EXAMINERS' REPORT

November 2023 examinations

Subject F203 — *General Insurance*

Fellowship Applications

INTRODUCTION

This main aim of this report is to assist candidates preparing for the F203 examination. The Examiners scrutinise the official syllabus, refer to the Core Reading, which elucidates the syllabus, for crafting questions. However, they are not strictly bound to limit questions to the Core Reading material exclusively.

For essay-type and open-ended questions, especially in advanced subjects, the report might include more discussion points than what would be expected for a top-scoring answer.

Using past exam papers and examiner reports as study tools requires careful consideration, as each exam question is distinct. Professional exams aim to evaluate advanced cognitive skills like the application of knowledge, synthesis, and analysis, and presenting informed conclusions or advice.

Successful candidates focus on responding to the given questions rather than merely reciting their knowledge.

Finally, this report is based on the legislative and regulatory framework relevant at the time of the exam's creation. Candidates using these reports for revision should be aware that circumstances might have changed since then.

General comments on the aims of this subject

F203 aims to equip candidates with the capability to apply their knowledge of the general insurance sector and actuarial practices in real-world settings. A candidate who passes this stage is expected to understand not just the technicalities of general insurance actuarial work, but also have a firm grasp of product knowledge, competitive market dynamics, regulatory frameworks, and operational aspects of an insurance company. They should be adept at integrating these various areas to provide comprehensive advice.

We offer two essential pieces of advice to candidates: (i) read each question thoroughly and (ii) organize your thoughts before writing. It's important to note that achieving a passing mark doesn't require addressing all the points mentioned in this report. The focus should be on accurately responding to the question rather than attempting to cover as many points as possible.

The phrasing of each question is deliberate, and candidates should pay close attention to it. Common errors due to misreading questions are highlighted in the question commentaries. Writing about unasked topics wastes time and won't earn marks, though these broader responses might be relevant in a professional setting. An exam, with its limited marks, requires focusing on the specific scope of each question.

If a question explicitly mentions a particular aspect, it's safe to assume that there are marks allocated for that component. During the exam creation, any unnecessary content is removed, indicating that (for example) included numbers or data points are relevant for analysis and commentary.

Candidates should also consider the placement of each question section within the overall context. New information provided in between sections is pertinent to the subsequent sections. Avoid using information from later sections when answering earlier ones.

Regarding the second piece of advice, F203 is the critical paper where we assess deeper thinking skills. Successful candidates display independent and broad thinking. When reviewing past papers, remember that generic points typically score lower than insights showing professional acumen.

We recommend candidates take a step back and thoroughly consider the question's context, rather than just analysing numbers with standard techniques. This approach involves thinking about the practicalities of the business, stakeholder perspectives, wider impacts, regulatory or ethical considerations, the suitability of actuarial methods for the situation, and current economic factors. Such a comprehensive approach leads to a more nuanced understanding of the risks and dynamics, valuable in professional practice. Commentary on the current paper points out instances where this broader perspective was lacking.

More broadly, we advise employing basic exam techniques like structured responses and effective time management. The online exam format should aid in organising answers. Using bullet points can clarify answers, but ensure each point is distinct and avoid repetition. Tailor your answers according to the command words used in the questions.

Candidates providing well-reasoned, question-specific points, even if not in the marking scheme, will be awarded marks.

Question 1

i. Describe the Underwriting Cycle

Bookwork: Lots of marks available. Important to explain the cycle as well as the factors setting off the cycle.

- In the past it has been observed that insurance premium rates have varied in ways that do not reflect the underlying cost of providing the insurance.
- This is most common in large commercial and industrial insurance but affects all classes of insurance.
- Insurance is generally highly profitable.
- This position is commonly known as a hard market.
- The level of profits attracts new entrants to the market and encourages existing insurers to write more business.
- To fill the extra capacity, premium rates are reduced to attract business.
- Eventually premium rates fall to the extent that insurance is generally loss-making.
- Reinsurance rates often turn first and drive increases in direct pricing.
- This position is commonly known as a soft market.
- The actual mechanisms that reduce the size of the market when it is unprofitable will be companies exiting certain lines, i.e. withdrawing as a reaction to unprofitability because of unwillingness to accept continuing loss.
- or in extreme conditions becoming insolvent.
- Reinsurance being less readily available.
- In the past, soft markets have often ended when a major disaster triggered severe losses at a time when premium levels would not support the normal level of claims.
- Examples of this in the recent years are Riots (Sasria losses); Covid Business Interruption losses; KZN flood losses.
- Insurers leave the market in response to the level of losses or reduce the amount of business they write.
- With restricted availability of insurance, premium rates increase.
- Eventually premium rates rise to the extent that insurance is generally profitable.

