Actuarial Society of South Africa

EXAMINATION

27 May 2013

Subject F203 — General Insurance Specialist Applications

EXAMINERS' REPORT

Question 1

a) Define and briefly describe the term "motor fleet rating".

(Bookwork – definition of "fleet rating" in Unit 1)

- The process of determining premium rates for fleets
- Different techniques, largely based on the size of the fleet and the amount of claims history available, will be used from those that would be used for the individual risks in a fleet.
- Small fleets may be largely rated according to book rates per vehicle with some adjustment for expense savings
- Large fleets may be rated using some form of experience rating with the credibility of a fleet's past claims experience increasing with the size of the fleet

b) Discuss the information you would need to do a formal rate review under a typical motor fleet policy.

The candidates should have answered this question in relation to the context of the situation described in the question. The insurer is already doing fleet business and the rate review should be focusing on the risk rate in the particular context of fleet rating – where individual data is often not available. A list of rating factors applicable to individual motor business did not score marks. Neither did extensive comments around investment income, capital and expenses and other factors that require more in-depth consideration in personal lines business. Some candidates described "how" they would go about doing the rate review instead of concentrating on the information that would be required.

- Exposure data:
  - Amount of kilometres travelled would be ideal, especially if vehicles are equipped with telematics fleet management devices
  - Number of vehicle years
  - Amount of vehicles at a particular time (start/mid-way/end) of policy year
  - Accumulation of risk
  - Sum insured

- Claims data:

  - Determine the appropriate claims definition, by incident/reported/settlement
  - Split between large losses and attritional claims
  - Reinsurance recoveries / salvages
  - Determine a one-to-one link between claims incidence and exposure to risk
  - Do the claim amounts include claims expenses or not
  - Data on the amounts of each individual reported claim:

    Type of claim

    Amount paid, gross and net of reinsurance

    Outstanding payments / case estimates

    IBNER adjustment based on past experience

  - Relevant dates of each individual reported claim:

    Accident date

    Reported date

    Settlement date

  - An IBNR adjustment to cohorts of claims that are not fully run off
  - Past claims inflation adjustments appropriate to the underlying claim types

- Claims and exposure data should be split up by:

  - Each of the last 5 policy years
  - Different types of vehicle (e.g., sedan, minibus etc)
  - Possibly by area, if data volumes are sufficient

- Information on **changes** in policy structure and dealings with the company in order to standardise claims data

  - Change in policy deductibles / excesses

- Change in reinsurance arrangements (deductibles and cover limits)
- Change in methods of claims reporting and claims handling

- Information on the business practices
  - Average vehicle age of the fleet
  - Average vehicle turnover of the fleet
  - Driver experience and endorsements
  - Driver turnover
  - Types of goods transported
  - Past driver convictions, lawsuits
  - Grade/level of fleet management telematics system, changes in the system

c) Discuss the advantages and disadvantages to Rover of using a captive structure to self-insure the motor fleet risk

Some candidates answered the question in the context of obtaining a cell within a cell insurer, instead of considering a cell captive (which is an insurer in its own right with its own licence.)

Advantages:

- The net insurance cost to Rover will be lower since a captive structure would avoid paying for the expenses and profit margins of Gemini
- Rover can deduct the premium as a business expense (if the captive is set up at arms' length) and build up reserves from pre-tax profits
- Captive would benefit Rover directly as it would be incentivised to improve its risk management processes
- Matching of timing and cash flows; particularly with motor fleet third party liability, losses may emerge over a longer period of time. A captive is able to reserve from current funds for future claim payments, thereby matching revenue and expenses attributable to each financial year
- The captive can be used to insure not only Rover's fleet of commercial vehicles, but may also provide cover to and draw premium from other lines of business to increase cost savings and further improve efficiency
- The captive can expand its book of business by offering insurance to related third parties

- Rover might not be able to find a better insurance offering (compared to what the captive can give) in the current market
- Reserves for unpaid claims and unearned premium, otherwise kept by the insurer, can be held by the captive and invested
- Broader, simpler and tailored insurance cover specific to the insured's needs, can be developed
- There may be tax advantages in setting up a captive, e.g. by setting a captive up in a different territory where less tax may be payable
- They can get direct access to reinsurers and Lloyd's
- Insurance profits can be paid back to the parent in the form of dividends.

