider the assumptions used to calculate the member’s benefits (previous valuation basis may not be appropriate)

(b) *Should accrual of retirement benefits cease*

Financial implications

- There is no deficit in respect of the past service liability on an ongoing valuation basis
- Consider the position in respect of death and disability benefits
- Can the employer continue contributing in respect of these benefits?
- Contributions in respect of fund expenses will have to continue

Employer

- Employer retirement contributions cease

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner's Report

- Avoid immediate debt to employer on liquidation (deficit and expenses)
- But employer may have to continue contributing in respect of any future deficit and in respect of fund expenses and risk benefits
- Employer retains investment and inflation risk
- But will benefit from any recovery in investment markets
- Consider the provisions of employment contracts / labour legislation

Members

- May still retain risk benefits (as above)
- Investigate possibility of voluntary member contributions to the fund to compensate for loss of benefit accrual
- Alternatively make additional private provision
- Retirement provision retained with a possibility of benefits being reinstated in future
- No option for members to get access to fund benefits (only available on termination of employment)

Fund

- Rules will have to be amended
- Until amendment approved, accrual of benefits have to continue
- Reconsider investment strategy
- In the light of different cash flow requirements (low contributions and possible increase in benefit payments as a result of retrenchments / withdrawals)
- Also considering the potentially disastrous effect of further investment losses, but allowing for participation in any investment recovery
- This in turn may affect valuation assumptions

### QUESTION 3

*This is a typical/standard question on transfer values and should have been answered better. Students did surprisingly poorly on it. Lots of points do need to be made to score well.*

- (i) Set out your checklist for determining the transfer values including a discussion of the methods and assumptions that might be used to calculate them.

Rules and legislation

- the transferor funds rules must be consulted
- though there are unlikely to be set rules for determining TVs on acquisition
- the trustees must decide/agree on a method and set of assumptions
- check for past practice (previous bulk transfers)
- And pension increase policy
- the TV must be a fair and reasonable reflection of the benefits accrued
- including discretionary benefits and ones that have become established practice (reasonable benefit expectations)
- the security of remaining members must not be prejudiced
- Section 14 of the PFA and PF Circular 120 are relevant
- the FSB's approval will be needed
- legislation prescribes the minimum benefit that must apply

## Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner's Report

- which is the greater of (i) the prescribed value of a deferred pension or (ii) a return, with interest, of the member's contributions and the "vested" portion of the employer's contributions

### Basis

- Start with last valuation basis,
- Stripped for elements of prudence
- But economic assumptions may have to be revised given the drop in equity values
- And actual underlying investment strategy
- Allow for any changes in inflation and salary increase expectations
- Make appropriate allowance for pre- and post-retirement mortality
- Withdrawals, expenses, (possibly) marital status and (possibly) existence of children
- The assumptions should reflect the characteristics of the transferring members
- e.g. higher withdrawal rate, salary increases
- The FSB will want to know why a different basis has been used
- Seller might argue that their IAS19 basis is more relevant as it more realistic
- And avoids possible over-funding due to some implicit conservatism in the statutory valuation basis
- Although the purposes are quite different: accounting disclosure vs. benefit security
- Consider valuation assumptions used by transferee fund so that transferee fund does not acquire deficit or more assets than required to secure transferring members' benefits

### Various Methods

#### *1 Value of Accrued benefits*

- Recognise full value of entitlement in respect of past service
- Allowing for future salary increases
- This is the ARV on the AAM or PU methods of funding

#### *2 Share of Fund*

- This would reflect the state of funding of the seller's scheme
- Specific consideration should be given to the Employer Surplus Account in this calculation (which in SA belongs to the employer)
- Seller would want to avoid making good any deficits
- Buyer would want greater of accrued benefits and SoF to get share of any surplus transferred
- But trustees are unlikely to be able to transfer more than SoF, so seller may have to fund part of deficit (if there is one) by way of a lower sale price

Regardless of the method chosen, the final transfer value is subject to the legislated minimum benefit as above

### Contingency reserves and surplus/deficit

Share of the solvency reserve:

- Less need for the full solvency reserve after bulk transfer
- part of this can justifiably be transferred
- the surplus scheme/rules should clarify this

Subject SA4RSA (Pension and Other Benefits Application) – September 2009 – Examiner’s Report

Share of employer’s surplus:

- Decision to be taken by employer trustees only
- Employer unlikely to give up part of its surplus account
- And does not have to because the entire company is not being sold
- The Sale agreement may specify otherwise.

What if there is an asset shortfall?

- if the trustees doubt the employer’s ability to make good the deficit, they should include the level of under-funding in the TVs
- in which case the buyer may offer to secure shortfall
- or if Sale agreement specifies full value (and Seller pays in shortfall)
- or, depending on employer’s covenant, they are prepared to make good the shortfall in TVs, which is their ultimate responsibility
- employer can use the employer surplus to fund or partially fund deficit

Sale and Purchase agreement

- The trustees are not obliged to abide by any aspect of the Sale and Purchase agreement’s in terms of the amount transferred
- unless any shortfalls are paid by the seller or buyer
- The rules may need to be amended to comply with the agreement.
- Or the agreement may be amended to comply with the fund rules and the trustees’ fiduciary duties

Other/general

- Need to factor in fund interest (and amendments to investment strategy, if any) until actual payment
- Confirm financial position of remaining members (for PF120)

(ii) Detail the factors that you would bring to the trustees’ attention, in response to the issue raised by the newly elected trustee.

- In the UK members have a legal right to individual transfers of the cash equivalent of their leaving service benefits
- So this could be taken as the appropriate way to determine the aggregate bulk transfer value in this question
- The UK deferred pension is revalued with pension increases
- In SA, members’ minimum DB benefits (the MIR) are revalued on a prescribed basis
- Which includes provision for salary increases, not just pension increases and will exceed the UK leaving service benefit
- In recent times MIRs based on ILG method have exceeded ARVs, because of the reduction in the real discount rate used to value these deferred pensions
- (alternatively MIR’s based on 40% EY method have decreased due to an increase in EY and hence ARV greater than MIR)
- In any event, TVs in SA are usually the greater of ARV and MIR
- Unless the fund is in deficit, but then the MIR applies