

**Subject F201 — *Health and Care***

**Specialist Applications**

**May 2015**

**EXAMINERS REPORT**

## Marking Solution F201 May 2015

### Question 1

*(i) Discuss the impact that the introduction of GEMS in 2006 has had on the South African medical schemes industry.*

*{This question was based on bookwork.}*

GEMS was introduced in 2006 and experienced rapid growth in the years that followed.

A large part of this growth was in the form of government employees who moved to GEMS from a number of other medical schemes.

In particular a large number of these members came from open medical schemes

The members who belonged to these open schemes and were eligible to become GEMS members also tended to have a lower average age and claim less compared to non-government employees.

The result of government employees leaving these schemes was an increase in average claim costs (and consequently contributions) on schemes that had large proportions of these members.

Some open medical schemes (that had previously marketed extensively to government employees) were severely affected and experienced financial difficulties which resulted in large contribution increases and amalgamations.

Additional growth was achieved by previously uncovered public service employees joining the scheme.

A large proportion of the growth in the total number of lives covered by the medical schemes industry since 2005 is attributable to the addition of these previously uncovered GEMS members.

Membership of GEMS was *not* made mandatory for employees who belonged to another medical scheme at the time of GEMS' inception.

However, public servants were encouraged to join GEMS by means of a subsidy that was significantly higher than the subsidy they would receive on other medical schemes.

New government employees are only eligible for the subsidy if they join GEMS.

GEMS is now the second largest medical scheme in the country (after Discovery Health Medical Scheme) and the largest restricted one.

This has given GEMS substantial negotiating power as well as efficiencies of scale.

Some medical schemes are concerned that healthcare providers may aim to make up discounts passed on to GEMS from other less influential schemes and consumers.

**(Maximum 6)**

*(ii) Describe Regulation 4 and its application concerning movement between options (excluding termination of membership and re-joining a medical scheme).*

*{This short knowledge question was generally well answered.}*

Medical schemes may restrict the movement of members between options.

This is to prevent anti-selection by members moving to more comprehensive options when a health event occurs.

Each scheme must provide one opportunity per annum for option movement.

Members who change options within a medical scheme can do so without additional underwriting or waiting periods being imposed.

Option selection is usually offered at the beginning of the benefit year.

**(Maximum 2)**

*(iii) List the factors that may influence an existing member's decision to change their benefit option.*

*{This question was generally poorly answered. While the question asked candidates to list factors that may influence a member's decision to change benefit options a number of candidates listed factors that will determine the member's choice of benefit option.}*

Affordability. If the member cannot afford his current level of cover and wishes to remain on the scheme he will be forced to buy down.

This affordability problem may be due to changes in income. An increase in income (for example through promotion) may cause a member to want to buy up.

It may be due to changes in the tax treatment of medical scheme contributions.

Or changes in expenditure (for example due to above-inflation increases in fuel and electricity costs or tax increases).

Or a change in any employer subsidy of medical scheme contributions

The relative size of the contribution increase on the member's current option may prompt a member to reconsider his current option.

How the post-increase contributions compare to the contribution rates on the other options

As well as any changes in income band boundaries on the contribution table and/or the relative contribution rates on the different income bands.

If the contribution increase percentages were not the same for all options on the scheme, affecting the cost of its options relative to each other the member may reconsider the value for money proposition of his current choice

Benefit changes (on the member's current option or another one) may make it worthwhile to move to another option. This includes changes to the Prescribed Minimum Benefit entitlements.

Other changes to the option such as the introduction of provider networks, formularies and protocols.

Changes in geographic location. A member may find that a change in location has an impact on accessibility to providers on an option's network.

Waiting periods. For example, the member may have joined the scheme on a low cost option, waited for any waiting periods to expire and will now buy up to a more comprehensive option.

A member may decide to change option on the advice of a broker.

Risk aversion. Some people have a strong aversion to risk and may want to increase their level of cover if changes in income, for example, allow them to do so.

The introduction of a new option that may be more suitable/attractive to the member

The scheme may have removed the option the member belonged to, in which case he is forced to select another option.

Past claims experience may prompt a change in option – for example if the member's benefits were exhausted early in the year or they were subject to a large co-payment or the specialist reimbursement rate was not sufficient.

A change in family structure may prompt a change if another option offers better value for money based on how the contribution table is structured (in terms of relative member, adult and child contributions).

Anti-selective behaviour.

