ACTUARIAL SOCIETY OF SOUTH AFRICA
Advancing Actuarial Excellence

EXAMINATION - MEMO

14 May 2025 (am)

Subject A311 — Actuarial Risk Management
Core Principles

Paper Two

EXAMINERS' REPORT

This subject report has been written with the aim of helping candidates. This report summarises the main points that the examiners were looking for and some common problems encountered.

QUESTION 1

Examiner comments: *These were mostly bookwork questions that were well handled by most candidates. Part (i) required examples (not just a definition) to score all the marks. Candidates at times had a hard time articulating the relatively simple concepts in part (ii). Often knowing the gist of a concept is easy but formally defining it can prove hard! Some candidates showed confusion in part (iii) in their understanding of the inverse impact of the liabilities' valuation on the company's purchase price, i.e. that the higher the company's liabilities, the lower the purchase price.*

(i)

- Liabilities/claims that have been incurred but have not yet been reported. For example, insuring an employer's liability policy for which the insured event (e.g. pollution/harmful exposure) has taken place, but no-one is aware of it yet since effects are not yet visible.
- Future periods of insurance against which premiums have already been received. For example, receiving annual premiums upfront at the start of the financial year, but being only at the half-year reporting period.
- Claims that have been incurred and notified, but not yet paid, whether partly or in full. For example, waiting for the final claim amount to be specified by the court in the case of a liability claim.
    - Such outstanding reserves may also include claims that have been finalized, but that will be paid out over a period of time, e.g. a monthly and annual payment.

Credit was given for abbreviations such as IBNR, IBNER, OCR, UPR etc. and the candidate clearly demonstrated an understanding of the meaning.

(ii)

Best Estimate Basis

- The provisions will be calculated based on the actuary's best estimate of future experience
- This means the set of assumptions has an equal probability of overstating versus understating the values

Optimistic basis

- Assumptions are chosen which result in a low value of liabilities/provisions.

Prudent/cautious basis

- Assumptions are chosen which result in a higher value of liabilities/provisions.

(iii)

- A more prudent basis would result in a higher value of liabilities…
- …and hence a lower value when calculating the value/price of the company.
- Reasonable to expect that a best estimate basis might be used to calculate the value of liabilities of Company B
- This achieves fairness when valuing the liabilities to be taken over…
- …and might make it easier to reach agreement between actuaries acting for different parties.
- However, a different basis might be used in the following circumstances:
    - due to a power imbalance between the parties concerned
    - because of a stronger desire to proceed by one party…
    - …perhaps because of a very distressed financial position…
    - …or the potential for value creation in the combined entity if the deal proceeds.

    - There may be significant uncertainty in reserves and both parties recognise the need to hold margins to protect security.
- Fundamentally the buyer would prefer a basis that means they pay the least for the company,…
- …i.e. a basis that lowers the value of the assets and results in higher liabilities *(credit was given for similar comments that the seller would prefer a basis that does the reverse)*.

QUESTION 2

Examiner comments: *Candidates struggled with this question, and most could not come up with a sensible structure or list of ideas of things to consider, with scant answers as a result. Many wrote at length only about data collection. It was disappointing to see a concerning number of students detailing which additional medical underwriting the insurer should include (or changes they should make to "rectify" the situation). The question was clear that the insurer was dropping the "calling for additional medicals" and students were required to discuss which investigations were appropriate to assess the impact of this change. Term assurance's key assumption is mortality and a surprising number of students either didn't speak about mortality/claims at all or only briefly touched on it. Many just assumed the company would be worse off automatically and proposed mitigation options instead of investigations. Better candidates realized that expenses and sales are part of the discussion here.*

The company could investigate experience against assumptions/expectations in the following areas.

Mortality investigation

- With only two years data, any changes in mortality experience are very unlikely to be statistically significant unless the company is very large…
- …and most mortality tables have a select period of at least two years.
- The mortality rate within the first and second years of the policy could be calculated both before and after the change.
- The number of deaths and the exposed to risk would be counted, taking care that they match.
- If there is sufficient data to generate credible results, analysis by cause of death would be a useful guide to the underwriters.
- Analysis by age and sex might be possible, but for deaths at short duration this would be less useful than the cause of death analysis.
- An investigation into the underwriting outcomes may also be beneficial, and may include monitoring:
    - the proportion of cases where special terms were offered
    - the rate of acceptance of special terms
    - the proportion of cases declined

Expense investigation

- Underwriting expenses should emerge from the company's expense analysis.
- Before the change these would include costs paid for medical reports and examinations.
- Costs could be expressed both as a charge per new policy written and as a charge per case proposed. For comparison with the costs two years ago, it is important to inflation adjust the results.

