

EXAMINERS' REPORT

May 2017 examinations

**Subject F203 — *General Insurance*
Specialist Applications**

OVERALL

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

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

Performance on this paper was mixed. In line with previous F203 exams, a considerable number of candidates undermined themselves by providing generic or off-topic answers. Specific observations are provided by question throughout this report.

Candidates should note that F203 is the key paper at which we test candidates' broader thinking. This is generally the final paper before qualifying as a professional, and we consider a capacity for broader thinking to be one of the best indicators of a candidate's suitability to act as a professional actuary. As such we aim to design exam papers so that it is difficult to pass without displaying some capacity for independent and broad thinking, as well as to heavily reward instances where these skills are displayed. When reviewing past papers, candidates should assume that the marks available for generic points are substantially less than those awarded for the more challenging points that would be the mark of high quality professional insight in a practising actuary. Marks available for list items from bookwork are lower still.

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

QUESTION 1

This question tested candidates understanding of reinsurance. The topic has not been covered extensively in the South African syllabus and overall the performance was poor. Candidates failed to show their appreciation for a reinsurance environment. The question contained an indexing calculation which was very poorly answered.

i. Examiners' notes:

This was a straightforward knowledge question. Better candidates clearly understood the application part of the question.

a.

Working Layer

- A layer of excess of loss reinsurance at a level where there is likely to be a regular flow of claims (Relatively higher frequency compared to other Non-Proportional covers)

Stability Clause

- A clause that may be included in a non-proportional reinsurance treaty, providing for the indexation of monetary limits (i.e. the excess point and/ or the upper limit) in line with a specified index of inflation/fixed rate agreed upfront

b.

Working Layer

- Mainly used to increase capacity (as with other Non-Proportional cover are more about limiting exposure to adverse deviations)
- Used where it is desired to significantly limit exposure to adverse deviations in claims experience / Insurer has low risk appetite for volatility of earnings
- E.g. with a new class of business, in respect of which there is little or no experience or small class.

Stability Clause

- Used to ensure that the layers agreed maintain real value through time / maintain equity between insurer and reinsurer. Particularly useful in periods of high inflation or where the term of cover is quite long.

ii. *Examiners' notes:*

The knowledge part of the question was well answered. Candidates struggled to compare the 2 reinsurance structures relative to each other from both the insurance and reinsurance perspective.

a.

A proportional reinsurance

- The treaty will specify the maximum cession as a multiple of the cedant's retention in each case, which will have a maximum value
- An insurer may require several layers of surplus reinsurance to cover all its risks
- For example, a 3 line surplus with R10 million retention allows the cedant to retain up to R10 million on any risk, and it may cede up to three times what it retains
- The reinsurer will pay commission to the cedant that reflects the cedant's commission to the insured, possibly plus over rider and/or profit commission.

A non-proportional reinsurance

- Relates to losses arising from a single event at one time
- It will refund the insurer the amount of a claim above a retention - Up to a limit (usually)
- The retention and/or limit may vary according to a particular inflation index
- Cover will usually be limited to a certain number of claims for the full amount
- After a full loss to the layer, it may be necessary to pay to reinstate the cover for further losses
- A company will normally need several layers of excess of loss cover.

b-i

Reinsurer

- May produce more income than non-proportional cover. This will depend on excess point and number of lines of business, but reinsurer gets proportion of each risk that breaches the retention limit.
- Arguably easier to administrate as information will be passed through on bordereaux.

Insurer

- May give attractive profit or ceding commission, usually exceeds the rate of commission paid by direct writer + overrider/profit commission
- Provides unlimited reinstatements at no extra cost (apart from loss of profit commission)
- Provides significant catastrophe cover, which leads to lower capital requirements. Usually states an event limit

b-ii

Reinsurer

- Can set pricing for layer, determined as a rate on line
- Can limit downside risk by limiting reinstatements. Also by increasing retention for cedant, reinsurer is not exposed to as many claims

Insurer

- Cedes only part of risk, which reduces cost.
- Can choose to reinsure only from a certain level in line with the insurer's risk appetite

iii. *Examiners' notes:*

The calculation question was poorly answered by most candidates. None of the candidates applied indexation of either premium or losses which was required from the question. The question required the answer from the reinsurers perspective whereas most candidates did not read the question this way – even though the question clearly led candidates this way. i.e. participating in a treaty, profit commission etc.

