

Actuarial Society of South Africa

EXAMINATION

27 April 2009 (pm)

**Subject SA4RSA — Pensions and Other Benefits
Specialist Applications**

EXAMINER REPORT

Question 1(i): List the main reasons underlying this change in fund arrangement

This question was reasonably well answered by all the candidates

- many blue-collar workers didn't understand / trust defined benefit funds
- withdrawal benefits were poor / seen as unfair
- there was an increase in workforce mobility
- this all led to pressure from employees and labour movements
- for more realistic / fair / transparent / portable exit benefits
- the move to DC became synonymous with a move to provident funds - labour preferred lump sum retirement benefits as many employees moved to rural areas on retirement where pension payments are not readily accessible
- this was supported by employers whose open-ended liability ceased
- and whose risk was transferred to members
- and often the cost of future DC benefit provision was less
- many funds had healthy surpluses at the time and this enabled them to make the conversion attractive, increasing the take-up by DB members
- Consultancy firms had strong relationships with employers and emphasized the benefits to the employers. This was a fee generating exercise for them which enhanced the momentum of the process.

Question 1(ii): Explain why members prefer DB and discuss your proposals

This question was reasonably well answered by all the candidates, especially as far as identifying members who would prefer a DB environment is concerned. However, not enough time was spent on proposals to deal with members' concerns (such as poor conversion terms at retirement).

Those averse to investment risk

- Especially those closer to retirement
- Provide investment choice, including a low-risk or risk-free portfolio
- The fund could enhance conversion values to compensate for the investment risk
- This could be calculated by discounting retirement values at a risk-free rate
- A default life stage investment portfolio can be constructed for those intimidated by making a choice

Those planning to stay until retirement

- Because the improved withdrawal benefit would not be an attraction
- Conversion values could be calculated ignoring withdrawal decrements
- and by adding the future service contribution shortfall where applicable
- Introduce a DB underpin

Those who prefer a fund-paid pension as opposed to an outsourced pension

- For fear of poorer pension increases and/or
- Adverse annuity rates at retirement (due to insurer costs, margins and conservative assumptions) and/or
- Severing ties with the company and/or
- The conversion basis may penalise them (e.g. they may have a very young spouse)
- Need to communicate insurers' track records and stress that investing is their business
- Stress that competition should keep annuity prices down
- And that retirees may shop around for the best rates and most suitable products
- Could include expected insurer expenses and margins in the conversion values or show the effect
- Consider additional enhancement to improve likely pension increases or initial pensions

Married members prefer the more valuable spouse's death-in-service pension

- Communicate that the conversion value includes this component
- Assuming it was prefunded and not current costed
- Calculate and provide compensatory enhancement
- e.g. annually insure the difference between the value of the spouse's pension and 3 x pensionable salary and the member's share
- Stress that the new benefits do not discriminate between married and single members
- Make a voluntary top-up cover scheme available (free standing)

Other general points

- The benefit is known in advance – it makes planning easier
- Those who expect high salary increases closer to retirement (executives)
- There may be concerns or a lack of understanding re whether they will get a fair share of the large DB surplus when the conversion is made

Other general solutions

- Retain the DB category for those who don't want to convert
- Communication to members will be critical

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Question 1(iii): Describe the statutory role a valuator might play in a hybrid scheme?

This question was reasonably well answered by all the candidates, although some also included actuarial duties that are not a statutory requirement (which gained no marks). Few included the requirement to certify rule amendments and to comment on the insurance of risk benefits.

- Section 16 of the Act requires the valuator to furnish a statutory report at least every three years
- The report must:
 - Investigate the financial soundness and recommend corrective action, where required
 - certify whether assets are appropriate relative to the nature of the liabilities
 - certify the adequacy of ongoing contributions
 - comply with PGN207 regarding required information
- Certify financial soundness where rules are amended
- Section 14 transfers: certify that reasonable expectations have been met
- Comment on the appropriateness of reinsurance or self-insurance of risk benefits (if necessary)

Question 1(iv): Outline the input that could be expected from the independent actuary

This question was reasonably well answered, although some candidates incorrectly included statutory duties in the tasks of the independent actuary.

