

Actuarial Society of South Africa

EXAMINATION

20 October 2014

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

MARKING SCHEDULE

GENERAL COMMENT

The paper tested a wide range of skills and practice areas across the 3 questions. Some candidates were very poor on any 2 out of the 3 questions but did reasonably well in the other question. Overall no such candidates passed the exam. This illustrates that candidates need an understanding of the whole employee benefits syllabus in order to do well in the exams.

QUESTION 1

- i) **Set out the IAS19 valuation assumptions you would use as at 31 December 2014 based on the information above and the methodology used in setting the 31 December 2013 assumptions. State any assumptions you make.** [4]

Well answered.

- Discount rate: 9.5%
- Inflation: 9.5% less 3.0% less 0.5% = 6.0%
- Assuming that the inflation risk premium remains at 0.5% p.a.
- 2013: salary increases of price inflation +1%, assume this still applies for 2014
- Salary increases of 7.0%
- Pension increase 2013 was $3.35\%/5\% = 67\%$ of inflation – not sensible that it was based on % of inflation given pension increase policy
- But $1.08/1.0335-1 = 4.5\%$, implies pension increase assumption based on net pri of 4.5%
- Hence pension increase 2014: $1.095/1.045-1 = 4.78\%$

- ii) Based on the above information, do the following:
- Estimate the assets, active member liability, pensioner liability and the overall financial position of the Fund as at 31 December 2014
 - Estimate the disclosures that Company X would recognise in its financial statements for the year to 31 December 2014.
 - Reconcile the amount shown in Company X's balance sheet over the year
State any further assumptions that you make. [20]

Well answered by most candidates. To be expected as similar type questions were asked in previous exams.

- a) Estimate the assets, active member liability, pensioner liability and the overall financial position of the Fund as at 31 December 2014

- Estimated asset as at 31 December 2014:
 $EE\ Cont\ (7.5\%) = R6m$, $ER\ cont = 20\% / 7.5\% * R6m = R16m$
 Assets:
 $R550m \times 1.14 + (R6m + R16m - R25m - R30m) \times (1.14)^{0.5} = R591.8m$
 {Estimated investment proceeds = R74.8} – (A)
- Estimated active member liability as at 31 December 2014:
 $EE\ cont\ of\ 7.5\% = R6m$. $ER\ service\ cost\ of\ 16\%$ is therefore about R12.8m. Total cost of one year service is R18.8m
 Expected liability using IAS19 assumptions as at 31.12.2013 hold true:
 $R100m \times 1.08 + (R18.8m - R25m) \times (1.08)^{0.5} = R101.6m$
 {Interest cost = R7.8m} – (B)
 Salary increase as at 31 December 2014 of 6% is in line with assumptions so no need to adjust for this.
 Real pre-retirement interest rate increased from 1.89% ($1.08/1.06 - 1$) to 2.33% ($1.095/1.07 - 1$) i.e. by 0.44%
 Assume that the 31.12.2013 sensitivity results still hold.
 Estimated active member liability = $R101.6m \times (1 - 0.15 \times 0.44) = R94.9m$
 {Actuarial gain due to assumption change = $R101.6m - R94.9m = R6.7m$ } – (C)
- Estimated pensioner liability as at 31 December 2014:
 Expected liability assuming assumption hold true:
 $R480m \times 1.08 + (-R30m) \times (1.08)^{0.5} = R487.2m$
 {Interest cost = R37.2m} – (D)
 Post retirement interest rate gap remains unchanged at 4.5% so no need to adjust assumption.
 Allow for higher pension increase as at 31 Dec 2014:
 Estimated pensioner liability = $R487.2m / (1.0335) \times (1.04) = R490.3m$
 {Actuarial loss due to pension increase = $R490.3m - R487.2m = R3.1m$ } – (E)
- Financial position as at 31 Dec 2012:
 - Assets: R591.8m

- Liabilities: $R94.9m + R490.3m = R585.2m$
 - Surplus = $R6.6m$
 - Surplus reverts to ESA per rules so Company X would recognise full surplus
 - Key assumptions (valid alternatives may apply):
 - Contributions, benefits and pensions paid spread evenly throughout the year
 - Salary increase as at 31 December 2014 is the same for all members
 - Benefit outgo value is on average equal to the IAS19 liability held for a member i.e. not profits or losses arise on exit.
 - Expenses are met directly by the Company
 - Actual experience to 31 Dec 2014 is consistent with the above estimates
 - Assume that the 31.12.2013 sensitivity results still hold (if not stated above).
- b) Estimate the amounts that Company X would recognise in Profit and Loss and in Other Comprehensive Income for the 2014 year.