- If the family has an expectation that one or more family members will have greater healthcare needs in the future the member may wish to buy-up. For example a couple may buy up to a new option if they are (or plan to be) having a baby.
- Ageing and the associated increase in healthcare needs will cause people to buy up as their healthcare needs increase (if they can afford it).
- Conversely if they do not expect to fully utilise their current level of cover they may wish to buy down. For example they may have chosen their previous option in order to undergo a procedure, which has now been performed, and now want to move to a more affordable option

- Someone in the family might have just received a diagnosis of a new condition that may require additional benefits or an expensive procedure that is not covered (or fully covered) on their current benefit option.
- The person may have purchased health insurance which prompts them to buy down. For example he may have purchased GAP cover and then moved to an option with a lower specialist reimbursement rate.
- Awareness of PMBs. Someone might buy down if he/she becomes aware that a lower cost option must still cover all of the PMBs and is not concerned about the non-PMB benefits (e.g. day-to-day benefits).

**(Maximum 10)**

*(iv) Discuss the impact that introducing non-PMB hip and knee replacements to the second most comprehensive option may have on the scheme.*

*{This question was poorly answered. Candidates lost marks by failing to discuss the impact of the benefit change and instead listing the information they would need in order to decide whether the benefit should be introduced or not. Time was also wasted on aspects such as how they would calculate the cost of the benefit or which risk management measures the scheme should put in place. Marks were also lost because candidates made strong assumptions (e.g. that the second most comprehensive option on the scheme is loss-making) rather than considering the implications of all possibilities.}*

For discussion purposes let's call the most comprehensive option "Option A" and the second most comprehensive option "Option B".

This is a benefit enhancement and therefore it will increase claim costs, all other things being equal (and assuming an above zero incidence of non-PMB hip/knee replacements on Option B).

Other than the cost of the procedure itself additional costs may be incurred due to complications such as infection which lead to additional (and potentially expensive) care being required.

If the brokers are to be believed, the introduction of this benefit will make Option B more attractive in the market. A possible outcome is therefore that more new business may be attracted to this option.

The question states that Option B does not offer competitive benefits (in terms of non-PMB joint replacements) compared to similarly priced options in the market. This implies that the brokers would prefer to have the benefit added while the contribution rate remains at this price point.

If the cost of the benefit is added to contributions the option may now become uncompetitive.

If the benefit is added but contributions are not increased to compensate for the expected expenditure the option will record worse financial results, all other things being equal.

If the option is recording net healthcare deficits then the addition of more members will simply increase the deficit on this option, which will worsen the financial results of the scheme.

Such an effect will be amplified if the additional members have an adverse risk profile, compared to the existing Option B population.

On the other hand if Option B is recording surpluses and the addition of these members does not result in a significant deterioration of the option's risk profile (or leads to an improvement) then this new business will be to the benefit of the scheme.

Joint replacements are typically performed on older patients and the addition of this benefit cannot be expected to bring an influx of young and healthy beneficiaries that may have improved Option B's risk profile.

A possible exception may be sportspeople who may also require joint replacements due to injury or wear-and-tear. There will be relatively few of these.

There may be pent-up demand for joint replacements amongst members who could not previously afford to belong to Option A.

In the short-term (say the first year) this pent-up demand may result in a large number of joint replacements being performed.

Once this pent-up demand is met utilisation of the benefit should reduce to a lower level in the long-term.

However, if the increase in new business is solely due to the introduction of this benefit then the option may grow due to anti-selective purchases by members who expect to use this benefit.

These members may then also buy down at the earliest opportunity once the procedure has been performed.

The risk of anti-selection is significant since joint replacements are elective procedures.

Similarly, Option B members who may previously have considered transferring to Option A (or an option on another scheme) in order to access this benefit, will now be more likely to remain on Option B.

Previously they would have brought up to Option A if they needed to utilise the benefit.

Members on lower options who could not afford Option A contributions in order to gain access to such a benefit may now buy up to the more affordable Option B.

The scheme would have received increased contribution income as a result of these buy-ups to Option A. The scheme will now forego this additional contribution income.

Similarly, members who were on Option A may now consider buying down to Option B due to the lower relative contributions and the enhanced benefits (although they are expected to have a lower overall level of benefits).

If the introduction of this benefit was accompanied by a larger contribution increase to cover the expected cost of the benefit then individuals who do not expect to undergo hip and knee replacements will see the change as a reduction in perceived value for money and have an incentive to buy down.