Sales investigation

- It will be important to look at new business both in terms of the number of cases and the average size.
- The company could also investigate whether any competitors have adopted similar underwriting approaches.
- Measuring market share over time will be useful.

- One would want to measure the intermediaries' perception of the disadvantages/advantages of the changes.
- Hence, the volume of business from supporting intermediaries would be measured.
- A questionnaire could be prepared for intermediaries that have supported the company both before and after the change,…
- …and for those intermediaries who either started or stopped supporting the company as a result of the change.

QUESTION 3

Examiner comments: *Q3(i) Students performed reasonably well in answering part (i). Those with less understanding of basic reinsurance concepts often confused surplus reinsurance with excess of loss reinsurance. In contrast, better students recognised that the heterogeneous nature of the risks made surplus reinsurance a more suitable option. Focusing on the benefits as opposed to the features of the surplus scored poorly. In part (ii) candidates often lacked sufficient distinct points in their responses. This question effectively encouraged students to apply their bookwork to a specific scenario and think beyond their standard lists which many struggled to do. Combining the benefits and costs of reinsurance with risk appetite and capital considerations gave better candidates a lot of topics to comments on and they scored better. Many students successfully earned the full 3 marks in part (ii), but weaker candidates would try and use less obvious forms of ART for the catastrophe risk exposure and hence struggled (e.g. weather derivatives or integrated covers are not obvious choices for this risk).*

(i)

- proportional – the reinsurer covers an agreed proportion of each risk
- the proportion can vary by each risk reinsured
- for high volume business, the maximum cover and the retention limit are specified in the treaty.
- Given that the risks CorpSure insures are very heterogenous…
- …their requirements for reinsurance will not be the same for all risks.
    - This makes surplus preferable over quota share since the cedant can decide on the proportion to cede for each individual risk.
    - This flexibility enables amount ceded by CorpSure to be tailored to the size and variability of individual risks.
- More efficient way of ceding premium than quota share as only pay for precise cover required (subject to limits on proportions imposed by treaty)
- Able to fine-tune exposure
- Used to write larger risks
- Used to spread risk
- Administration more difficult than quota share
- Does not cap the cost of very large claims.

(ii)

- The extent to which each type or level of reinsurance would reduce claims volatility…
- …and hence smooth profits.
- Stability of profits will affect ability to pay stable dividends (which shareholders may prefer).
- For example, more excess of loss protection (i.e. lower excess point) may result in more stable results.
- Capital requirements and statutory solvency,…
- …especially the extent to which changing the reinsurance protection would impact the statutory solvency position.
- Company strategy in relation to new business plans, e.g. whether planning to expand the business,...
- …and how much of a strain new business place on capital.
- The ability of the company to withstand large losses,...
- …including the size of the company's free assets or available capital.
- Senior management and shareholders' attitude to risk.
- The potential for accumulations of claims,…
- …e.g., whether there is high exposure in one geographical area.
- If so, individual excess of loss will not address this and so the company may decide that it needs more quota share…
- …in order to write a wider range of risks but maintain similar levels of net exposure.
- Alternatively, it might decide that it needs to purchase aggregate excess of loss reinsurance.
- Whether the company benefits from technical assistance from existing reinsurers…
- …and whether a change in the reinsurance programme would affect this arrangement.

- The cost and value for money of reinsurance available in the market.
- How CorpSure's market reputation might be affected by a change in the reinsurance programme,…
- …e.g. will investors, analysts, brokers and customers view the change as improving the company's financial position, security, prospects, product offerings etc.
- Security status and counterparty exposure…
- …since reinsurers with better security may charge more for the cover.

(iii)

Post loss funding

- A guarantee that in exchange for a commitment fee funding will be provided on the occurrence of a specific loss, or in this case, catastrophe event.
- This might be in the form of a loan or equity.

