Actuarial Society of South Africa

EXAMINATION

April 2008

Subject SA3RSA — General Insurance Specialist Applications

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable

Comments

The solutions contained in this document are more detailed than what would typically be required for a clear pass. Any relevant points made by candidates were given full marks, even if they are not contained in the solutions presented below.
Further comments are given in the solutions presented below.

Question 1

i) *The question was not well answered as not enough different points were generated.*

- There may have been a change in the mix of business / target market. The average turnover was gradually increasing each year (presumably by inflation) but then dropped 10% in the last year. At the same time, there was a big increase in the number of policies. It is likely that the risk profile of the new policies is significantly different to the profile of the older policies.
- There may have been an increase or decrease in amount of advice given relative to the amount of sales. This could be impacting on the total turnover. This could also have an impact on the risk profile. The probability of PI claims is likely to be much lower than property claims, but the potential claim size could be much higher.
- There could be many risk factors that are not allowed for, such as the location, type of stock held, amount of advice given, etc. This could be resulting in anti-selection.
- There could have been changes in the risk and/ or economic environment, e.g.
- an increase in crime or more policies in higher theft risk areas affecting theft claims
- less qualified or inexperienced staff resulting in extra PI claims
- a change in the type of consulting services provided resulting in a change in the risk of PI claims.
- Random bad experience.
- There could have been a catastrophe event affecting many franchisees in 2007, or one large claim. If the catastrophe or large claim had been fully reinsured, this would not have impacted on the net loss ratio though.
- It is possible that the type of reinsurance utilised has changed over time, or the terms offered may have changed. This would affect the net results.
- There could be reporting errors in some of the years.
- There may have been changes to the cover offered in the product over the years.
- There could have been changes in claims handling procedures. It may be that the claims department has been less strict on verifying claims information.
- Claims handling expenses could have increased. (ulae & alae)
- Incorrect reserves may have been held in the past. If these were under-stated, corrections from previous underwriting years may be showing in the 2007 financial experience. There may have been latent claims from previous years that weren't adequately reserved for. There could also have been changes to the reserving methodology.
- There could have been changes to salvage received or other recoveries on certain claims.
- Certain exclusions could have been removed from the policy wording.
- Changes in tax, regulation or judicial decisions.

- Client behaviour change, such as change in claiming patterns, risk protection purchase or risk management.
- Fraudulent claims could've occurred.

ii) *This question was not well answered and in particular the fact that "no cross subsidy" was to be reflected in the rating was not addressed adequately, if at all. No enough points were generated with regards to data.*

- The existing internal data that you have for the product could be used. You would ideally only want to use the most recent years' data but if there are not that much data, it may be necessary to include older data too.
- The internal data you have for this product may not be adequate on their own. You could look at using data from other products that you offer covering similar risks. (Low likelihood as it is a niche product)
- There could be other external data that may be useful to use, for example crime statistics.
- Reinsurers may be able to provide some useful information.
- You could look at competitors' premium rates.
- Actual experience of the new policies may differ from the experience for older policies - i.e. need to examine these differences and the reasons for these differences.
- For any external data you would need to compare the terms of the policy cover offered, the level of risk underwritten and the loadings included for expenses and profit.
- The data you are using would need to be adjusted for the following, to ensure that the experience is appropriate for the period in which the rates will apply:
  - Unusually heavy or light experience
  - Large or exceptional claims
  - Trends in claims experience
  - Changes in risk
  - Changes in cover
  - Inflation
  - Court awards/legislation
  - Different target market
- The different perils covered under the policy should be analysed and priced for separately, to prevent cross-subsidisation if there is a change in the mix of business.
- Risks should be separated into broadly homogeneous groups e.g. the location of the franchises. The choice of rating factors is constrained by the data you have available.
- As you are trying to avoid all cross-subsidy, you should include all potentially relevant rating factors in your data, and quantify whether or not they have an impact on the risk.
- The above should be done for both claims frequency and severity.

- You should also aim to allocate expenses to policies appropriate to the way in which they occur. Certain expenses may be per policy expenses whilst others are more appropriate to allow for as a percentage of premiums (fixed versus variable).
- The rates should also be loaded to ensure the required profitability is met.
- Load for commission and other expenses.
- Franchisor could also be a source of data.
- The rates should be adjusted to allow for the cost of reinsurance that will be purchased.

iii)