However, their claims are not expected to decrease proportionally to the reduction in contribution income. As a result such buy-downs will have an adverse impact on the scheme.

**(Maximum 9)**

**[Question 1 Total: 27]**

## Question 2

(i) Explain the methodology you would follow to calculate the amount of the provision as well as how you would go about setting the necessary assumptions.

*{The majority of candidates performed poorly on this question, only attaining a few marks by writing down the generic methodology for post-retirement healthcare subsidy valuations of contribution subsidies (as contained in the core reading). Candidates who did well in this question applied their minds to the specific circumstances and the task at hand, which was to explain how they would calculate the amount of the provision at this time.}*

This is a form of post-employment liability valuation wherein we need to calculate the net present value of future shortfalls between claims and contributions.

IAS19 (AC116) specifies that the actuarial valuation method used to value the liabilities is the Projected Unit Credit Method. The Projected Unit Credit Method builds up the liability for each unit (in this case the beneficiaries being subsidised) in order to build up the total liability amount.

Essentially we will need to calculate the net present value of future risk claims and then deduct the net present value of future contributions.

Thus the contributions and claims need to be projected over the remaining lifetimes of these pensioners and then discounted to produce a net present value.

This net present value will be the amount that needs to be provisioned on the balance sheet.

### Contributions

The first step in calculating the provision will be to obtain data for the members concerned including factors such as age, gender, benefit option and details regarding their dependants.

We should also find out how future dependants will be subsidised. For example if a member marries or has a new child will these new dependants be included in the subsidy as well?

100% of contributions for these pensioners need to be included in the calculation (contribution subsidies are irrelevant to this particular calculation, unlike post-retirement *contribution* subsidy calculations).

An assumption will be required regarding future rates of contribution increases.

Via the contribution side of the calculation the liability is not only dependant on the claims experience of this group of pensioners but on the long term prospects for the entire scheme.

As a result the assumption about contribution increases should take into account:

- The current and projected solvency of the scheme
- The scheme's current underwriting results (is it over- or under-priced?)
- The expected ageing of the medical scheme's population, which may be a function of the employer's future business plans. (Is it expanding or contracting? Is it planning to sell off other divisions in the future?)
- Is it anticipated that the scheme may be closed to new members at any point in the future?
- We should explicitly consider the impact of the active members from the division being sold leaving the scheme. It is unsafe to assume that this group of active members was producing exactly the surpluses required to cross-subsidise the specific pensioners on this option.

## **Claims**

For the risk claims the calculation will be similar except that instead of community rated contributions we need to estimate the future claims, which vary by age and other risk factors.

Therefore we will at minimum require a "claims curve" which models claims by age and gender to estimate total future claims.

Such a claims curve may be derived from the scheme's data (if it is credible – otherwise the actuary may have to source data from other schemes). A GLM or other methods may be used to construct the claims model.

## Assumptions

An assumption will be required regarding future escalations in claims (excluding ageing as this is explicitly allowed for by the claims curve discussed above) arising from:

- Healthcare cost inflation and
- Utilisation trends

A suitable discount rate is required.

The choice of discount rate may be based on the yields on bonds with an appropriate duration or a zero-curve if one is available.

Healthcare cost inflation will be related to (but not necessarily the same as) consumer inflation.

A long term inflation assumption may be derived from the spread between the yields on fixed income and inflation linked bonds.

The future inflation rates derived in this way may require some adjustment for the market risk premium.

The discount rate and inflation assumptions should be consistent with each other. (The difference between these two rates, which determines the real discount rate, is more important than the absolute values.)

If contribution tables are income rated then we will need an assumption of changes in income in retirement...

...as well as an assumption of how any income bands may be adjusted. For example are these bands adjusted annually based on CPI or negotiated annual wage increases?

If there is more than one option on the scheme then we should allow for these pensioner members to change options in future. For example pensioners may buy up to more comprehensive options as they get older.

In order to perform the projections a multiple decrement model is required

We will need assumptions regarding the following decrements:

- Rates of withdrawal from medical scheme membership (for example pensioners leaving the scheme if they cannot afford the contributions anymore or they decide to join an open medical scheme)
- Mortality rates after retirement
- Spouse's age difference (if actual dependant ages are not available)
- The ages of independence of child dependants (when they will no longer be considered to be child dependents).