Step 1: Standardise Premium

Year	Written Premium	Average Rate	Rate Index	Premium
2012	200	10%	1.800	360.00
2013	300	11%	1.636	490.91
2014	500	12%	1.500	750.00
2015	400	13%	1.385	553.85
2016	500	15%	1.200	600.00
2017	700	17%	1.059	741.18

Step 2: Standardise Loss

Incurred Year	Loss	Index	Indexed Loss
2012	100	142%	141.85
2013	145	134%	194.04
2014	900	126%	136.23
2015	200	119%	238.20
2016	260	112%	292.14
2017	450	106%	477.00

Assumptions:

- Assume premium rate is appropriate for business ceded to surplus
- Assume the mix by type and size of property has been stable over time
- Assume IBNR already included in incurred loss number given
- Assume property loss will increase 6% next year
- Assume that claims happen on average mid-way through the year

Step 3: Calculate Profit Commission

Year	Indexed Written Premium	Indexed Loss	Indexed Loss Ratio	Ceding Commission	Profit Commission	RI Combined Ratio
2012	360	141.85	39.40%	25.00%	5.12%	69.52%
2013	490.91	194.04	39.53%	25.00%	5.09%	69.62%
2014	750	1136.23	151.50%	25.00%	0.00%	176.50%
2015	553.85	238.2	43.01%	25.00%	4.40%	72.41%
2016	600	292.14	48.69%	25.00%	3.26%	76.95%
2017	741.18	477	64.36%	25.00%	0.13%	89.49%
Total	3495.94	2479.46	70.92%	25.00%	0.00%	95.92%

Discussion/issues

- Justification/Explanation for the premium rate being applicable to this surplus treaty.
- What caused high loss ratio in the 2014 year
 - Was the event caused by a Catastrophe event, if so are there other inuring contracts to consider now?
 - Linked to Very large claim - discussion of other inuring contracts.
 - If catastrophe need to ask what is appropriate return period for such an event?
 - Adjust this by spreading the loss over appropriate period? Marks awarded for commentary provided on Results of such an analysis.
 - Sudden increase in premium may have been a reflection of poor underwriting or changes in geographical spread.
- Request the details of the exposure/history of large risk losses?
- Deterioration of combined ratio in 2017 may indicate a different risk profile and that the increase in premium to 18% may not be sufficient.
- Is experience rated profit commission value appropriate?
- Consider building aggregate loss distribution for treaty?
- Does the product satisfy our internal expense loading required?
- Does the product satisfy our internal profit loading requirement?
- Internal capital allocation/profit target?
- Allowance for investment return?
- Other considerations e.g. relationship with insurer/broker, other business.

Conclusion

Marks were awarded for a logical argument considering the experience in the 2014 year, investment income, internal expenses and the reinsurers profit expectation.

iv. *Examiners' notes:*

This question tested some higher order thinking about the reserving perspectives from reinsurers and insurers. The first part of the question was well answered, but most candidates could not think of clear differences between the reserving data used by insurers and reinsurers.

a. Bordereau

- A detailed list of premiums, claims and other important statistics (e.g. largest risks and dates).
- Provided by ceding insurers to reinsurers, so that payments due under a reinsurance treaty can be calculated.
- Small claims are often provided as a summary, details are only given routinely for large claims, above an agreed threshold.

b. Differences in triangles

- Data provided most probably only quarterly/half yearly so frequency of observation and reporting delays are the main difference.
- The reinsurer will not be able to see premium and claim movements at intervals shorter than the agreement allows for above.
- Claims which are reported to the insurer just into the start of a new period will thus have an additional reporting delay of either 3/6 months depending on the term.
- There will be a short delay between the close of a reporting period and the reinsurer getting the data to allow for processing time and the handover process.
- Additionally, in a bordereau small claims are often aggregated so that although the reinsurer may know that there were X claims included, the reinsurer will not be able to investigate the attributes of individual claims.
- Premium definition may be different e.g. gross or net of commission (or other related problems).
- Some claim amounts will change several times in the period the reinsurer will not see all the claim movements.
- E.g. A claim may be made which then reverts to a nil claim. The reinsurer may never know about the claim as there may be no obligation on the insurer to report nil claims.
- There could exist a 45 /30 (other other) day delay in submission meaning that a reinsurer's year-end may be missing the latest quarterly?

v. *Examiners' notes:*

This question gave a lot of information which most candidates applied in their answer. Better candidates explained their reasoning as well as concluded their answer with their point of view. (This was required from the question, but the majority of candidates did not write a conclusion).