Disadvantages

- Rover must contribute the capital required to support the captive's business plan, as determined by the insurance regulator in the captive's chosen domicile
- While these funds remain within Rover, they may not realize the same return as they would have if invested in other operations or opportunities
- Rover might not have internal insurance expertise and may be reliant on consultants (which has another cost implication too)
- Future costs and risks of maintaining the captive are uncertain (including regulatory costs)
- The time and costs involved to manage the captive might not justify the expense saving in either insuring outwards or retaining the risk
- For the same reason, risk managers may be distracted from risk improvement that might generate much more savings
- Within a competitive insurance environment, Rover will lose out on the opportunity to exploit insurance cycle movements
- Continuation of cover will be less secure than in the case where the risk is transferred to a large insurer with a likely larger capital base (e.g. risk of catastrophe)
- There may be a lack of risk transfer for the Rover group as a whole, if no reinsurance cover is bought.
- Takes focus away from core business
- May not be able to get favourable rates from reinsurer
- Might not be a viable option for such a small scheme (R100m)

d) List measurable factors of driver ability, applicable to Rover's list of appointed commercial vehicle drivers, that are expected to have a direct relation to the expected claims cost under the policy

- Age (as a proxy of experience)
- Time keeping (including hours per shift)
- Telematics statistics, e.g. speed / acceleration / cornering / braking
- Types of licences received / driver qualifications
- Date licence received (or time since receiving driver's licence)
- Additional courses attended (e.g. advanced driving)
- Knowledge of Road Traffic Law, highway code and driving behaviour
- Accident record / number of offences/penalties of drivers
- Medical history e.g. days off sick
- Whether sight tested / licence restrictions (e.g. wearing glasses)

e) Discuss the practical risk management practices that may be implemented in Rover's day-to-day business in order to reduce the total expected losses under the policy

Candidates generally scored better in (e) than in (f). There was much duplication, both within a subsection and between sections (e) and (f). For example, many candidates elaborated extensively on the benefits of telematics which did not score additional points. Some candidates' answers contained aspects that should have been in the other section, i.e. ways of monitoring.

- A well publicised statement of the risk management policy by Rover's senior management
- Stringent reviews of employment applications, requesting evidence of qualifications, references from previous employment
- Examination of the original driver's licence
- Regular and detailed inspections on fleet vehicles by the fleet engineer
- Full written records on vehicle accident and service history needs to be held
- Drivers should be provided with all the necessary equipment to optimise effectiveness and minimise risk, e.g. GPS system, driver packs, route maps, communication devices, training
- A strong disciplinary policy is essential
- There needs to be a continual focus on new and improved initiatives to reduce risk, e.g. having an internal risk management committee and regular brainstorming sessions on how to improve the current risk management system
- Compliance with Road Traffic legislation and regulation is essential - compliance should be rewarded and non-compliance penalised
- Health and sight checks on drivers
- Install telematics devices

- Ensure safety of vehicles where they are stored e.g. safe storage facilities, emergency evacuation procedures, fire drills, keep keys in safe etc

f) Discuss how Gemini could implement risk monitoring systems to assess the effectiveness of Rover's risk management practices suggested above.

The answer should be related to what the insurer can practically do from their offices to measure the effectiveness of risk management. Many suggestions given by candidates require almost a physical presence at the insured's premises. Very few candidates mentioned and elaborated on actual claims, which is the most important factor the insurer needs to keep an eye on.