Expected asset as at 31 December 2014:

- $R550m \times 1.08 + (R6m + R16m - R25m - R30m) \times (1.08)^{0.5} = R559.7m$

{Expected investment proceeds = $R42.7m$ } – (F)

Asset reconciliation IAS19

○ Assets at start	550.0m
○ Member contributions	6.0m
○ Company contributions	16.0m
○ Benefits paid	-55.0m
○ Discount rate return (F)	42.7m
○ Excess return (A less F)	<u>32.1m</u>
○ Assets at end	591.8m

Liability reconciliation IAS19

○ Liability at start	580.0m
○ Member contributions	6.0m
○ Service Cost	12.8m
○ Benefits paid	-55.0m
○ Interest cost (B plus D)	45.0m
○ Actuarial loss (gain) (E less C)	<u>-3.6m</u>
○ Liability at end	585.2m

- Profit and Loss

○ Service cost (net of member conts.):	12.8m
○ Interest cost:	45.0m
○ Discount rate return:	<u>-42.7m</u>
○ Recognised in P&L	15.1m

- OCI

○ Excess returns:	-32.1m
○ Actuarial loss (gain):	<u>-3.6m</u>
○ Recognised in OCI	-35.7m

c) Reconcile the amount shown in Company X's balance sheet over the year

○ Liability (asset) 2012:	30.0m
○ Recognised on P&L:	15.1m
○ Recognised in OCI	-35.7m
○ Company contributions paid	<u>-16.0m</u>
○ Liability (asset) 2013:	-6.6m

iii) Estimate the financial impact on the IAS19 disclosures if a pension increase assumption of 75% or 100% of inflation were implemented as at 31 December 2013. State any assumptions that you make. [5]

Unfortunately the question referred to a valuation date of 31 December 2013 and not the intended date of 31 December 2014. It was possible to do the calculations at either date and candidate's answers were marked accordingly. This question was well answered by the better candidates but poorly answered by the rest. The answer below is based on the valuation date of 31 December 2014

75% of inflation

- Pension increase assumption would be 4.5% p.a. (75% of 6.0%)
- Pri would be 4.78% instead of 4.5% i.e. 0.22% higher
- Assume that the sensitivity results from 2013 still apply in 2014
- Implies a decrease in the pensioner liability of about 1.76% (0.22x 8%)
- Active liability will decrease by a similar amount (probably slightly higher percentage as average retirement age likely to be less than current pensioner age)
- Revised liability: $R585.2m \times (1 - 0.0176) = R574.9m$

- Assets remain unchanged and surplus increases to R16.9m

100% of inflation

Same assumptions as above

- Pension increase assumption would be 6.0% p.a. (100% of 6.0%)
- Pri would be 3.30% instead of 4.5% i.e. 1.2% lower
- Implies an increase in the pensioner liability of about 9.6% (1.20x 8%)
- Revised liability: R585.2m x (1+0.096) = R641.4m
- Assets remain unchanged and surplus of R6.6m reduces to a deficit of R49.6m

iv) Set out the points you would make in response to the FD

[8]

There are different views on this issue. Credit was given for any sensible actuarial view. Poorly answered by most candidates.

- The IAS19 assumptions are ultimately the responsibility of the Company. The Company can therefore decide what pension increase assumption it want to use.
- There is no legal requirement in terms of the Pension Funds' Act or in terms of IAS19 to fix pension increases at a fixed percentage of inflation.
- Pension increases are a discretionary benefit (i.e. not fixed in the rules). IAS19 only requires that discretionary benefits are valued in line with what the beneficiaries can expect in future.
- The Fund's pension increase policy is 75% of inflation but this is subject to affordability. Simply setting the allowance for future pension increases equal to 75% of inflation would result in the same liability as if the Fund guaranteed pension increases at 75% of inflation (given that the discount rate is based on risk free government bond yields).
- The last 5 years' pension increases have been just above 100% on average but this needs to be placed in context:
 - Past increases can raise expectations of similar future pension increases
 - But this depends on how the past increases were communicated to pensioners
 - If pension increases have exceeded 75% in recent years because the Fund has earned good investment returns then this supports setting the future pension increases based on affordability
 - The fact that the last 5 years' increases were volatile relative to inflation also supports the "affordability" arguments as opposed to some fixed percentage of inflation

- If there is a past practice of the Company funding increases when 75% of inflation (or even 100% of inflation) was not affordable, then the case of a 75% of inflation pension increase assumption is strengthened
- Might want to consider a longer pension increase history. Recent higher increases might not reflect the long term trend

QUESTION 2

- i) **Discuss the factors that the Trustees should consider in making such an offer to active members** **[8]**

A reasonable attempt was made by most candidates although some wasted time by making points regarding conversions that were irrelevant to the question.

