

EXAMINATION

September 2008

**Subject SA1RSA - Health and Care
Specialist Applications**

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable

Comments

The solutions contained in this document are more detailed than what would typically be required for a clear pass. Any relevant points made by candidates were given full marks, even if they are not contained in the solutions presented below.

Question 1

i) *Part (i) was answered well.*

- Introduction, including scope of report, intended audience, limitations
- Description of subsidy policy
- Data analysis and description, incl limitations
- Valuation methodology
- Valuation assumptions
- Results of valuation, plus analysis of actuarial gains and losses
- Sensitivity analysis
- Conclusion and Recommendations

ii) *In part (ii) several candidates neglected to recommend an actual basis – this was clearly required in the question. Candidates should note that they would not get marks for recommending an assumption of “anything between 5% and 20%”. Whilst a recommendation of a range for a value is acceptable, choosing such a wide range is meaningless and cannot earn any marks.*

Financial assumptions

- The most important assumption is the gap between the long term valuation interest rate and the long term medical inflation rate
- In this context medical inflation refers to the expected contribution increases
- The valuation interest rate has to be set by reference to long term corporate bond rates, unless the actuary is of the opinion that the market in corporate bonds is not sufficiently deep, in which case Government bonds may be used
- Most actuaries in South Africa prefer to use long term Government bonds as a reference point
- Given current Government bond rates of around 10%, it would be appropriate to assume contribution increases of around 8% to 9% (i.e. a gap of 1% to 2%, although 0% to 3% could probably be justified)
- This is also higher than long term CPI, probably reasonably assumed to be 6%
- As the contribution table of the scheme is income rated, the actuary will also have to make assumptions on:
 - The rate of pre-retirement salary inflation for active members
 - ...probably at around 7% or 7.5% relative to the above
 - ...and the rate of post-retirement pension inflation
 - ...which depends on the retirement fund rules, but is typically at CPI, hence in this context can be assumed to be 6%
 - ...and finally on the rate at which the income bands will increase in the long term

-and this can typically be assumed to be such that there would no bracket creep (i.e. bands increase in line with salary inflation)

Demographic assumptions:

- Pre-retirement mortality, typically latest SA mortality table, such as SA85-90 or similar
- Adjusted for HIV / AIDS on the basis of the latest ASSA model
- Post-retirement mortality, typically an appropriate annuitant table, such as PA(90), as it is more prudent to have lighter mortality in retirement
- Other pre-retirement decrements based on the company's experience or if not available industry tables, namely
 - Rate of disability retirement
 - Rate of withdrawal
 - Rate of retirement, including early retirement
- Depending on valuation methodology, assumptions may also be required in respect of:
 - Spouses' age difference
 - Number of dependants at different ages
 - Rate of marriage at different ages
- The actuary could also make an assumption about the rate of migration between the different options

iii) *Some candidates only discussed the REF in general terms, and did not indicate the potential impact of the REF on the PRMA liability.*

- The REF only equalizes risk in respect of PMBs
- Those schemes with a higher pensioner ratio, such as this one, would tend to be net receivers from the REF
- As the demographic risk is assessed on the basis of age and chronic conditions, and with only a few exceptions (e.g. HIV / AIDS) chronic prevalence increases with age
- Which means that the scheme would be in a position to decrease contributions for all members
- And this will lead to an immediate reduction in the PRMA liability to reflect the reduction in contributions
- Furthermore, the lower contributions might attract more younger and healthier members to the scheme, which will further increase its long term viability and lead to further stability in the contribution rate,
- And this will again be reflected in a decreasing PRMA liability in the sense that the gap between contribution inflation and the valuation interest rate can be reduced
- Although higher membership would increase the liability provided those who join are also entitled to post-retirement subsidies.