Securitisation (Catastrophe bonds)

- A transfer of risk to the capital markets by issuing a bond to those markets.
- The redemption and/or interest payment on the bond is contingent on the occurrence and severity of a catastrophe event.
- Funding is provided upfront which reduces counterparty risk for the insurer.

QUESTION 4

Examiner comments: 4*(i) Part (i) contained perhaps less well-known bookwork concepts and many candidates could not get to the full two marks available. Part (ii) had many good responses, but the wording clearly pointed to reports accompanying the financial statements, so the focus was not on more ratios or financial figures as much as other aspects of governance and reporting. This was based on bookwork and candidates are not required to have detailed knowledge of company reporting suites. Part (iii) saw candidates understanding the issue at hand, but often not writing enough for the marks available This was an example of applying a very well known list (reasons for underwriting), but in a less traditional context.*

(i)

Probability of default
Probability that a loan will default over a specified period of time (e.g. 12 months).

Loss given default
This is the percentage of outstanding loans that a defaulting borrower cannot repay.

(ii)

Additional reports might disclose information such as commentary on:

- Information on its competitive position in the local market…
- …which may include metrics such as number of clients etc.
- the performance of the company against key objectives
- the company's investment strategy and investment performance
- the progress of the company against its long-term and short-term strategic objectives
- the company's attitude to risk…
- key risks faced by the bank…
- …and how it manages and mitigates those risks
- The company's governance arrangements and how the Board assures itself of independence

(iii)

- It can protect the bank from being selected against by clients who could not get credit elsewhere (or at worse terms).
- It would be detrimental to the bank if they get all the "bad" credit risks that other banks wouldn't finance.
- It will enable the bank to classify their credit risks in homogenous groups…
- …where similar credit profiles are charged similar interest rates.
- This means that similar credit risk profiles are treated fairly and consistently relative to others.
- Higher credit risks would obviously be charged higher interest rates.
- Lower credit risks might be attractive to the bank…
- …and can be offered competitive rates.
- It will enable the bank to identify clients where special terms may be added to the load agreement.
- These may include a requirement of a deposit for applicants where there is higher risk…
- …or the availability of longer terms (or other attractive features) to better credit risks.
- In some risky cases, a decision might be made to decline offering the credit altogether.
- Doing loan underwriting will also ensure that the actual credit default experience does not depart from that assumed when loans were granted.
- The collection of the risk profile data will also enable future analyses of their credit exposure.
- In the case of a mortgage, there is also the property asset itself to consider.

- Loan underwriting will increase the likelihood that the mortgage is commensurate with the property being purchased.
- The size, age, location of the property itself may also be considered when making decisions on the loan.

How it may be done:

- Information on the applicant will be collected, which may include
  - Employment status
  - Income
  - Credit history with the bank
  - Credit scores from bureaus
  - Financial information on current debts, other properties, investments etc.
  - Documentation may be required to verify some disclosures, e.g. payslips etc.
  - This information is typically processed by a credit scoring model that will determine what rates and terms to extend to the client.

QUESTION 5

Examiner comments: *The question in general was well answered by candidates who understood the different types of general insurance products. Under part (i) many could not name three types of liability insurance that were relevant to this scenario and also could not accurately define them. Especially the concept of legal liability to pay someone was missing. Many listed professional indemnity insurance, which is not an obvious choice in this situation as you are not really rendering a service here. Most students could identify the type of liability insurance cover that was relevant in part (ii) but could only very briefly explain why the claim wouldn't be settled soon. Surprisingly, some students did not know what it means to be fatally injured. Part (iii) only required a basic set of comments from the bookwork, but most students could not come up with enough comments for the marks available. Most students could describe property and/or vehicle damage insurance. The different types of financial loss insurance proved trickier to identify and describe. Several listed types of insurance that were not even general insurance products and hence showed very poor understanding. Part (iv) was an open question, and a wide range of reasonable answers were accepted, but few scored the full marks available. Candidates will do well to learn from such higher-order type application questions for future attempts.*

(i)

Public (or 3rd party) liability cover

- to indemnify BuildCo against any legal liability towards a third party or member of the public killed, injured, harmed, or any damage to the property of a 3rd party due to any negligence of BuildCo in their operations.

Employer's liability cover

- to indemnify BuildCo against any legal liability towards their employees killed, injured, harmed due to the negligence of BuildCo in their operations.

