EXAMINERS' REPORT

November 2023 examinations

Subject F103 — *General Insurance*
Fellowship Principles

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.

QUESTION 1

i. Impact on recovery of underestimating EML:

- The insurer will still make the agreed proportionate recovery should a claim occur, regardless of the size of the claim.
- In most circumstances there would be a reduced recovery from the reinsurer (compared to if the EML had not been underestimated) if a claim occurs, because:
  - The policy may now fall below the retention limit, in which case there would be no recovery.
  - Otherwise there would be a smaller proportion above the retention limit and hence a smaller reinsured proportion.
  - E.g. Where the insurer aims to retain as much of the risk as possible up to a specified maximum retention limit.
- The proportional split may, however, be unchanged under certain circumstances, such as:
  - If the "correct" (higher) EML was below any minimum retention limit (in which case nothing would have been reinsured anyway); or
  - If the insurer has a strategy to use the same proportion of cover on all policies of this type, and maximum/minimum retentions do not come into play.

ii. The reinsurer may be unhappy with EML underestimation because:

- This could be an indication that the insurer is unable to estimate its risks correctly.
  - Thus the insurance premiums may be too low.
  - Even though the premium is shared proportionally with the reinsurers, if the premium is too low they will receive too little premium.
  - If the insurer (and reinsurer) have underestimated the risk from outset, the reinsurer may also have agreed to pay too much reinsurance commission.

iii. From Policy 1 we know that the EML remaining after A is 0.8 × \$100m = \$80m.
X was only able to use 1 of the 4 lines of cover due to the limitation placed on it by the minimum retention limit.
Hence, to use only 1 line of cover, X would have to retain \$40m – which must thus be the minimum retention limit (and reinsure \$40m with B).

iv. a. Claim left after A = 4 × \$9m = \$36m
Hence (a) = 0.5 × \$36m
= \$18m

b. Claim left after A&B= \$36m – \$18m = \$18m
Original cover was 90% net claims in excess of \$10m.
Applying the stability index the cover becomes 90% of net claims in excess of \$9m (99/110 × \$10m)
Hence (b) = 0.9 (\$18m – \$9m)
= \$8.1m

c. (c) = 4, since X retains as little as possible on each risk
If it does this X will retain:
$0.2 \times (0.8 \times \$250m) = \$40m$
This satisfies the minimum retention requirement.

d. Claim left after A = $4 \times \$40m = \$160m$
Hence (d) = $0.8 \times \$160m$
= \$128m

e. Claim left after A&B = \$160m – \$128m = \$32m
Let the adjusted excess point on the XL cover be E.
Then $0.9 \times (\$32m - E) = \$18m$
Hence E = \$12m
As the excess point has increased by 20%, the Stability Index is:
$110 \times 1.2 = 132$

f. As there were no surplus recoveries on the claims, no surplus lines were used.

v. Net claims after A-C = \$516m (4 × \$129m left after A) – \$146 (B) – \$26.1m (C) = \$ 343.9m
Hence recovery from D = 70% (\$343.9m – \$133m) = \$147.63m

The better prepared candidates tackled this question fairly well Marks were lost carelessly by some through not showing calculations or omitting currency or units..

In part (i) many candidates did not focus on the impact related to the size of reinsurance recoveries as instructed. Many candidates did not appreciate how this would impact the proportion reinsured.

Candidates who struggled in part (i) generally also struggled in part (ii). Many candidates did not focus on why the situation may displease the reinsurer (as asked) and discussed what the reinsurer might do about it.

The calculations, in parts (iii)-(v), were handled well by the better prepared candidates, but handled very poorly by those who did not understand the underlying principles.

Common mistakes included ignoring the quota share in subsequent calculations, misunderstanding of the operation of surplus reinsurance and incorrect application of the stability index.

QUESTION 2

i. Policy movements may include:

- Lapses or renewals: failure to renew, or renewal of, an existing policy.
- New business: inception of a new policy.
- Quotes not taken up: where a quote is given but the policy is not incepted.

