EXAMINERS' REPORT

November 2024 examinations

Subject F103 — *General Insurance*
Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principal 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. The possible bases are:

- Losses-occurring basis:
  - This basis provides the direct writer with cover for any claim incident(s) under the treaty occurring within a defined period (i.e. corresponding to an "accident-period" cohort).
- Claims-made basis:
  - This basis would provide the direct writer with cover for any claims under the treaty reported to the direct writer within a defined period (i.e. corresponding to a reporting-period cohort).

ii. Risk to the insurer:

- Occurs when moving from a claims-made to a losses-occurring basis.
- The risk is that there may be periods relating to policies already written in which the insurer was exposed to risk, but for which there is no insurance cover.

iii. Risk to the reinsurer:

- Occurs when writing new business on a claims-made basis.
- The risk is caused by the fact that it may be unknowingly accepting cover for latent claims already incurred, but which only come to light once the new cover is in place.
  - This may be exacerbated by non-disclosure on the part of the direct writer.

iv. a. Proportion reinsured with B = (150 – 100)/200 = 0.25 of the original policy
Hence (a) = 0.25 × (R1m/0.25) = R1m

b. Sum Insured left after A&B = (1 – 0.25 – 0.25) × R400m = R200m
Hence (b) = 0.01 × 90% (R200m – R50m)
= R1.35m

c. As Co. X retains the minimum permitted, all 4 lines will be used.
This implies that 20% of 75% (R60m) of the EML is retained, which is acceptable.
Hence (c) = 80% × 75% × (R2m/0.25) = R4.8m

d. Let S be the sum insured.
Then 0.01 × 90% ((0.2)(0.75)S – R50m) = R0.9m
(0.15)S = R90m / 0.9 + R50m
S = R1000m

v. XL Reins Premiums paid = (b) + R0.9m + R7.75m = R10m
XL Reinsurance Recoveries = R5m
Profit Commission = 0.5 × (0.7(R10m) – R5m) = R1m
Thus Loss on XL Reins = XL Reins Premiums – Recoveries – Profit Commission
= R10m – R5m – R1m = R4m

In part (i) several candidates did not get the correct bases.

In part (ii) several candidates outlined the main risk faced by the reinsurer, rather than the main risk faced by the insurer as asked for.

Part (iii) was generally answered fine (by those who knew the relevant bases).

Parts (iv) and (v) produced a wide spread of answers, with the better prepared candidates scoring close to full marks. At the other end of the spectrum, however, some weaker candidates scored close to zero, demonstrating a complete lack of understanding of the basic principles.

In part (v), several candidates did not indicate whether their final calculation represented a profit or loss (referring to it as "profit/loss").

Some candidates lost marks by failing to specify the currency and units (or getting the currency wrong). Saying "all figures in Rm" is not sufficient, as not all figures are currency.

QUESTION 2

i. Possible reasons:

- Actuaries are relative newcomers to the general insurance space.
- There have been fewer years to collect and establish processes for actuarial applications.
- The range and scope of data needed is very large, given the wide range of products offered and perils covered.
- Many niche areas are covered, where insufficient data is available.
- Complex statistical models (ideally requiring more data than available) are used to set rates.

ii. Internal parties:

- Management: overall involvement, will make business decisions and determine shape and form of required management information / reports.
- Accounting/finance: premium and claim involvement for payments and collections and preparing summaries.
- Underwriting: premiums involvement – rating, improvements, monitoring.
- Claims: Settle and process claims, monitoring.
- IT team: both premiums and claims – write and implement system, testing procedures and the safe storage of date..
- Actuarial: both premiums and claims – rating, reserves, reinsurance strategies, management information.
- Reinsurance team: premiums and claims – monitor reinsurance adequacy and treaty performance.
- Marketing: Premium/policy involvement – Market performance and opportunities.

- Conduct/compliance team: premiums and claims – ensure customers are treated fairly and appropriate conduct related items are considered.

iii. External parties:

- IT supplier to advise on hardware requirements and assist in the modification of the system for the company's needs.
- External consultant appointed to assist/test the process.
- Brokers or other parties could assist with input/ testing.
- Regulators needing to be satisfied that operations won't compromise policyholders.

In part (i) many candidates misinterpreted this question which was asking about the general insurance market and not insurers specifically.

Part (ii) was answered reasonably well, although many candidates gave vague points such as "admin team", without being specific about the administration role being referred to (e.g. claims/underwriting).