- Confirm that the fund's rules still permit a conversion / transfer of this nature. If not, consider rule amendments needed.
- Will need to provide pre and post conversion reports to the FSB which sets out the terms of the conversion etc.
- Cannot offer less the prescribed minimum benefits
- Also consider what was offered in 2005 conversion:
 - Current members did not elect to convert in 2005, so would possibly require a greater incentive now to convert?
 - Members will have seen the performance of the DC fund over the last 9 years. This will influence members (positively or negatively depending on that performance).
 - Offering significantly greater incentive now might create unhappiness with 2005 converters?
 - But given that it was 9 years ago and was done on a voluntary basis, less reason for 2005 converters to be unhappy
- Offer is voluntary therefore less need to ensure members better off in most circumstances than if would be for a compulsory conversion
- But need to give sufficient information to members to allow them to make an informed decision. Detailed communication is therefore essential.
- Consider providing financial counseling to members

- Look at appropriateness of current valuation basis for the purposes of determining transfer values. Might want to review decrements, etc

ii) Discuss how Fund X might alter its investment strategy in response to the above changes [7]

Reasonable attempt by the better candidates.
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- Currently contribution income of R87.5m (25% of R350m) exceeds pension payments R50m per annum.
- Assuming active member lump sum payments don't exceed R37.5m by too much, contribution income plus investment income received probably exceeds benefit outgo.
- This will change when contribution income reduces to R17.5m. Fund will be cashflow negative.
- Fund will therefore need to ensure that assets are structured to meet this shortfall. Will most likely require a move to more liquid assets with stable market values (short term bonds and cash).
- Could also consider some form of cashflow swap to meet pension payments for a fixed number of years. Type of swap will depend on pension increase policy of the Fund
- The transfer of 80% of the active members in 3 months time may also require a change in the current investment with either a hedging of the assets against any market movements or by allocating part of active member assets to cash.
- The long term investment strategy of the Fund will depend largely on:
 - The pension increase policy (the less the pension increase is guaranteed or the lower the affordability hurdle rate, the more aggressive the policy can be)
 - The ability of MegaMart to deal with any volatility in the funding level of the Fund (both making good shortfalls on the statutory valuation basis and dealing with fluctuations on an IAS19 basis)
 - The level of reserves and the ESA in the Fund. The bigger, the more investment freedom the fund has.

- Reduction in assets with the transfer and net outflows may result in a reduction in possible investments e.g. fund may no longer qualify for segregated portfolios
- All things being equal, one would expect a slightly more conservative investment strategy to result with a greater emphasis on liquidity

iii) Comment on the key considerations for MegaMart and the Trustees regarding the future of Fund X after the transfer [9]

Poorly answered. Candidates simply did not make enough relevant points given the marks available.

- Size of fund is now significantly smaller. Would need to see how this impacts on administration and investment expenses.
- In particular, investments will most likely need to move to pooled investment portfolios over time as the fund becomes smaller
- Certain expenses are likely to remain unchanged as the fund grows smaller (audit, actuarial fees etc)
- With the on average younger active members transferring out, the duration of the fund's liabilities will have reduced
- But the average duration is still likely to be in excess of 20 years given the average age of members and pensioners
- Liabilities are also likely to become more volatile as the fund's membership decreases and demographic experience becomes harder to predict. This may require a more conservative valuation basis.
- Alternatively, risk benefits may need to be insured or insured on a more exact basis.
- As the fund ages, the investment strategy might need to become more conservative, but this depends on the level of reserves and ESA within the fund.
- A more conservative investment strategy will result in a higher liability but this may be offset by a lower solvency reserve
- More conservative valuation basis will result in required employer contribution rate increasing. Can this still be met from the ESA?

- MegaMart will need to consider if it still wants to sponsor the fund once there are no more members and whether it wants to spend time (through employer Trustees) looking after the fund
- Might consider outsourcing the pensioner to an insurer if the reserves and ESA can meet the costs of doing so (or if MegaMart covers any additional cost) or alternatively hedge some of the pension liability through cashflow swaps and / or mortality insurance
- Alternatively, could transfer the pensioners to any other pension fund that MegaMart participates in?