ii. Discuss the likelihood of occurrence of large individual claims and catastrophes in each of the company's classes of business, giving examples of how they may arise in each case.

Bookwork: Lots of marks available. Important to keep with the context of the question – i.e. Medium Sized insurer. Important to make the clear distinction between the lines of business being asked – writing down what differentiates the claims within this line and then compared to the other classes being examined. Claim characteristics are frequently examined and as a result was generally well answered.

Personal and commercial motor

- Large claims are likely to be a smaller proportion of total claims cost to arising from large individual claims.
- Likelihood of large claim usually higher for commercial owing to exposure, although will depend upon experience of policyholder
- In South Africa the RAF handles large bodily injury claims – therefore unlikely to get large liability claims.
- Catastrophes may arise from, say, a motorway pile up or weather events such as floods

- Potential accumulation of risk is greater for Commercial Motor

Household buildings and contents

- Most household contents claims are small, mostly due to property damage.
- More household buildings claims are large…
- …e.g. total destruction due to fire, or total rebuild for subsidence
- But generally, the proportion of large individual claims is smaller than for liability classes of business
- Catastrophes are a significant feature for household insurance, being a key driver of profitability for a particular accident year

These generally arise due to weather conditions…

- …such as earthquakes, flood & storms
- Fire Claims can be very large - often concentrated due to building style/building estate rules (Thatch property - PE)
- …and their occurrence is strongly linked to weather conditions…
- Possibility, although very unlikely to have a large Personal Liability claim (Often sold as an addition to the Houseowners policy)

Commercial property

- Large individual commercial property claims are common
- As a proportion of total claims cost large individual claims are more significant for this class than for motor or household
- Potential for very large claims depends on nature of portfolio (e.g. retail, industrial, small/medium/large assureds)
- Large claims can arise when there is significant property damage
- E.g. fire resulting in destruction of whole building
- But also from business interruption claims if this cover is included within the contract
- Catastrophes generally arise due to weather conditions
- Potential for accumulation of losses owing to proximity of risks

Employers' liability

- Employers' liability gives rise to bodily injury claims of various sizes, including some very large ones
- Large individual claims can arise where bodily injury is such that cost of
- medical care is very high e.g. back injuries
- or employee's salary is high…
- or employee is young…
- …and therefore, loss of future earnings when unable to work is high
- The likelihood of some large claims (e.g. asbestos) will depend upon size of past exposure and trades covered
- Occasionally catastrophe (Not natural catastrophe) type claims – or rather an aggregation of claims can affect this class, although this is unlikely
- Catastrophes will depend upon trades covered

Public liability

- Public liability gives rise to property damage and bodily injury claims of various sizes, including some very large ones

- Likelihood will depend upon business covered, e.g. major sporting event
- Claim size distribution is generally more skew for public liability than for employers liability
- In some cases, public liability insurance policies may include limited coverage for product liability, especially if the insured's business involves both services and the sale of products. However, the coverage for product liability in a public liability policy is typically secondary to the primary coverage for general liability claims

Professional indemnity

- Claim sizes generally depends on professions covered within account
- Likelihood of a large claim depends upon policy terms and conditions and generally frequency is more variable than for other classes
- A professional negligence claim against a large firm of accountants may result in a very large claim if a company became insolvent as a result of negligent advice

iii. Outline the key factors the insurance company should consider when deciding on the appropriate program to purchase

Time management is probably the key factor on this question – because you can easily write too much for the allocated marks. Make sure to list the most appropriate first – particularly those that relate to the question. The below contains all the considerations – remember though that listing the below in a non-coherent way will also not score great marks – you have to show that what you are answering the question specifically and not the question: tell us everything you know about reinsurance.

