Faculty of Actuaries **Institute of Actuaries**

EXAMINATIONS

September 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.

M Flaherty
Chairman of the Board of Examiners

7 December 2004

1 *This question was answered well by most candidates.*

(i) **Policy data**

- Start and end dates of cover and dates of changes in cover
- all rating factor details
- all exposure measure details including limits, excesses etc.
- source of business
- details of premiums charged, unless they can be calculated by reference to the details on rating factors and exposure
- premiums net of commission etc.

Claims data

- date of claim event
- date reported
- date settled
- date reopened
- dates and amounts of payments (including recoveries & expenses)
- case estimates, if they exist, of amounts outstanding (and date)
- other types of estimates (e.g. factor estimates)
- rating factor details i.e. link between claims and policy details
- type of claim
- details of payee
- type of peril

(ii) **Personal medical expenses**

- current age of policyholder
- smoker/non-smoker
- type of cover (hospital group)
- extent of cover (excess, limits)
- the extent of the family group covered
- occupation
- NCD as a proxy to medical history
- post-code (address) as indicator of likely regional hospital costs
- gender

Employers liability

- payroll OR number of employees
- type of industry or occupation
- exposure and claims experience
- location of the workforce
- the materials handled
- health and safety standards etc.
- the processes involved
- turnover
- size of deductible

2 *The numerical solution in part (i) is the answer which the examiners had expected to be given. However credit was also given where candidates had assumed an Accident Year accounting basis.*

(i) Let growth in business = k
Premium in previous year = P
Premium next year = $P * (1 + k)$
Post tax profit = $P * (1 + k) * (1 - 0.7 - 0.1 - 0.1) * 0.7 * 0.9$
$= P * (1 + k) * 0.063$
Solvency margin required = $P * (1 + k) * 0.5$
Profit generate = additional solvency margin
$P * (1 + k) * 0.063 = P * (1 + k) * 0.5 - P * 0.5$
Solving for k gives 14.4%

Assuming no investment return
Commission, management expenses and profit distribution continues at same rate
Loss ratio is as assumed
Calculation is done annually
No reinsurance

(ii) Grow more quickly by:

Charging higher premiums for the same exposure
Reducing cover for the same premiums
Stricter claims control.
Improved UW / risk selection
Reducing expenses and policy acquisition costs.
Reduce premiums with increase loss ratio more than offset by the reduction in per policy expenses
Reducing the dividend that it pays out / not pay out a dividend at all.
Raising additional capital.
Buy additional quota share reinsurance.
A suitably structured financial reinsurance deal
Change investment strategy to increase investment return.
Incorporate in a tax haven.
Incorporate in a country with lighter insurance regulation.

3 *Most candidates were able to make a reasonable attempt at this question, but there was a wide variety of answers with the better candidates scoring almost full marks.*

Advantages

Tax efficient
May be legislative or regulatory advantages
Fill gaps in insurance cover available in the market
Focus efforts on risk management
Manage overall Insurance spend of the company

Improved financial planning due to more predictable insurance premiums, especially the effects of the insurance cycle
Access reinsurance capacity directly.
Retain the expected profit that might otherwise be ceded to its insurers

Disadvantages

Administrative expense of setting up the captive
Capital cost required to set up the captive
The captive may need to get regulatory approval from all the countries that the multinational operates in order to accept risk from all its operating subsidiaries.
Insurers may be able to provide assistance with risk mitigation / claims control. The captive may not have the same expertise in all the different countries that the company operates.
By setting up the captive, the multinational is retaining risk.
Setting up the captive may divert management focus from its core activities.
Compliance with insurance regulatory requirements

4 *Many candidates used the paid claims information in part (ii) whereas the question stated that the reserving is based on reported claims, hence a number of marks were lost. Also in part (ii) some candidates derived the figures of ultimate claims and did not go onto say what effect this had on the declared profits.*