The mortality rates will need to be applied to joint lives as we need to allow for spouse's mortality.

*{The core reading lists numerous other assumptions such as withdrawals from employment and normal/early retirements. However, since we are only working with a defined pensioner population here these assumptions are not relevant and do not attract marks.}*

If the company plans to fund this liability an assumption will also be required regarding the future rate of return on plan assets (in other words the expected investment returns on the assets held by the employer to match the liability).

The entire liability will be accrued as it relates to pensioners and not in-service employees.

The actuary should perform sensitivity testing of the results.

**(Maximum 15)**

**[Question 2 Total: 15]**

### Question 3

*(i) Describe the nature of a medical scheme's liabilities.*

*{This knowledge question was based on the core reading. It was, however, poorly answered. Many candidates discussed the nature of a medical scheme's expenses and cost drivers rather than its liabilities.}*

For a South African medical scheme, healthcare claim liabilities have the following features:

#### **Term**

Health and care liabilities relate to:

- claims that have been incurred but not yet reported (IBNR) as well as...
- ...claims that have been reported but not yet paid.

In terms of the regulations to the Medical Schemes Act, a valid claim must be paid within 30 days of the receipt of a claim, which must be within four months of the date of service.

In practice, the use of electronic claims submission by health care providers has increased significantly over the past number years, thereby significantly reducing the delay between the claim service date and the claim payment date.

Therefore the majority of claim liabilities in the healthcare environment are very short term...

Schemes will also have current liabilities (for example amounts payable to non-healthcare service providers such as broker commission or amounts owed to healthcare providers that are awaiting the next bank payment run).

In addition schemes have a liability in terms of the amounts held by members in medical savings account balances.

**Nature**

As discussed above the majority of health and care claims liabilities relate to claims that have already been incurred but not yet reported.

For a medical scheme (as well as a managed care organisation that takes risk) these IBRN claim liabilities can be regarded as fixed monetary liabilities.

Where the insurer agrees to a capitation arrangement with a provider it is possible that the provider bears the risk of changes in the prices of goods and services covered under the arrangement.

In such cases the capitation provider can view these capitation fees as fixed monetary amounts.

**Uncertainty of Amount**

For risk takers that provide indemnity benefits (e.g. medical schemes and managed care organisations that takes risk), both the incidence and the severity of claims outgo is uncertain.

The severity of various claim types will be different depending on the claim type. For example the level of variation in hospital claim severity is different from GP claim severity.

The uncertainty in the estimate of the outstanding claim liability may also be affected by changes to claims submission patterns, claims processing speeds and administrative backlogs.

In practice, the level of uncertainty will be influenced by the size of the risk taker. The larger the risk taker, the less volatile the claims experience is likely to be as random claims fluctuations will be spread amongst a large group of members.

The level of uncertainty may also vary depending on whether the scheme is paying claims on a fee-for-service basis or is making use of alternative reimbursement models.

**Currency**

Most of the claims costs for a South African risk taker are likely to be in South African rands.

Certain liabilities such as claims incurred under international travel benefits may be paid in a foreign currency.

For the majority of South African medical schemes such foreign currency claim liabilities should constitute a small proportion of total claims.

Medical schemes do have exposure to currency risk due to the cost of medical equipment and pharmaceuticals being subject to exchange rates which may vary significantly, even in the short term.

**(Maximum 9)**

(ii) List the characteristics of the assets that should be held to cover these liabilities under a matched investment strategy.

*{This short question is based on bookwork and was well answered. Curiously the candidates who performed poorly in question 3(i) did not consider these points in their response to that part.}*

Given the above liability characteristics the majority of the assets held under a matched investment strategy to meet the claims liabilities of a typical South African risk taker should be invested in

- rand-denominated;
- short-term;
- marketable; and
- liquid

assets,

**(Maximum 2)**

*(iii) Explain the impact that the above arrangement may have on the predictability of TechMed's net healthcare results.*

*{Question 3(iii) tested candidates' understanding of the elements of risk and uncertainty in the operations of a medical scheme (the question about net underwriting results excluded discussion of investment income). Candidates had to apply this understanding to the circumstances of the specific scheme that was described to them and conclude how predictable this scheme's net underwriting results will be.*

*Candidates' responses to this question were very disappointing. Many candidates failed to answer the question as it was asked, ignoring the question of predictability and focusing on factors that may cause claims to increase such as over-servicing in a fee-for-service environment or upward referral by the capitated healthcare provider. High expenses do not necessarily imply unpredictability. Candidates also failed to consider the possibility of favourable results due to random variation. Marks were lost due to candidates focusing solely on healthcare expenditure and ignoring other aspects of a medical scheme's operations that have a bearing on the net healthcare result, such as contribution income and non-healthcare expenditure. Candidates who performed well in this question took a structured and logical approach to the problem.}*

Contribution income is based on the number of members and dependants. It is therefore easy to predict for a given membership.