Type

- Based on specific risks insurer wants to manage.
- QS could be appropriate to share risk and reduce volatility.
- Potential other benefits such as commission or cost sharing for a quota share structure
- If the business is profitable, QS would mean ceding profitable business.
- XoL would be more appropriate to protect against large single losses.
- CAT XoL would limit exposure to aggregated losses after a catastrophe event.
- *Others mentioned: Surplus / Stop loss – would need good explanations for marks consideration as these treaty types are typically not used to cap large losses from events.*

Retention Level

The appropriate retention level should align with the insurance company's overall risk management strategy, financial strength, and business objectives. It's often a dynamic decision that may change over time in response to evolving market conditions and company performance.

The key factors to consider when deciding on the appropriate retention level include:

Risk Appetite/Tolerance:

- It reflects the organisation's willingness and ability to absorb losses without causing financial distress. A higher retention level means the company retains more risk, which may be suitable for financially stable insurers with higher risk tolerance – we are only told that the insurer is of medium size.

Financial Strength:

- The financial strength of the insurance company is crucial. Companies with strong capital reserves and robust financial positions may opt for higher retention levels because they have the capacity to absorb larger losses without significant impact.

Premium Cost:

- Higher retention levels often lead to lower reinsurance premiums because the insurance company is retaining more risk. Conversely, lower retentions result in higher premiums. Assess the trade-off between premium costs and retained risk.

Regulatory Requirements:

- Insurance regulators often set minimum capital and solvency requirements, which may impact the retention level an insurer can select. Compliance with these regulations is essential.

Reinsurance Market Conditions:

- Market conditions can affect retention decisions. In a soft market (where reinsurance is readily available and affordable), insurers may opt for lower retentions. Conversely, in a hard market (where reinsurance is costly or scarce), they may increase retentions.
- Evaluate the capacity of the reinsurance market to provide the desired coverage at the chosen retention level. Some insurers may need to adjust their retentions based on market availability.

Historical Loss Experience:

- An insurer's historical loss experience in a particular line of business can provide valuable insights. Past data on claims frequency and severity can inform retention level choices.

Recoverability of the contract

The recoverability of the reinsurance contract depends on various factors, including the terms and conditions outlined in the reinsurance agreement. These terms may specify:

- The types of losses that are covered by the reinsurance (e.g., specific perils, types of policies).
- The limits of liability or the maximum amount the reinsurer will pay.
- The deductible or retention amount that the ceding company must absorb before the reinsurer's coverage kicks in.
- The premium amount paid by the ceding company to the reinsurer.

Recoverability can also be influenced by the financial strength and solvency of the reinsurer. If the reinsurer becomes financially unstable or insolvent, it may impact the ceding company's ability to recover its losses.

Solvency Considerations

- In the Standard Formula:
    - Premium and reserve risk will decrease as a result of reduced premium and reserves after considering reinsurance

- Biggest impact will be on catastrophe risk (natural and man-made depending on reinsurance program) where the gross loss will be reduced by the expected reinsurance recovery (after considering counterparty default risk)
- Credit risk relating to reinsurance recoverables will need to be considered
- Possible increase in concentration risk capital requirement due to reinsurance recoverables, will depend on spread of reinsurance participation
- Would only be allowed to consider eligible reinsurance contracts
- The formula would also consider the number of reinstatements to determine which of the scenarios are applicable to the insurer.

iv. Describe the following four statistical methods of calculating claims reserves, indicating conditions when each method may be suitable.

Very easy question.