- Mid-term cancellations: where a policy is stopped mid-term.
- Endorsements / Mid-term adjustments: where a policy is amended during the policy year.

ii. Possible reasons include:

- Assessing operational performance against the company's own goals: It enables informed planning and decision making to improve operations.
- Monitoring risk accumulations and business mix from new business written: This will impact on the company's capital and reinsurance requirements.
- Gaining market intelligence from quotes not taken up, written business and lapses: These can provide an initial indication of being out of line with the market and of competitor strategies.
  - This could be done by product type and risk group.
- Meeting regulatory requirements: These might include regular reporting of specific movements.
- Influencing the market: Publishing results of some movements analysis may influence new customers to purchase a policy from the company e.g. relatively low lapse rates indicating satisfied customers.
- Assess the impact of a new set of rates or marketing campaign, and hence sensitivity of the portfolio.
- Reserving and pricing: The outputs of monitoring exercises may provide important inputs into the reserving and pricing processes.
- Checking data accuracy: Policy movements can be used to check data accuracy e.g. by reconciling changes in number of policies in force with movements.
- To assist in assessing the effectiveness of distribution channels or administration systems.
- Part of the actuarial control cycle: The outputs of monitoring exercises would be used to validate assumptions in models.

iii. Possible reasons could include:

- This may be related to a sudden increase of washing machines sales themselves caused e.g. by attractive prices or other reasons.
- It might be caused by a reduction of warranties offered by the washing machine manufacturer.
  - Or a higher need for warranties if the quality of the machines becomes doubtful e.g. due to a change in how or where they are produced.
- There may have been media reports of washing machines exploding or causing other damage.
- There may have been a change of sales channel e.g. to include a large retailer that sells large numbers of washing machines.
- There may have been a change to the cover terms and / or pricing to make it more attractive than before.
  - And/or more attractive than competitor products.
- It may be due to better incentives / remuneration offered to the distribution channels.

- There may have been a withdrawal of this cover type by competitors.
- There may be a generally better uptake of insurance products due to an upturn in the economy.

iv. Possible implications:

- Reputational damage if the insurer is not able to cope with increased volume and results in poor service.
- Enhancement of reputation if competitors have withdrawn from the market and this insurer continues to offer a valued product and good service.
- Higher capital requirements possibly leading to insolvency in the extreme case.
- Anti-selection and resulting underwriting losses if volume growth is due to pricing changes which don't accurately reflect risk.
- Higher underwriting profits from increased sales if pricing is correct e.g. due to fixed costs being more than covered by loadings.
  - The extent of this depends on whether the large sales growth was a one-off or whether it will continue.
- Higher claims and lower underwriting profits if higher warranty sales were linked to lower quality washing machines being produced.
- There may be insufficient reinsurance.

Parts (i) and (ii) were easy bookwork questions, on which candidates generally scored well, although several did not generate enough points. In some cases comments were made related to claims movements while the question specifically asked about 'policy' movements.

Some easy/simple "reasons" and "implications" were missed in the last parts, with several candidates complicating the answer unnecessarily.

QUESTION 3

i. Risks include:

- Liquidity risk: the risk of not having sufficient cash to meet the liabilities as they fall due.
- Currency risk: the risk that changes in the value of the assets, or the liabilities, of the company adversely impact the available capital or investment funds.
- Market risk: the risk relating to changes in the value of the portfolio due to movements in the market value of the assets held.
- Economic risk: the risk of investing in certain asset classes at certain stages in the economic cycle when the assets are overpriced.
- Credit risk the risk that a counterparty to an agreement will be unable or unwilling to fulfil its obligations.
- Group risk: the risk of required investment changes following a change in the parent's requirements.

ii. Variables include:

- Future inflation rates: CPI, medical, legal, wages, building materials etc.
- Future money market interest rates.
- Future exchange rates.
- Future equity returns, split between dividends and price changes.
- Future property returns, split between rents and price changes.
- Future bond returns, split between income and price changes.
- Future asset class returns for the major overseas markets.
- Credit spreads and projected default rates.
- Future house prices (if selling mortgage indemnity).
- Future unemployment rates by country.
- Projected real GDP.

iii. Main steps:

- Define clear objectives that reflect the company's risk tolerance.
  - They should include a tolerable probability of adverse financial position (e.g. insolvency), over a specified time horizon, and a profitability or expected financial position objective.
- Set assumptions for the ESG and cashflow projection models from data collected, testing distributions for goodness of fit.
- Construct cashflow projection models:
  - Of outflows that include claims and expenses, and liabilities at required dates.
  - Of inflows that include premiums, investment income and redemptions and asset values at required dates.
  - The cashflow projections will be based on outputs from the ESG.
- Run the ESG model to produce many scenarios over the specified time horizon.
- An initial investment strategy must be selected.
- Using the ESG scenarios, run the cashflow projection models based on the selected investment strategy.
- Summarise the output from the cashflow models to assess how well the objectives have been met.
- Repeat the process using different investment strategies, and select those that best meet the objectives for further analysis and discussion with decision makers.
- Test the robustness of the output using sensitivity analysis to check how sensitive results are to changes in assumptions.
- Summarise the results for decision making, tailoring the documentation for intended users e.g. more explanations will be needed for non-technical directors.

iv. Risks:

- Model risk (i.e. model structure is wrong).
  - Mitigated by running alternative models to assess sensitivity of results to model and obtain independent expert view on model suitability.

- Parameter risk (i.e. risk of incorrect economic or liability assumptions).
  - Mitigated by running the ALM on various assumptions to assess sensitivity of results to changes in assumptions.
- Risk of errors in running the model as stochastic models are very complex.
  - Mitigated by detailed audit trails and review by an independent practitioner.
- Risk of results not being understood correctly by users leading to incorrect decisions.
  - Mitigated by adequate training of decision makers (i.e. directors).

Overall performance was good on this question.

For part (i) some candidates did not provide risks relating specifically to investment strategy.

For part (ii) some candidates demonstrated that they don't understand what an ESG is/does by listing inappropriate variables.

For part (iii) most answers were adequate although a number were too brief and/or obscure.

In part (iv) most candidates gave model and parameter error.

QUESTION 4

Possible products:

- Employers' liability:
  The logistics company will be indemnified if there is any loss resulting from an accident caused by the employer's negligence or where employees may suffer injury due to harmful working conditions (possible given that warehouse employees could be around dangerous equipment such as forklifts).
- Commercial (fleet) motor property insurance:
  The logistics business will have numerous delivery vans and trucks on the road and will want to be insured should these vehicles be involved in an accident or if the vehicle is stolen. This insurance will indemnify them from losses arising due to damage to the vehicle in the event of an accident, or will indemnify them in the event of a theft through the replacement of the vehicle.
- Motor third party liability insurance:
  This will likely be included in the above motor contract and will indemnify the business in the event that one of their drivers is in an accident. It will cover the business for loss or damage to the property of third parties caused by the insured vehicle, and it will cover them for any bodily injury or death of third parties caused by the insured vehicle.
- Public liability:
  There are likely to be external visitors (i.e. not employees) that may be injured on the business' premises. This will indemnify the business from any losses arising due to members of the public that are injured on the premises.

- Directors' and officers' liability insurance:
  Given that it is a public company, the business will want to be insured against any losses arising due to negligence on the part of the directors and officers of the same business.
  [Note that this insurance is purchased *by* the company. If the directors purchased it for themselves it would severely impact the insurability of the product in increasing moral hazard (remember that the insured party *must* have an interest in the insured peril not occurring). If a director purchased the insurance for themselves then they would have an interest in the peril occurring since they would then get a payout.]
- Commercial buildings property:
  The business will want to insure any warehouses and offices that it owns. This cover may be on a first loss basis.
- Moveable property (contents) insurance:
  The business will want to insure its commercial contents in its warehouses and offices. The insurance will provide a benefit that enables the business to replace the depreciated value of the contents. In addition, commercial content insurance may be taken out to indemnify the business against losses arising from theft or damage to stock in the warehouse.
- Goods in transit insurance:
  Depending on the logistics arrangement, the business may need goods in transit insurance to indemnify them against any losses arising from losing or damaging the goods they are transporting.

Candidates that scored well in this question had a firm grasp on product definitions and could easily provide clear, precise and concise reasons for their suggestions.

Candidates that score poorly showed a lack of understanding of what these products actually cover. Answers were often vague using words like 'protect' and 'cover' throughout without actually suggesting a reason why the business could use a product.

Some candidates misinterpreted the question and attempted to provide seven examples of each of property and liability products.