In part (iii) credit was not awarded for suggesting reinsurers or auditors, as they are not likely to be involved in the system migration process itself.

QUESTION 3

i. Risk profile: The risk profile is defined by the risks that have been modelled- as they arise from existing business and a finite period of new business activities – and the key outcome (usually financial in nature) used to measure success or failure.

Risk measure: Linking the key outcome to a capital amount required to achieve that outcome. It will be defined in terms of a required confidence level and a time horizon.

Risk tolerance: The required confidence level stated in the risk measure. A parameter that links the risk measure, as applied to the risk profile, to a single capital amount (i.e. the amount of risk the insurer is willing to take on related to the amount of capital).

ii. Impact on capital model:

- Additional climate risks (such as physical, transition, and liability risks) not yet accounted for must be incorporated into the modelling of insurance risk – relating to the risks that now need to be modelled.
- The increased insurance risk caused by adverse climate scenarios leading to worse financial positions must be calculated – i.e. solvency and financial impacts must be linked to climate risks.
- Existing capital models may incorporate existing and future business risks over a different time horizon (e.g. the next year) so the risk measure's time horizon for climate risks may require model modifications.

- The risk tolerance may not be the same when compared with the existing capital model. It may be necessary to extend the model such that it models this requirement separately.

iii. Proportionality: An action should be proportionate to the problem or task at hand and need not go beyond what is necessary to achieve its objective. The most significant risks should be incorporated first into the capital model. The more significant the risks, the higher the level of detail and potential complexity of the modelling approach should be considered.

Practicability: An action can only be required if practicable. When considering how to incorporate risks into the model, the existing model structure and data available should be considered and used as far as possible.

iv. The objective is that all significant direct impacts on the insurance risk component should be modelled in order to make sure that the most material risks are accounted for.
Following proportionality, the most resources and time should be spent on business areas that have the largest and make up the most significant portion of the business.
Hence, the majority of the effort should go towards the residential property insurance with less going towards crop insurance. This relates to the guidance mentioning "significant and direct impacts…".
Practicability would state that measuring all the impacts of climate change (even indirect impacts like transition and liability risk) on something like phone insurance are impractical. Thus work should be done at looking at how to meet the objective of measuring only reasonable things. This pertains to the comment in the guidance on "material risks".

Many candidates scored poorly in this question which is surprising given the level of theory in it.

Common mistakes in part (i) confusing the elements within definitions of the features.

In part (ii) many candidates did not incorporate the features of the capital model into their answers.

In part (iii) a worrying number of candidates confused proportionality with the proportions method; many candidates took these as a joint item where they are in fact distinct, and each needed to be explained.

In part (iv) many candidates could not explain how both principles could be applied to meet the regulator's requirements.

QUESTION 4

i. A captive insurance company is an insurer that is wholly owned by an industrial or commercial enterprise and set up with the primary purpose of insuring the parent or associated group companies and retaining premiums and risk within the enterprise.

In addition to accepting the risks of their parent companies, captives may also accept external risks on a commercial basis. In some territories this is necessary in order for insurance premiums paid by the parent to be tax-deductible.

The reasons why ENat may have set up a captive insurer are:

- To fill gaps in insurance cover that may not be available from the traditional insurance market.
- To manage the total insurance spend of large companies or groups of companies.
- To enable the enterprise to buy cover directly from the reinsurance market rather than direct insurers.
- To focus effort on risk management.
- To gain tax and other legislative or regulatory advantages.

ii. Possible rating factors:

- Sum insured split by building, machinery and contents
- Probable maximum loss (PML)
- Maximum Foreseeable Loss (MFL)
- Type of plant e.g. solar, wind or coal
- Age of Plant
- Location of Plant
- Size of plant / area covered
- Power generation capacity
- Technology employed e.g. large turbine or multiple small turbines
- Hazardous material
- Limit / Excess
- Exclusions
- Risk Mitigation procedures
- Previous loss experience

iii. Factors to consider:

- Availability of accurate date to determine the risk premium:
  - Can ECap provide data at the correct level of granularity in order to determine the risk premium using Experience Rating for layers where there is enough data.
  - If there is limited data, does the company have experience in doing exposure rating techniques in high excess layers.