The four statistical methods for calculating ultimate claims in insurance are widely used in actuarial analysis. Each method has its own characteristics and may be suitable for different situations and data conditions. Here's an overview of each method and when it may be appropriate:

Chain Ladder Method:

- The Chain Ladder method is a widely used technique for estimating ultimate claims in insurance. It relies on historical claims data to project future claims.
  - Could be based on incurred or paid date
  - Create claims triangles on a cumulative basis by development period and origin period
  - Calculate the development ratios and apply the latest diagonal to complete the triangle
  - Apply a tail factor if appropriate
  - Subtract the current incurred claims from the calculated ultimate
  - An inflation adjusted triangle can be used if an explicit inflation assumption is required

- Suitable Conditions:

  - The Chain Ladder method is suitable when there is a reasonably consistent pattern of claim development over time.
  - It works well when historical data is available, especially for long-tail lines of business (e.g., liability insurance) where claims may take years to fully develop.
  - It's useful when data is credible and there are enough data points for credible projections.

b. Average Cost Per Claim Method:

- The Average Cost Per Claim method calculates ultimate claims by multiplying the average cost per claim by the number of expected claims.

  - Triangles are created for both claim amounts and claim numbers
  - Another triangle is created of the average claim amounts by dividing the claim amount triangle by the claim number triangle
  - The average claim triangle and the claim number triangle are projected to ultimate using development factors
  - The ultimate claims are calculated by multiplying the ultimate average cost per claim by the ultimate claim number

- Suitable Conditions:
    - Method useful when trends in claim frequency and severity are different and it would be more beneficial to model these separately
    - It may work well for lines of business with a relatively stable average cost per claim.
    - Also, if the average claim amount is correlated to be time dependant – e.g. some legal lines of business.

c. Loss Ratio Method:

- The Loss Ratio method estimates ultimate claims by applying a loss ratio to the earned premium.
- Estimate a loss ratio for a given class of business – generally based on pricing assumptions and further informed by updated management information.
- Multiply an exposure measure (usually earned premium) for each accident year by the expected loss ratio to get the ultimate claims

- Suitable Conditions:
    - The Loss Ratio method is suitable when there is a historical relationship between claims and premiums, and this relationship is expected to hold in the future.
    - It's often used for new lines of business with little claims data being available.

d. Bornhuetter-Ferguson Method:

- The Bornhuetter-Ferguson method is a combination method that considers both historical claims data and an estimate of expected future claims.
    - Could be based on incurred or paid data
    - Determine the initial estimate of the total ultimate claims for each origin period using premiums (expected exposure) and an a priori loss ratio
    - The estimated ultimates are then multiplied by the unreported percentage to calculate the estimated unreported claims
    - The unreported percentage is calculated as 1 minus the reciprocal of the cumulative reported development factor.
    - The unreported expected losses are added to the current actual incurred claims to get the ultimate claims.
    - Method useful when you want to weight the loss ratio and other development methods

- Suitable Conditions:
    - This method is useful when a more comprehensive approach is needed, combining historical data with an understanding of the expected future claims environment.
    - It's often used in situations where changes in the business environment or underwriting practices need to be factored into the projection.

The choice of method depends on the nature of the insurance portfolio, the quality and quantity of data, and the goals of the analysis. Actuaries need to exercise judgment and carefully assess the appropriateness of each method for a given situation to make accurate projections of ultimate claims.

v. Describe why an actuarial department might adjust claims data for large claims and catastrophes for the purposes of: (Pricing / Reserving / Capital Modelling)

The sub-question with the most application in question 1 – poorly answered by most. Also important to distinguish capital modelling from simply completing the SAM standard formula. This is not capital modelling but regulatory reporting.

Reserving

- If left unadjusted in aggregate data, individual large claims may distort the projections of outstanding claims reserves
- This will be the case if the individual large claims have a different claims development pattern than the attritional claims in the portfolio
    - Auto approvals generally occur on smaller claims with larger claims being subject to more internal processes
- If the mix of large and attritional claims is variable from year to year then leaving the large claims in the aggregate data could result in an unstable triangle on which chain ladder or other methods of reserving are used
- This will result in unstable claims development factors with average claims development factors coming out of the analysis being potentially inappropriate for those years of account with higher/lower large claims experience
- Catastrophes cause a similar problem to individual large claims although the difference in development may not be as marked as those for large claims
- A significant problem could be that the catastrophe claims if left in the data could bias the average occurrence date
    - E.g. a storm occurring at the end of an accident year may result in the year being less mature than normal
- Other large claims – e.g. subsidence claims tend to take a long time to report, so splitting of these types of claims from the aggregate data will lead to greater accuracy within claims reserving
- Catastrophes may lead to greater claims leakage owing to pressure of making payments and this again will distort the true payment pattern
- Inflationary effects on large claims is likely to be different from those of attritional claims
- There may be very specific features of individual large claims and catastrophes for which subjective inputs by underwriters and other experts would be valuable in forming an appropriate view on the ultimate position