Motor 3rd party liability cover

- to indemnify BuildCo against any legal liability as a result of an accident of one of their vehicles causing damage to other vehicles, property or resulting in death, injury or harm to 3rd parties.

(ii)

- Likely to claim under employer's liability.
- Liability insurance is known as long-tailed insurance business
- This mainly stems from the legal processes that are required to be followed to determine the size of the liability claims…
- …and court proceedings can run for many years.
- Determining the liability settlement amount requires input from actuaries, lawyers, medical specialists and other professionals.
- In the case of the collapse of the development and death of employees, actuaries are required to estimate the future potential earnings of each of the individuals to assist in determining the liability payout.
- Similarly, with those injured, the costs of their treatment and foregone future income needs to be estimated.
- Additional time may be required for the extent of the injuries to become known.
- Allowance is normally also made for pain and suffering – which is subjective and may be contested between various parties in court.

(iii)

Property and/or vehicle damage insurance

- BuildCo would have insured their tools, equipment, vehicles and building materials and structure.
- This would indemnify them in the event of loss or damage to these due to fire, floods, theft, storms.

Financial loss insurance

- BuildCo would likely have taken out pecuniary loss insurance to cover them against failures of 3rd parties to deliver on promises made or to repay debts…
- …on non-delivery of building materials for example.
- Fidelity guarantee insurance would be taken out to protect them against dishonest actions/fraud by employees.
- Business interruption cover would compensate BuildCo for losses resulting from a disruption in the operation and progress of the development,…
- …e.g. the collapse in this case.

Other comments:

- All the above kinds of insurance are short-term in nature with annually renewable and reviewable cover…
- …paid for by regular premiums.

(iv)

- Despite being fully covered for all the property damage and liability towards employees because of the collapse, BuildCo would have suffered severe reputational damage
  - People interested in purchasing property from developers are unlikely to trust the safety of any of BuildCo's future builds.
  - Builders and other construction employees are unlikely to be willing to work for BuildCo, given what had transpired and the potential risk involved with BuildCo projects
  - Professionals, e.g. architects and engineers would not want to be associated with BuildCo given the impact that this may have on their personal professional reputations.
  - BuildCo may find it harder in future to obtain permissions and approvals for Builds from city councils.
  - There may also be criminal investigations and other proceedings to determine the cause of and the responsibility for the collapse which may continue for many years.
- However, if BuildCo liquidates and relaunches under a different name/brand, they may be able to continue developing properties,…
- …especially if they are found to not have contravened any building codes or other regulations and the collapse was simply an accident

QUESTION 6

Examiner comments: *Overall, the question was reasonably well-answered, but candidates continue giving very generic answers and not tying their points to the scenario at hand which contained a lot of useful information to use in the answer. Application to given scenarios is very important in A311! Part (i) was mostly bookwork, but many candidates gave details around the benefits, terms of cover, impact of cross-subsidies, etc. as opposed to listing the features of the group policy itself. Part (ii) was well-answered for the most part.*

Few candidates scored very well in part (iii) as the answers tended to be generic (as mentioned earlier) and omitted a lot of the details provided in the question itself. Most candidates missed the fact that Oh Life is a large insurer and thus this single policy is unlikely to result in significant new business strain, liquidity risk or solvency issues – with many citing these as some of the key risks posed by this policy.

Candidates tended to make too few distinct points around various ways the insurer can reduce its risk in part (iv), but a wide range of ideas were accepted.

(i)

- Single policy that covers multiple lives (the group)
- Short-term
  - annually renewable and reviewable
  - May use experience rating
- Usually low (to no) underwriting involved
  - Often compulsory to limit anti-selection
  - Cover linked to criteria, e.g. being actively at work at inception
- Regular premiums (monthly) or single premium for period
- Can be sold via brokers or directly

(ii)

- Attractive to members
  - Ensures ongoing membership (retention)
  - May assist to attract more members
- Paternalism towards members – looking after their needs in difficult times
  - In the absence of provision, members may look to the organisation to assist them
    - Possibly following recent experience, e.g. pandemic resulting in more (unexpected) deaths
  - Members may not be aware of their need for funeral cover
- Cheaper cover than individual members may be able to obtain on their own
  - Some members may not be able to afford private provisioning
  - Reduced administration costs as a result of admin being handled by organisation…
  - … and achieving economies of scale.
- May offer in reaction to other church organisations providing such benefits
  - In order to avoid losing members to other organisations
- Could possibly be compelled by regulation (unlikely!)