    - For exposure rating, detailed information on the sizes of risks written by ENat will be needed.
    - In addition, is it possible to verify the accuracy around estimates for sum insured, EML and PML.
- Underwriting considerations:
    - Will underwriters be able to get direct access to power plants or detailed reports from specialists to better understand the risk mitigation procedures and policies?
    - Do the underwriters have the experience to properly underwrite these specific types of risks.
- Exposure:
    - What will the excess of loss layers be, i.e. excess point and upper limits?
    - Are there any exclusions?
    - What other reinsurance cover is in place e.g. quota share or stop loss agreements?
- International group considerations:
    - Is the international group prepared to take on exposure to ENat given potential risks faced by ENat, such as load shedding?
    - How does the group feel about geopolitical risks in the country and are they placing any restrictions on exposure in this country?
    - What is the risk appetite of the board and are they willing to be exposed to ENat?
- Reinsurance capacity and SCR considerations:
    - What is the impact of writing this deal going to have on the SCR and is there enough capital to write this book of business?
    - Does the group have internal capacity and appetite to retrocede if the capital in local market is not sufficient?
    - If external retrocession is required, what is the cost of this?
- Competition and profit margins:
    - Are competitors prepared to quote and how much capacity is there in the market?
    - Will company be able to obtain the required profit margins ?
- Other:
    - Does the company have resources and time to quote within the deadlines of the tender?
    - Does the company have existing business with ECap and does it want business with ECap?

Part (i) was bookwork and was well answered by most candidates.

Part (ii) was generally well answered.

In part (iii) a number of candidates displayed poor exam technique and described/discussed factors that should be considered when pricing a reinsurance arrangement, rather than giving the brief outline asked for. As a result, many gave more detail than required and went into aspects which were not asked for. Apart from demonstrating that they did not fully understand what was being asked, these candidates wasted time.

QUESTION 5

i. Property:

- Commercial buildings property insurance: To indemnify against damage to any warehouses or offices.
- Moveable contents: to indemnify against the theft or damage of any moveable items on site or at the offices.
- Construction insurance: To provide cover for any nuclear construction projects over their lifetime. The benefit would be paid should certain perils result in the inability to finish the project.
- Engineering insurance: Related to construction insurance. To indemnify the company should there be any perils relating to machinery breakdown, explosion, and electronic failure.

Liability:

- Public liability insurance: Should a member of the public be injured or killed on a construction site or on the premises of a power plant, this insurance would cover the resulting damages.
- Employers' liability: To provide cover to the nuclear power company should there be damage, illness, death to an employee as a result of the negligence of the employer. Particularly important given the high-risk nature of the work.
- Directors and Officers (D&O) liability insurance: Indemnifies the company against the legal liability to compensate third parties owing to any wrongful act of the insured director.
- Environmental liability: Insurance that would cover the legal costs and clean-up fee should there be environmental damage caused due to a break-down of the plant..

Financial loss:

- Business interruption cover: Should the plant be unable to produce energy on a day then this insurance will cover the financial loss resulting from this interruption in services.
- Fidelity guarantee insurance: Provides cover to the insured against financial losses caused by dishonest actions of employees.
- Legal expense cover: The company may be involved in court proceedings due to its perceived risks as an energy source. As such, this insurance indemnifies the company against legal expenses from court proceedings being bought against/by it.
- Cyber risk insurance: Power plants are often part of crucial infrastructure to any country. This makes them prime targets for criminal hackers. This insurance would assist in preventing hackers from having undue control over the power supplier.

ii. A first loss basis is appropriate where it is unlikely that there is a loss in excess of the sum insured and thus the parties to the insurance agreement agree to restrict the sum insured.

The sum insured in this case would not be the full market value of the property but instead the estimated maximum loss (EML). This is a measure of what the underwriter believes could feasibly be lost in a single accident. Given that the insurance is covering a smaller sum insured, the cost of insurance is cheaper and hence the premiums are cheaper.

iii. As the property insurance relates to a nuclear power plant, if it were to have a meltdown it would affect much more than just the property and land it is built on. Thus, a first loss basis is unlikely given the potential scope for damage.

Overall, candidates should not have struggled with this question, although several did.

In part (i) candidates that scored poorly often mentioned products that were less relevant to the context given in the question, used generic terminology in their explanations; did not fully explain the reasons for cover; or tried to mention several different products in a single line.

In parts (ii) and (iii), candidates that had little idea about first loss clearly showed this in their inability to link EML and first loss and often wrote lengthy answers with little substance.