Pricing

- If left unadjusted in aggregate data, individual large claims would unduly dominate the experience of the risk group which may lead to inadequate pricing, and in turn would lead to further anti-selection.
- This is particularly relevant for rating cells with lower levels of premium - and therefore data points
- e.g. older drivers, or new construction type housing where a presence of a large claim may be more due to random occurrence rather than systematically bad experience
- This could create non-competitive premiums
- Pricing would require an understanding of the distribution of larger losses of this type

- Pricing the catastrophe element of an insurance premium may be done with input from catastrophe modelling software and so the claims data would need to be adjusted to avoid double counting
- There may be a desire to recognise the capital intensity of different contracts in their price, and this would be heavily driven by the large claim / catastrophe potential
- There may be coverage or mix changes brought in after major losses that mean that similar events are unlikely to occur going forward
- There may be different trends expected on large claim events, for example greater claim inflation due to court awards

Capital modelling

- Would want to model CATS & large claims separately in underwriting risk as they can be major drivers of experience at the tails of distributions
- CAT events can also impact across multiple lines of business and without separating the claims for analysis - this interaction will be lost
- Would also want to remove CAT events if model gets any inputs from CAT models such as RMS as otherwise would end up double counting in the non-cat u/w module
- Would want to be able to model these events individually where possible as the severity distribution affects reinsurance recoveries
- Reinsurance recoveries have a major impact on capital at the tails of distributions
- Catastrophe events would even need to be modelled separately from large claims as they would have a different severity distribution and would produce different reinsurance recoveries for the same severity and may even be covered by different reinsurance programmes
- Large claims and catastrophes will also distort reserve runoff patterns so may need to be removed for reserving risk models to be appropriate
- There may also be links with market risks, particularly for large catastrophe events which often impact the equity market in particular
- There may be some links with operational risks as well due to the higher-than-normal operations within the company

Question 2:

i. **Suggest three possible advantages and disadvantages of having a fully digital insuretech platform**

Advantages

- Good customer experience given increased push for digital by clients
- Lower costs due to reduced overheads, sales staff, claims handling (limited)
- Ability to implement latest technology without having to worry about legacy systems e.g., AI claims handling, Chatbots, sophisticated rating engines, analytics engines
- Lower costs can be passed onto consumers in the form of lower premiums enhancing social inclusion in insurance
- Attracts a more tech-savvy market segment
- Since prospective client completes data him/herself, data quality should be better compared to paper proposal forms or call centre client making mistakes
- Should be much quicker to implement rating or benefit changes
- Could add features that traditional insurers may not be able to have e.g. to "switch cover on or off"

Disadvantages

- Difficult and expensive to attract sales (marketing, agency partnerships etc.,) onto platform and hence get scale
- May limit consumer trust given limited to no interaction with humans
- Exposes insuretech to significant cyber risks
- Development costs associated with tech platform, bugs with code releases etc., which pose a risk to customer experience
- Persistency risk given ease of cancelling/lapsing policy, limited retentions

ii. **The company is considering the following ways to establish itself in the insurance industry:**
A lot of repetition of advantages for one approach being disadvantages for another approach is not useful here. It is critical to show understanding of how each of the business models work in practice, both from a commercial standpoint (what profit consists of) as well as from a practical standpoint.

a. Fully licensed Insurer
b. Underwriter Management Agency
c. Cell Captive Arrangement

Apply to be a fully licensed insurer

- + Control all profits due to owning own license
- + Control all strategies for insurer etc., including underwriting, reinsurance, marketing etc.,
- +Brand Recognition: Being a licensed insurer can enhance the company's brand recognition and credibility in the marketplace, potentially attracting more customers and business partners.
- - R15m minimum capital required
- - Process to obtain license is administratively intensive and also involves a number of costs
- - Have to set-up all end to end processes incl governance, claims, support functions etc., which are expensive

- -Competitive Market: The insurance industry is highly competitive, with established insurers dominating the market. Breaking into this market can be challenging.

