

EXAMINATIONS

April 2004

Subject 303 — General Insurance

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.

J Curtis
Chairman of the Board of Examiners

5 July 2004

- 1** *This question was generally well answered with many candidates scoring the majority of the marks*

The calculation method used for other claims reserves may not produce a result including IBNR

The combined reported and non-reported claims in the reserve analysis process does not enable a true assessment of the cost of claims.

Feedback into pricing — enabling the true assessment of the cost of claims.

Feedback into the business control cycle.

To assist in asset / liability matching

Statutory reporting requirements may insist on the separate quantification and reporting of IBNR claims reserves.

To allow accurate comparison of the profitability of different lines of business.

- 2** *This question was well answered by most candidates.*

- (i) The model must be capable producing claim distributions both gross and net of a specified reinsurance structure.

Enable the user to test various reinsurance structures.

Must accurately describe the insurer's CPI book, present and prospective.

The model should run quickly and reliably with communicable answers, encompassing key deterministic variables.

- (ii) Cost and availability of the various reinsurance structures vs their likely benefit.

Security Status of the available reinsurers.

Size of free reserves.

Opportunities to find co-insurers.

Any constraints placed by regulators and rating agencies.

Impact on solvency requirements from regulators or rating agencies.

Company's attitude to risk.

Return on capital constraints.

How does the chosen reinsurance structure compare with competitors.

Size of book versus rest of business.

Long term relationship with insurers.

Alternatives to XOL reinsurance

Extent of in-house experience in this line.

Services available from reinsurers.

- 3** *Most candidates could define what was meant by a deductible, however many candidates struggled with the second part. Several candidates did not state whether the suggestion was correct or not but talked around the possible reasons. Many candidates mentioned fixed expenses in their solutions and sensible comments were awarded marks accordingly.*

- (i) A deductible is the amount which, in accordance with the terms of the policy, is deducted from the claim amount that would otherwise have been payable and will therefore be borne by the policyholder.

The aggregate deductible applies across all claims in total. It is the total amount of all claims borne by the policyholder before the insurance company becomes liable.

- (ii) This is incorrect.
If true, in an extreme example — £100,000 deductible implies £0 premium, without removing all risk
The mean of the aggregate distribution is the risk premium
One pound of deductible reduces the premium by the expected value of claims less than or equal to that pound
Assuming probability of claims exceeding the deductible is not 1
The reduction in risk premium would be less than the deductible

4 *There were many possible points to make in this question, but some of the answers given by candidates did not demonstrate to the examiners their understanding, especially when it came to stating the constraints. Most candidates nevertheless managed to score reasonable marks on this question.*

Charge higher premiums for the same exposure.

Take on more exposure:

- By reducing premiums where elasticity of demand is greater than 1
- By expand into new classes of business (including inwards reinsurance and coinsurance)
- By expanding into new areas of risk within existing classes
- By writing larger risks within existing classes
- By development in “new” countries
- By acquire another Insurance company

Expand into new distribution channels e.g. Direct marketing, internet

Increase advertising / marketing / customer services

Incentives for customers e.g. alarm clock or pen

Increase sales force

Increase commission levels offered to agents / brokers

Increase capital in order to obtain a higher credit rating which is more attractive to potential clients.

Constraints:

Level of free reserves. If it grows too much it may not have enough capital to support its business.

Competition from other insurers and self retention if it tries to increase its premiums too much.

There may be regulatory constraints on:

- premiums that it can charge.
- authorisation to write lines of business / countries
- distribution channels that can be used
- minimum solvency ratio

It may not have the expertise to write new classes of business

It may not have the staff / infrastructure to expand quickly.

Acquisition of another company may be too costly.
Expanding into new distribution channels may alienate existing distribution channels.
Brokers may resist reduced premium as this implies reduced brokerage
Company's reputation may inhibit growth

Cashflow

New salesforce may be costly / difficult to recruit and train

- 5** *Whilst the examiners had expected the solution as given in part (ii), it was clear to the examiners in their post exam meeting that the term 'under-estimating' could have been interpreted as meaning either that premiums were higher or lower than the market. Hence marks were also awarded for the alternative explanation*

The main problem encountered seemed to be that candidates did not know the difference between a soft market and a hard market.

- (i) It is caused by over-supply of insurance capacity in certain products.
Soft market is a term describing that part of the insurance cycle when business is least profitable.
i.e. inadequate premiums being paid for the amount of risk assumed.

Its longevity and depth result from the true effects of
claims inflation,
broadening wordings cover
and increases in exposure
being under-estimated at the time of writing business.
Persists because premium increases lag behind claims notifications

- (ii) Risks

Write a **larger** volume of unprofitable business **than planned** leading to
Over statement of profits and under statement of reserves

- managers not aware of true financial condition
- leading to bad business decisions.