Initially:

- The conversion projections, comparisons and determination of a starting contribution rate will be done by the valuator, but the independent actuary can review the method and assumptions and check the results for reasonability
- Illustrate prospective benefits and associated risks under other scenarios (e.g. more conservative assumptions)
- Put forward alternative methodologies for determining the conversion proceeds
- Consider and comment on other benefit designs (e.g. tiered contributions)
- Assistance with communication to members
- Input into investment strategy

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Regularly:

- Regular review of whether fund is meeting objectives: what impact is premium and risk benefit inflation having on projected retirement benefits?
- Comment on appropriateness of the methods used to distribute investment returns to individual members' accounts and the various reserves of the fund
- Comment on investment philosophy / channels in relation to liabilities and members' reasonable benefit expectations
- Input to benefit statements (are DC members getting a clear/fair picture?)
- Assistance in communicating what additional contributions members might need to make to target certain replacement ratios
- Input into future transfers (basis and method)

Question 1(v): Summarise solvency reserve impact on funding level and contributions

This question was generally poorly answered. Candidates were specifically required to deal with three issues, namely the impact of the solvency reserve on the funding level, on future contributions and how to apply the reserve on full conversion. Only one candidate explained properly what a solvency reserve is to start with and most candidates proceeded to deal with one section of the question only.

- This reserve acts as a buffer against adverse experience
 - Determined by revaluing the liabilities using more conservative assumptions
 - PF117 provided the assumptions to use as at the surplus apportionment date
 - If $A/L > 100\%$ then the fund is considered sound and no deficit-spreading additional contributions would be required
 - Ideally, the fund would prefer $A/(L+R)$ to be $> 100\%$
 - If $(A - L) < R$, then R will be limited to $(A - L)$
 - The employer may want to consider contributing more than the best-estimate theoretical future required rate to fund the full R
 - But then it would be preferable if the rules spell out what will happen with future surplus
 - If $(A - L) > R$, then $(A - L - R)$ should be considered for surplus distribution
- If all DB members convert
- The fund would need to re-evaluate its surplus at the new conversion date
 - Consult the rules for guidance on the solvency reserve and what happens on conversion / termination of the DB category
 - Preferable to include the solvency reserve in the conversion values as members take on the investment risk and the solvency reserve was created for this purpose in the first place.
 - The reserve would not ordinarily be required in the DC category, except if DB underpin is provided
 - The surplus available for distribution would increase from $(A - L - R)$ to $(A - L)$, if conversion values add up to L

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- But the request to convert is coming from members so the employer may reason that their potential share of the surplus if the solvency reserve is released, should not be used to enhance the conversion values
- Some of the surplus may go towards a reserve in the DC category used to provide any underpins
- Some of the solvency reserve may go towards a reserve in the DC category used to provide any underpins
- The rest of the solvency reserve will become surplus and should be distributed between the stakeholders (members and employer) in accordance with Section 15C of the Act and/or the rules if these have been amended to deal with future surpluses

Question 1(vi): Interpret employer's rationale and suggest trustees' response

This question was poorly answered by candidates, most of whom did not suggest how the trustees should respond to the employer as requested in the question.

- The employer may feel that it bore all the risk in the DB category and should now be compensated with any potential surplus
- Because they would need to increase contributions if this buffer proved insufficient and a deficit arose
- However, had it not been established at the surplus apportionment date, members may have been allocated more of the surplus
- But so too, might the employer have received more surplus
- If the reserve is transferred to the Employer's Surplus Account (ESA) it must be used for specific purpose
- Some of which may benefit members
- But the employer may also take a contribution holiday
- Importantly, by converting to DC, the employer transfers its (investment, longevity etc.) risks to members
- So on the whole it does appear inequitable for the employer to retain the full solvency reserve
- How badly do the members want to convert? Would they accept the employer's proposal?
- What is the contribution rate under the new structure as well as the comparative projected benefits? Will the conversion values be acceptable to most members if there is no enhancement to actuarial reserve values? The employer has an interest in most of the members accepting the offer.
- Would the employer consider the transfer subject to the ESA then only being used for benefit improvements?