RC = Reinsurance Company

CC = Cedant Company

- The timing of RC's indemnification to CC does not depend on the timing of CC's payment to the policyholders. Thus, no timing risk is transferred. Although it could be argued that the insurance company is using the policy to smooth their income over time.
- Historically, aggregate losses have mostly exceeded R200m, in which case the amount of indemnification to CC would be R50m. The profit made in this case for RC would be $R48m - R50m = -R2m$. This indicates that there is not really a reasonable possibility that RC will experience a significant loss, since a R2m loss would not be considered significant.
- By same argument it appears that the amounts of the cash flows are likely to be certain and thus there is not significant underwriting risk. Since there is no significant timing or underwriting risk (= "insurance risk") transferred and no reasonable possibility of a significant loss, this contract should not be accounted for as reinsurance.
- This is effectively a fixed interest investment with interest over one year of around 4% p.a.

QUESTION 2

This question examined the commercial aspects of launching a liability product (Medical Malpractice) in the South African market. The question offered a lot of marks and the wording of the questions guided candidates to structure their answers and in effect making the questions easier to answer. Questions i, iv and v required some higher order thinking and overall these parts did not score well.

- i. *The first part was straightforward and well answered by most candidates. 2nd part of the question was not well answered with candidates struggling to apply their knowledge showed in the first part of the question.*

Risk attaching (RAD) vs Losses Occurring (LOD)

- LOD (Losses Occurring During) basis, does exactly what it says and states that the contract will respond to any losses that occur within the contract period. In property

insurance (per-risk and catastrophe covers) it is quite straightforward, because the losses generally start at a precise time.

- RAD (Risks Attaching During) contracts will cover all policies that incept during the contract period, irrespective of when the losses occur in the future. Depending on how the original policies are worded, the losses could emerge several years after the policy period itself has expired.

Merits of each for Medical Malpractice cover

- Discuss the advantages from the physician's side by not having any gaps in cover. With LOD, cover needs to be obtained for periods after retirement and after any claims made against the client. Example of delay in losses emerging is with gynaecological problems where birth defects associated with delivery may not be known for some time.
- There are also problems with transitioning from one basis to the other so important which basis is being offered and which basis the client was on previously.
- The price for LOD is initially lower than for RAD (particularly when changing from RAD to LOD) but have to buy missing cover later.
- Insurer has an advantage with LOD, as the tail for reserving is potentially much shorter given the most likely sunset clause implemented on claims. This makes pricing easier for this product.
- Insurer could experience influx of claims at the end of the policy term with LOD as healthcare professional tries to cover all bases (unlikely though).

ii. *Question ii was the longest question of the paper. The structuring provided in the question guided candidates and the average mark for the question was relatively high. The below shows a model answer, marks were awarded for points made which relate to the question.*

Licence Considerations

- If the insurer is not already authorised to sell such business then it must seek to gain authorisation for those classes included in this type of contract in accordance with the FSB regulations.
- The process of obtaining the licence may take time and influence the launch of the product.

Marketing the product

- The product is aimed at healthcare workers in South Africa. This will include the following: working students; new entrants to the market and existing healthcare professionals. Each one of these will need to be covered on a different basis and the risk profile is also different for them.
- The product will also need to consider the differences between state and private workers and the difference benefit requirements of each.