QUESTION 5

i. The insurance cycle (or underwriting cycle) is a cycle seen in the insurance market where the market cycles between high and low premiums and hence cyclical profitability.
   When premiums are high and profitable, new insurers enter into the market in order to capture a share of these profits. This is said to be a hard market.
   Increased competition drives down premiums, this is known as a softening of premium rates. This leads to lower unprofitable premiums which push insurers into insolvency or to write less business. This is said to be a soft market.
   As insurers exit the market, competitive pressures are reduced and remaining competitors increase premiums until business is profitable again, this is known as a hardening of premium rates.
   The cycle continues again.

ii. a. Effects:

- Providing policyholders with free airtime may improve the retention rate if this is not done by competitors and if customers feel like it is worth the value of the premiums paid.
- However, the cost of providing the airtime will reduce profits. As such, the potential cost of providing the airtime should be weighed against the potential increase in policies sold to determine the proposed changes effect on profitability.
- A positive sentiment towards the offer may not be reflected by all policyholders. In force policies may feel left out that this offer is only provided to new customers and as such be less likely to renew their contracts (increasing lapse rates and decreasing profitability)…
- There may be an anti-selection effect with new users as those that feel the airtime is worth the premium paid, take out the insurance only for 6 months and then lapse the policy when the airtime offer expires – this would have negative impacts on profitability and lapse rates…
- The opposite may also occur, as policies are likely to be held for 6 months, the policyholder may be more likely to stay with and renew their policy with the insurer (particularly if there is an opportunity to cross sell other products). This would decrease lapse rates and increase long-term profitability as business acquisition costs could be spread over a longer in force policy lifetime…

b. Effects:

- Any incentive to pay back money to the policyholder will result in reduced profitability if such payments exceed expected levels and if premiums are guaranteed.
- If the incentive is regarded by the market as reasonable and attractive then this may both improve policyholder behaviour in the form of reduced claims as well as improve the expected lifetime of the policy and as such the insurer may be able to spread the acquisition costs of the policies over a longer time and thus improve the overall profitability of the product**.**
- However, given that mobile phones are usually replaced more frequently than the incentive timeline and given that a mobile phone insurance product is likely to have high churn, it may be unlikely that many policies will reach this point. As such, the expected cost of offering the incentive may be small.
- It may improve policyholder retention as policyholders aim to be claim-free for 5 years. Although this is unlikely given the expected lifetime of a phone.
- If the market finds that the incentive is practically unobtainable, then there may be a turn in public opinion against the insurer for offering misleading incentives. This may result in reputational risk which could increase lapse rates and hence decrease profitability.

c. Effects:

- The aim of the exclusion is to reduce claims from incidents while a policyholder is intoxicated. By reducing these claims, if the policyholder base and premiums stay the same then this should increase profitability.
- The market may however not find this type of exclusion reasonable (particularly if it is not market practice), in which case lapses may increase and profitability declines with lost sales.
- Consideration must also be given to what type of customers may find this exclusion unsuitable. If only those that are most at risk (likely younger policyholders that drink regularly) lapse their policies, then the book as a whole may have better risks which could improve the products profitability as fewer claims would be expected.
- The ability to enforce this exclusion must also be considered. Profitability may not practically increase as claims may be falsified and policyholders can fairly easily claim that they lost their phone a day or two later or they could claim to not have been intoxicated. If this occurs, then the exclusion may have a minimal effect on claims and hence a minimal effect on profitability…

Candidates performed reasonably in part (i). Candidate scoring badly generally structured their answers porrly.

Part (ii) separated stronger and weaker candidates. Strong candidates were able to "discuss" (as the question asked) the nuances and mechanisms of how these product changes may influence lapse rates and profitability. Strong candidates were also able to make use of the question pre-amble and use the softening of the market in their answers.

Weaker candidates were vague in their answers – they would provide statements but then not link them to what the question asked for. For example, "people may value the airtime offered." – Yes, they might. How does this increase in perceived value translate to higher/lower profitability of the product and would it increase/decrease the lapse rate? Weak candidates struggled with communication and clarity of thought in their answers. Weak candidates would also re-state points just in the negative. For example, "profitability may decrease if the cost of the cash reward is not considered in the premium charged / profitability may not decrease if it is included." – both are correct, but they mean the same thing. Applying the negative to a statement and arriving at the same point does not provide any more to the answer if one doesn't show elaboration of thought and show how it is different to the previous answer.