QUESTION 6

i. A risk pool is an arrangement under which parties agree to share insurance premiums and losses for specific insurance classes. P&I Clubs are a type of risk pool. It has a specific term as it relates predominantly to the pooling of risks among ship owners so as to cover certain types of marine risks (mainly liability) that could not be covered under a commercial marine policy.

ii. Lloyd's syndicates:

- Individual members of Lloyds are known as 'Names'.
- Names can be either corporate or individual.
- Names conduct their business in groups of members known as syndicates.
- These syndicates collectively coinsure risks.
- These syndicates are authorised and governed by Lloyd's.
- Each syndicate may specialise in a particular type of insurance.
- Each syndicate appoints a managing agent to run its insurance operation.
- The syndicate will employ underwriters to write insurance business on behalf of the members.
- The Names underlying a syndicate that have taken on a risk by contributing backing capital will accept a portion (relative to their capital contribution) of the insured risk.
- Any insurance profit or loss is shared by syndicate members.
- A Name's share of a syndicate is fixed during an underwriting year.
- A syndicate has access to Lloyd's global licenses that enable Lloyd's syndicates to write business anywhere in the world.

iii. Suitability:

- A Lloyd's Syndicate may be more suitable as:
  - Depending on location, risk pooling in the form of a P&I Club may not be possible.
  - Given Lloyd's global license, there may be a syndicate that is better able to insure the company given international risks.
  - This may also be the case if the shipping business is particularly niche then Lloyd's may be better suited.
- However, if the shipping business is largely similar to other global shipping, then the P&I Club is likely the better option, as it:
  - Can provide ship owners with technical assistance in the marine market and advice on issues relating to the shipping industry.
  - Provides diversification and economies of scale for cost savings.
  - Offers bargaining power for reinsurance as a group.
  - It is likely to have the required terms (e.g. liability cover) that would otherwise be unavailable in the market.
  - It is a mutual based structure so there is no insurer's profit margin to have to pay, making it potentially cheaper.

Part (i) was surprisingly poorly answered given it being a bookwork question. Candidates were generally either able to talk on P&I clubs or risk pools. Many struggled to coherently relate the two and poor scoring candidates often spoke of pools and clubs being synonymous.

Part (ii) was either well or poorly answered. Low scoring candidates often made contradictory statements and did not understand that syndicates are formed before risks are written. Many also went far too in-depth on the slip system and tried to regurgitate bookwork in hope of scoring marks.

In part (iii) few candidates scored well, many candidates did not read the question which asked for reasons when one or the other would be more useful, many tried to give generic answers about both.

QUESTION 7

i. Investment restrictions and rationale (maximum of four):

- Requirement to invest in specified assets (prescribed assets): Regulations may be designed to ensure appropriate matching of assets and liabilities.
- Limit per asset class: Rationale is likely to be to reduce the risk of inadequate diversification and over-concentration in a specific asset class.
- Limit (including nil) per individual asset: Rationale is to ensure adequate diversification and avoid risky and speculative assets.
- Limit per counterparty: Rationale is to limit risk of credit default.
- Requirement to match assets and liabilities or to hold a mismatch reserve: Rationale is to reduce the risk of mismatching leading to insurer insolvency.

- Restrictions on assets used to demonstrate solvency (admissible assets): Rationale is to limit investment risks of weaker insurers in particular.
- Custodianship of assets: Rationale is to limit the risk of theft of insurer's assets.

ii. a. Loss ratio = Claims incurred / Premiums earned
= 200 / 250 = 0.80

b. Profit margin = Post-tax profit / Premiums earned
= 25 / 250 = 0.10

c. Return on capital = Post-tax profit / Shareholder funds at start of year
= 25 / 100 = 0.25

iii. Suitability of XYZ's investments:

- MAT insurance liability characteristics include:
  - Most claims will be for physical damages (whether to own craft/vessel/goods or third party), which will be reported quickly but settlement might take longer due to time needed for repairs and to establish liability.
  - Third party liability claims relating to injury and death may take several years to settle due to protracted litigation.
  - Claims will be inflation linked due to cost of repairs, medical costs, loss of earning and court awards increasing at least at CPI.
  - Insurer's own costs are mostly staff-related and hence inflation linked.
  - Currency will be varied, depending on where repairs need to be done, and where third-party claims are to be made.
- Local cash deposits and money market instruments are likely to be very liquid and hence suitable for very-short term liabilities.
- However they are unlikely to be suitable for all liabilities, in particular:
  - Returns are unlikely to match liability inflation over longer terms, potentially leading to insufficient funds to meet future claims.
  - Currency mismatch for many claims increases solvency risk if local currency depreciates relative to claim costs to be met in foreign currencies.
  - Unlikely to be suitable for the insurer's free assets due to low expected real returns.
- Other factors may contribute to suitability:
  - The insurer's solvency margin may be very strong and there is a deliberate choice (e.g. based on investment outlook) to mismatch assets and liabilities.
  - Local regulations may influence investment choices.

iv. Potential impact on investment strategy:

- The proposal may lead to a more suitable matching of assets and liabilities by currency in respect of Landia business.
  - However, many claims for Landia MAT companies might not be made in Landia currency, and the proposal ensures future mismatch risks.
- Landia money market instruments are unlikely to offer suitable liability inflation matching over longer terms.
  - The Landia government may pose a greater credit risk than better alternatives.

