EXAMINERS' REPORT

May 2019 examinations

Subject F203 — *General Insurance*

Fellowship Applications

INTRODUCTION

The attached report has been prepared by the subject's Principle Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners and should not be taken as model solutions.

Overall

For numerical questions, the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit.

For essay-style questions, the marking schedules contains open ended marks for other sensible comments in some sections where they are deemed necessary. Overall, there are significantly more than 100 marks available.

Performance on this paper was relatively poor compared to prior examination sessions.

- *Candidates continue to undermine themselves by providing generic or off-topic answers. Specific observations are provided by question throughout this report.*
- *The examiners also want to comment on the poor quality of hand-written scripts where text is barely legible. If you intend on writing the paper next session, please ask a peer to review your handwriting where you have written something under similar conditions.*

Candidates should note that F203 is the key paper at which we test candidates' broader thinking. This is generally the final paper before qualifying as a professional, and we consider a capacity for broader thinking to be one of the best indicators of a candidate's suitability to act as a professional actuary. As such we aim to design exam papers so that it is difficult to pass without displaying some capacity for independent, broad and commercial thinking.

Markers also heavily reward instances where these skills are displayed. When reviewing past papers, candidates should assume that the marks available for generic points are substantially less than those awarded for the more challenging points that would be the mark of high-quality professional insight. Marks available for list items from bookwork are lower still.

Most candidates couldn't convince the examiners that they could apply higher order thinking to solve the problems posed. The majority of candidates answered the questions very generically (especially question 1 parts v and question 2 parts iii and iv). Question 1 part ii which required a bit of thought to develop the solution was especially poorly answered. The examiners did not notice that candidates were under time pressure.

In conclusion, we would offer candidates two key pieces of advice – read the question properly and take the time to think about what is going on. Time spent making sure that you are answering the question that is asked is therefore more valuable than a panicked rush to put down as many points as possible, regardless of whether they are relevant.

QUESTION 1

This question examined candidates' understanding of a range of actuarial concepts in relation to a medium sized South African Insurer. These would be the difference between Allocated and Unallocated Loss Adjustment Expenses and suggested ways in which to calculate Unallocated Loss Adjustment Expenses.

Reasons for differences in calculating the ULAE for a going and non-going concern. The steps required for determining the risk margin for IFRS purposes.

Finally, candidates were required to discuss what reserving and general business items that were provided to them in the question they would draw attention to in a report to the actuarial committee as well as the benefits of peer review.

i) This question required candidates to discuss the differences between ALAE and ULAE. This is from the notes and was generally satisfactorily answered.

Allocated

Directly attributable to the actual claim, examples include:

- Towing Fees for Motor Accident if not part of the actual claim amount
- Claims Assessor fees (When not part of internal functions)
- Legal Fees especially in the case of arbitration
- The above components generally form part of the gross claim cost

Unallocated

These are internal costs as a result of having a claims department, examples include:

- Direct claim department costs (salaries, rent, stationary etc.)
- Indirect Costs (Actuarial dept; Finance Dept; Reinsurance dept…)
- The above usually determined on some activity-based costing methodology

ii) Section ii required candidates to discuss the possible different methods for calculating the ULAE and the steps required to perform these calculations. Part b required candidates to describe advantages and disadvantages of their proposed methods.

This question was poorly answered in general with most candidates not thinking sufficiently about the calculation of ULAE and providing the examiners with alternative methods of calculation.

Better answers showed understanding of which expense items would form part of the ULAE but did not adequately address the process required of generating a reserve from this.

Marks were allocated for all feasible suggestions.

(a) Run-Off Calculation (ACPC)

1. Determine the cost assigned to claims from the annual activity-based costing exercise
2. Segment the above correctly into the lines of business as used for provision setting
3. Assign the historical costs by accident period
4. Based on the total number of claim movements determine the average expense per claim
5. Project future number of claims movements on chain ladder methodology, multiply total projected movements of claims (Still to occur) with the average cost calculated in (4) above.