- Incorporate realistic targets and timescales to reduce measures such as frequency and average cost per claim and regularly monitor experience against those targets
- Do a routine route assessment on telematics statistics if telematics is being used
- Monitor the amount of kilometres (distance) travelled
- Analyse claims by:
  - particular driver
  - route (location)
  - type of vehicle
  - time of day travelled
- Closely monitor the mix of claims in relation to different perils and claim reasons and the trends thereof over time.
- Request more frequent bordereaux / update risk register
- Request immediate notification of claims above a certain level
- Reconcile claim payouts on the system / bank statements with those on policy records/ bordereau
- Identify systemic risks and claims patterns that might not be necessarily tied to the fleet. For example, consider the experience on other motor classes over the same time period
- Monitoring should be cyclical. Any issues highlighted by the monitoring process should be addressed and once counter-measures are implemented, the effectiveness of these measures should be closely monitored
- Award Rover for good risk management practices e.g. by premium discounts

g) Describe the main aspects you should cover in actuarial reporting on the performance of the underwriting department, and the actuarial performance of the portfolio overall.

In this section candidates needed to describe the main aspects that should be covered in actuarial reporting on the performance of the underwriting department and the portfolio. Many ignored the fleet setting in the question and provided a basic theoretical structure more fit to a personal lines environment. The question also did not ask how one should generate the figures that should be included in the report. A few candidates misinterpreted this question completely by giving an outlay of professional guidance notes, not scoring any marks.

- Report on the sufficiency of rates:
  - Net and Gross (of reinsurance) written premium and net paid claims
  - Loss ratios over time
- Report on the exposure:
  - Volumes (for example policy count, motor fleet size)
  - Estimated Maximum Loss / large losses
  - Aggregation / accumulation of exposure
- Report regularly to underwriters about:
  - how they are performing against budget
  - where current rating is not sufficient to cover claims and expenses and meet profitability targets
- Based on the company's own claims experience, show underwriters the risk areas which they can exploit and areas they should avoid
- Demonstrate how proposed changes are likely to affect key indicators
  - What-if / scenario analyses e.g. the effect of different excesses on rates and expected future profits
  - Impact analyses – to assess suggested rate changes on the current book and future new business take-up
- Where data is concerned, give an indication of credibility attached to the company's own data and how it compares with the credibility attached to external sources, e.g. data provided by reinsurers/ reinsurance brokers
- Demonstrate how the following cost items were allowed for to arrive at the final rates:
  - expenses (fixed and overhead)
  - allowance for profit / return on capital
  - investment income
  - catastrophe spreading
  - cross-subsidy assessments
- Illustrate the effect of the reinsurance structure on the overall experience, e.g.
  - Proportion reinsured and total profit ceded under the current structure

    - Results of a dynamic reinsurance model / optimisation to demonstrate the effect of alternative structures and to compare it against the current structure
- Report on the performance of the various brokers and broker commissions paid
- Report on prevalent broker expectations on the rates offered and reasoning behind it

- Compare current rates with available competitor rates and highlight areas of the book that are vulnerable to competitors

Question 2

a) Describe the differences in the scope of benefits that employers are obliged to cover as set out in ODMWA and COIDA.

Candidates needed to distinguish between ODMWA and COIDA by giving information under different headings as the benefits are not the same.

- ODMWA only covers cardio-respiratory diseases (such as pneumoconiosis, tuberculosis, chronic airways obstruction, occupational asthma and progressive systemic sclerosis) which, "in the opinion of the Certification Committee (of the Medical Bureau for Occupational Diseases), is attributable to the performance of risk work at a controlled mine or works".

- COIDA covers all employees and provides for the medical examination, certification and compensation of all employees who are injured on duty or who suffer from an occupational disease excluding that covered by ODMWA.

b) State the benefits payable under ODMWA and COIDA.

ODMWA:

- Temporary total disability:
    - 75% of an employee's loss of earnings for a period of up to six months to a person who is suffering from tuberculosis which does not render him permanently unfit to do his ordinary work.