Question 2(i): Discuss the fund's investment strategy issues

This question was reasonably well answered by candidates. However, none considered the special investment requirements of a member surplus account and employer surplus account, and few discussed the position of contingency reserves and the impact of possible surpluses or deficits.

- Strategy must comply with regulation 28 of the Pension Funds Act
- Which limits investments in various classes to different percentages
- The trustees need to understand the fund's requirements (e.g. a particular real return)
- An asset liability matching report would assist
- Consider specialist or balanced mandates
- And instruct chosen asset managers accordingly
- Benchmark the performance and monitor and review regularly

- Strategy should be aimed at limiting or eliminating future deficits
- If the employer is not committed to meeting future deficits then the trustees only have existing assets to meet future benefit payments and fund expenses
- the amount and timing of future payments cannot be known precisely
- uncertainty arises due to:
 - longevity and dependants' eligibility and longevity
 - inflation and therefore pension increases and expenses
 - the occurrence of early retirement, withdrawal, death and commutation
- One option is to secure some/all benefits with an insurer
- This won't be possible with paid-up members' benefits
- Alternatively treat the scheme as closed and meet future cash flow needs as they fall due from assets
- Less expensive because the insurer will load for risk, expenses and profit
- Could try to invest to match cash flow requirements
- Gilts are best able to meet guaranteed requirements, but if increases are linked to inflation, there is a significant inflation risk
- Good quality corporate bonds are similar offering slightly higher return, but with more credit risk
- Index-linked gilts can provide inflation-proofing
- But full matching by term unlikely
- Due to a lack of these gilts, particularly at longer terms
- Interest swap arrangements with banks can provide a customised match of cashflows, but credit risk should be managed carefully
- And still issues with very long term of some of the liabilities
- Thus some investments won't match, which introduces reinvestment and/or disinvestment risk
- There is also risk in changing investment strategies now, especially if the scheme is significantly underfunded

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- If a matched portfolio leaves the scheme with surplus assets, the trustees could consider benefit improvements, a Section 15C surplus distribution or bolstering the solvency reserve
- The existence of any contingency reserves and employer or member surplus accounts may need to be invested in line with the purposes of those accounts
- A less risky strategy would be appropriate for the solvency reserve
- Members' wishes should be reflected in the investment of the member surplus account (again, probably more conservative)
- The employer may be willing to adopt a more aggressive strategy on its share of surplus assets
- If there is a deficit on the best estimate basis, assets in the employer and member surplus accounts must be used to fund the deficit
- If there is a deficit on a matched strategy the trustees must decide whether to adopt a riskier strategy (e.g. more equities) to meet expected cash flows, in consultation with the employer
- But this introduces generational inequities – earlier leavers are less exposed to risk
- Or accept that all members get less than their full benefit (if employer is no longer sponsoring deficits)
- But the employer must guarantee minimum benefits, in terms of the Act
- Or the trustees can offer members transfer values and wind up the fund
- The deficit could be due to the equity volatility in which case it may be temporary
- Consider moving to a matched strategy when equities prices improve
- The rules must be consulted
- If there is a sponsoring employer, what is the likelihood of them paying future contributions
- Given their responsibilities in terms of the rules and the Pension Funds Act
- This might enable a riskier investment strategy
- But the trustees must be mindful of the employer's ability to afford increased contributions when equities fall

Question 2(ii): Outline how asset liability modeling techniques could be useful

This question was reasonably well answered by candidates.