If contributions are income related the close relationship between the scheme and the employer also reduced uncertainty regarding movements between income bands due to, for example, annual wage increases.

The claim frequency and severity risks within the scope of healthcare services covered by the capitation agreement are being transferred to DuraMin.

Capitation fees may be a fixed fee per capita defined in a capitation agreement (contract) between TechMed and DuraMin and the total amount will not vary unless there is a significant change in the number of beneficiaries.

Capitation fees may also be calculated based on a risk-profile basis (risk adjusted capitation fees). Barring substantial changes in the scheme's risk profile the average amount per beneficiary will not vary significantly.

Even then, if the changes in beneficiary numbers can be anticipated (which is likely given the close relationship between the scheme and the employer) then that will be easy to predict as well.

Administration expenses will constitute the largest proportion of non-healthcare expenditure.

If TechMed is administered by a third party the basis for administration fee will be defined in a formal administration agreement (for example a monthly fee based on the number of members).

On the other hand if it is self-administered it will have a budget for administration expenses.

Management expenses will therefore be predictable in the same way as contribution income and capitation fees.

The direct claims are paid on a fee for service basis. This means that the scheme retains the frequency and severity risks for such claims.

In terms of legislation occupational injuries will be at the expense of the employer.

The direct claims relate to cases such as advanced surgery, oncology and trauma. These tend to be low in frequency but high in cost.

A small change in the frequency of such cases have the potential to have a large impact on the total direct healthcare expenditure.

Furthermore the costs of such claims can vary significantly. For example a few additional days in ICU can add a significant amount to the cost of an admission.

The existence of managed care and/or benefit limits (on non-PMB claims) can limit the open ended nature of the costs and make them somewhat more predictable.

All of the members are employees of the same company and most of them will be working in a deep underground mining environment. This has a number of implications:

- The members work in a high-risk environment and accidents are more likely than it would be in most other environments.

- There is a concentration of risk as many employees may be injured in a single incident or contract a disease such as flu.
- The working conditions of these members will also expose them to hazards that may affect their long-term health.
- A restricted, mandatory medical scheme is not exposed to the uncertainty related to membership that are experienced by open medical schemes.
- Many members may be migrant workers and their dependants may therefore not live close to the mine and, more importantly, DuraMin's healthcare facilities. Because suitable access to healthcare is enforced on medical schemes dependants who live "out-of-area" will need to access other providers who will most likely charge on a fee-for-service basis, adding to the unpredictability.

The direct claim costs from year to year will be very volatile as a result and therefore difficult to predict.

The scheme is preparing its budgets on a best-estimate basis, which means that there are no safety or uncertainty margins.

The amount for direct claims in any given year, as a stochastic variable, will show a large range of variation, for the reasons discussed above.

The net-healthcare result will therefore be a stochastic variable with an expected value of zero (budgeting for breakeven results).

The true net healthcare result in a given year may therefore vary significantly from one year to the next and the true net-healthcare result for any given year will be difficult to predict with a high degree of accuracy.

Over a period of a number of years, the average result should be a break-even result.

**(Maximum 9)**

*(iv) Discuss the appropriateness of TechMed's proposal.*

*Your response should comprise a discussion of:*

- *The factors you need to consider;*
- *Relevant risks;*
- *The appropriate level of the minimum reserves;*
- *Additional requests for information you may need to make;*
- *An evaluation of the relevant aspects of TechMed's experience, based on the available information; and*
- *Your conclusion.*

*{Question 3(iv) was a long question which presented candidates with a complex situation which they needed to assess in order to reach a conclusion as to the appropriateness of a proposed investment strategy. While the question superficially appears to be an investment question the examiners were testing candidates' understanding of the relationship between the risks arising from investment strategy, those arising from the medical scheme's operations and how these need to be balanced against each other in the pursuit of higher investment returns. Candidates who performed well in this question covered a wide range of aspects related to the various risks involved.*

*Since we only have the complete balance sheet for 2014 most calculations in this solution are based on 2014. Calculations based on other years were valid as well.}*

The basic investment principle is to maximise returns subject to paying liabilities as they become due.

