Actuarial Society of South Africa

EXAMINATION

27April 2009 (pm)

Subject SA3RSA — General Insurance Specialist Applications

EXAMINER REPORT

Examiner's overall comments:
Most candidates didn't answer all the aspects that the specific questions required. Generally the number of points generates within an answer were insufficient.

Question 1

i)
Examiner's comments:
The question was reasonably well answered. The important factors were covered well, but the explanation of why each section was important was not adequately addressed.

Distribution channel analysis
This is the essence/key issue of the proposal. It needs to be analysed properly to explain why this is a good idea and what business growth and resultant profits will be achieved. If this analysis is done incorrectly, it could lead to losses and inappropriate decisions e.g. it might not be a good idea to sell motor, or to go direct at all. This analysis forms the starting point of whether the company should consider the proposal or not.

Factors:
Broker vs. Direct: direct business is competition to your broker market. You will need a clear communication and impact assessment of this change in your proposal. You will need a strategy to ensure that you don't gain business on the one side and lose business on the other side. You want to avoid the potential consequence that brokers could stop supporting you and you could lose business.

Branding & marketing of products for the two channels and/or the company as a whole also need to be considered differently.
Direct marketing: Evaluate the options (TV, billboards and mail-shots) & the costs of this in comparison with the current distribution channels. This includes the scale and timing of expense. Brokerage varies and depends on volumes, direct costs up front and once off.

The target market and resultant risk factors the new channel and specific product will differ to your current portfolio and pricing/other assumptions.

Cost of distribution (remuneration levels) and the impact on pricing.

Resource allocation:
It is vital that resources are sufficient to service this business. Insufficient resource leads to poor service and resultant loss of business. Resources include staff, computers/IT, (call centre technology, rating software) advertising/start up budget, i.e. each resource type will need to be considered separately. May need additional pricing resource and skill set due to the fact the brokers may have been pricing business. A proper resource plan and costing will be needed to ensure that you have sufficient resources available at the right time.

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Factors:
Additional growth: More policyholders will require more people in the service departments & in back office departments & if additional building space required. e.g. claims, administration etc.

Direct contact point: this will either be a telesales environment and/or internet based, but it needs to be manned properly and working effectively to deal with the increased business volumes. Client service and quick response to queries will be critical. Ensure that there are appropriate/sufficient resources (skills & number).

Leverage off existing or create new: the company will need to consider if it is going to use and train existing resources to handle the direct motor only business or set up new resources. Assess remuneration cost and ease of attracting and retaining staff. E.g. supply of labour)

Administration systems: can they cope with the new business drive or not or will they need to be amended.

Direct financial advice: FAIS compliancy of direct sales force and associated costs and timing of implementation. Sufficient cash flow to meet need.

Risk Based Capital:
It is important to ensure that you have enough capital to support this new line of business to ensure that you are able to satisfy FSB regulatory requirements and are able to meet policyholder liabilities when they are due and to protect the shareholders interest. (Competitiveness of rates, capital/roe could be considered as more important, i.e. candidates can rank importance.)

Factors:
Capital: Inherent risk: you will need to determine the inherent risk of new class (potentially new because stand alone or new because new policyholders and therefore a new risk profile). Different policyholders have different risk profiles and therefore you need to consider different risk factors such as volatility, exposure to Cat events, frequency and severity of claims etc.
Correlation and diversification: This will need to be assessed specifically for this added product, even though motor business is being written in the current personal lines portfolio. There may not be much additional diversification as it is highly correlated and as such could increase exposure to certain perils.

Bigger gross premium income may lead to more stability, which could then impact your reinsurance spend and therefore the capital.

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Return on capital: You will need to ensure that this class will be able to meet its return on capital profile. Cross subsidy between lines is acceptable in this regard and possibly even necessary in its start up phase due to initial costs of direct marketing.

The capital allocation for pure motor as to personal lines may or may not be different, i.e. a different ROE requirement in itself.

Assess potential increase in operational risk due to new way of doing business, including process and systems risk.

ii)
Examiner's comments:
The question was reasonably well answered. Most candidates failed to comment on the variance in price in the high value car market being lower than the variance in price in the lower value car market.