QUESTION 3

- i) **Compare the main features of an umbrella retirement fund to a standalone fund and describe the possible reasons why an employer would typically consider moving their retirement benefit provision to an umbrella fund.** [7]

Well answered by most candidates.

Umbrella vs standalone

- Both are registered in terms of the Pension Funds Act
- Standalone funds are only open to entities associated with the sponsor of the fund (typically an employer or union). Umbrella funds are generally set up by an administrator (the sponsor) and are open to any employers who decide to participate in the fund.
- Umbrella funds tend to limit the benefit structure that a participating employer can implement as most umbrella funds are valuation exempt. Typically umbrella funds would not pay pensions or cater for certain types of reserve accounts (e.g. investment reserve for smoothing etc). Standalone funds do not usually have such restrictions
- Trustees in a standalone fund must be at least 50% member elected. Trustees in an umbrella fund are appointed by the sponsor but usually at least 50% are independent of the sponsor.
- Umbrella funds often interact with participating employers through a management committee or through a broker.

- Umbrella funds often have more investment options available to members and participating employer that a standalone fund would have.
- Umbrella funds usually offer economies of scale in terms of administration and investment fees when compared to a typical standalone fund
- Umbrella funds offer a one-stop shop with less direct interaction with other service providers when compared to a typical standalone fund
- No compliance requirements on participating employer in an umbrella fund

Reasons for moving

- Umbrella funds are usually sold on the basis that they are cheaper in terms of administration fees than what a standalone fund
- There is also a potential saving on investment fees due to economies of scale that an large umbrella fund can achieve
- However, these fee reductions don't necessarily benefit the participating employer as the umbrella fund sponsor may retain some of the fee saving
- Better governance. Umbrella fund trustees are often industry experts. They either work for the sponsor or are independent. Independent trustees are often appointed from various sectors in the retirement industry (actuaries, lawyers etc). In theory this should ensure a more professional board of trustees that what most standalone funds have.
- Further, being a trustee has come with increased obligations and risks in recent years. An employer and its employees might be reluctant to take on these risks and obligations in by becoming trustees in a standalone fund.
- Time. The employer appointed trustees of a standalone fund tend to be senior people at the employer (this is also often the case of member elected trustees). The increase in governance of retirement funds means that considerable more time is spent on fund issues. The employer can reduce this time spent significantly by using an umbrella fund.
- Options. Umbrella funds often offer far greater choice of investments that a standalone fund. This is attractive to some employers / senior employees at the employer.

ii) Discuss the likely complications that would need to be overcome in order for Company X to retain its existing retirement benefit structure within an umbrella fund arrangement [5]

Surprisingly poorly answered. Candidates did not consider the features of the current fund that would most likely be incompatible with the rules of a typical umbrella fund.

- Umbrella funds tend to only provide lump sum death benefits.
- Spouse and child pensions would therefore need to be replaced with a lump sum benefit
- This will most likely result in some members being better off and some being worse off as far as death benefits are concerned. This would need to be explained to members so that they can make alternative provision
- Will not be able to self-insure risk benefits in an umbrella fund if this is the case in the Fund.
- Umbrella funds only offer pooled investment portfolios offered by investment managers or multi-managers.
- Keeping the Fund's existing risk profiled portfolios which contain segregated portfolios will not be possible. This could involve a significant change in the investment strategy.
- Might need to realize assets in segregated portfolios at inopportune times or may not be able to sell assets at all (e.g. large property)
- If the Fund has reserve accounts, it might not be possible to replicate these in the umbrella fund

iii) Describe how you would compare the impact of costs on a member's retirement benefit. [5]

Well answered by most candidates. There are a number of different ways of determining the impact of costs. Most candidates considered the change in NRR or projected Fund Credit. The method set out below looks at the reduction in returns. Any valid method was marked accordingly.

- Look at the reduction in overall return under each retirement fund due to the application of expenses and investment fees.

- This would involve:
 - Projecting the expected future contributions up until NRA.
 - Allow for salary increases (6% per annum plus some added %)
 - Deduct the cost of risk benefits but not expenses from the contributions
 - Together with the current Fund Credit, this gives the expected gross cashflows towards retirement benefits (call this A).