    - a temporary total disability benefit also applies to the 12 month period immediately after the date on which he performed risk work for the last time

- Lump sum benefits:
  - for persons suffering from compensatable diseases (other than tuberculosis) in accordance with the formula: (A x 12) x B where "A" represents the person's monthly earnings (as specified in the Act) up to a maximum of R2 000 and "B" represents an annuity factor depending on the extent (degree) of the disability and whether a previous payment has been paid or not.
  - The minimum benefit payable is a lump sum of R7 000

- If a person who has died is found to have been suffering at the time of his death from a compensatable disease, amounts equal to those payable to living persons will be payable to his dependants and such amount shall be divided amongst them in such proportions as the Compensation Commissioner for occupational diseases may determine

- Double compensation (between ODMWA and COIDA) is prevented by Section 100 of ODMWA

COIDA:

- COIDA provides for the compensation for temporary total or partial disablement (calculated on the basis of Schedule 4) and subject to a minimum and maximum amount prescribed by the Minister.

- compensation for total temporary disablement shall be equal to 75% of the employee's monthly earnings and for partial temporary disablement, such portion thereof which the Commissioner considers equitable.

- The employer must pay such compensation for the first three months, after which the Commissioner (or mutual association) takes over the payments and repays the amounts already paid out by the employer.

- Compensation for temporary disablement is usually limited to a maximum of 12 months but may in certain circumstances be extended to 24 months.

- disability benefits provide for loss of earnings and take the form of either a lump sum or monthly pension, depending on the degree of disability

- In the case of death, a lump sum benefit is paid that provides for loss of earnings, pension and reasonable funeral costs.

c) Discuss the parameters that should be included in the projection model and their impact on the underwriting results

Most candidates wrote lengthy answers without commenting explicitly on the impact of the parameters on the underwriting results, costing them half the marks.

- Volume of business (written premium)
  - Need to determine what volume of business is necessary to obtain critical mass
  - If premiums not sufficient it will reduce underwriting profit or lead to losses
- Expenses
  - Level of expenses important – need to recoup initial development and running costs
  - Do expense analysis to allocate expenses appropriately to new product, otherwise profitability of different products (existing and this new one) may be skewed
  - Projection should ideally distinguish between marginal and fixed costs
  - Reduces underwriting profit
- Commission
  - Allow for commission paid depending on sales model (i.e. direct vs. using brokers)
  - Commission is regulated, make sure that maximum amount is not exceeded
  - Reduces underwriting profit
- Technical provisions
  - Allow for technical provisions according to regulations for this product line

- Leads to reduction in underwriting profit in first year. Subsequent years will depend on the movement in these provisions – increase in provisions will lead to a decrease in underwriting profit and vice versa.

- Cost of capital
  - Allow for the cost of capital needed to underwrite this product
  - Reduce underwriting profit
- Discount rate (or investment return)
  - Allow for discounting of cash flows in future. Leads to lower present values. The underwriting result will only be neutral if the actual return achieved is equal to the discount rate used.
- Reinsurance
  - Allow for reinsurance premium, commission, effect on technical provisions and capital
  - Effect of reinsurance not clear: can be "effective" (i.e. increases underwriting profit on a net basis) or not, depending on premium payable and programme as a whole and may or may not be effective on either an expected or actual outcome basis
- Profit loading
  - Additional/explicit profit loading will increase underwriting result
- Claims estimate
  - Estimate of claims paid (i.e. loss ratio) – will reduce underwriting profit
- Tax
  - Allow for estimate of tax based on current legislation. Will reduce insurance profit (if profitable business) rather than underwriting profit. Tax losses can be accumulated to be offset against future tax liabilities.
- Lapse / churn
  - If the business is profitable, lapses will decrease the underwriting result. The effect on expenses that can't be recouped will also reduce the underwriting result.

d) Discuss the factors that you would need to consider in the calculation of the technical provisions at the end of the first financial year of underwriting this product.