Outline
Policy terms and conditions: excesses, types of cover may differ from damage only to comprehensive motor
Different pricing methodology: actual methods yielding different results and different rating factors used with different loadings
Different assumptions around volatility, severity and frequency for the cars identified
Different target markets: some companies target luxury cars and hence offer cheaper rates. It seems our rates are less competitive in the cheaper car arena, than the luxury car arena.
Percentage wise (High value 39% (2016.75-1459.68)/1459.68 vs Low value 56% (1177.76-752.87)/752.87) the spread in price is lower in the luxury car could mean volatility in experience or hence could explain the competitiveness of your rates.
Different data, experience and difference in any single rating factor (e.g. different location with different risk view) in the quote of each company could lead to different pricing results.
(this includes all factors relating to risk profiles)
Different shareholder and capital requirements leading to different return on equity loadings
Different expense loadings and different approach to loading expenses, e.g. fixed cost vs variable cost loadings
Different allowance for cross subsidy between rating factors and between different makes and model for cars
Mistakes in pricing
Pricing arbitrage, underwriters tweak their price below or above their minimum required premium to increase or limit volumes in certain areas. i.e. overall competitive market forces.
Different reinsurance structures of different companies could have different prices which would need to be reflected in the office premium.

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To the extent that investment income is allowed for in the pricing, the interest rate used, depending on the underlying investment policies.
Underwriting discounts provided by some insurers, but not by others
Different interpretation of where the market is currently in terms of the insurance cycle.
Rates could be indicative and then change after more in-depth underwriting is applied.

(iii)
Examiner's comments:
Most candidates explained the information they would give but fell short in terms of explaining their approach and how they would relay that information.

Approach

- discuss pricing methodology and assumptions
- explain data used and where data was sufficient and what adjustments you made and justify them
- explain the reason for your *rating factors* chosen
- explain all areas of uncertainty in your assumptions and approach, justifying your resultant loadings and/or conclusions in terms of pricing
- explain briefly (as it is to the board) the actual statistical analyses done and goodness of fit of distributions
- explain expense loadings and approach used
- similarly explain return on equity and other loadings.
- Explain all the items mentioned above and why you feel the other prices are not appropriate
- You will need to elaborate on expected sales volumes given your current price and the market conditions and what the expected outcome of the risk profile/mix of business.
- Specifically also comment on the resultant growth, solvency and profitability of these expected sales
- Explain the results of any profit testing analyses performed.
- Warn the board of potential outcomes should they deviate from your suggested price. i.e. anti-selection.
- Explain whether or not the prices are fixed for a set period of time or adjustable as market conditions change.
- + reputation risk of getting it wrong
- Elaborate on any actuarial guidance used in performing your analyses and where you complied, where you didn't and why.

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(iv)
Examiner's comments:
Candidates didn't generate enough points for this question and missed many points that had specific relevance. E.g. nearest policy anniversary date.

Advantages:
Encourages loyalty, i.e. less lapses, which leads to a higher embedded value per policy, i.e. greater profitability
Encourages good behaviour, i.e. encourages policyholders not to claim. Discourages small claims and hence improves profitability
Pricing: a bonus system adds a rating factor and policyholders that reach certain levels of the bonus system, show similar behaviour/experience. i.e. it produces a homogeneous rating factor. i.e. the history of whether claims have been made or not, is used to indicate the propensity to claim in future.
Consistent with what is happening in the market and benefit is in demand

Disadvantages:
This bonus system needs to be compared to that of competitors. Is it more or less generous and how will this impact sales volumes and risk profiles. This point can be viewed as a merit.
Pricing: Paying money back to policyholder reduces profitability. This needs to be considered and allowed for appropriately in the pricing to ensure shareholders returns will still be achieved.
(Difficult to price and to predict the behaviour of the customer base)
Also, the sales impact could be more expensive upfront leading to greater costs and less profitability.
It can be an administrative burden: keeping track of reserves and eventually ensuring that the refunds are actually paid increases administration.
There is less incentive to stay after 3 years, as the refund reduces, i.e. rather cancel and take out a new policy
Some policyholders may have a 1 month break in cover, which means that they would need to start all over again, which could create a negative perception and produce the opposite to what the intention is.
(or reputation impacted by an unhappy client that claims in the last month.)
It only pays out after 3 years, which may be too long a time horizon for policyholders
Nearest policyholder anniversary, adds complexity, admin and explaining to policyholder.
Significant risk that policies can claim in the first 6 months, without losing their bonus due to "nearest anniversary clause" i.e. anti-selection

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(v)
Examiner's comments:
This question was answered poorly. Many candidates didn't mention lapses. Generally there was a lack of factors mentioned and candidates failed to demonstrate a clear thought process.

Calculation of reserve:
Either PV(future benefits for all in force policy holders) less PV(future premiums of all inforce policy holders) = discounted cash flow approach
Prospective approach
Or
Retrospective approach:
For all in force policyholders: calc total value of expected future benefit and accrue it to your current point in time. E.g. a straight line approach: total term per policy is 36 months and 1/36th accrues each month.