- Determine the expected retirement benefit under each retirement fund option by:
 - Reducing the 12% per annum gross investment return by the investment charge
 - Deducting the administrative charge from the contributions
 - Rolling up the above contributions plus current Fund Credit to NRA using the reduced return (call this amount B)

- Solve for the investment return that would equate the cashflows in A to the value of B. The difference between this return and the gross 12% per annum will be the reduction in yield.

{Credit given for any other method that gives an overall picture of the impact of costs}

iv) Calculate the impact of costs for both Johnny and Sarah under the Fund and the two umbrella funds and comment on your results. [17]

There are a number of valid approaches that can be followed and papers were marked accordingly. This question differentiated the better candidates who answered this well. Other candidates answered this extremely poorly.

- Assume salary increases of inflation plus 1% per annum i.e. 7% per annum
- Assume salary increases are continuous
- Assume Rand fees increase in line with salary increases
- Assume risk benefits will remain at 1.25% of salaries in the umbrella funds

{ Kept full decimals for calcs – show % to 3 decimals below }

Fund build-up:

Net annual return is 12% - 0.5% = 11.5%

Real return above salary increases is $1.115/1.07-1 = 4.210\%$ per annum or 0.344% per month

Johnny:

$$100000*(1.115)^{35} + 6000 *(0.17-0.0075-0.0125)*a_{35x12@0.344\%} *1.115^{35} = 13\,535\,742$$

Sarah:

$$3500000*(1.115)^{15} + 75000 *(0.17-0.0075-0.0125)*a_{15x12@0.344\%} *1.115^{15} = 25\,631\,978$$

UF A build-up:

Net annual return is 12% - 0.75% = 11.25%

Real return above salary increases is $1.1125/1.07-1 = 3.972\%$ per annum or 0.325% per month

Johnny:

$$100000*(1.1125)^{35} + (6000 *(0.17-0.0125)-100)*a_{35x12@0.325\%} *1.1125^{35} = 12\,245\,723$$

Sarah:

$$3500000*(1.1125)^{15} + (75000 *(0.17-0.0125)-100)*a_{15x12@0.325\%} *1.1125^{15} = 25\,209\,513$$

UF B build-up:

Net annual return is 12% - 0.75% = 11.25%

Real return above salary increases is $1.1125/1.07-1 = 3.972\%$ per annum or 0.325% per month

Johnny:

$$100000*(1.1125)^{35} + (6000 *(0.17-0.0125-0.01)*a_{35x12@0.325\%} *1.1125^{35} = 12\,627\,841$$

Sarah:

$$3500000*(1.1125)^{15} + (75000 *(0.17-0.0125-0.01)*a_{15x12@0.325\%} *1.1125^{15} = 24\,771\,720$$

Full formula (no expenses deducted from contributions)

Johnny:

$$100000*(1+i)^{35} + (6000 *(0.17-0.0125)*a_{35x12@i}*(1+i)^{35} = X$$

Sarah:

$$3500000*(1+i)^{15} + (75000 *(0.17-0.0125)*a_{15x12@i}*(1+i)^{15} = X$$

Where:

X = future value of retirement benefit under Fund, UF A or UF B above for Johnny or Sarah respectively

$$i' = ((1+i)/(1.07))^{(1/12)}-1$$

i = annual return earned which needs to be solved for

Using i=12% i.e. the gross rate yields R15 719 342 for Johnny and R27 566 790 for Sarah

In all cases above the value of X is lower, hence yield below 12%

Using iteration:

Reduced return per annum (i)

	Fund	UF A	UF B
Johnny	9.90%	9.59%	9.68%
Sarah	10.64%	10.52%	10.39%

Reduction in yield (12%-i)

	Fund	UF A	UF B
Johnny	2.10%	2.41%	2.32%
Sarah	1.36%	1.48%	1.61%

v) **Comment on your result in iv)**

[5]

Some good answers but most candidates either ran out of time or did not have sensible results from iv) to comment on.

- Fund is cheapest option for both J & S.
- Not surprising given size of Fund
- Reconsider move to umbrella fund?
- S has lower reduction in yield than J but calculation ignores past expenses reflected in fund credits. Fund credit only attracts investment fee going forward
- So direct comparison in reduction in yield between J & S is not really meaningful.
- UFA vs UFB for J shows that for lower paid members, a fixed Rand admin fee will result in a greater reduction in yield than a % of salary based admin fee.
- Fixed admin fee is probably a fairer reflection of the actual cost of administration. However, salary % is more in line with current Fund structure (redistributive)
- Cost should not be the only consideration. Investment options, governance, time saving, reputation of sponsor etc should also be considered when looking at the 3 funds