(iii)

Pricing/claims risk

- No data on members nor dependants are provided – simply the premiums being paid over and claims submitted
- Will only know the number of covered lives each month, but no information about the group (or individuals') risk profiles,
- E.g. age, gender, state of health, smoker status, etc.
- The R20p.p may be too low for the mortality risk posed,
    - e.g. if membership is relatively old, or
    - if membership is concentrated in lower demographic groups (LSM's),
    - which may lead to significantly more claims than expected and losses being made on the product
- The risk may be exacerbated if product can't be re-priced due to competitive pressure in subsequent years based on prior years' experience
- Also, a risk that there are higher expenses than anticipated,
    - especially around claims underwriting and processing and verifying eligibility of claimant for claim

Anti-selection

- Members' choice in whether to buy cover month-to-month
    - Risk that only those who feel that they have a high chance of dying taking out the cover e.g. the old and the sick
    - And younger healthier members opting out of cover
    - Resulting is a poor risk pool for the insurer and higher claims than anticipated

Fraud/dishonesty

- Not covering all family members under the policy –
    - Insurer will not be aware, but will be liable for a claim for any of the family members dying, despite not receiving premiums for all
- Collusion between The Faith and members when a member or dependent dies who was not covered
    - Since The Faith recons premiums and claims and provides no details to Oh Life
    - The scope for dishonesty (due to wanting best for members) is significant
    - Potential for fraud, e.g. faking death certificates etc.
- Resulting in significantly more deaths/claims than expected in comparison with the number of lives expected to be covered and paying premiums.
- There may be potential theft of premiums, but simply not paying over all premiums each month.
- Members may "game" the system by paying one month and skipping the next, in order to avoid lapse notification rules.

Regulatory risks

- Not allowing this business model of The Faith acting as broker
- Fines, penalties, restrictions on the sale and administration of this type of product√

Reputational risks

- This will mainly arise in the event of any claims being repudiated for whatever reason,…
- …e.g. a brief lapse in premiums for a member following a period of payment and then subsequent death in a month when premiums were not paid.
- Delays in verifying/paying claims
- Or benefits not sufficient to meet the funeral costs/other needs of families of deceased.

Operational risks

- Admin by the The Faith, may just be poor as a result of a lack of professionalism which may lead to…
- …incorrect premiums, delayed and duplicated claims.

Competitor risks

- The Faith is a large group which will be attractive for competitors to target with better offerings
- May result in loss of profitable business and significant premium income and possibly inability to recover initial costs of designing and administering the product to The Faith

(iv)

- Additional disclosure requirements by The Faith
    - Demographic information on the 2500 members
        - Age, gender, occupations, etc.
    - Monthly mapping of premiums to specific covered members/dependants
    - Mortality experience over recent period for organisation, e.g. 5 years of members and their dependents
- Disclosure requirements by those taking up cover
    - Number of dependents plus their age, gender
    - Initial declaration of health by all to be covered
- Ensuring all lives in household are covered
    - Only paying out claim for those members and dependents who were disclosed and premiums received for
- Compulsory (or minimum) take up of the product by members
- Exclusion of those seriously ill at inception (or waiting period for eligibility for benefits)
- Waiting period before benefit entitlement for all members/dependants
- Reduced initial benefit
- Reduced benefits for different categories of dependent (e.g. children)
- Reviewable premiums and benefits – experience rating
- Regular review/monitoring of emerging experience
- Reinsurance cover to protect against more claims than expected

QUESTION 7

Examiner comments: *LC to complete. Part (i) was well answered. The intention of the question was to get candidates to think about how you can limit the cost of a claim, as opposed to the cost of providing the insurance, i.e. to focus more on the severity component of the cover and not the frequency. Part (ii) was well answered, but some only focussed on the one party and not both. Part (iii) was reasonably well answered, but many candidates went into detail on the pricing issue only as opposed to the "risks of the expansion" as asked. Many valid comments not mentioned in the sample solution below also scored credit. Especially the monitoring part of the question was poorly answered. Candidates must realise that generic phrases like "compare actual vs. expected outcomes" simply do not get marks. You must apply it to the situation. It was also not just a question on how to build a model. Of course, models are part of the solution, but rather keep comments brief and cover more topics, than labouring one step in the process.*