- Any discounts offered should be offset by loadings on other polices to ensure overall profit is achieved.
- Monitor the cross-subsidy. If management do offer any discounts, they should monitor the experience going forward to ensure that they don't start writing a larger portion of the business in these discounted areas. This could also result in the overall premium becoming inadequate.
- Management could consider using credibility rating where they are not that confident in their own experience, i.e. peer review the pricing exercise and phase in the difference between old structure and new structure, or phase in between new structure and market rates.
- If expenses and profit loadings haven't been accurately allowed for, management should allow for a minimum premium and ensure that the discounts don't result in premiums dropping below this minimum.
- Management could impose additional underwriting criteria which will enable them to reduce the rate in certain instances, or changes in cover e.g. exclusions.
- When adjusting the model, management should consider the likely impact that the new rating model may have on the volume and mix of business that they will be attracting and if this impacts the pricing itself again (i.e. feedback in control cycle impact)
- Overall ensure that the rates are marketable / reasonable and only deviate if management is completely sure, i.e. to avoid anti-selection.
- Instead of changing pricing structure, management could allow for leniency in pricing mandates - needs to be a set of rules within which sales people should follow.
- The franchisor relationship may be fragile which may force management into certain deviations - i.e. other, non-technical factor should be considered

iv)

- Impact on reinsurance relationship: potentially more buying power.
- Catastrophe exposure and accumulation exposure could increase and hence reinsurance cover could cost more.
- Practicality of collecting premium: would you charge group or individual companies?
- Impact on administration/ expenses/ systems.

- Relationship with franchisor and franchisees. Is making the change critical to keeping the client?
- Higher total premium income due because it is compulsory. i.e. everybody will have to buy and premiums will be collected for the previously uninsured.
- Potentially charge lower rates due to good risk anti-selection not being present anymore, i.e. good risks that chose not to take cover are now included and hence improves the overall risk profile.
- Need to understand additional risk and impact on pricing. Would you be able to get the additional information required - specifically risk profile of new franchises?
- Deposit premium and then adjustment premium i.e. admin could change & premium collection/experience rating.
- Increase in volume could place a capital strain on the insurer, which could then impact its reinsurance requirements.
- Desired level of exposure to this class of business and the prospects of this class of business.
- Insurance company cannot be selective in terms of who they cover anymore - i.e. forced to take good with the bad, which could impact experience.

v) *The fact that the points in this question was in addition to the points raised in question iv), was ignored. (i.e. still an envisaged compulsory product) Hence the relevant points in this regard were not considered /raised. Insufficient number of points generated.*

- Accuracy and completeness and availability of data - i.e. ownership moves.
- System may be inadequate and hence not able to provide what you need - impacts pricing, reserving, capital modelling etc.
- Mitigate: audits, clear service level agreements at outset, close monitoring and follow up, provide them with training.
- Lack of incentive to control/minimize claims experience, i.e. lack of claims management.
- This could cause worsening of experience, which causes losses.
- Mitigate: audit, profit share, clear rules in service level agreement.
- Also trend and experience analysis ability may be hampered
- Moral hazard/ fraud potentially increase due to arms length nature of administration/claims handling.
- Mitigate: audits, spot checks, and trend and experience analyses.
- Understanding of risk, lowering insurance spend: i.e. client will understand the risk and insurance spend better, which could lead to lower insurance purchase (risk) impacting business volume and profit of direct writer.
- Mitigate: long term arrangements / offer additional value add services.
- Cost of administration and how this is allowed for in premium rates and if the insurance company will be given their fair share of the administrative expense. Risk of paying more to franchisor than internal costs.

- Mitigate: agree up front costs & consider viability of proposal. Insist on expense analysis reports to prove/justify the actual expense spends.
- Level of expertise of staff and actual ability of company to manage the insurance structure between the numerous franchisees. i.e. risk that service level from franchisor not great and impacts franchisee opinion of insurer. (This could cause the whole book to move or franchisees putting pressure on franchisor to cancel insurance entirely or could result in incorrect claims being paid. This includes reputation risk for the insurer if job not done properly.)
- Mitigate: Provide/appoint independent claims assessors to ensure no fraudulent claims.
- Require additional information for large claims and multi-claimants.
- Mitigate: service level agreements, training, complaints call centre, monitor services, results and experience and act upon findings & cash flow monitoring. Manuals and documentation
- Reinsurance: there could be problems with the reinsurance premiums not being paid over correctly to reinsurers or with the Franchisor not requesting the correct reinsurance recoveries.
- Mitigate: training, monitor services, audit admin practices

Question 2

i) *The exact terminology within each model was not known, which reflects a general lack of knowledge of book work. Not enough points were generated when considering the appropriateness and more specifically the reasons why the methods were not appropriate, which indicated a lack of knowledge and understanding. There were a lot of points relating to the specific details of the company that were not raised.*