- iv) *Most candidates did not pick up the fundamental issue in this question, namely that the valuation would now be on a claims basis, as opposed to a contribution basis, and that this will increase the liability significantly. It is disappointing that very few candidates understood this basic principle of PRMA valuations.*
- The company can be regarded as effectively providing a guarantee on the financial position of the scheme
 - Which means that further payments may well be required in future as the scheme's finances are unlikely to improve due to the high pensioner ratio
 - Given this, the company's liability is not only in respect of contributions, but also in respect of claims
 - Which means that the PRMA liability has to be valued on the basis of pensioner claims, i.e. by not taking into account the cross-subsidy from younger to older members currently implicitly contained in the contribution rates
 - Due to the removal of this cross-subsidy in the valuation, the defined benefit obligation of the employer will increase immediately,
 - a pensioner claim valuation will therefore results in an increase in the PRMA liability relative to a contribution valuation
 - The actuary will also have to assume a gap between the long term valuation rate and the rate of medical claims inflation,
 - which would be smaller than the gap between contribution inflation and the valuation rate, or even negative
 - and this will lead to a further increase in the PRMA liability
 - Overall, there will be a very significant increase in the PRMA liability
 - Unless the employer can demonstrate that no future payments will be made to the medical scheme under any circumstances
- v) *The answers to part (v) were disappointing. Very few candidates picked up that strategy (a) would lead to a claims liability valuation basis, and hence increase the liability. The various points relating to waiting periods and underwriting under part (c) were generally also not mentioned.*
- a. Setting aside funds in the medical scheme
- Any funds injected into the medical scheme will become part of the general accumulated funds of the scheme
 - And cannot be ringfenced to be used only for pensioner contribution subsidies
 - Which means that this strategy would be very ineffective in reducing the long term liability reflected on the balance sheet
 - And only to the extent that the injection helps to stabilize the finances of the scheme will it reduce the long term liability

- But this is likely to be more than offset by the fact that the liability will have to be valued on a claims as opposed to a contribution basis, which will be entrenched by the capital injection into the Scheme
- b. Taking out annuities
- The liability value of the annuities is likely to be lower than the liability value of the subsidies
 - This is because the annuities will commence at the same Rand value, but will increase probably in line with CPI, and not in line with the (higher) contribution inflation of RetailHealth, as no insurer would write an annuity with such a guarantee. Note: candidates who assumed that the annuity would be flat and not increase in line with inflation were given full credit.
 - Also, the payment may well be tax efficient in the hands of the employer
 - And hence this is an effective strategy to reduce the liability
 - However, to avoid legal action, the employer will probably have to disclose that the value of the annuity offered is lower than the value of the subsidy
 - And this will have to be agreed with and negotiated with individual pensioners
 - Many of whom may well be willing to accept it, if they are worried about the employer's future commitment to pay subsidies.
 - but some pensioners may choose not to, which means that some proportion of the PRMA liability would still be carried on the balance sheet
- c. Subsidise contributions to another open medical scheme
- Closing RetailHealth means that the existing reserves of the Scheme can be paid out to members
 - But this is likely to be a protracted legal process
 - However, assuming that it can be done successfully, members would have to be happy with the employer's choice of scheme to agree to it (if one scheme is chosen for subsidy)
 - And this will depend on how benefits and contributions and service and managed care practices compare against RetailHealth
 - The receiving open scheme may impose waiting periods on some members, to the extent that it is allowed in the Act
 - Which means that some members may be without cover for certain conditions for a defined period, which would cause problems for the employer
 - Unless the employer transfers the entire group in the 1st of January in any particular calendar year, when waiting periods cannot be applied
 - If the employer does not choose a single scheme, but instead pays a subsidy to any scheme that the member wishes to join, waiting periods will almost definitely apply

- And members may object to this and via legal processes stop the employer from implementing this strategy
- However, if the above problems can be overcome and the strategy implemented, the employer may be better off in the sense that there will be no question about the fact that the employer could then disclose the PRMA liability on the basis of a contribution as opposed to a claim based valuation
- The long term contribution inflation in the open medical scheme will also most likely be lower than what RetailHealth faces, as the open scheme is likely to have a much lower pensioner ratio
- And this will in itself reduce the PRMA liability of the employer
- This is therefore an effective strategy to reduce the liability, but may be difficult to implement
- This strategy could also be implemented by merging RetailHealth with the open scheme, but this would have to be agreed to by the Trustees of the open scheme and would be subject to the Registrar's approval

d. Network for more comprehensive option

- Having a provider network in place for the more comprehensive option is likely to reduce long term contribution inflation
- Particularly if it allows the more effective management of PMBs that have to be paid at cost in most instances
- But will not be particularly effective in immediately reducing the PRMA liability of the employer, as the benefits are likely to emerge over the medium to long term, and the Scheme still has a fundamentally high risk group
- Also, it will almost definitely not be popular for the members of the comprehensive option, who pay high contributions and would not want to have their choice of service providers restricted
- And this is particularly true given the compulsory nature of membership for high income employees, and would most likely be resisted by top management
- There is also a risk of selective downgrading
- The strategy is therefore unlikely to succeed