- Need to consider who to sell the product to: Will it consider the full spectrum of healthcare professionals or will the product only target a specific segment i.e. specialists and GP's.
- Can approach medical practitioners or HPCSA to assess demand for product in South Africa.
- At launch date it needs to be determined how to provide cover to Healthcare Professionals (HCP's) who have had cover with other insurers/protections societies.
- The terms of the contract on how prior losses could affect the experience needs to be investigated. Otherwise selection and anti-selection would be a major issue.
- Does the insurer have any similar products that are already sold on a stand-alone basis i.e. other professional indemnity product so that the marketing of this new product can leverage off that product. This will especially be true for distribution advantages.
- Need to determine the likely penetration of this product in the market. Who are the current competitors and try to think how they will respond to this product.
- Need to think ahead on how your product will differentiate you in the market - will this be on price/service offering. This could also be on changing the basis from LOD to RAD.
- Consider any likely changes in the market? This will be in terms of future disruptions i.e. Robotic medicine.

Product features

- Perils are likely to be for medical negligence. Need to think about the types of negligence that are likely to affect each cohort of professionals covered.
- Do we want to offer the cover to medical partnerships? I.e. will group cover be provided to these consortiums?
- We need to consider the period of cover under the policy. That is, is it an annually renewable contract, or a monthly policy. If it is an annually renewable contract, then we must consider the options available for not renewing an individual's cover.
- If an individual cancels cover - do we want to offer a tail coverage product covering the professional for many year's into the future. Need to determine the risks inherent in such a contract.
- Decide on Policy Limits to be applied.
- Need to think about the likely Allocated Loss Adjustment Expenses inherent in the contract. This will be lawyer and investigation fees which are likely to be a significant part of the claims cost.
- Do we want to attach a waiting period to the contract? This will be for professionals who have not had cover before and therefore to reduce selection risk. There will also be an exclusion period, such as thirty days at the start of the policy during which no insurance claim will be valid.
- Any terms used in the contract would need to be clearly defined. For example, what is deemed as proper practice management. What happens when a specialist performs a procedure that is not classified within his/her normal specialist role.

- We also need to consider what, if any, endorsements would be allowed during the policy year. For example, can the level of cover be changed and how will this affect our selection risk.

Distribution Channels

- Company may not be able to significantly spend on marketing. Consideration for going direct vs using intermediary market vs using an existing or new UMA.
- Will we be using a Direct approach, therefore having all the data readily available on our systems or will we use an intermediated approach or targeting hospitals. Which party would carry out the policy and claims administration?
- Will the system we currently use cater for this new product. In terms of claims questionnaires, premium rating etc.
- What management information will we require from the system.
- What are regulated commission rates for this product if going the intermediated route.

General Administration

- Need to consider closely your likely customers' needs and resources. This is especially important in terms of the changing regulations i.e. POPI and TCF. The product proposed should be suitable for the HCP to understand the levels of risk that he faces as a provider and then also understand the benefit terms and condition to link this to how he is covered by the product. Therefore, the seller should address:
 - Type of Healthcare discipline
 - level of risk inherent in the services provided
 - levels of cover required by the HCP
 - What other forms of cover are available to the HCP. I.e. how does risk management influence the likelihood of claims
 - Are there other benefits attached. e.g. assistance with Risk management products

Pricing

- The level of selection inherent in taking up cover needs to be carefully considered by any pricing strategy.
- We need to consider what rating factors are likely to be used. The most likely are:
 - Type of HCP
 - Age of Professional
 - Number of Years in Practice
 - Geographical area
 - Number of cases handled
 - Turnover per year - proxy for number of patients/procedures performed
 - Prior Claims and outstanding litigation

- To derive a risk premium, any appropriate internal data will be used with the usual factors regarding past experience being considered. For example: period of data/out of date, large claims, trends, inflation. If little or no internal data are available on the need to look to an external market sources.
- Additionally, we would consider the premiums being quoted by other insurers, protections societies while considering the level of cover that they offer.
- After having obtained a risk premiums to our best ability, allowance would then be made for commission, expenses, profit, contingencies and investment return.
- To smooth out fluctuations in premium rates over time we would need to form a view of the average likely claims cost during a full economic cycle. However, care would be needed if our competitors were not following this procedure, but were instead looking at the very short term. In that case we would be relatively cheap when risks were high and vice versa. This would most likely lead to selection against us.
- In looking at loadings for expenses and so on, we need to project volumes of exposure and consider per policy and per premium loadings. The premium would then be expressed as x% or fixed amount per policy sold.
- Need to address cost, availability and type of RI as well as ROE required by the company.