- If the proposal is not based on net of reinsurance liabilities, XYZ is forced to hold more assets in Landia than necessary, which may be unsuitable for XYZ's other liabilities.
- The need for investment in Landia may increase investment costs e.g. custodian fees, broker and asset management fees, monitoring and reporting costs.
  - However, some costs might be saved e.g. on converting Landia premiums into local currency.
- The proposal might be in conflict with XYZ's local regulations.

Overall performance on this question was good.

Part (i) was mostly bookwork, however some candidate struggled with possible rationale for restrictions.

Part (ii) was well answered by most.

Part (iii) was answered less well by candidates less familiar with MAT. A number of candidates offered alternative investment strategies, which is not what was asked for.

Most candidates struggled with part (iv). A number suggested impacts not relevant to the investment strategy.

QUESTION 8

i. Key requirements underlying the Basic Chain Ladder (BCL) method:

- The future pattern of claims development derived from past experience should remain stable.
- There should be sufficient data available that can be grouped into homogenous reserving classes.
- Unusual link ratios or trends in link ratios need to be understood and judgement applied in selecting appropriate link ratios.
- The most developed cohort is assumed to be fully developed. If this is not the case then a tail factor should be applied.
- The data used in the BCL calculation should be accurate and reconcile to the financial statements.

ii. Advantages:

- Grouping all classes together will increase the volume of data available which will make it more likely that there is sufficient data available to apply the Basic Chain Ladder method.
- The majority of the book consists of personal motor, thus in aggregate the future
- pattern of claims development should be stable.

- Applying the BCL to a single claims' triangle is simpler and less time consuming than applying it to several claims' triangles.
- Applying the BCL to a single claims' triangle implicitly allows for correlation between different reserving classes.

Disadvantages:

- In recent years the increase in liability business will distort the run-off of claims since liability business is longer tailed than personal motor.
- Applying a primarily motor claims run-off pattern to liability business will understate the liability IBNR. This may not have been an issue before since liability was a small portion of the total book, however given the increase in liability business it is now likely that the liability IBNR may be understated. However, overtime this will be offset by an overstated motor IBNR due to the influence of the longer run-off of liability claims on the aggregated development pattern.
- It is more challenging to allocate IBNR between different reserving classes.

iii. Calculations:

Ultimate claims (IELR) = Earned Premium x IELR

Ultimate claims (ACPC) = ACPC x No. claims reported / % claims reported

Accident Year	Claims incurred (Rm)	Ultimate Claims (R millions)			IBNR (R millions)		
		IELR	ACPC	Selected	IELR	ACPC	Selected
2022	50	110	125	117.5	60	75	67.5
2023	27.5	180	137.5	158.8	152.5	110	131.3

iv. Accuracy of IBNR:

- The accuracy depends on the appropriateness of the selected initial expected loss ratios and the relevance of the market statistics to your company's claims experience.
- However, the suggested approach should result in a more accurate IBNR, since the claims run-off pattern used in the aggregate triangle is based primarily on personal motor claims which won't be suitable to project the run-off of longer tailed liability claims.

Part (i) was bookwork and was generally well answered. Some candidates stated that the BCL method assumes that inflation is constant over the period of projection, which is not the case. The assumption is that historical inflation, which is assumed to be a weighted average of past inflation, is replicated in the future.

Part (ii) was generally well answered. Candidates who performed best focused on the main issues of applying the BCL to heterogenous claims data, and the impact of this on the IBNR.

Part (iii) was poorly answered by most candidates. Some candidates confused ultimate claims with IBNR, while some candidates over complicated the question by recalculating development factors. Candidates should be very familiar with applying basic reserving methodologies.

Many candidates could have performed better on part (iv). Several candidates did not refer to the previous reserving methodology, and thus did not answer the question which asked for a comparison between the previous and the proposed methodologies.

END OF EXAMINERS' REPORT