2. Be an underwriting management agency while there's a fully licensed insurer UW all risk

- -Distribution requires an intermediary which deems the model completely ineffective
- -UMA's typically underwrite non-traditional type risks – not aligned with the strategy. Generally not cost effective to run a commoditised insurance product (such as personal lines Motor) via a UMA.
- + Capital requirements to carry risk not required
- + Possibly leverage backing insurer data to price
- + Can leverage insurer processes e.g., U/W, claims, actuarial
- + Insurer ultimately responsible for the risk
- - Profits belong to insurer
- - Insurer can influence certain strategies e.g., where to underwrite
- -Reputation Dependency: The company's reputation and success may depend on the underwriter's performance and reputation, which can be a risk if the underwriter faces issues

3. Set-up a cell captive arrangement

- +UW profits belong to you minus license fee and any other admin costs
- + can leverage captive providers admin function etc.
- + Control all strategies, including underwriting, reinsurance, marketing etc.,
- - Need to still capitalise the arrangement
- -Typically, not for insurers who are looking to go large scale

iii. What sales strategies would you adopt to get policyholders onto the platform?

- Direct marketing through Billboards
- Television and radio broadcasts
- Sponsorships of events
- Call me backs on website
- Digital marketing and search engine optimisation, Google ads, ads on platforms e.g., YouTube
- Other forms of Social media..
- Listing on insurance aggregators
- Embedded insurance on affinity partner websites

<Anything well explained in the context of the digital platform was considered for marking>

iv. Suggest with reasons, four rating factors you would use when quoting for your comprehensive motor product. (Hint: be mindful that rating is performed on a fully digital basis)

This question in particular is a good indicator of how much thinking is required to answer a question properly. Not any 4 rating factors would make the cut. For example, if you only have 4 questions you can ask, asking for ID number as one question is far more useful than asking for age, gender, etc separately. The fewest, most critical questions are very important in a digital context, and this hint was even provided in the question.

Customer ID number

- This will reveal Age & Gender
- Allow for credit check to be performed
- Pulling additional insurance related data

Risk address (Sharing location on the app)

- Location data is essential in to assess the risk of accidents, theft, and other perils associated with motor and home insurance.
- Urban areas with high traffic congestion and a greater likelihood of accidents typically result in higher premiums compared to rural areas with lower traffic and lower accident rates
- Location data is a central component of usage-based insurance programs, where the insurer monitors the insured vehicle's location and driving behaviour through telematics devices or mobile apps.
- Drivers' behaviour and mileage, along with location data, are used to calculate premiums based on actual driving patterns, potentially resulting in more personalised and dynamic pricing.

Vehicle VIN number

- Information on the risk being insured – e.g. Make, Model, Power to Mass etc.
- Vehicle Value – determine market value
- Safety Features of the vehicle
- Proxies possible repair costs
- Associated model theft risks (e.g. Toyota vs Mini)
- Crashworthiness of a vehicle

Other Considerations (4 was asked)

- Number of historical claims in x-years, provides indication of claims frequency
- Regular driver status, Clarity on who will be driving the car and whether data above can be used
- Enhancements to vehicle
- Previous insurance details
    - Insurer to determine whether they should decline you for cover to due to being too risky
    - Number of years of previous insurance, helps identify persistency risk, whether you view insurance as a commodity and hence how to recoup acquisition cost
- Other options possible? When was driver's licence obtained, previous insurance declined, where kept at night, tracker device installed, work address, daytime parking with security access?

v. Suggest with reasons, six risks that are specific to the insuretech (regardless of the final model that the start-up is established under) which you would highlight to management?

&

vi. How would you mitigate the risks you have mentioned in question iv.?