Claims

- When submitting a claim proof will be needed. This should be in the form of medical or legal reports as appropriate. Our company will require suitably experienced resources to handle claims efficiently. In this respect, external claims handling services may be needed.
- We need to consider what claims information should be kept helping with our future rating.
- We need to consider whether payments are made to the insured or given directly to patient who suffered damages.

Other considerations

- Any complaint procedures should be clearly set out in the documents.
- The insured needs to be told of circumstances where there have been changes in the HCP's job or moving from self- employed to being employed in partnership.
- Any cancellation rights of the insurer should be set out.
- A cooling-off period of, say, 14 days should be allowed.
- The insurance contract will be governed by the law of the country.
- Possibility of purchasing reinsurance. This would enable the company to gain experience in this new area.
- Capital implications under the current or new SAM regime and available capital

iii. *This was again a very straightforward question. This also tied in with last year's paper showing the benefits of past exam practice. Most candidates scored well in this question.*

a. Business Planning

- Description of current and likely future environment in which the company operates
 - E.g. about competitors, regulations, etc.
- Financial strategy, including Key Performance Indicators
- Must include your role & purpose of report, and describe the main aims of the company
- Key measurable targets detailed, against which success of financial strategy can be measured
- Risk profile, i.e. Type of HCP's on the book (High Risk vs Low Risk HCP providers)
- Reinsurance strategy
- Distribution strategy
- SWOT (strengths, weaknesses, opportunities and threats) and Business Risk analysis
- The investment strategy for this class of business
- Income and Expenditure forecasts / projected technical account general business and balance sheet
- Intention to diversify into other classes of business and / or acquire other portfolios
- Results of scenario testing
- Capital implications, solvency and ROE under both Interim Measures and SAM

b

Business Levels

- Number of Healthcare professionals
- Likely penetration levels i.e. new business levels
- Lapse Rates
- By location
- Premium Income
- Premium earning pattern
- Acquisition Costs
- Commission rates
- Expense levels
- Profit margins

Economic

- Medical Inflation
- Subjective view of Social inflation
- Other inflation affecting likely claims

- Investment returns on assets
- Investment strategy
- Proportion of non-investible assets
- Net of tax and expenses

Insurance

- Claims frequency
- Claims average cost
- For current & future business
- Exposure profile
- Claims handling costs (Likely to be significant)
- Reserving assumptions for claims outstanding
- E.g. IBNR and run-off patterns
- Reinsurance arrangements

External

- Competitive environment
- Regulatory environment
- Tax

c. Basis

- General economic environment to bring context for any changes in the competitive environment.
- Discussions would be had with senior managers, underwriters, reinsurers and consultants
- For business levels need to consider general economic trends: e.g. likely penetration, growth in Healthcare profession, effects of any regulatory changes in general).
- Strategic alliances i.e. link with hospitals/Medical groups. And what are their projected business volumes?
- For premium rates consider competition and strength of strategic alliances.
- Acquisition costs and commission rates will depend on rates agreed with intermediaries (if any) and any processing costs at the insurer end.
- Internal expenses allowance should be based upon the breakdown of expenses for the insurer.
- Future dividend rate assumption will depend on strategic goals and market standards for insurers.
- Inflation estimates assessed looking at historic trends, but must be forward looking and take account of current economic and the social environment.
- Social inflation especially needs to be considered - especially the increasing litigiousness of society.
- For future investment returns, need to look at assets held to back technical reserves.

- Look at historic returns, and assess against current market environment.
- Tax and expense likely to be easy to estimate based on existing rates, taking account of any planned future changes. South Africa relevant.
- Review past claims history (Difficult because of changes in Society). This could be info gathered from prior court cases - although the information is likely to be scanty due to settlements out of court.
- Need to establish realistic estimate of technical reserves.
- Because of the low amounts of data - you are most likely to use a variety of techniques but typically this will be done on a more individual basis at the start.