- Prescribed method is deterministic risk based capital approach to measuring solvency.
- The model was calibrated by means of industry statistics obtained by the STAR returns. The model assigns a capital charge to each element of risk that the company is exposed to and then aggregates the individual charges allowing for diversification and correlation.
- Reinsurance on a non-proportional basis is not properly allowed for because of limitations of the STAR data.
- Insurance liabilities are estimated to be 75% sufficient; the Capital Adequacy Requirement is 99.5% sufficient.
- Appropriateness:
    - Easy
    - Cheap to implement
    - Still solvent on the current basis i.e. R1bn – 700m > 264m
- Not appropriate:
    - Non-prop reinsurance not adequately allowed for, hence the motor and commercial property capital allocation will be incorrect
    - Current solvency requirement is 10% of (750 – 140) plus 15% of (750 – 165) = 148.75. The prescribed method will result in a lot more capital R115.25m, making it harder to meet shareholder return requirements and could cost the company a lot if the previously free capital was being used more optimally for other sources of revenue (e.g. equity investment)
    - The exact nature of the company's business/classes of business may not match the industry average which will lead to the incorrect solvency capital requirement
- A Certified Model is a medium term temporary solution to assist in making the transition from prescribed-formulae-based to Internal Model based solvency demonstrations.
- Certified method is deterministic with stochastic elements. Where the company has sufficient data and modelling expertise, the company can model these aspects of the business individually and allow for them appropriately within the model
- Appropriateness:
    - Potentially only for motor book due to the size of this class of business
    - Enables a company to understand and manage its risks better for the stochastic elements of the model
    - Will result in more appropriate capital, but still not ideal as only a part of the book is modelled appropriately

- Not appropriate:
    - Won't solve the reinsurance modelling problem
    - Internal model method has to follow, which means the company will need to get appropriate data and modelling skill on board within a certain period of time.

- Internal model method models all elements of risk faced by the insurance company stochastically. It relies a lot on the data and modelling skills of the company
- Appropriateness:
    - Appropriate:
    - Complete risk based approach, which should result in the most appropriate capital requirements.
    - Hence meets the security needs of shareholder, policyholders and regulator
    - Appropriate allowance for reinsurance
    - Appropriate allowance of Cat risk
    - Appropriate allowance for operational risk
    - Appropriate allowance for diversification and correlation
    - Assists on overall risk management
    - Helps management understand the true nature of the risks
    - Results could feed into underwriting, pricing and make these more appropriate
    - Results can be used to ensure efficient capital management and include more appropriate reinsurance spend
    - Will assist in determining a potentially more appropriate dividend policy as a lot of the guesswork about capital (in the rules based system) will be eradicated.
    - It can assist in determining an appropriate investment strategy
- Not appropriate:
    - Need data
    - Expensive: model and skills, especially south Africa has limited actuarial resources in this regard
    - It could lead to a higher capital requirement, but added comfort as the number will be more correct
    - Strictly conditional on FSB's approval.

ii) *The question should read "internal" model and not "international model". This was correctly interpreted and didn't have any negative impact. Insufficient details on the practical challenges were provided, for example cost and time weren't considered.*

- Cost: develop model and costs involved of software purchasing, employing actuaries (given their availability) and getting systems aligned, fixing data and implementing of software
- Overcome:

    - Appropriate budget, get buy in from shareholder/at appropriate board level, purchase and employ appropriate software
- Time to completion: project may overrun, i.e. sticking to deadlines
- Overcome:
    - Implement it as a project with appropriate sponsorship and measurable deadlines. Implementation plan to be agreed by all those affected, i.e. obtain buy-in.
- Information/data availability and work needed to make data useful + other sources
- Specifically for Marine, the smallest class, this may be a problem
- Overcome:
    - Develop appropriate systems and educate/train capturing staff on the importance of accuracy
    - Obtain reliable industry sources, reinsurers, potentially pooling data where possible
- Lack of experience and hence not sure how to model certain aspects of the business:
- Overcome:
    - Peer review model at different stages by skilled actuaries
- How to model Cat model and operational risk
- Overcome:
    - Accepted market Cat models (from broker environment)
    - Operational risks – look to the banking environment and overseas/UK studies
- Staff turnover – as you train/ up skill your staff they become more poachable due to the shortage of short term insurance actuaries
- Overcome:
    - Appropriate remuneration and incentive schemes
- Up to date information in model: due to the time it takes to develop the model the business in all likelihood could be changing due to marketing strategies given the changing environment.
- Overcome:
    - Constantly involve key elements of business (production teams) in all discussions and considerations of modelling the various classes of business.