(i) Claims made which end up as nil claims
E.g. Claims are made which fall outside the coverage of the policies
Claim assessments cautious which leads to an overstatement of outstanding reserves
Reported claims do not allow for salvage or subrogation which reduce the ultimate claims

(ii)

Premiums	100		
Initial estimate lr	100%		
Actual LR	120%		

End of year	1	2	3
Paid	30%	90%	100%
Reported	50%	105%	100%

Dev ratio	2.100	0.952	1
Cum f	2.000	0.952	1
= 1 – 1/cum f	0.5	–0.05	0
Reported claims	60	126	120
Claim reserve	50	(5)	0
Est Ult Claims	110	121	120
Actual ultimate claims	120	120	120
Overstatement of Profit	10		

End year 1 profit calculated 10 too big
Year 2 — ultimate claims estimate deteriorates by 11, ultimate claims overstated by 1
Year 3 zero difference

Assumptions: Written premiums all become earned.
Claims runoff according to the expected pattern.

(iii) + Simple method — avoids any subsequent investigation
+ For a short tailed line the errors generated will be relatively small and short lived.
– Does not allow for corrections once a different view of the likely ultimate claims is known
– May not satisfy accounting standards which require best estimate reserves
– may give managers a false sense of security as to the true profitability of a portfolio — either too high or too low
– For long tailed lines the errors generated will potentially be large and long lasting
- Pay more tax than necessary as profit overstated
– The errors may overstate the true solvency position of the insurer, leading it to take actions that may jeopardise the real solvency. In other cases the reserves may be too prudent and so reserves that are too high are held potentially restricting opportunities available.
– The company may price using these reserve estimates, leading to incorrect premiums being charged.

5 *Several candidates gave examples of third parties who not in fact third parties e.g. policyholders and staff. Apart from that most candidates answered this question reasonably well.*

(i) Failure of a reinsurer could mean that it does not get reinsurance recoveries that it is due. It may also have to purchase additional coverage.

Failure of an intermediary / Broker would mean that it may not get some premiums owed to it.

Failure of a supplier of goods or services. The insurer would have to spend additional money securing those goods or service.

Failure of a Financial Organisation / Bond issuer in which the Insurer has assets. The insurer could lose those assets.

Failure of another insurer may mean that this insurer is asked to make payments into a compensation fund. However the company could benefit from a gain in extra business.

(ii) Limit the amount of reinsurance that Insurance companies can place with a single Reinsurer.

Limit the amount of reinsurance that Insurance companies can take into account with a single Reinsurer when determining solvency.

Impose or increase a Statutory Minimum Solvency Margin

Limit the amount of assets the insurer can invest in a single company / bond issuer.

Require the licensing of intermediaries / brokers.

Require insurers to hold a bad debt reserve

Require insurers to hold certain asset classes or restrict asset classes

Require reinsurers to deposit assets / collateral to back their obligations to Insurers.

Require that reinsurers and other financial organisations have sufficient credit rating and are supervised more stringently.

6 *In answering this question some candidates failed to realise that commercial property business is usually made up of buildings, contents and business interruption. In part (iii) the answers were generally very short and many candidates did not mention anything other than reinsurance.*

(i) Sum insured
Type of business (including hazardous chemicals)
Location of premises
Estimated maximum loss
Age of building
Safety equipment, including fire protection equipment
Construction type
Excess
Risks covered
Past claims experience
Risk management procedures

(ii) Variability in claim frequency at any one time and from one period to another
Variability in claim severity at any one time and from one period to another
Individual large claim
Notification delays
Settlement delays
Moral Hazard. Fraudulent Claims.
Anti-selection.
Crime Rates (theft and arson claims)

Economic conditions, affecting attitude to claiming
Judicial decisions
Changes in legislation
Accumulations of risk
Catastrophes
Currency risks
Reinsurer security
Reinsurance mismatch
Policy wording
Inflation
Latent Claims
Increases in claims expenses