- ALM uses a stochastic model for the economic elements of the cash flow analysis
- i.e. price inflation and asset class investment returns
- The model estimates the probability of future events
- Such as the probability that all benefits will be paid
- Or that the funding level will suffice to outsource benefits to an insurer
- Results will show mean and variance of the distributions modelled
- Useful in setting investment strategy (e.g. when assets are inadequate for a gilt-matching strategy)
- ALM can be used to compare the risk/reward pattern of different strategies
- Results will be sensitive to the underlying assumptions
- And may simply reinforce common sense
- May indicate when/how to move away from currently volatile equities

Question 2(iii): Describe impact and employer response following a fall in equities; highlighting impact on company's accounting valuation

[Each point is worth ½ a mark]

Although the question was reasonably well answered by candidates, they failed to deal with all three issues mentioned in the question, namely the impact on the fund, the employer's response and the impact on the employer's accounting valuation.

- Asset values will have changed, but not liability values
- Except for any impact due to minimum benefits value being based on the earnings yield
- Need to measure what the market conditions mean for
 - The ongoing solvency level
 - Funding requirements and
 - accounting expense if there is a deficit
- The employer could do nothing and hope for a recovery in asset values
- If short term fluctuations are not a concern for them
- If the fund goes into deficit the employer may be required to fund the deficit
- Discuss a possible change in asset distribution / investment strategy with the trustees
- Consider reducing benefits via a Section 18 scheme.
- Close the scheme, but minimum benefits will become an immediate liability
- Assess investment and corporate risks

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Accounting valuation

- IAS19 requires market value of assets and liabilities based on risk-free yield
- Hence accounting position will have deteriorated
- The change will be disclosed in company accounts
- Employer to explain / reassure shareholders
- Company's external credit rating may change

Question 3(i): Describe the information you would require to conclude the valuation

This question was well answered (as it should be)

- Response from former valuator to request for reasons why appointment may not be accepted, or whether there are any matters that you need to be aware of
- Letter from Principal Officer to FSB notifying new appointment in terms of section 9A of Pension Funds Act, and acceptance by FSB
- Rules of Fund, incorporating all amendments to present time
- Copy of report on previous statutory valuation, and any other actuarial reports
- Copies of minutes of trustees' meetings and any other relevant committees from at least the past three years
- Asset manager reports for the inter-valuation period
- Audited annual financial statements of Fund for each of the inter-valuation financial periods
- (Alternatively, asset statements, current assets and current liabilities)
- Pension increase policy
- Rates of pension increase awarded during the inter-valuation period
- Rates of inflation, BEASSA conventional and inflation-linked government bond yields at valuation date
- ILG yield or 40% of EY for minimum benefits

Question 3(ii): Draft your response to the trustees

This question was very poorly answered and none of the candidates produced a reasonable numerical attempt at the analysis of surplus. In addition, candidates generally did not properly justify any assumptions suggested and did not produce the answer in a draft format (as requested).

- PF117 is a market related realistic basis, expected to vary from valuation date to valuation date
- The 3% inflation used last time was ambitious. A rate of $1,073 / 1,038 - 1$, i.e. 3,4% would have been more realistic.
- This means that greater pension and salary increases should have been provided for and that the funded level was overstated.
- But the equity premium used was conservative. 3.0% is more commonly used and realistic, based on historical experience and would have increased the discount rate and reduced the liabilities by more than the above effect