The main point that candidates should have recognised from this question was that this type of business is mainly written on a claims made basis, which leads to very specific impacts on the reserves – there will be no AURR and the IBNR is short-tailed (even though the claims run-off might still be long-tailed.)

- OCR will be based on case estimates
- Case estimates will be determined by claims assessors. This is a new product line – accuracy of OCR will depend on the expertise and experience of claims assessors.
- OCR need to allow for expenses including possible litigation cost (unknown to the insurer at this stage)
- Employers' liability is mainly written on a claims made basis,
- Therefore cover is only applicable to claims reported during the underwriting period
- The IBNR will be short-tailed (There might be a short reporting delay at the end of the period)
- There may be a more significant IBNER that needs to be taken into account, to provide for underestimated outstanding claims reserves
- But you will not have an accurate history on what the likely size of the OCR underestimation is.
- The UPP can be calculated on a similar basis (e.g. 365th method if the risk is evenly spread throughout the policy year and if an annual premium is paid) to other policies.
- For policies written on a claims made basis, an unexpired risk provision will (similarly to IBNR) not be large, as claims need to be reported in the period to be valid.
- In summary - at the end of the first year, the insurer is unlikely to have enough information to determine the technical provisions accurately
- Could use the statutory requirements as an indication of the "average" technical provision of the market
- Statistical techniques will not be appropriate without enough credible data

- But may need an additional margin for prudence/uncertainty
- And the statutory requirement may not be the preferred / applicable method for financial reporting

- Compare own results with industry history and statistics to determine whether results are appropriate

e) Briefly state how the capital adequacy requirement is calculated and then discuss what the impact will be on the insurer's capital adequacy requirement over the next few years (based on current capital requirements) should the employer's indemnity liability product be introduced.

This question required a brief statement on how the capital requirement is calculated, with a more detailed discussion on the impact of introducing a new product on the capital requirement. Candidates spent too much time writing down detailed information on the capital requirement and in some cases even added detailed descriptions on how all the reserves should be calculated on the statutory basis which did not score any marks. Few candidates went into the detail of the impact of the new product on the capital requirement. In the context of the given question, "longer tail" should specifically refer to the time taken by legal and administrative proceedings that is usually encountered with liability business and does not refer to the reporting of claims.

The CAR is calculated as follows:

CAR = max(MCR, SCR) where

MCR = max(R10m, 15% of NWP; 13 weeks' operating expenses)

SCR = BSCR + Operational risk capital

BSCR = $(\text{Insurance capital}^2 + \text{Market capital}^2 + \text{Credit capital}^2)^{1/2}$

It therefore makes sense to look at each of these components in turn

<u>MCR:</u>

- Assuming that the insurer is holding more than R10m capital already, the introduction of the new product should not make a difference.
- However, if the insurer's SCR capital is less than this amount the introduction of the new liability product could lead to an SCR that is higher than the absolute minimum amount of R10m – leading to a higher requirement applicable to the insurer

- If premiums increase (more than "natural" growth based on the existing products only) the 15% of NWP could lead to an increased MCR, although this will only have an effect from the next year.
- 13 weeks' operating expenses: unless the expenses increases significantly by introducing the new product, it should not have a marked effect

- All of the above will only be applicable if the insurer is currently on an MCAR basis

<u>SCR:</u>

- Operational risk capital charge is based on the higher of a premium or provisions calculation...
- Both premiums and provisions should increase after introducing the new product.
- The IBNR reserve for the liability business class is much higher than for the other personal lines. The OpRisk charge will therefore increase
- The effect of the increase in the OpRisk charge is unclear:
  The OpRisk charge is limited to 30% of the SCR (which in turn will change), therefore it is not certain (considering the information given) with how much the OpRisk charge will increase and whether this increase on its own will lead to a higher SCR.
- Assuming that the product is successful and that business grows over the next few years, this will lead to increased premiums and provisions and an increase of OpRisk over time.
- Insurance risk capital charge: Because this is based on a % of NWP the capital will increase.
- The capital charge depends on the business class and liability business' factor is higher than that of the rest of the personal lines they are currently writing.
- As business grows over time, the insurance capital charge will increase (and vice versa)
- The increase in the insurance risk capital charge will depend on the amount of reinsurance bought, as the charge is based on net written premium.
- Only approved reinsurance can be taken into account to reduce the premium
- Credit risk capital charge: the interim measures' capital calculation does not make allowance for credit risk on reinsurance assets
- Credit risk may increase due to increased reserves – depending on which classes of asset the assets backing the reserves are invested in