In both methods it is important to consider the following:
Data:
-the feature is new so your past data will not be entirely appropriate, as the feature itself will influence experience

Experience
- claim frequency: probably adjust downwards, as smaller claims will reduce
- double decrement: your reserve calculation needs to allow for the probability of future lapse and future claim, as you would not hold the full premium rebate amount per policy, but rather hold it at a portfolio level appropriate for current in-force population, but allowing for their future probabilities of not making the 3rd policy anniversary in a claims free state.
- For both frequency and lapses the impact will vary over the term of the policy, the closer you get to the bonus date, the greater the impact the potential bonus has on the behaviour

Company's current reserving policy would need to be considered to ensure that your reserve calculation is aligned to the policy. E.g. method of calc and level of sufficiency: you would need to consider the same approach.
Assumptions need to be aligned/consistent (not necessary equal to) similar assumptions used in pricing and other areas of the business. E.g. lapse assumption in pricing and reserving.

Reserve per policyholder or at an overall portfolio basis:
- Per policy calculations will add accuracy, but you will need to have lapse assumptions and claims frequency assumptions for policyholder in order to do this. i.e. the work becomes very detailed and complex. Computer/resource constraints could be a concern

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- Grouping may be necessary due to your assumptions. However, detail is lost, which makes future analyses difficult. Having a per policy reserve, even though the same assumptions apply to many policyholders will make future analyses work more valuable, as it will enable you to come up with a greater level of detail in your assumption setting

Timing of profit & Tax:
- The reserve will need to be set at a level that SARS is comfortable with, i.e. not too high.
- the reserve per policyholder could also increase over time due to the fact that the closer the policyholder gets to the bonus date, the less likely he/she is to lapse or claim
- You may want to produce a smooth reserve to smooth out the impact on the financials and allow appropriate planning and analysis as the book grows.
- The way in which you do this will impact the timing of realising profits to the company and hence impact actual shareholders return.

Discounting
- You will need to consider whether or not to discount this reserve and if so at what rate, depending on the underlying investments

Level of prudence and sufficiency
- You will need to determine what level of prudence is implicit or explicit in the reserves.
- You might want to determine a best estimate (release profit early) or a 75% sufficiency (in line with regulation.

Future premium increases and decreases (i.e. where actual premiums differ from what was expected in the reserving calculation.
- Premium increases will need to be considered in the reserve projections and the business plan
- Premium decreases will result in reserve releases and the reserves will need to be adjusted as and when this happens or there needs to be an allowance in the reserving bases for this.

Nearest policy anniversary date:
You will need to include appropriate assumptions to allow for this. Once the policyholder has claimed, an initial reserve could be immediate as the nearest policy anniversary could be almost 6 months earlier. The entire reserve to date will be released, but an immediate reserve will be raised due to the fact that you are already almost 6 months into the new bonus period.

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If this happens in subsequent years after year 3, an immediate reserving strain will arise as you were only holding reserves sufficient for 7.5% of written premium and by resetting you will need to hold at 15%.

(vi)
Examiner's comments:
Few candidates did well in this question. Candidates displayed a general lack of understanding.

Regulation to consider
- FSB/ACT is prescriptive with regards to claims reserves and UPR & a contingency, only. Premium rebate reserves are not mentioned and hence doesn't have an impact
- SARS is prescriptive with regards to technical reserves, relating to claims and mentions any other expenses incurred in running the business, but does not mention or specifically allow a premium rebate reserve.
-Ideally the company should aim to put the movement in these reserves through the income statement in such a manner that they do not attract tax. The company would probably need to engage with the regulators in this regard.
- IASB / IFRS mentions fair value of reserves and requires and refers to the amount for which an asset can be exchanged, or liability settled, between knowledgeable, willing parties in an arms length transaction. This approach would apply for the premium refund reserve. This will impact quantification only and not impact the where and how.
- To ensure that the regulators & accounting profession views these reserves favourably the company might want to engage with the FSB & SAICA to consider whether or not there is anything they need to consider in terms of booking these reserves
-These reserves do not relate directly to claims and as such do not form part of technical reserves.

EITHER

However, one could argue that because the reserve is contingent on a claims event, or rather the lack their-of, it could be considered a technical reserve, but not a claims reserve.
Also, by nature the fact that it is a peril/risk to the insurer it should form part of the liability and hence claims reserve in terms of its accounting process
i.e. it should be deducted in income statement prior to tax and be shown as a policyholder contingent liability on the balance sheet.