Advantages (+) / Disadvantages (-)

(+) Based on your actual run-off
(-) Data might not be available / not accurate (activity-based costing, especially when based on time sheets, are seldom 100% accurately recorded)
(-) Activity based costing exercise is intensive process
(+) Will provide tracking mechanisms for future years

(b) Future Length Period

1. Determine length of time required to run-off claims
2. Determine cost of claims department in terms of resources required to run-off claims
3. Add an allowance for inflation (if justified)
4. Add possible margins to cater for staffing/changes in estimate
5. From the above determine cost per time period (e.g. monthly) and multiply the by the average number of future periods required

Advantages (+) / Disadvantages (-)

(+) Relatively easier easy compared to method 1
(-) Activity based costing exercise is intensive process
(-) Activity based costing exercise may not be accurate
(-) Not as granular - will be difficult to apply for each line of business

(c) Use SAM methodology as described in the notes to the question

To benchmark results of the above

Advantages (+) / Disadvantages (-)
(+) Easy to use
(-) Captures an industry average… not related to your own in-house expertise

(d) Approach 3rd party specialist dealing with run-off claims to determine likely cost

(-) Finding such a specialist
(+) Fair value (Objective)
(-) Only consider when no longer going concern

iii) Candidates were required to explain the difference in calculation the ULAE for a going concern versus a non-going concern entity. This question was poorly answered with the majority of candidates not even convincing the examiners that they understood the difference between a going versus non-going concern entity and were hence unable to comment on the calculation of the respective ULAEs.

Not a going concern:

- No further premium income to offset business costs
- "Runoff "reflects that the organization is settling liabilities previously incurred and not incurring new obligations
- Thus, no subsidy would exist to cater for time periods where only 1 or 2 past claims exists - for these claims the necessary resources would still incur a fixed cost
- Should consider a possible change in the number of people employed in the claims department - this could reduce expenses over time.

If Going Concern:

- ULAE costs will be partially covered by on-going internal costs as new claims will be dealt with at the same time as old claims - spreading of fixed costs
- Would expect the ULAE to be a smaller component of the overall reserve

iv) Section iv required candidates to discuss two approached for the steps required to determine a risk margin for IFRS purposes as well as the practical implications of each method. In general, this question was again poorly answered with most candidates being unable to properly explain 2 methods of calculating the risk margin or elaborate on the practical implications of the methods.

a. Cost of Capital Approach (SAM)

The risk margin should be calculated by determining the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirements necessary to support the (re)insurance obligations over their lifetime.'

The Risk Margin according to the CoC method is generally determined by the following steps:

1. Determine the Capital Requirements
    - (Additional mark if stating that the capital requirement does not need to include CAT capital)
    - Valid argument about hedgeable vs non-hedgeable market risk (Depending on view)
    - Project the Capital Requirements in all future periods of risk exposure.
    - Could be estimated by the run-off pattern from projecting provisions
2. Multiply the Capital Requirements by the Cost-of-Capital rate in each period.
3. Discount the amounts calculated under (2) using the risk-free rate.

b. Practical Issues

- Profile of reference entity assuming the liabilities may differ (Entity itself; Other entity)
- Determining the correct capital requirements (Regulatory vs Economic capital)
- Correct pattern of projection (Assuming the same as the liability)
- Correct cost of capital rate - weighted average cost of capital might be too high?
- Which discount rate to use?

a. Stochastic Reserving Methods

- Bootstrapping historic losses to derive simulation specific parameters for the respective distributions
- Chain-ladder-type approach (Mack method)
- Methods that measure the variability of the link ratios
- Bayesian approaches that derive distributions of the parameters given the model, the data and an appropriate prior distribution
- Generally, require user to select the form of the distribution (e.g., normal or lognormal)
- These models produce mean estimates consistent with the deterministic chain-ladder algorithm

Analytical approach using a recursive formula:

- It is a distribution-free approach as only the mean and the standard error are estimated.
- The mean estimate produced by the Mack Method is equal to the standard chain-ladder point estimate (volume-weighted-all-years).
- The estimates for the standard error of the claim liabilities are based on the variability of the triangle.
- To derive percentiles or ranges, an additional assumption has to be made on the distribution of future payments (e.g., normal or lognormal)
- The total risk can be split into process error and estimation error.

b. Practical Issues

- The underlying assumption is that the simulated data has the same statistical properties as the observed data
- The Bootstrapping method assumes that the residuals of the actual triangle and the chain ladder implied triangle are distributed around zero
- User makes assumptions regarding the prior/initial distribution of the parameters (for example the link ratios and ultimate losses)
- What is the correct distribution to use

v) *Candidates were provided with actuarial information as at the end of 2017 and the end of 2018 and were required to outline and discuss the main items that they would include in a report to the actuarial committee with emphasis on the changes made between the two valuations and their impact on the results.*

Given that all information was provided to candidates, this question was probably the most disappointingly answered of all with the vast majority of candidates showing insufficient insight apart from listing generic items. Candidates also did not show the required commercial acumen for input to a report that will be presented to a board committee.