There were many logical errors arising from poor grammar and poor sentence structuring. While it is a time-pressured exam, answers must be sufficiently clear to gain credit.

QUESTION 6

i. Sources of heterogeneity:

- The policies sold between the companies not being identical (e.g. one may sell mostly wheat insurance whereas the other sells potato insurance)**.** In other words, the business mix between the companies may be different (crops, regions, size of policies, etc.)
- Different insurers having different practices (e.g. underwriting, claim settlement etc.).
- The nature of data or quality of data stored may not be consistent across insurers.
- The distribution method may differ between insurers,
- Timing of policies – period over which policy data is captured.

ii. Insurance Risk

- Given that Crop-Inc has done its due diligence, it would be expected that the insurance books that it is acquiring should be profitable (i.e. the NPV of future premiums are expected to at least match the NPV of expected future costs with allowance for a profit loading). Additionally, that reserves and capital held against the book should be adequate. Theoretically, there should be no increased or decreased risk from these books and the aggregate capital held across all books should not need to increase/decrease immediately following the acquisition. I.e. Crop-Inc is not buying an insolvent book of business.
- However, the acquisition of these books may provide additional diversification for the portfolio as a whole which should improve claim stability thus decreasing the capital requirement for insurance risk.
- Additionally, the insurer may be able to leverage economies of scale by consolidating back-office functions (e.g. administration, sales, claims assessment etc.) across the books of business. This could reduce the expense charge per policy and thus reduce the capital requirement for insurance risk.
- In increasing its book, given that it is a crop insurance portfolio, Crop-Inc may be exposing itself to a national aggregation of risk. This increases the exposure of Crop-Inc to very large nation-wide catastrophes. If the diversification benefit does not sufficiently offset this, then there may be an increase in the capital requirement for insurance risk.
- With a larger portfolio, Crop-Inc may be able to get more preferential rates from reinsurers and as such may be able to reduce its capital requirement for insurance risk.
- Crop-Inc may be able to use the large volume of data it has collected to better reserve for current policies, have a more detailed picture of expected claims experience and price more accurately for future policies. This should decrease the capital requirement for insurance risk as there would be reduced volatility in the portfolio with there being better rating.

Operational Risk

- Given that Crop-Inc is acquiring several other insurers, it will need to integrate the people, processes and systems from all these insurers into a single business. As such, there will be increased operational risk resulting from:
  - An increased administration risk: As staff are moved between insurers, there is potential for increased administrative errors occurring as staff may not be familiar with new systems or processes. This will increase the operational risk capital requirement.
  - Increased technology risk. Data will be sitting on different systems across the various insurers. As data is consolidated into a single system, there is an increased risk that data may be corrupted or lost, vulnerabilities in the IT security system appear, and technology is incompatible. This will increase the operational risk capital requirement.
  - Increased governance and compliance risk: As business is consolidated between insurers, there is a risk that legislative requirements are not met as issues slip under the radar in the transition. This will increase the operational risk capital requirement.
  - Increased strategic risk: As the insurer incorporates other insurers, the ability to effectively implement business plans and strategies may be diminished as the organisation's complexity increases. This will increase the operational risk capital requirement.
  - Increased fraud risk: Similarly to the governance and compliance risk, as people are moved between insurers there is an increased risk that a fraudulent employee slips under the radar. This will increase the operational risk capital requirement.

iii. Uses of policy and claims data:

- Administration
- Preparing accounts
- Preparing statutory returns
- Analysing performance
- Informing investment strategy
- Financial control and management information
- Risk management
- Reserving (including unexpired risk assessment)
- Experience statistics
- Premium rating and product costing
- Marketing

Part (i) was either very well answered or very poorly answered by candidates Many candidates could not come up with sufficiently different answers to be awarded marks.

In part (ii) many candidates gave many points but often these were irrelevant (e.g. , defining insurance and operational risk when the question does not ask for this). Often candidates failed to distinguish separate points, lumping them together in a way such that it was not clear that

they understood the different points mentioned. Strong candidates were able to identify that the due diligence having been performed and the sale still going ahead infers things about the business.

In general, candidates seem to struggle with "Discuss" questions, often taking a single view or simply answering as an "outline briefly" question. In such questions it is necessary to consider multiple points that show the nuance of the issue.