Risk of writing larger volumes of business than planned and not being able to service it.
There is a risk that the true profitability of business written is not known for some time
and the company writes business at less profitable rates than it expects.
Leading to a significant weakening of the financial condition of the company.

When the extent of this position is realised reserves must be increased
(sometimes dramatically)
leading to a reduced solvency position,
requiring additional capital support and/or other remedial action.
This reduced solvency may directly impact the quantity of profitable new business that the company can write
and in the extreme may lead to the insolvency of the company.

6 *Many candidates did not demonstrate sufficient knowledge to perform very well in this question. This was the most difficult question on the paper and certainly sorted out those that could think around GI issues and those who struggled. In the majority of cases there were just insufficient valid points made.*

- (i) The frequency and average cost can be related to the economy (Housing market) i.e. there is a strong dependency on property selling as many subsidence claims arise following surveys for buyers.
Such claims are also related to several other events, e.g. the weather (unusually dry spells), closeness of trees, pipes and soil conditions.

Long notification and settlement delays.

Low frequency and high severity

Can have high levels of reopened claims.

Claim size distribution can be highly skewed.

There can be significant accumulations of claim occurrences and notifications during particular periods.

Claim costs subject to inflation.

Date of occurrence is usually uncertain

This may lead to disputes about coverage especially when there have been changes in the insurance company providing the cover.

Need for individual loss assessment by a claims adjuster

Active claim management can significantly reduce the cost of a claim.

(ii) **Reinsurer Advantages:**

New product type and hence it may attract significant new business.

Possible diversification away from its other products.

May be highly profitable if there is very little competition.

May enable it to attract more traditional business from its cedants. (Cross selling).

Aggregate limit and deductible cap liability.

Claims notified wording removes problem of late notification

Such a product would be very attractive to insurers as it would enable them to price their own policies with more certainty

Reinsurer Disadvantages:

Lack of data to price this business and possibly requirement for more capital.

Risk of anti selection. If there are long lags between adverse weather and subsidence claim notifications, Insurers may be able to select against the reinsurer.

Risk of anti selection. Exhaustion of aggregate deductible removes insurers financial incentive to monitor claims.

How do you deal with reopened claims? They could just as easily be opened as new claims.

Long settlement delays mean that the ultimate losses from the policy will not be known for a long time. If mispriced initially, then this could be very costly.

Claim inflation is likely to be significant due to long settlement delays.

Claim experience is potentially linked to the economic / housing cycle. This can be very difficult to price for.

- (iii) (a) Data on past years experience.
 - Notifications and ultimate losses by calendar year.
 - Listing of all subsidence claims showing details of:
 - Notification date.
 - Payments (dates and amounts)
 - Changes in outstanding case estimates (dates and amounts)
 - Additional details on the claims e.g. geographical area, likely cause etc.
 - In force policy counts, premiums and sum insured by geographic region. In order to check exposure to high risk areas.
 - Expected policy count, premiums and sum insured for the exposure period by geographical region.
 - Clarification from the insurer on how it handles reopened claims.
 - Information about changes in excess levels and any changes planned for the future.
 - Insurer's policy conditions
 - Insurer's underwriting philosophy
 - Expertise in handling claims
- (b) Industry data on claim notifications and claim costs.
 - Externally available models
 - Own claims experience of subsidence
 - Judicial findings and market practice
 - Economic data on Housing Market.
 - Building cost Index as a proxy for claim cost inflation.
 - Climate and weather data e.g. Rainfall data, Soil moisture and composition data etc.
 - Applicable Tax rates
 - Expense loadings (including brokerage, commission and management expenses).
 - Required Profit loadings
 - Investment yields
 - Cost of capital
 - Contingencies
 - Retrocession costs (if applicable)
 - Competitors prices (if available)

7 *This question was generally well answered, however there were some points on which candidates demonstrated that they did not understand accounts for a general insurance company and important statistics.*

In the calculation of the solvency ratio in part (i) candidates were expected to make a reasonable assumption on how to obtain written premium from the data. Whilst not particularly accurate the assumption of net written being the same as net earned was accepted as in the solution below.

- (i) Gross Loss Ratio = The ratio of the cost of claims to premiums, both gross of reinsurance.
 Net Loss Ratio = The ratio of the cost of claims to premiums, both net of reinsurance.
 Can be on an earned basis or a written basis.
 Expense Ratio = The ratio of management expenses plus commission to premium
 Combined Ratio = The sum of the loss ratio (claim ratio) and the expense ratio
- Solvency Ratio = The free reserves divided by the net (of reinsurance) written premiums.