- For the remaining assets, credit risk will stay unchanged unless the insurer changed its policy regarding investing in assets in certain credit ratings and/or investing in different types of assets due to the introduction of this product

- Market risk capital charge: liability business is more long-tail ...
- which could lead the insurer to invest differently for example by investing in more equities than before, to match assets and liabilities more appropriately

- this will lead to the market risk capital charge to increase over time, depending on the investment decisions made
- A change in investment policy will only have an effect on market and/or credit risk if the assets backing liabilities change. (I.e. if investments are made with free assets, it will not have an effect on the capital requirement)

Overall:

- It is likely that the capital will increase initially, and further increase over time as the business grows ...
- as there is no diversification benefit in the design of the current capital requirements

f) List the reasons why the Financial Director would consider using ART for this new line of business.

Many candidates recited a list of the benefits of purchasing reinsurance – there needs to be something in relation to this situation that supports the use of ART rather than traditional insurance. Some candidates confused ART with a cell or a captive.

- reduced costs
- seek coverage not available in the traditional reinsurance market
- can access financial markets as an alternative source of capital
- restructure and manage aggregate risk
- alternative to catastrophe provisions
- reduce the cost of capital under regulatory requirements

- optimise performance under accounting, regulatory and taxation requirements
- stabilisation of underwriting result
- the company wants to diversity from the current reinsurance used / get an additional source of capital / expand the spectrum of cover

g) Discuss the likely structure of the following methods of ART under Employer's liability cover, highlighting the specific benefit it might hold to the insurer:

Bookwork:

Financial quota share – likely structure

- This is a traditional quota share arrangement, but written for the primary purpose of a financial arrangement involving the commission payment.
- Financing is achieved e.g. by overcompensating, (i.e. paying more than a normal reinsurance commission), in the initial period and under compensating, (i.e. paying less than a normal reinsurance commission), over a period thereafter.

Financial quota share – benefits

- Provide full cover without immediate need to finance full undiscounted liability

Spread loss – likely structure

- Insurer paying annual or single premiums to reinsurer for coverage of specified claims
- These premiums accumulate with interest (contractually agreed) in an experience account.
- The balance of the experience account is settled at the end of a multi-year period.
- Definition of a claim such that it cannot be much greater than the sum of the premiums

Spread loss – benefits

- Useful where insurer is exposed to potentially large risk that may occur from time to time – spread the effect of a big loss over several years
- The reinsurer is taking limited timing risk only and can therefore offer this at low charges
- Very limited underwriting risk (limited risk transfer to reinsurer (but insurer gets the liquidity and security of the reinsurer
- Helps to reduce the volatility of the insurer's reported results
- Less volatility should reduce the requirement for capital allocation and therefore improve return on the capital employed
- Less volatility reduce buffer capital thereby freeing up this capital for other uses
- But then also need to allow for credit risk of the reinsurer

h) Give an opinion on whether either of the options mentioned in (g) above would be suitable in this situation.

Very few candidates offered a firm opinion.

- This class is volatile and furthermore being a new venture exacerbates the potential for volatility
- Financial quota share will not reduce the volatility and is therefore not suitable
- Spread loss is usually used to give protection against single very large risks. In this situation the insurer might be exposed to very large risks, but also an accumulation of large risks.
- Spread loss will reduce the volatility reported, but not if a very large risk occurs within the first year
- Spread loss will be suitable