OR

The reserves are directly related to earned premiums and as such should be in the income statement after net earned premiums, as a separate item. A new total: net earned premium after premium refund reserves could then be added.
At the same time a policyholder liability will be created on the balance sheet, which should form part of policyholder liabilities (i.e. non distributable).
i.e. it should be deducted in income statement prior to tax and be shown as a policyholder contingent liability on the balance sheet.

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Other information to consider:
- You can consider regulation in other countries where this type of benefit is provided.
- In your recommendation you will need to consider any relevant actuarial guidance that my assist you
- You can discuss this with industry peers (actuaries and accountants) and other companies providing this type of benefit in order to develop a solution/recommendation

Question 2

(i)
Examiner's comments:
This question was answered poorly with most candidates being unable to generate sufficient points and demonstrating an inability to interpret the numbers provided. Many candidates only concentrated on underwriting risk. Individual points raised were reasonable, but candidates didn't adequately address all the aspects of capital modelling.

Reasons: CHANGE IN CALCULATION
Capital allocation methodology:
- Method may not be coherent and hence doesn't behave in expected way. E.g. TVAR vs VAR. In an incoherent method, doubling premium income may not lead to doubling of capital.

Any change in methodology and assumption from previous years:
- Change in capital allocation method
- Change in catastrophe modelling (assumptions & method)
- Refinement of assumptions setting e.g. use different curves for calibration of large losses, & attritional losses
- Change in reserve methodology leading to increase/decrease in reserves which decreases/increases capital.
- The correlation matrix method e.g. from deterministic/judgemental to statistical/stochastic or vice versa
- change in data sources e.g. for inflation assumptions

FSB may have reviewed internal model and made changes, which have directly influenced / changed your internal model.
Operational risk: the company might have to make a greater allowance for this due to the fact that its operations have effectively doubled and are there clear controls and risk management initiatives in place to facilitate this added growth. New staff and systems to cater for growth add to this risk
Asset risk component could've changed. A larger company, due to the growth results in a bigger assets base, which could make diversification easier in terms of an investment portfolio. However, the company is medium sized, so its investments should have critical mass.

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Reasons: CHANGE IN BUSINESS
Diversification:
- Introducing motor business introduces some form of diversification that could reduce overall capital. However, also an impact of doubling existing business as capital for that went to 560 < 300* 2.
- Similarly the effect of correlation due to the change in book, might not be the same (i.e. might not have a linear impact) than what was present previously.
- The level of diversification could be significant as the overall premium levels increased due to higher gross premium income (double) and the new classes of business and all things being equal the capital level dropped.
- Motor claims are impacted by different things, e.g. quality of driver, road, hailstorms, etc. than what impacts a commercial and household property book.

There is less volatility due to the increased size of the book which could explain the reduction in capital. (e.g. household property)

Expenses:
Introducing a new class could lead to economies of scale and reduce the overall relative level of expenses or the volatility of expenses, causing a reduction in overall capital.

Reserve run-off and experience of new business in the year (2008) have a big impact on the capital assumptions. There could've been changes in the behaviour of different classes which lead to a change in assumption.

Change in risk profile: if premium income doubled the nature of the risk and hence the underlying experience (volatility etc,) could change significantly, which could lead to different than expected capital numbers. (household and property and commercial)

Product development: there may have been changes in current products or new products (terms & conditions) introduced to facilitate the growth. This could change the underlying risk associated to a class of business.

Due to the change in portfolio (new class and doubling income) the reinsurance structure might've changed. i.e. different protection levels bought and this may impact the credit risk of the company depending on the ratings of the reinsurers used.

Reasons: OTHER
Errors: there may have been errors that have been corrected

PLEASE TURN OVER

ii)
Examiner's comments:
This question was answered poorly. Candidates answered too broadly and didn't mention the key points specific to the question were. Candidates didn't generate enough thoughts on the specific issues that management need to consider.