	1999	2000	2001	2002	2003	Total
Gross Loss Ratio	43.9%	71.8%	112.3%	150.9%	67.3%	96.9%
Net Loss Ratio	51.9%	38.5%	65.5%	119.4%	93.1%	81.5%
Expense Ratio	27.8%	28.8%	52.4%	46.2%	31.9%	38.2%
Combined Ratio	79.6%	67.3%	117.9%	165.6%	125.0%	119.7%
Solvency Ratio	98.1%	61.5%	108.3%	120.4%	84.0%	95.8%

- (ii) (a)
- | | | | | | |
|-----------------------------------|-------|-------|-------|-------|-------|
| Management Expense Ratio | 9.3% | 7.7% | 14.3% | 15.1% | 7.6% |
| Expense Ratio as calculated above | 27.8% | 28.8% | 52.4% | 46.2% | 31.9% |

Management expenses rise dramatically as the company expands in 2001 and 2002, almost doubling from the 2000 expense level.
 Management expenses are brought under control in 2003
 Similarly Expense Ratio increases dramatically in 2001.

- (b) Growth

GEP Growth	7.6%	163.4%	-11.8%	33.3%
NEP Growth	-3.7%	61.5%	10.7%	54.8%

Growth in Gross premiums of 163% in 2001 is dramatic, similarly the 33% growth in 2003 is large.
 Large changes like this may be a result of acquiring another company.

Net Premium change is less volatile than the gross premium change
 The large increase into 2001 follows the increase in gross premiums.
 The large increase in 2003 is due to reduced reinsurance purchasing as a percentage of gross income

- (c) Reinsurance purchasing

Ceded Premium change	18.2%	26.8%	55.1%	43.6%	34.5%
RI Cost = RI Prem					
– RI Recoveries	11	(12)	(52)	(66)	62
Ri Loss Ratio	8%	163%	150%	192%	18%

Reinsurance loss ratio, and hence recoveries were low when the company was small.

Ceded premiums have increased significantly with the growth in gross premiums

Reinsurance spending has been good over the period with recoveries exceeding premiums.

(d) Underwriting profitability

Net UW Profit	11	17	(15)	(61)	(36)
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Net profitability in the last three years has been negative

Although negative, the underwriting profit has improved in 2003.

- (iii) Comment: After a period of rapid growth it would be sensible for the company to consolidate.
 Expenses have been reduced dramatically in the last year and these need to be kept low — reducing them if possible.
 Reinsurance purchasing has reduced probably as prices have risen due to the high level of recoveries in the middle years.
 A cost benefit analysis of reinsurance spending should be performed.
 Effort needs to put into gross and net underwriting profits.

8 *Many candidates scored very high marks on this question. Most of the solution was straightforward bookwork. Several candidates did however seem to struggle with the calculation part (v).*

- (i) Expected investment return credited
 Commission
 Fixed expenses
 Other variable expenses
 Cost of retrocession
 Profit
 Adjustment for competition
 Contingencies
 Tax
 Cost of capital

(ii)

- the model being used should be valid, complete and adequately documented
- the model chosen should reflect adequately the risk profile of the classes of business being modelled
- the parameter values used should be accurate for the classes of business being modelled
- the outputs from the model and the degree of uncertainty surrounding them should be capable of independent verification for reasonableness
- The model, however, must not be overly complex so that either
 - The results become difficult to interpret and communicate
 - The model becomes too long or expensive to run.

(iii)

- Definition of ruin
- collect data
- group and modify data
- choose a suitable density function for each of the variables to be modelled stochastically
- specify correlations between variables
- estimate the required parameters for the chosen density function(s)
- check the goodness of fit is/are acceptable and attempt a fit with different density function(s) if it is not
- construct a model based on the chosen density function(s)
- run the model many times, each time using a random sample from the chosen density function(s)
- count the number of scenarios in which each of the lines of business produces ruin for the company
- produce a summary of the results that shows the distribution of the modelled results after many simulations have been run
- perform sensitivity tests on results
- Calculate the capital allocation that equalises the ruin probability for each class

(iv)

Advantages

Captures interdependency of variables and general volatility better

Capital required for infrequent events — need concept of probability

Provides additional output to management — e.g. reinsurance purchasing

Best practice/competition

Deterministic model cannot do probability of ruin

Disadvantages

More complex and time consuming

Danger of spurious accuracy

(v)

Capital for EL = y

Capital for PI = $3y/2$

Total capital = $5y/2$

Required return on capital = 40%

Required profit = $40\% \times 5y/2 = y$

Profit for EL = £12m

Same return on capital means profit for PI = $£12m \times 3/2 = £18m$

Total profit = £30m

Therefore, $y = £30m$

Total capital = £75m

- (vi) There may be a regulatory minimum level of solvency which this may not reach
Need to consider how this compares to competitors, and the implication on market confidence
Opportunity cost of capital – may be better utilised elsewhere
No track record, therefore
The credit rating of the company will depend on the capital available
- a lower credit rating will reduce the ability of the company to sell the reinsurance
- The availability of capital may impact on the company's ability to raise any more
Market may not be able to sustain sufficient premium to produce desired returns on a higher capital base
Quality of people affects ability to raise capital

END OF EXAMINERS' REPORT