In part (iii) a lack of preparation was clear in poor scoring candidates. Candidates that could not remember all the points from bookwork seemed to panic and gave peculiar answers for later points. This should have been an easy and quick question.

QUESTION 7

i. Techniques:

- Burning Cost approach
- Frequency-Severity Approach
- Multivariate models including GLMs
- Original Loss Curves

ii. Factors to consider:

- Validity of current method.
  - A full review of the existing pricing model should be carried out to establish whether the current model is still appropriate, and if not, the reasons for this should be identified
- The amount of data available.
  - If limited data is available, then a burning cost may be the best option,
  - MAT property damage could have enough data available to fit distributions to both incidence and severity allowing the use of a frequency-severity model. This will allow for more complex insurance structures, e.g. deductibles or limits, identifying trends in the data and can provide more information on the risk by carrying out simulations.
  - In the event that the data is too sparse (e.g. for large MAT liabilities) to derive a credible experience rate using a frequency severity model or multivariate model, original loss curves could be used to infer prices for layers.
  - An advantage of original loss curves is that it allows us to split the risk premium into various layers, which is useful for MAT cover due the likelihood of excess of loss reinsurance cover, deductibles etc.
- The presence of trends in the data.
  - The burning cost method will not make it possible to spot any trends and therefore will provide less of an understanding of changes impacting individual risk.
  - A frequency-severity model is useful for analysing trends in frequency and claim amounts, and hence is often used for commercial covers.

- The need to review rating factors.
  - Due to the complexity of risks, MAT cover uses many rating factors, which should be reviewed regularly due to the size of risks .
  - Multivariate models (incl GLM) are best suited for modelling risk premium as a function of exposure to several factors.
- The frequency of model use.
  - Is the aim to produce a new set or rate tables that gets updated once a year or will the model be updated more frequently, e.g. monthly or daily. If once a year, then a burning cost approach maybe a quick and easy way to update the rates tables. However, if the model will be used daily then having a GLM with specific factors may be easier to use.
- The expertise available.
  - If the team does not have the expertise required to run more complex models like GLMs or original loss curves, then this will not be practical to implement unless additional training is carried out.
  - If the expertise is available to build a multivariate model (GLM), this will allow premium rates to vary by different risk factors in order to more accurately assess risks.
- Access to modelling software (incl costs).
  - The costs of changing software/systems using specific techniques may outweigh the benefits.
- Flexibility of the method.
  - Does the company want a single technique for all lines of business or would it prefer separate techniques for each line of business.
  - How easy it is to incorporate new and/or external data into the modelling process.

iii. Factors:

- Other than the risk premium, the office premium will contain an allowance to cover all other types of expenses, an allowance for any premium tax and a profit loading, all of which should be reviewed.
- A review of the distribution channels currently used and the impact these have on both commission and expenses should be carried out. Depending on the target market of the product, changing the distribution channel could have a huge impact on both the final office premium as well as profitability.
- The type of reinsurance used will have a direct impact on the final office premium. A review of the current costs of reinsurance should be carried out as well as obtaining quotes from other reinsurers in the market to determine if better prices can be obtained for the services provided.
- An analysis of expenses by different sources and types is required to ensure suitable expense allowances are made. The current expense margin should be reviewed per product and compared to the outcome of the analysis to ensure these are still correct.
- The profit loading applied to MAT should be looked at and whether it is in line with the risk profile for that line of business. The profit loading may also be influenced by business objectives e.g. obtaining larger market share and therefore

discussion with senior management should be carried out to find out whether there are any business objectives that should be accounted for.

- Shareholders will require a specified return on capital. A review of the amount of capital required for each line of business (after the effect of reinsurance), including MAT, and for writing new business, should be considered to ensure that the margins are met. The required rate of return on this capital should be appropriate to the shareholders risk/return appetite.
- Depending on the reserves required to be set up for each product, the amount of investment income expected might be added as a negative loading.
- Taxation should also be considered and suitable allowance made if this is not currently adequate.
- Contingencies (not allowed for in the profit loading) would also need to be considered and included if not currently done.

Overall this question was well answered.

Part (i) was book work and most candidates scored full marks.

In part (ii), candidates who applied their answers to the question and discussed factors by linking their answers to different techniques scored highly. Several candidates went off topic and did not stick to the question asked and therefore wasted time and scored very few marks.