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- Liabilities have increased from R2,80 bn ($= 3,0 / 1,07$) to R5,33 bn ($= 5,7 / 1,07$) if the funding level remained at 107%. Surplus is therefore R373 m.
- (This is essentially what needs to be justified, to explain why the funding level has remained constant. There are various ways of doing it. This is one way.)
- The main contributing factors include, roughly:
 - Surplus at last valuation (LV) of $(3,0 \text{ bn} - 2,8 \text{ bn}) = \text{R}196 \text{ m}$
 - Gross discount rate was $7,3\% + 61\% \times 1,5\% = 8,2\%$
 - Allow for Retirement Fund Tax (RFT), say 0,7%
 - Use a net discount rate of 7,5% at LV
 - Expected interest on LV surplus $= 196 \times (1,075^3 - 1) = \text{R}48 \text{ m}$
 - Investment surplus $= 5,7 - (3,0 \times 1,075^3) - 0,5 \times 1,075^{1,5} = \text{R}1,42 \text{ bn}$
 - Salary increases were greater than expected: 8,4% vs. 4,0%
 - Which increased the liabilities by $75\% \times 5,33 \times ((1,04/1,084)^3 - 1) =$ a deficit of R467 m
 - And benefits paid would have been greater than expected during the inter-valuation period (IVP)
 - Pension increases greater than expected: 7% average vs. 3%
 - Which increased the liabilities by $25\% \times 5,3 \times ((1,03/1,07)^3 - 1) =$ a deficit of R144 m
 - And pensions paid were greater than expected during the IVP
 - The proposed basis has changed.
 - An equity premium of 3% is more realistic.
 - Implying a discount rate of 11,1% now ($= 9\% + 70\% \times 3\%$).
 - There is no RFT now.
 - Although the discount rate has increased, inflationary expectations have increased by more than this.
 - Expect inflation to be $1,09 / 1,026 - 1 = 6,2\%$
 - (Some students might adjust, say by 0.5%, for uncertainty in real guarantee, so $[9\% - 0.5\% - 2,6\%] / 1,026 = 5,8\%$)
 - Real rate in excess of salary inflation is $1,111 / (1 + 6,2\% + 1\%) = 3,6\%$
 - At the LV it was $1,075 / 1,04 - 1 = 3,4\%$. Similar, but...
 - At TV the post-retirement interest rate is 4,6% ($= 1,111 / 1,062 - 1$)
 - And LV it was 5,1% ($= 1,082$ (no RFT allowed) $/ 1,03 - 1$)
 - The overall effect of these basis changes is in the region of say 5% of liabilities, so $5\% \times 5.33 =$ a deficit of R266 million
 - Ignoring other effects for now, this amounts to $196 + 48 + 1416 - 467 - 144 - 266 = 783$ vs. 373. A deficit of R410 million must still be explained.
 - The main factor is likely to be the change in the discount rate for Minimum Individual Reserves (MIR) from 3,8% pa to 2,6% p.a.
 - The weighted future term to retirement is 16 years; effect of the increase in the MIR rate is to increase the MIR liabilities by $(1,038 / 1,026)^{16}$, i.e. 20%
 - MIR liabilities include accrued deferred gratuity and pension.
 - Minimum benefits paid would have been > expected due to the lower rate
 - Other points to be made regarding factors contributing to the financial condition include:

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- Mortality experience of pensioners and in-service members
- Withdrawal and ill-health/early retirement experience
- Effect of new entrants.
- Adequacy of contributions to meet cost of accrual over the IVP
Change in Risk reserve
- Change in minimum benefits reserve (assuming that the top-up to minimum benefits is separate to the basic PSL)
- (holding PSL with a minimum of MIR is also common)
- Adequacy of administration expense provision
- Adequacy of funeral premium provision
- Change in data supplied for previous valuation / data errors
- Other changes in bases not dealt with earlier, such as assumptions relating to pensioner mortality, in-service mortality, withdrawal rates, ill-health rates, family statistics

Question 3(iii): Explain the risks facing the fund

This question was surprisingly poorly answered with most candidates only dealing with investment / inflation risk and not mentioning any of the other risks facing the fund (as requested).