Question 2

- i) *In general candidates performed fairly well on part (i).*
- This is a large scheme with stable demographics so changes in risk profile should not be the driver, but this could be confirmed through thorough analysis of plpm by age and movements in age and gender profiles
 - Were there any benefit changes that might have increased hospital utilization (for example removal of certain exclusions or deductibles)?
 - All analysis should be done by option to identify which option is driving the experience. There may have been moves of the membership between options which could explain some of the increases in cost.
 - Breakdown hospital plpm into admission rates and average costs per event
 - Consider admit rate by:
 - age and other demographic factors to gain insight into sub population claiming more
 - Admitting doctor type to identify which discipline is driving the admissions
 - Region to identify which areas experienced increased hospitalization usage.
 - Duration of membership to see whether new or existing members are claiming more, this will also help test any anti-selective activity and underwriting efficacy
 - It is important to note that while a scheme's population may be stable on a net basis, there may be large moves in and out of the scheme and this introduction of new lives for old can result in changing characteristics and costs
 - In terms of cost per admission, consider the tariff increase granted, and what proportion of hospital costs this applied to
 - The average hospital cost per admission should be analysed by hospital group to see if a particular group is driving cost more than others
 - Case mix will be important to take into account as a change in the types of admissions may explain some of the increase
 - Broad types of cases should also be considered – emergencies, surgical and medical cases - as these have different cost characteristics
 - Within hospital admissions, analysis should be done on changes in length of stay as well as levels of acuity to measure how much changes in these items contribute to the increase.
 - Theatre times should be analysed to look for increases in average time.
 - Non tariff items should also be analysed. These are in two groups – medicines and surgicals, and are currently governed by different regulations.
 - Increases in the prices of medicines should be known, but increases in the use of medicines (mix and volume) should be analysed.

- Surgical prices increases are not subject to regulation and have been linked to exchange rate moves and other inflation factors. These price increases should be analysed.
- Changes in utilization of surgical items should also be understood.
- Changes in the incidence and type of large claims
- Changes in seasonality (i.e. a harsher winter than usual)
- Other non tariff items like prosthesis add a lot to hospital bills on average, and changes in prices and utilization should also be analysed.

ii) *Candidates performed fairly well on part (ii).*

- Managed care interventions could be developed and implemented or existing interventions tightened. These might include clinical protocols for admission to hospital for certain procedures that might require a prosthesis – i.e. try and stop the admissions completely, based on accepted clinical principles
- This may be accompanied by some alternative offer of benefits to compensate members, or suggested alternative for of treatment
- Could engage specialist disciplines driving utilization (eg orthopedic surgeons and cardiologists) to agree on methods to reduce costs. This could be to use less, or to use more cost effective alternatives.
- Could implement a designated service provider network for some prostheses
- Incentives could paid to the doctors to encourage prudent prosthetic behaviour, as measured against their peers, provided quality of health care is also part of the assessment
- The scheme could enter price negotiations with suppliers of the prosthesis to secure lower costs
- Could potentially take out a reinsurance contract to protect against these risks, but this is unlikely to be available in the market.
- Hospitals could also be encouraged or incentivized to stock cheaper alternatives, although this would be difficult for some types of prostheses where doctors might insist on a particular brand
- If increases are attributable to a small group of doctors these could be contacted to develop targeted cost saving strategies
- Alternatively a network of doctors with prudent behaviour in respect of internal prosthesis could be set up. This might only work for some options, and there may be some doctor resistance against it.
- Going into next year the following year certain benefit changes can be made
 - These include setting or lowering a prosthesis limit
 - Developing a formulary where only certain prosthesis are paid for
 - Place co-payments on all or expensive prosthesis
 - Certain procedures that use prosthesis could be excluded
 - Deductibles can also be placed on certain procedures with the intention to lower utilization
- All of these interventions would be subject to the requirements of Prescribed Minimum Benefits legislation

- And may differ for different options
- iii) *Most candidates failed to mention the full range of measures that could be implemented.*
- This is a large year on year increase. The analysis on the types of cases (i.e. casemix) would provide some direction on tactics. There may have been changed in treatment patterns which will need to be understood to effectively manage the length of stay
 - Managed care protocols can be developed or bolstered
 - Benchmarks on lengths of stay for certain procedures can be implemented and /or enforced more tightly,
 - Authorisations can be changed, per procedure, or type of admission, to a benchmark number of days, with further clinical information and motivation needed for further days in hospital to be approved
 - Case managers activity can be stepped up on discharge planning to get people out of hospital earlier
 - Lengths of stay can be observed to increase if the admission rate for shorter admissions decreases, this should be expected
 - Early discharge to rehabilitation or step down facilities can reduce costs, and may have better techniques for managing length of stay.
 - Specialist disciplines driving length of stay can be engaged to assist in developing protocols for managing length of stay and agreeing on suitable benchmarks.
 - Doctors could be incentivized to discharge patients early if appropriate
 - Maintenance of quality standards will again be key
 - Going into next year, options design could include a network design element (either for doctors or hospitals) that are efficient in respect of length of stay
 - Disease management programs can be bolstered for chronic conditions where admissions are likely (for example cardiac disease, diabetes). Maintaining the health of these patients will improve their LOS
 - Investigate the funding of certain new technologies (for example laparoscopic procedures) that reduce the length of stay in hospital with the same or better outcomes, and then encouraging these technologies through benefit design
- iv) *This was a straightforward bookwork question and most candidates got most of the marks.*
- Fee for service. Risks transferred: price risk. (Note that it is not strictly true that price risk is transferred for *all* types of claims under fee for service, but this answer was accepted in accordance with the definition of price risk in the core reading.)
 - Per diem rates. Risks transferred: price risk, intensity risk
 - Fixed fees and global fees. Risks transferred: price, intensity & severity risk