To establish expected ultimate claims outgo for business written to date

- Estimates will need to make allowance for claims handling costs.
- Allowance for future reinsurance plans will need to take account of existing arrangements and any planned future changes.
- The impact of any known or likely future changes in the market, regulatory environment or corporate taxation will need to be allowed for.

iv. This part of the question was not answered well by all candidates. Candidates did not use the information in the question to structure their answers.

- Society has a greater sense of entitlement to claims pay-out. This to an extent has been driven by more liberal treatment of claims by workers' compensation boards, legislated rises in compensation benefit levels, and new concepts of tort and negligence.
- Increasing use of lawyers. No win, no fee type advertising where the lawyer is compensated based on percentage of the winnings. The predominant thinking is that when any accident happens, some human error must be to blame and somebody must make amends, preferably someone with deep pockets.
- Tendency to focus on pain and suffering. With individuals living longer even in extremely critical conditions, damages more frequently contemplate the catastrophic costs of long-term critical care for an injured plaintiff. Moreover, because non-economic awards are often assessed as a multiple of economic damages, the higher costs associated with rising medical expenses result in non-economic awards that are higher still.

- v. *This question required that candidates consider the pricing aspects of the product. Most of the answers were not tailored to pricing with candidates mentioning very generic points which did not score marks. Better candidates answered the question from a pricing perspective. As the whole paper was quite wordy, some candidates struggled to finish the paper in the allotted time.*

Office premium = Claims Cost
+ Expenses (per premium, per policy and fixed)
+ Profit margin
+ Contingency Loading
– Investment Return

- Term of policy is likely to be annual, so allowance for inflation and future investment returns is a significant component. The length of tail in claims is also very significant and will further make investment returns so much more important in your projection.
- Risk premium will need to be expressed in present day terms, so future claims will need to be modelled and discounted back at expected real rate of return. Based on past inflation patterns you would need to make a call on how this will play out in the future.
- Will present high inflation trends continue - i.e. following the effects of social inflation.
- Presumably medical malpractice inflation is higher than normal inflation and fact that is likely to be higher than return on assets. An assumption will be required on the rate above the expected inflation.
- Will medical negligence claim caps be introduced, so as not to disincentives Dr's to practice?
- Will certain cases set precedents for others and how long into the future do we expect the trend to continue?
- Need to specify base period for which rates will operate to ensure appropriate discounting.
- Pricing needs to be assessed on a burning cost basis with explicit profit and contingencies loaded separately.
- This allows for greater understanding of true underlying risk and premium levels required to achieve profitability.
- Long term nature of policy will mean that Contingency loading needs to make due allowance for uncertainty in expected real rate of return on assets.
- Allowance to be made will consider past economic and investment data, especially the more recent data.
- However, the past is not necessarily a guide to the future, as can be seen from the inflation data given, so the assumptions must make due allowance for current and potential future state of the markets / economy / societal changes.
- Need to consider the assets that will be held to back the technical liabilities.

- Likely to be varying short — long term fixed, index-linked securities and equities. Index linked and equity exposure may be suitable for matching real (inflation-linked) aspects of liabilities. (However, need to check the Solvency Capital Requirements).
- Exchange rates may be relevant if some cases are considered from overseas and therefore our courts look at matching compensation to those countries.
- Also need to consider solvency levels, which assets are to be used for free reserves and the likely capital allocation to this business.
- May use equities to match some of free reserves. However, allowance for future returns will need to take account of additional market risk.
- Due to the uncertainty regarding the potential claims profile, the risk may more than negate the potential for greater returns.
- Asset-liability modelling may be used to assess suitable matching portfolio.
- As part of this exercise will need to project expected future claims, this may involve testing of many different scenarios, and may use stochastic models to gain better understanding of distribution of outcomes.
- Important to gain good understanding of potential claims runoff. Some cases may be more than 20 years.
- Assumed rate of return should mirror stated objectives in Business plan, with risk of not achieving targets allowed for through contingency margin. Contingency margin to include assumptions about legal expenses, compensation benefit levels, negligence damages.
- Also, allowance will need to be made of Board's tolerance for risk and any risk appetite statements.
- Based on varying nature of past inflation, one strategy might be to introduce Fund type policy where HCP's pay upfront premium and then based on experience in the pool a top-up/dividend payment might be recouped/payed at the end of the policy term.

END OF REPORT