Business Profile

- Growth discussion (15% Growth)
- Business growth yet the IBNR has decreased (lower % of premium)

Reinsurance

- Proportional % has dropped
    - Most likely because of retaining more
    - Providing the examiners with your view of why this occurred (Profitable business argument)
- Non-Proportional premiums remained stable
    - Good loss experience
    - Capacity in the market
    - Should look to renew on more favourable terms as no large claims in the last 2 years

Specific Net

- RI OCR reflects ceded percentage to the proportional treaties
- Change in allowance for Non-Proportional recoveries - due to no large claims being recorded in the last 2 periods
- Provisions are probably closer to best estimate
- Reasons for implicit allowance for risk margin
- Could possibly have overstated the provision in the prior period

Actual vs Expected

- Shows significant over-reserving in prior period
- Is this only due to better than expected experience vs implicit margins assumed
- Not required to remove prudence from the accounts, however moving to IFRS 17 will dictate accounting policy change
- Need to investigate classes where most prevalent (Provide your view of the Reasons for this)

Methodology

- Comment on the Gross & Net methodology
- Consistent Methodology used
- OCR still using system case estimates (No Change)
- Methods can be viewed as being actuarial best practice
- Removal of implicit margins & quantifying these
- Removing excessive prudence (In line with A vs E)
- Most prevalent in the IBNR/IBNER line
- Addition of explicit ULAE
- Consistent with SAM & future IFRS 17 requirements
- Should allow for total reserve sufficiency (current IFRS)
- No application for discounting
- Allowance for 3rd-party - removes prudence from reserves. Need to be based on actual recovery triangles rather than estimated. Any changes in methodology can lead to adverse results
- Zero-ising negative development - if case estimates were too high in the past there will be an element of negative IBNER in the development. Check that these trends persist in the data

Risk Margin

- Moving to applying stochastic risk margin at entity level has caused risk margin to drop significantly
- This is driven by diversification experienced between lines of business

vi) The final part of question 1 required candidates to discuss the benefits of peer review in the context of the report to the Actuarial Committee. In general, this question was adequately answered.

- Management and executive level personnel and person being peer reviewed can have more confidence in the piece of work that was produced.
- There is likely to be a greater consistency of procedures and quality work produced among all business units once a programme of peer review is fully implemented.
- Operations generally become smoother. Peer review encourage effective cross-training. Since work will be reviewed by a second qualified professional; each assignment does not necessarily have to be given to the in-house expert or specialist in a given area. In this way, institutional review procedures give managers more flexibility in making assignments and scheduling work.
- It is best practice to implement a programme of peer review across a wide range of business activities
- Since properly executed peer review should help to reduce errors of all types, e.g. Professional Indemnity claims. Sooner or later such reduction in exposure should be reflected in a reduced cost for errors and omissions insurance.
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- Peer review will give the regulators more comfort re the insurer's practice (aside from the fact that peer review could have been a regulatory requirement!)
- (Also, perhaps a small point), but the scope of external audit could be reduced if the review cover work the auditors would have done and they are willing to rely on it

QUESTION 2

This question examined a range of actuarial topics related to a large general insurance company in the South African market that had not shown sufficient premium growth in the last few years. The company only has 60% of its data on their own systems with the rest being administered by UMAs and brokers.

The first part of the question asked candidates to discuss alternatives techniques to calculate the IBNR reserves for policies not administered on their systems and the advantages and disadvantages of these techniques.

The second part of the question was pricing related and asked candidates to explain how they would go about doing a pricing exercise for an HCV portfolio not administered by them with specific reference to data collection, data adjustments, rating factor selection, market considerations and practical implementation of the pricing model.

Finally, candidates were required to discuss why an UMA pricing model could not be suitable for use in a direct channel and what the practical implications would be for distributing this new product via its direct channel.

i) The first part examined the alternative techniques that insurers could use to calculate IBNR reserves when they do not have the underlying claims data on their system. This question was adequately answered with most candidates considering a few alternative methodologies as well as the advantages and disadvantages of their proposed methodologies.