TechMed wants to adopt a strategy of deliberately mismatching the assets and liabilities in order to achieve the higher expected returns expected from riskier asset classes such as equities and property.

When assessing whether a policy of deliberate mismatching is appropriate, you should be satisfied that the scheme will be able to meet its liabilities under adverse market conditions.

Such mismatching is therefore only appropriate where the risk taker has assets significantly in excess of its statutory solvency requirement.

### Free assets

The first thing we therefore need to consider is the amount of free assets the scheme has available to invest.

It is however important to remember that the allocation of assets to regulatory and free assets is a notional exercise. Schemes do not account for their assets in this way.

The minimum “Regulatory” assets the scheme must hold amount to R218.8 million as at 31 December 2014 are:

- the fair value of liabilities (R15.9 million), plus
- 25% of contribution income (R202.9 million)

The total assets are equal to investments plus cash =  $308.9 + 100.3 = R409.2$ . Thus the excess or “free” assets in 2014 amount to  $409.2 - 218.8 = R190.4$  million.

If we apply the information in the question we get the following results:

*{This table does not attract marks but does assist in developing a solution.}*

| Asset type   | R million                       |                           |                |
|--------------|---------------------------------|---------------------------|----------------|
|              | Allocation of Regulatory assets | Allocation of Free assets | Total          |
| Cash         | R 54.7                          | R 2.6                     | <b>R 57.3</b>  |
| Bonds        | R 164.1                         | R 3.7                     | <b>R 167.8</b> |
| Property     | R 0.0                           | R 10.2                    | <b>R 10.2</b>  |
| Equities     | R 0.0                           | R 171.9                   | <b>R 171.9</b> |
| Other        | R 0.0                           | R 2.0                     | <b>R 2.0</b>   |
| <b>Total</b> | <b>R 218.8</b>                  | <b>R 190.4</b>            | <b>R 409.2</b> |

| <b>Asset type</b> | <b>Notional allocation of "Regulatory" assets</b> | <b>Notional allocation of "Free" assets</b> | <b>Total</b>  |
|-------------------|---|---|---------------|
| Cash              | 25.0%   | 1.4%  | 14.0%         |
| Bonds             | 75.0%   | 1.9%  | 41.0%         |
| Property          | 0.0%  | 5.4%  | 2.5%          |
| Equities          | 0.0%  | 90.3%                                       | 42.0%         |
| Other             | 0.0%  | 1.0%  | 0.5%          |
| <b>Total</b>      | <b>100.0%</b>                                     | <b>100.0%</b>                               | <b>100.0%</b> |

### **Appropriate level of minimum reserves**

It is well understood that the minimum 25% solvency requirement is typically not a good indicator of medical scheme solvency as it does not take into account each scheme's specific circumstances.

In order to determine whether the scheme's proposed strategy is appropriate we therefore need to consider a number of risks that may cause its reserve level to drop below the appropriate minimum level, as well as the statutory minimum. Risk based capital methods should be applied to determine this.

### **Membership considerations**

The size of the scheme (in terms of the number of beneficiaries) is an important factor to consider when assessing the scheme's level of risk.

A large scheme will be subject to less claims volatility than a small scheme, all other things being equal.

Thus a small scheme will require more reserves, proportional to contribution income, than a larger scheme.

TechMed had 18 008 members and 48 317 beneficiaries at the end of 2015. This makes it a relatively small scheme.

We also need to look at historic and future changes in membership.

TechMed has been losing members, with a significant decrease in membership between 2012 and 2013.

Therefore TechMed's argument that it has been able to maintain a steady solvency ratio of around 50% is not correct. If the scheme membership had remained stable over the period the solvency ratio would have been lower.

If this trend of reducing membership continues then the appropriate (risk based) solvency level that TechMed's needs to maintain will increase over time.

The scheme is budgeting for the number of members and beneficiaries in 2015 to be exactly the same as they were in 2014. We can therefore conclude that, in the short-term at least, TechMed expects membership to remain stable.

In the longer term the number of members depends greatly on the fortunes of the employer.