(iii)

- Use test: the company must be able to prove that it is using the FCR capital model in its day to day running of the business as part of its risk management strategy. It needs to consider all areas of risk faced by the insurance company. The company needs to demonstrate that it has been using it successfully for at least a year prior to obtaining approval from the FSB.
- It is important to ensure good corporate governance and to ensure that the company is taking into account its risk appetite in every decision it makes in running its business, i.e. it ensures that the company is not just running numbers

and providing an output but actually understands the spirit of FCR and complies with it in every aspect of running its day-to-day business

- The FSB is likely to assess as follows:
  - risk management report
  - audit & site visits (staff interviews)
  - assess decision making documentation

(iv) T*he integration of the capital model into the company's overall risk management strategy was not addressed. Too much focus was placed on the model, with failure to mention other less direct issues. Not all points stated in the question were addressed, which lead to marks that could easily have been achieved, being missed out on. The Board's Use test concern was not addressed in the answer.*

- Successful integration:
  - Evaluate the current risk management policy and determine how the capital model can augment certain areas, where additional work is needed to the capital model to ensure its integration and what areas of the current risk management strategy need to be changed to align it with FCR and the capital model itself.
- Organisational buy in is critical
  - appropriate communication of model, its input, parameters and outputs, but most importantly in every day language to non-technical colleagues to ensure understanding and acceptance of its application within the risk management framework
  - training workshops will be needed
  - key that staff understand how the decisions they make impact the capital model.
  - included in this are appropriate incentive schemes for staff and department that aligns their outputs/key performance indicators directly with the need to manage risk within the regulatory capital framework environment
- The capital model will model each aspect of risk faced by the insurance company and assign a capital number to it (or a risk measurement number that can easily be transcribed to a capital model. Each department/division in the business will need to consider all their decisions in light of the impact on capital, i.e. all business decisions and actions need to address: "how will this impact the company's exposure to risk and hence capital requirement"
- In each of the main business areas this can be done as follows:
- Reinsurance:
  - Full capital modelling is needed when making reinsurance decisions – i.e. exact quantification of risk, cover and cost of cover and credit risk exposure. In place of raising capital, an insurer may rely on reinsurance to provide security for its ability to pay losses. This is likely to be very useful in a soft market when access to reinsurers' capital is cheap. This would need to be appropriately assessed by the decision makers, who will use the internal model to make their decision.

- Investment strategy:
  - Asset liability matching needs to be considered and normal investment risk factors such as liquidity, volatility etc. and an accurate capital quantification is needed before an investment
- Pricing and underwriting: (potentially the biggest area of risk)
  - Impact of incorrect price, return on capital, ability of price to cover expense etc. need to be considered in light of capital. If the pricing/underwriting leads to changes in the underlying risk, the potential impact of this on capital needs to be modelled, if possible. The impact of underwriting risk may be easier to incorporate as one can subjectively assess the extent to which the risk exposure of the company is changing (or not) due to underwriting decisions. Pricing may be a bit more difficult to interpret/incorporate, especially where there is no deliberate under or over-pricing taking place. The pricing accuracy may have to be viewed in the same light as operational risk and allowed for under that category. The impact of this may be mitigated by having appropriate control, checking and audit process in place.
- Marketing/sales:
  - There needs to be an assessment of risk in terms of these activities. Growth leads to a greater capital requirement and clear targets with restrictions should be set in place e.g. 15% growth OK, but in excess would need additional capital so need to ensure appropriate liaison with the capital team.
  - Bad business growth (i.e. poor risks) need to be measured and assessed in some manner, probably only retrospectively and perhaps this could feed back into their incentive schemes. Frequent/monthly measurement and feedback will be critical
  - (this can be extended to Cat exposures and ensuring that appropriate reinsurance cover is in place with any given business growth)
- Claims management, finance and other operational areas:
  - Policies and procedures (checks and audits) need to be in place to ensure appropriate corporate governance and hence limited operational risk. These need to be updated on a frequent basis and checks should be in place to ensure that policies are being adhered to
- Recruitment/Human resources:
  - It is critical that the correct staff are hired and that they have appropriately incentives. Succession planning is needed and the impact of incorrect decisions in this department need to be quantified within the capital and risk management requirements of FCR
- Information technology:
  - How do IT decisions impact capital requirements? Are they meeting the needs of the capital model and could they lead to changes in the systems/way in which we do business that could affect our overall risk exposure. Projects and potential budget overrun need to be planned, monitored and assessed in light of the overall risk management and capital requirements.

- Overall:
    - It is critical that the outputs and business decisions that are made in each department of the business are clearly understood. Each of these should to be assessed and measured frequently in light of FCR capital and risk management requirements, some monthly (pricing/underwriting),
    - some quarterly (ALM), some half yearly(finance procedures), some annually (reinsurance). Ideally there should be a range within which divisions can operate that have minimal impact on capital and risk to allow them to do their business, but there should be set limits in place which once breached, will result in a change in capital and risk management that could impact their overall performance measurement. Careful planning, communication and interaction are needed when developing these limits and ranges.

END OF EXAMINERS' REPORT