Ultimate Loss Ratio method –

- Set the IBNR as the balancing item when considering paid and incurred claims year to date for a portfolio against earned premium for the year.
- ULR may be adjusted to take account of known poor performance or large losses.
- Method assumes consistent reporting and settlement delays to past years

Interim Measures –

- Use the percentage of earned premium tables as set by the regulator during the calibration of the interim measures requirements before the SAM regulations came into force.
- Can also be adjusted for known longer or shorter development experience

A percentage of premium approach

- Calibrated with reference to a similar underlying portfolio administered on the insurers own system. Again, reserves can be adjusted for known differences in development experience or loss ratios
- Can argue that the method assumes a stable ULR, i.e. no changes in the speed with which claims are reported / settled from one year to next

Advantages and disadvantages of the alternative techniques
ULR Advantages

- Easy to calculate and apply
- Makes limited allowance for own experience

ULR disadvantages

- Difficult to allow for trends and changes in mix and source of business
- Can show significant variance from year to year

Advantages of Interim Measures

- Easy to calculate and apply and calibrated for the South African Market
- Results will be consistent from year to year

Disadvantages of Interim Measures

- Not done at a granular level so may not be appropriate for the specific type of product that you are setting IBNR reserves for
- Difficult to allow appropriately for any trends or differences in experience

Advantages of percentage of premium approach

- Reserves for similar classes of business will be set at a similar level to the rest of your portfolio
- Easy to calculate and apply

Disadvantages of percentage of premium approach

- Claims processes of brokers and UMAs may be significantly different than the rest of your portfolio. This can be for reporting delays, limits, coverage etc. This can lead to reserves being significantly understated or overstated.

Credit was also given to other suitable methods and associated advantages and disadvantages

ii) Section ii asked candidates to explain how they would perform a pricing exercise for an HCV portfolio not administered by them with specific reference to data collection, data adjustments, rating factor selection, market considerations and practical implementation of the pricing model. There were a lot of marks available for candidates and on average most candidates passed or nearly passed this question. However, candidates seemed to waste a considerable amount of time by listing generic pricing considerations and GLM techniques that were not specifically asked by the question.

a. Collection and Checking of available data

- You will need to go to the UMA and request an extract of appropriate claims and exposure data from their system
- Exposure Data will need to be extracted split by comprehensive, third party and value-added products
- Data should be collected over 3 to 5 years with a tradeoff between data being out of date, available volumes and claims being fully run-off
- Exposure data needs to identify any changes in cover or risk details over the year - e.g. vehicle age, use etc.
- It is general market practice to use accident year as the definition of a year as the claims experience will be far better developed than that of an underwriting year
- You will need to select a measure of exposure. Typical measures of exposure will be vehicle years, sum insured or mileage (if available and accurate)

- Typical rating factors that you would consider are:
    - Sum Insured
    - Vehicle make, model and age
    - Power of vehicle or petrol / diesel
    - Use or industry
    - Levels of excess / franchises
    - Size of fleet and past performance of fleet with credibility
    - Geographical area of operation
    - Types of trailers etc.

- Claims and exposure data must have a link between them so that they can be matched together
- Claims data should include amounts and dates of payments, identify the perils and include any unpaid reported claims
- Establish whether or not the claims data includes claims handling expenses (both internal and external)
- Large claims - take account of peril. A large claim in one peril could be an average sized claim on another peril
- Reconcile claims and exposure data with another source of data such as management accounts
- Do any years exhibit unusually light or heavy experience? Is this expected or is exposure or claims data missing or double counted?
- Carry out spot checks on individual data to check that claims and exposure are correctly calculated and linked
- Ensure that new business and lapses in a year contribute to the correct amount of exposure for the calendar year
- Does the data need to be augmented with any external data such as:
    - TransUnion credit or loss ratio scoring data.
    - Mead and Mcgrouther vehicle data.
    - Updates of vehicle sum insured values

b. Any adjustments to the data that may be required

- The data may need to be adjusted to allow for the following:
    - Changes in risk or cover
    - Trends in claims experience
    - any large claims
- Allowance may need to be made for any IBNR claims
- Consider adjustments that may need to be made for heavy or light experience in a particular year
- Consider any inadequacies that have been noted in reserve estimates
- Allowance needs to be made in either the data or modelling for expected inflation from the base period to the period over which the rating will be in force
- Allowance may also need to be made to sum insured or other exposure measures
- Any expected changes to policy terms and conditions e.g. higher excesses
- Adjustments for claims trends may need to be done separately in frequency and severity

c. Selection of appropriate rating factors

- Consider factors that are currently used in the market
- Consider other factors which could be used and provide a Competitive edge in the market
- Make sure that rating factors are representative of underlying risk factors
- Depending on modelling methods used, the statistical significance of rating factors can be tested. Various techniques available for this - forwards or backwards stepwise regression etc. Results will be model with fewest rating factors and best goodness of fit
- Test that rating factors are not significantly correlated with each other
- Certain rating factors may have useful interactions from a modelling perspective
- Some factors may be important for theft or accident but not important for glass as an example
- Rating factors should be easy to capture and measure and not subjective
- Rating factors should be well populated in the underlying data