Part (iii) was generally well answered, but few candidates generated enough points to score full marks.

QUESTION 8

i. Factors to consider:

- Type of contract (facultative, treaty, finite/non-traditional).
- Type of cover (quota share, surplus, per risk excess).
- Basis of cover (losses occurring, risks attaching claims made).
- Line of business.
- Homogeneity of data.
- Credibility of data.
- Length of origin and development periods.
- Claim type.
- Type of cedant.

ii. Additional data issues:

- Claims reporting delays are longer for reinsurers. This is due to reinsurance contracts requiring insurers to typically report on a quarterly basis.

- There is greater heterogeneity of exposure for reinsurance data. This may be due to more contract types, differing terms and conditions or case reserving philosophies. This is an issue since most reserving methods require large volumes of homogenous data.
- Industry benchmarks may be less applicable. This follows from the heterogeneity of exposures which may lead to very different claims development patterns.
- The information received about losses is less detailed than the information insurers receive. This is because the information is provided on an aggregated basis.
- Because of the complexity and individuality of reinsurance risks, it is difficult for reinsurers to have IT systems that capture perfectly all the contracts written and their key features.
- There is a greater tendency for claims to develop upwards for non-proportional reinsurance, particularly for liability business.
- Due to the heterogeneity of reinsurers' exposures, different reinsurers can experience very different claims development patterns, which makes industry wide benchmarks potentially less appropriate.

iii. Difference:

- Using an accident year cohort the chain ladder will estimate ultimate claims for claims occurring in the given accident year. The estimated ultimate claims only include claims relating to expired risk.
- Using an underwriting year cohort the chain ladder will estimate ultimate claims for claims arising from policies sold in the given underwriting year. The estimated ultimate claims include claims relating to expired and unexpired risks.

iv. Reason:

- IBNR reserves relate to expired exposure i.e. the claim event has already occurred. This is consistent with earned premium.
- As at the valuation date a portion of the written premium will be unearned. This unearned portion will cover claim events occurring after the valuation date. Using written premium will thus overstate the IBNR.

v. IBNR calculation:

% Earned at 31/12/2022	Earned Premium (R million)	Ultimate Claims (R million)	Ultimate Loss Ratio	Ultimate Claims Incurred (R million)	IBNR (R million)
100%	800	600	75%	600	60
66.67%	1 000	1 200	80%	800	80
33.33%	500	1 200	80%	400	100.0
				Total IBNR	240

vi. Issues to consider:

- If some engineering policies have a significantly different term than three years it could distort the earned premium calculation, and hence the IBNR reserve.
- The claims development percentages were derived for engineering business written in Northern Europe which may not be applicable to engineering business reinsured in South Africa.
- The IBNR calculated is gross of any retrocession. The retrocession recoveries will need to be calculated to determine the net of retrocession IBNR.
- The level of margin that should be booked. This will depend on the company's reserving policy.
- Whether there were any changes to the claims' development patterns which may invalidate the assumption that the past is a good guide to the future.
- If the assumption that the risk is earned uniformly, which is needed when calculating the earned premium, is appropriate.
- If any additional assumptions need to be made for direct or indirect claims expenses.

In part (i), a book work question, candidates performed well.

In part (ii), a bookwork question, candidates generally performed well. However, some provided too much detail or too many points given the mark allocation and thus wasted time.

In part (iii), another bookwork part, candidates again generally performed well However, some candidates commented on the benefits and drawbacks of using accident year and underwriting year claims triangles which did not score marks.

Candidates generally did not score well in part (iv) and did not identify the main reason why earned premiums are used to calculate IBNR since both earned premiums and written premiums relate to past exposure.

Candidates generally either scored very well or very poorly in part (v). Candidates who followed the approach given in the question generally scored very well. Some candidates calculated the earned premium on a financial year basis, instead of separately for each underwriting year as stated in the question, which did not score marks. Limited credit was given to candidates who used written premium instead of earned premium in the IBNR calculation. Generally, candidates who scored well in part (iv) understood the need to use earned premium and did not make this mistake.

In part (vi) candidates were expected to consider the issues arising from the additional information provided. Candidates who followed this approach generally scored well..

END OF EXAMINERS' REPORT