If the scheme has any insight into the employer's business plans, particularly as they relate to the size of the workforce, it will give us more information regarding expected trends in membership numbers as well as demographics.

### **Claims volatility**

The largest (or 'a large') area of risk for Techmed is claims volatility.

A scheme with more volatile claims experience will require a higher level of risk based reserves compared to one with predictable claims experience.

As discussed in part (iii) of this question Techmed can expect to have unpredictable claims experience.

We can also see in Techmed's financial information that claims experience had indeed been very volatile in recent years.

While the capitation fees are very stable (allowing for inflation)...

...direct claims (on a beneficiary per month basis) have varied a lot. For example direct claims were 36% higher in 2013 than in 2012.

This has resulted in large changes in the net healthcare result, with the figures ranging between deficits of R79.3 million to surpluses of R22.8 million, before investment income.

More information regarding the claims experience in 2013 would be useful when assessing whether this experience may continue in the future.

Even if the high claims were due to a rare event we cannot dismiss it as a once-off event and will have to allow for such events occurring from time to time.

If the scheme can purchase appropriate reinsurance it will be protected against such contingencies (and would be able to hold a lower level of risk-based capital).

From the available information we can conclude that the probability that TechMed may have to draw on reserves to cover a net healthcare deficit in any given year is not negligible.

### **Cash requirements**

For operational purposes (paying claims and other expenses) the scheme needs to hold sufficient cash.

TechMed is proposing that it will hold 14% of total assets in cash. Based on the available information that will amount to R57.3 million in 2014.

Monthly contribution income for 2015 will be R72.64 million.

On top of this it may expect average monthly investment income of R1.46 million.

Monthly expenditure (health and non-healthcare related) is budgeted to be of the same order of magnitude (R72.63 million to be exact).

It can therefore be expected that the scheme can cover its monthly expenditure with contribution income.

In reality seasonality and claims volatility will cause the expenditure to be more than contribution income in certain months.

Although the scheme budgets for a breakeven result it may only achieve that in December of each year, when claims tend to be lower than in other months.

Similarly investment income may not be evenly spread across all the months of the year.

And investment income may be directly reinvested, in which case it will not be available as cash.

It is therefore possible that there may be months where the scheme may need to draw on its cash reserves for operational purposes.

R54.7 million in cash appears to be sufficient for such an eventuality, depending on the proportion of claims that are paid directly.

However, in 2013 it would not have been sufficient to cover the R79.3 million deficit...

... and the scheme would have had to convert some of its other assets into cash.

Based on this alone we can conclude that the scheme's proposed limit on cash is too low and that it should be holding a greater proportion of assets in cash.

In the case where Techmed maintains the proposed asset allocation, should the scheme need to use some of this cash it will no longer be adhering to its own rule that 25% of regulatory assets need to be held in cash...

And it will have to convert other assets into cash to maintain cash at this percentage of regulatory assets.

We need to ask the scheme how it intends to approach the matter of allocation of regulatory assets. Will it aim to maintain the 25/75 split between cash and bonds on an ongoing basis or will it only deal with the matter occasionally (say a "rebalancing" exercise at the end of each financial year)?

If it does intend to maintain this 25/75 split then it will need more cash over and above the R2.6 million cash currently allocated to free assets to use for operational purposes, so that it will not have to access other assets.

### **Scheme policy**

We also need to consider aspects of the scheme's budgeting strategy.

If the scheme was purposely budgeting for operating deficits it would need a higher level of reserves than it would if it was budgeting for a surplus.

Since the solvency ratio is based on contribution income the reserves need to grow at a similar rate to contribution income growth if the scheme wishes to maintain the same solvency ratio.

TechMed is budgeting for a break-even result before investment and other income. Thus it is not expected that surpluses will contribute to reserves.

Consequently Techmed is dependent on the rate of return on assets being at least the rate of growth in contribution income in the long term in order to maintain its solvency ratio.

Another aspect to consider is the Scheme's risk appetite.

What is the maximum drop in solvency ratio or asset value that the Trustees are willing to accept as a result of their investment strategy?

Falling below the statutory minimum is likely to be something the scheme will want to avoid as far as possible as this is a breach of regulations and would lead to intervention by the regulator.

Holding a large proportion of its Regulatory assets in cash and high quality bonds means that, even in the unlikely event that it loses almost all of its free assets, it will still be able to meet regulatory solvency requirements.