d. Market Considerations

- The market currently only uses sum insured of vehicle and trailer as well as past claims experience so rating structures are very simple
- The UMA can only sell via brokers. Need to investigate how these brokers are quoting to clients
- Do the brokers currently interface with the rating system of the UMA or is it done on a more manual basis?
- How many other insurers are the brokers quoting for? Will there be opposition to changing quoting structures and methodologies to accommodate the rating changes?
- How many additional rating factors and questions are included and how much longer will it take the broker to generate a quote?
- Need to consider what the impact of the change in structure on existing business? Are there areas where the rates will now be significantly more or less which can lead to a loss of faith by the Brokers in the insurer's product?

e. Practical implementation of the new rating model

- The product will still be distributed by the UMA to its underlying brokers
- A rating engine engine will need to be developed and tested for accuracy
- Will the rating engine be centrally deployed in the UMA with the brokers accessing it via a web-service or will it be deployed on the underlying broker admin systems?
- The decision above will greatly affect how quickly rates can be changed and updates deployed with a central web-service providing a far quicker way to change and control rates
- How will existing quotes and renewals be dealt with?
- Will additional data need to be collected on policy renewal?
- Is the rating engine calling any other webservice to get credit or loss ratio related data? Does this slow down the performance of the rating engine in any way?
- What testing will be done before a broker is certified that the rating engine is giving accurate premium results for them to use in the market?
- How often is the accuracy of quoting tested again at a broker and are checks done that the broker is using the new rating engine - variance reports?
- Is the broker interfacing the new rating information accurately back to the UMA so that this can be used for experience monitoring and other future rating exercises?

iii) This section required candidates to discuss why a rating structure developed on UMA data may not be appropriate for use in the direct channel and the implications should the structure be implemented. The question was poorly answered with most candidates not evaluating the obvious differences between UMAs and direct channels, Candidates also did not consider the above in the context of this being a large insurer.

- The UMA sells a commercial policy via brokers to owners of HCV fleets
- The costs involved to the UMA will be commission to brokers, UMA fees and a profit loading to run at a target loss ratio. Allowance also needs to be made for any differences in reinsurance structures
- The direct channel will need to include marketing expenses to attract new business and will have a different model for paying and incentivising call centre sales staff
- The claims area of the UMA will have different claims processes, salvage agreements, recoveries methodologies and towing contracts in place
- The UMA will have existing relationships with Brokers that have been ongoing for many years and hence the quality of fleet business will probably be significantly better than business sourced directly from fleet owners
- The direct channel will need to charge the same premium for the products as the UMA does via the brokers else the brokers and UMA will become upset and may end up not supporting the insurer to the same degree. The considerations outlined above may however lead to the product being sold in the direct channel not make the required level of return or even being loss making.
- There may be anti-selection issues affecting direct and broker channels that could make the use of this rating structure inappropriate
- The UMA may operate in a geographically different area or may specialise in certain types of HCV sales such as tankers or long haul which may be different to the target market of the direct business

iv) This part of the question required candidates to outline the practical implications of distributing this new HCV product via their direct channel. Again, this question was poorly answered with most candidates not considering the requirements to launch a new product as well as the requirements of selling a commercial lines product in a channel that had until now been only for personal lines in the company.

- The insurer currently only sells personal lines products via their direct channel
- Current staff will only be trained and accredited to sell personal lines products
- Further staff will need to be recruited, trained and FAIS accredited to sell commercial lines products
- Sales conversations will need to be changed and these products will be far more advice intensive
- The Call Centre systems will need to be updated to allow for the sale of this product
- The product will need to be built and tested on the insurer's admin system with the rating engine also updated and tested to allow for this product
- The marketing of the direct channel will need to target a new market segment in order to attract HCV fleet owners to purchase this product
- Will better quality fleet owners want the hassle of dealing directly with an insurer when they have well established and long-running existing relationships with their brokers?
- The insurer may have other UMAs or brokers selling HCV products into the market who may be upset that the insurer is now effectively competing directly with them

- Claims processes for towing, salvage, recoveries, first notification of loss will need to be set up for this product
- Better control of data and risk selection could result in more accurate models and better risk selection for the insurer
- Insurer will need to set up policy schedules, policy wordings and ensure that product on their system meets all regulatory requirements
- Will this product fall into same RI treaty covering UMA or into other treaties? Are there any specific exclusions such as busses or dangerous good?

END OF REPORT