For a question like the above – a table works best to cover both the risk and the mitigation

Risk	**Mitigation**
Cyber risk given digital only platform	Penetration testing, set up of appropriate firewalls, having a robust UAT approach
Anti-selection risk and mispricing risk given limited sophistication of pricing models/no data	Testing rates out in the market / appropriate relativity loadings for main categories of risk, leverage reinsurance data,
Operational risk as a newly formed insuretech with new processes, especially IT and policy administration operational risks. Reputational risks as processes are still being refined resulting in bad customer experience e.g., double debits, bad claims experience and inability to easily speak to human	Embed controls into processes, e.g., approval rights for payments, Build seamless processes for customer experience Test processes prior to launch, launch a beta version to small community of individuals prior to full scale launch/above the line marketing
Risk that only the young risky segment takes out policies due to distribution approach Persistency risk given the ease of policy cancellation	Apply targeted marketing efforts initially instead of broad marketing strategy e.g., targeted digital marketing through social media analytics
Expense risk given the need to invest in marketing costs to attract customers through sales funnel and a policy base that won't translate to economies of scale yet	Take out QS Reinsurance with commission to offset some acquisition costs
Fraud risk as AI models to process 'simple' claims are still being refined	Embed Fraud models together with claims processing model
Capital risk due to being a new start-up that is not able to shoulder significant volatility due to capital base size	Raise significant working capital to shoulder hockey stick Reinsurance programmes with caps of Losses e.g., XOL, CAT Approach venture and seed capital funders with business plan and own capital committed
Reserving risk as there is no data upon which to set reserving basis, FNOL etc	Use Ultimate Loss Ratio method, continuously monitor and refine FNOL estimates etc., Use interim measure patterns but will require auditor approval
Funding risk regarding the ability to raise capital for the insuretech	

vii. Suggest four possible approaches to pricing the Motor Comprehensive portfolio considering the implementation challenges associated with each approach.

Most student answered this from a traditional pricing perspective – which was the considered. Some students included some more "creative" ways which was also then considered.

Utilise traditional actuarial methods, historical claims data, and statistical models to price policies. Since you don't have any data you will likely have to consider the following:

i. Leverage consultants to provide rating structure
- Would need agreements to protect IP of rating structure

ii. Partner with reinsurers for pricing structure
- Would have to likely give them Quota share or substantial reinsurance portion

iii. Leverage direct insurer data
- Proxy relativities through different policy schedules
- Requires collection of schedules, would likely have to pay people for schedules
- Challenges with PoPia would have to be overcome and insurer willing to would have to be found

iv. Implement market-based premium, extrapolating curves
- Would have to scrape rating sights/make calls to different insurers
- Target specific loss ratio and adjust based on rating factor answers
- Would require assumption on base claims cost

Could also Implement telematics devices or smartphone apps to collect real-time data on policyholders' driving habits, such as speed, acceleration, braking, and mileage. Price policies based on observed behaviour.

Challenges:

- Data Collection: Installing and maintaining telematics devices or encouraging app usage can be costly and may face resistance from some policyholders.
- Privacy Concerns: Collecting and handling sensitive driving behaviour data must comply with data protection regulations and address privacy concerns.
- Data Analysis: Developing algorithms to analyse telematics data and link it to risk profiles can be complex.
- Model Complexity: Developing and maintaining AI models to analyse and predict behaviour accurately can be resource intensive.

Offer policyholders the option to pay premiums based on kilometres driven or their vehicle usage patterns

Implementation Challenges

- Mileage Verification: Accurately verifying and tracking mileage may require advanced GPS technology or partnerships with mileage tracking service providers.
- Pricing Fairness: Ensuring that pay-per-use pricing remains fair to all policyholders, regardless of their driving habits or mileage, can be a challenge.

- Communication: Effectively communicating the benefits of this pricing approach to policyholders may require marketing efforts.

viii. Give examples of how you could design the insurance products to incorporate sustainability design features.

This question requires some thinking outside of the notes – hence a wide range of points were accepted.

Car

- Provide a slight premium discount for CO2 friendly cars
- Pay as you use cover to minimise CO2 emissions/vehicle on the road
- Rental extension that offers only electrical vehicle/carbon friendly cars
- Steer to repairer network/panel that has specific ESG rating

Home

- Discounts for smart geysers
- Discount for use of environmentally friendly building material
- Steer to carbon friendly builders

General

- Donate certain proportion of premium to sustainability projects
- Invest premiums in green funds
- Adopt sustainable practices across org, e.g., building type etc