Findings
Overall Capital numbers: R300m to R610m (560 for old book)
Business doubled + a new class was introduced, so capital went down relatively speaking
Message to management:
- discuss capital drivers / reasons lead to this.
- These should be continued as it makes company more sufficient and easier to achieve ROE requirements.
- The drivers for each product area as well as expense / service departments are critical to understand and improve upon e.g. write more business in certain areas or reduce in other areas. - This includes the level of cross subsidy inherent in the overall capital number and communicating the relative risk of each class of business and hence where the company should focus its growth going forward.
- Factors that lead to increased capital should also be discussed per management area and how each department can introduce initiatives to reduce the impact of these drivers and/or remove them completely.
- The impact of new classes of business on the capital number. The actual capital number and the ROE requirements need to be discussed. Does the company need additional capital from shareholder in order to write the new class?
- Solvency level of capital needs to be mentioned and how these results compare to this.
- Similarly the level of free assets (Assets – Liabilities) vs these capital numbers and whether or not there are any distributable shareholders funds and the strategy for these funds.
- is the company's reinsurance spend appropriate given the new class and factors for capital efficiency
- is the investment strategy still appropriate given the growth and change in mix of business (new class)
- Do these results influence or need to influence the incentive scheme in any way
- Three classes of business doubled premium income with positive impact on capital. Is business sure that pricing is sufficient and that future unforeseen development couldn't lead to an increase in capital going forward once the actual experience develops and shows a worsening in loss ratio. i.e. is management comfortable that all the assumptions are appropriate both on the pricing and capital side of the business.

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-profitability of each class needs to be considered in this discussion as it doesn't help having a capital hungry class with very low margins or a low capital class which doesn't make money either. i.e. ROE requirements, pricing margins, actual experience and capital need to be considered collectively for each product in any of management's business decisions going forward.

Commercial property: 120m to 260m
The capital for this class more than doubled given only a doubling in premium income
Message to management:
- Is there any cause of concern in terms of the underlying business e.g. target market, product term and condition changes, underlying experience & how do we fix them

Household property: 110 to 200
The capital for this class reduced relatively speaking as the premium income doubled and the capital number didn't go up to the same extent.
Message to management:
- Is there a driver that changed that can be improved upon going forward or was it as a result of the modelling?
- Care is needed to ensure that you identify the reason carefully as the impact is almost marginal (R10m) and it could be due to change in modelling (or for another reason that is not under the influence of the specific product department).

Household content: 70 to 100
The capital for this class reduced significantly relative to the premium income that doubled.
Message to management:
- Grow this line of business as it assists in meeting ROE, assuming that it is does also have an adequate pricing margin in the premiums.
- initiatives that influenced the capital number in this product need to be communicated to other product lines as these could be used with similar effect elsewhere in the business.

Motor: 50
A new class with a capital requirement of R50m
Message to management:
- The premium, risk and hence capital intensiveness of this business needs to be clearly communicated to management to assist them in taking necessary action. This includes an understanding of the key drivers.

PLEASE TURN OVER

- Monitoring of experience will be critical as it could lead to changes in the underlying assumptions determining the capital number and management need to be asap if the capital numbers and hence ROE requirements change as a result of actual experience.

(iii)
Examiner's comments:
This question was answered fairly, but candidates would've done better if they were able to generate more points.

Convince management of the accuracy of your results
- Management must be convinced that you understand their business. You will need to discuss each product line with conviction and convey facts about the business accurately
- You need to explain the capital model in layman's terms, i.e. what it does, what the inputs are and the outputs and how it derives the outputs
- You need to clearly explain the assumptions and get business input into these assumptions to test their validity and the accuracy of the assumptions themselves, given the knowledge that business has.
- you need to insist on understanding of future and current management action that may impact the numbers needs to be considered, understood and taken into account if relevant. If management can see that you are taking into account the most recent, vital facts into your model, they will be more convinced.
- You need to ensure that your numbers, calcs and methodology have been accurately checked and verified, e.g. via peer review and communicate this to management

The importance of considering capital in day-to-day business decisions
- JSE listed, therefore have shareholders that require a rate of return on their capital. If you can reduce this number for the given business and profitability levels, it becomes easier to meet ROE requirements.
- Capital also drives solvency and your ability to pay policyholder claims, especially in adverse conditions (worst claims experience and catastrophic events). This is the reason why the FSB requires each insurance company to hold a certain minimum capital requirement. Business decisions will influence solvency capital. (Currently via premium volumes and in future via risk based capital under FCR.)
- To pass FSB Use test for solvency, under the proposed FCR regulations and give the fact that this company will in all likelihood be following the internal model method approach, the insurance company will need to demonstrate that it does consider capital in its day-to-day business decisions.

PLEASE TURN OVER

- Capital is a form of quantification of risk. The riskier a business is the more capital it needs to hold and hence the more return it needs to make given the same element of profitability. Business needs to understand the risk inherent (risk addition or reduction) in each business decision and hence what the resultant impact on capital is as it effectively is the way in which the company (& individuals) is incentivised due to the fact that it is a listed company.

END OF EXAMINERS REPORT