- A solvency reserve ordinarily includes provision for reduced investment returns. There isn't one here.
- An alternative way of expressing this is to say that no provision has been made for an increase in inflation of a corresponding amount
- Over the long-term, the fund's investment strategy is to allocate the larger part of its assets to equities and other asset classes exhibiting similar performance characteristics to match the real requirements of the liabilities.
- At the valuation date, the exposure was 70%, which in the long-term is expected to provide for returns that exceed inflation of the order of 4% to 5% per annum, net of asset management costs.
- Over the short-term, there is protection in the form of the Solvency reserve and the surplus, but there can be no guarantee that these, and other sources of surplus that may arise, will be sufficient. The valuation approach is long-term in nature, rather than geared to the short-term.
- Short-term asset allocation strategies can mitigate the concern, but at a significant cost. Asset classes such as inflation-linked bonds would be suitable, but are expensive at this stage, compared to when they were first issued.
- Increased longevity of current and prospective pensioners is a further risk, but at this stage there is no sign that it is becoming a threat, according to the analyses conducted in the valuation.
- These can be addressed by more conservative funding (i.e. allow for improvements) and/or by insuring pensions

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- The MIR ILG discount rate has changed from 3,8% used at the last valuation to 2,6% at the current valuation. Since the valuation date, the rate may have decreased further at times, posing a possible risk to the Fund.
- Adverse mortality experience may lead to increased insurer costs. This is temporarily mitigated through the Risk reserve.
- Although the current high inflationary environment is expected to be temporary, the labour market will be pushing for high salary increases for a longer period, which will result in salary increase losses if general salary increases stay in double digits
- Admin expenses may increase by more than expected. The trustees should shop around to ensure competitive rates.
- Although the basis makes provision for inflationary pension increases, pensioners may come to expect high nominal increases in the high inflation environment.
- New entrants may decline, pushing up future required contribution rates
- Other risks facing the Fund (mostly listed in audited financial statements) include data errors, market risk, credit risk, solvency risk, currency risk, cash flow risk, liquidity risk and legal risk

Question 3(iv): Outline the additional points you would make to the trustees

This question was surprisingly poorly answered with candidates failing to discuss the alternative MIR bases, the rationale for using them, the implications of changing and then coming up with a reasonably recommendation.

- Since the original recommendation to use the “ILG” basis, on the grounds that it was likely to be more stable, it has proved to be more volatile than the “40% of EY” basis, decreasing from 3,8% per annum to 2,6% per annum at the valuation date, and may have dropped further at times.
- A sustained lower level of the ILG rate, as has been experienced elsewhere in the developed world, can be a risk to the financial soundness of the fund, and in any event while representative of the general nature of the fund’s liabilities, ILG’s are not representative of the fund’s actual asset allocation strategy.
- Extra volatility in this index is generated by the lack of supply of these bonds
- This risk in turn depends on the proportion of in-service members and the experienced rates of withdrawal.
- At the previous valuation the “40% of EY” basis would have required the deferred retirement benefits to be discounted at 2,6% per annum, and would have been the same at this valuation. The EY basis has proved to be less volatile than the ILG basis.
- At this valuation date, choice of MIR discount basis is not material (i.e. ILG and 40% of EY are similar at around 2,6%), though it has been material in the past and may well be in the future

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- The registrar would need to approve any change in MIR basis as it would not want the fund to tamper with the underlying results by switching/selecting MIR bases at successive valuations.
- The valuator has responsibility to give best advice for the long-term stability of the fund, so should be able to motivate a change in basis. Structural changes have taken place in the pricing of ILGs from initial 6,25% all the way down to near 2%
- It is most unlikely that the EY basis could remain at low (expensive levels) for sustained periods, for that implies that equity markets are at high levels. Historically, the SA equity market has not maintained a sustained high level for long periods. For example, at a PE of 20, corresponding to an Earnings Yield of 5%, the EY discount rate would be an expensive 2% (40% of 5%) per annum. The effect is mitigated by the fund's assets being more closely represented by equity-type assets.

Candidates typically made the following mistakes in answering questions:

- *Not answering the question asked / not reading the question properly*
- *Not planning time properly, often spending too much time on a low scoring question and not leaving enough time for the longer questions*
- *Not being concise in their answers - rambling and sometimes incomplete answers (hoping the examiner will figure out what was intended)*
- *Not generating enough points and spending too much time developing a minor point*

END OF EXAMINER REPORT