- Capitation. Risks transferred: price, intensity, severity, frequency risk
 - Percent of premium. Risks transferred: price, intensity, severity, frequency, actuarial and marketing risk
- v) *Candidates did not perform well on this part of the question. Some candidates did not discuss a data set specifically for the purposes of setting global fees and some of the data checks mentioned were also not relevant to the specific requirements of the question.*
- Hospital cost per admission and date of admissions (costs and counts of admissions)
 - Detail of costs per admission – theatre time, level of acuity, medicines used, surgicals used,
 - Types of case – what diagnosis, procedures, main doctor type, demographic characteristics of patients
 - Should have at least one year’s worth of data, up to 3 for small scheme
 - Then also need information on benefit design over past period to check their impact on hospital costs (for example carving out dental admissions)
 - Data from earlier years should be adjusted for inflation into the current year
 - Information on any special changes in the period of data (single exit price changes, rebate transfers to tariff items etc)
 - Professional fees per case including doctor fees, associated doctor fees (eg anaesthesia), radiology, pathology etc.
 - Data on doctors billing patterns if there are varying levels of reimbursement
 - Data should be checked for zero cost admissions, admissions with no hospital costs
 - Very high cost admissions should be identified and decisions made on how to treat them. If certain characteristics make these high cost events unusual (Siamese twins, etc) they should be treated as special cases and excluded from other data to avoid distortions.
 - Other checks should be done (eg admit rate absolute, trends, seasonality)
 - Should look for classifications and structures that explain variance in the average cost per event.
 - Check whether average costs are similar to industry statistics
 - Check total costs against information from the financials and or council returns
 - Check distributions of admissions, within each group or type of case to identify outliers that may need to be trimmed.
 - Once the fees are set, the model variance will also need to be measured / tested to test goodness of fit. If the fit is poor, the model will be difficult to report on and enforce.

vi) *Candidates did not perform well on this part of the question. Several candidates did not mention how the underlying fee for service data mentioned in the question would be used.*

- The actual cost per admission under the contract versus what it would have been with no contract given fee for service (FFS) data
- If there is a profit share in savings it will be calculated based on this difference (if there is a saving)
- Case mix will have to be measured and adjusted for
- Unexpected changes in case mix should be investigated – upcoding to more complicated cases can increase revenue improperly
- Hospital costs and each category of related expenses should be measured separately
- Inflation on each component will have to be measured in both price and utilization terms – for example price inflation on drug items, and the number of drug items used
- If there are carve outs of the program (for example very complex cases) these should be investigated in detail to monitor potential abuse of the structure
- Certain quality measures (mortality, readmission rate, infection rates) should be measured and monitored – versus years past, and versus other hospital groups
- Exact details of the admissions used in the classifications will have to be measured, and probably audited
- 6 months may be too soon to make any judgments on whether it is working
- Doctors should be polled to determine their reaction to the program – without doctor co-operation the model is not likely work.
- The contract may have allowed for certain inflation adjustments – these should be determined based on the agreed method.

vii) *The performance on this question was particularly poor. Many candidates did not pick up the fundamental issue: this restriction means there is now not much point in entering into the agreement.*

- R10 000 is quite low – below average, especially since related accounts are included
- This would be another way to carve out high cost cases
- There will be many cases under this R10 000 but the individual cost of these cases is quite small, case management would probably not have focused on these cases to begin with. In other words, this limits the potential savings that will be achieved
- It will need to be specified that happens when a case breaches the R10 000 – if it reverts to FFS, then the deal offers little protection.
- The hospital might not want to take risk for larger cases, which might be because they don't have experience in this fee structure.

- The R10 000 can also become a target so that a hospital will try to exceed R10 000 for cases just below the cut off.
- This may exclude certain types of cases altogether – cataracts for example.
- It would be better to have carve outs (if any) done in a different way – for example, based on some objective measure like clinical coding (but the quality of the clinical data can be poor)

END OF EXAMINERS REPORT