### **Investment risks**

Based on the asset allocation percentages and our calculations TechMed wants to invest 90.2% of its free assets in equity. For a medical scheme this seems a very aggressive investment strategy.

However, we should consider this within the context of total investments (in total only a maximum of 42% of total assets is being proposed, compared to an existing regulatory limit of 40%).

The first asset risk we need to consider is asset price volatility, particularly the downside risks.

Equity and property are expected to provide long term returns that will protect against inflation.

In the short term, however, market values can vary significantly.

If the scheme needs to sell some of its assets at an inopportune time (when market prices are low) the scheme may incur loss on these investments.

Having said that, the scheme would probably sell other assets such as bonds before it would resort to selling equities and property in order to generate cash.

A large proportion of the return generated by equities is expected to come from growth in asset prices.

This will not necessarily immediately contribute to the level of reserves in terms of Regulation 29 since capital gains may only be recognised once they have been realised.

In TechMed's case it appears that asset values have indeed been volatile.

We would need to have more information about the scheme's investment strategy (including historic asset allocation) and investment results over the period from 2012 to 2015 to understand why this was the case.

For example between 2013 and 2014 market prices appear to have dropped significantly (Accumulated funds reduced from R469.3 to R409.2, in spite of the scheme recording a R30.8 million surplus after investment income).

This assessment is supported by the fact that the value for unrealised capital gains in 2014 is zero.

While schemes cannot recognise unrealised capital gains for the purposes of calculating solvency, capital losses must be recognised immediately.

Any realised capital gains or losses would be included in the investment income line.

In 2014 the value of the investment income item is small at only R8 million. We can therefore conclude that the value of TechMed's investments suffered a significant drop during 2014, as opposed to the scheme having realised all of the capital gains at the end of 2014.

We also need to consider volatility of investment income.

In TechMed's case investment income appears to vary a lot although this may be explained by the realisation of capital gains, as described above.

Following a high risk investment strategy while at the same time having volatile claims experience means that the scheme would have to hold significant excess assets over and above the statutory minimum.

While TechMed has been fortunate in the years being considered, in the sense that high claims in one year were offset by good investment results or vice versa, we must consider the possibility and implications of a year with very high claims and falling market prices and/or low investment income. This would lead to the solvency ratio at the end of the year being much lower than the budgeted figure.

In order to truly understand the implications of the investment policy we need to make a longer term projection beyond 2015.

A stochastic asset-liability modelling exercise can be performed to explore the level of risk.

We need to determine whether the change in investment strategy will lead to higher rates of return and not simply increase the level of risk.

Is an additional 2% in equities worth the additional effort and risk compared to complying with the 40% limit prescribed by regulation?

### **The nature of the proposed investments**

Simply being told the maximum percentages limits that the scheme intends to apply to different asset classes is not enough information for us to fully assess the inherent risk.

The risks associated with individual investments need to be considered.

For example while government bonds offer a high degree of security the risk of default on high risk corporate “junk” bonds will be much higher.

How marketable will the assets be?

What will cost of realising or switching assets to comply with the new strategy be?

What will the investment manager costs be under this new investment strategy?

Are there reinvestment risks?

We also need to consider the nature of the proposed investments in different asset classes...

...as this will give us more insight into how “risky” those investments may be.

For example, does the scheme intend to invest in value equities or pursue higher investment return by investing in more risky growth equities?

Does the scheme intend to invest directly into property or does it wish to invest through collective property investment vehicles (which are more marketable and diversified)?

We also need to consider the level of management of assets.

For example is the scheme (or its investment managers) going to actively manage its investments or attempt to increase returns by actively trading (thereby incurring greater investment costs and increasing the level of risk)?

...or does it intend to take a more passive approach such as tracking an index or following a buy-to-hold strategy?

The limits in Annexure B, specifying the maximum percentage that may be held in any single investment (i.e. a single company's stock or a single property) means that the scheme is forced to diversify its assets.

However it may still be possible for the scheme to comply with the limits as they apply to a single holding and be over concentrated in a specific sector such as financial or resources stocks.

### **Market conditions**

What are the current market conditions?

For example if the market is over-valued (something than can only really be determined after the fact) and a correction occurs in the near future it would have been a mistake to invest an additional 20% of the scheme's assets in equity at this time.

### **Closing comments and conclusions**

Marks given for a well-reasoned conclusion.

**(Maximum 38)**

**[Question 3 Total 58]**

**[Grand Total 100]**