(i)

- Theft of device – Only pay a market related value (or original value), not replacement value.
- Accidental damage of the device – Use their own network of repairers. Use generic parts.
- Malfunction of the device – If not repairable then settle similar to theft, otherwise repair in a way similar to accidental damage. May also insist on client pursuing warrantee claim first.
- Other ways to reduce claims cost:
    - Insurer can also apply an excess to claims.
    - Procurement deals with popular manufacturers can also drive costs down.
    - Limit claims investigations costs by not performing the same claims underwriting on all claims.

(ii)

For TechSure

- A known brand associated with their product
- A partner providing local market experience
- Distribution network already established
- Potential repair network established
- Sharing of costs
- MobiCom might assist with product administration
- Potential for faster growth than going at it alone
- Data on device costs (perhaps even repairs) from MobiCom
- Data on potential client profiles
- There may be scope to share building space, etc.

For MobiCom

- Insurance likely not their key expertise
- Assistance in product design and pricing
- Improves the attractiveness of their existing offering
- Sharing of costs
- Potential for an additional revenue stream

(iii)

Specifying the problem

- It would be necessary to set up a business plan of the expansion...
- ...including a budget agreed/allocated to this expansion.
- This will include assumptions around sales volumes...

- ...expected claims (or claims ratios)...
- ...as well as expenses.
- TechSure would need to understand how different the underwriting experience/risks might be in the new market.
- It is likely that the business will be loss making at early durations,...
- ...so other measures of success would need to be defined/agreed.
- It will be important for MobiCom and TechSure to agree on what acceptable outcomes are...
- ...as they may have different objectives and disagreements may arise in their partnership.

Developing the solution

- A robust joint venture agreement/objectives document should be agreed upon to set up the terms of engagement of the two entities.
- The existing product needs to be reviewed to make sure that it is suitable for the new market.
- Rates are driven by frequency which maybe affected by issues such as crime etc…
- …as well as severity which is a feature of the cost of devices in the new market.
- The review may consist of changes to types of cover provided...
- ...as well as changes to any rates that may be required.
- Rates may include margins to address uncertainty in some assumptions.
- The fact that this a developing nation may restrict the options around repairs / replacements...
- ...as well as the value of the devices being insured.
- MobiCom might have valuable data on costs and information on how often they replace phones due to theft etc.
- TechSure can also approach their existing reinsurer for information on device insurance in similar markets.

Monitoring the experience

- It will be necessary to continually track the business performance against the business plan/projections.
- This will include metrics with regards to policy volumes...
- ...conversion rates of quotes...
- ...premium written,...
- ...as well as claims incurred.
- It will be valuable to understand the claims causes...
- ...as well as average cost per claim.
- This needs to be compared to the pricing assumptions made at the outset...
- ...and updates made to the model if necessary.
- Expansion is expensive and monitoring of expenses is important.
- Ongoing engagement with the local partner to get their feedback will be valuable.
- Survey policyholders to get their experience about the sales process...
- ...as well as their experience at claims stage.
- The effectiveness of the marketing strategy must be measured if possible.

General commercial and economic environment

- TechSure will need to make sure they understand local regulations for insurance companies...
- ...especially regarding the appropriate sales processes.
- Monitor the entry of other insurers/competitors.
- Given that it is a developing country, there may (or perhaps may not) be an appreciation for insurance for electronic devices....
- ...which may require a change to marketing strategies.
- Understanding what types of devices clients prefer in the new country is important…
- …as well as their general attitude towards insurance and technology, since as this would drive the potential for sales.

Professionalism

- A joint venture like this will require many different stakeholders and professionals to work together.
- On the one end MobiCom knows the local economy,...
- ...but TechSure knows insurance and underwriting risk.
- This will require all stakeholders to be open to objectively evaluate different opinions/strategies.
- One would want to take care to treat clients fairly, especially given that this is a new product.
- Pricing approaches/strategies should be well documented…
- …especially since one has two large companies working together, one would want to minimise potential disputes and misunderstandings.