(iii) Excess of Loss protection and Catastrophe XOL for large single events
Surplus reinsurance for ceding out larger risks.
Stop Loss / Aggregate XL reinsurance.
Exclusions (Terrorism / NCB)
Limits on size of risks that can be accepted.
Reduce exposure to certain industries / types of businesses that exhibit greater variability of claim experience (e.g. Oil industry or large multinationals)
Track and control aggregates by geographic region.
Diversify by region, industry, type of business.
Match liabilities and assets by currency in order to reduce currency risk
Restrict the territories / currencies that it writes business in to reduce currency risk.
Place reinsurance with financially strong reinsurers (AAA rated)
Spread the reinsurance placement amongst several reinsurers.
Employ specialist wordings staff to reduce risk from ambiguous policy wording.
Impose excess / deductibles
Impose catastrophe / event limits or other sub-limits
Stricter claims underwriting to prevent fraudulent claims
Review rating structure and rates more frequently to reduce anti-selection
Diversify into other areas of insurance

7 *The examiners were pleased with the general level of answers given to this question. The main area of difficulty was in considering what was actually insured. Several candidates included Goods In Transit within their answer. Examiners have also noticed recently that question asking for suitable reinsurance structures tend to get the standard answer of all types of insurance and not answers to the specific question.*

(i) Claims will generally be short tailed as typical trade credits are 3–6 months.
Claims will be in a number of currencies
Individual claims will generally be small and limited to the value of the export consignment.
There will be nil claims as late payments are made to the exporter resulting in the outstanding claim amount being reduced to zero

There will be claim recoveries because some original invoices will be paid after the insurer has paid the exporter's claim
There is likely to be accumulations of claims if a large number of exporters supply the same customer.
Accumulations are also likely if a large number of foreign companies experience financial difficulty due to economic conditions within those countries.
There is potential for fraudulent claims if the exporter and the customer are colluding.

(ii) Unique policy identifier
Name & Address of policyholder
Premium for the policy.
Policy excess or deductible
Value to consignment
Currency of payment.
Name & Address of customer
Country of customer
Business type of customer (Retail / Manufacturing / Services etc)
Terms of trade for paying the invoice e.g. 30 days
Date policy issued
Date of despatch
Date when Invoice is payable.

(iii) Split by Country
Split by Currency.
Group claims by the month in which the invoice is payable.

(iv) The Premium would all be earned on the date the invoice is payable as that is when all the exposure is.

Therefore UPR should simply be all the premiums on policies where the invoice date falls after the accounting date netted down for commission and other initial expenses.

(v) Aggregate XL reinsurance to protect against accumulations from failure of a single customer / multiple failures in foreign countries.

Stop loss reinsurance (if available) to protect poor experience across the book of business.

Risk excess of loss to protect against individual large claims

Quota Share reinsurance to lay off some of this risk and enable it to write a diverse portfolio.

Financial reinsurance to smooth results over economic cycles.

8 *Some candidates got the definitions the wrong way around, which meant that in part (ii) the points made were the wrong way around. However if candidates were consistently wrong then credit was given in part (ii) as appropriate. In addition credit was given if points were made in answer to one part of the question but fell into a different part in the examiners' solution.*

The question asked for a recommendation in part (ii) but some candidates failed to produce a recommendation and therefore no marks could be awarded. Any well reasoned recommendation would have scored marks.

(i) Experience rating can be prospective or retrospective, numbers or amounts based.
With prospective rating,
the premium at the renewal date depends to some extent on the experience of the risk prior to that renewal.
The insurer takes on all the underwriting risk in such an arrangement.
With retrospective rating,
the premium for the current policy period is adjusted, based on the experience of that period of risk.
A deposit premium, paid at the inception of the policy, will usually be followed by an adjustment premium, or refund, at the end of the period
The insurer takes on less of the underwriting risk.
Numbers based systems depend upon the number of claims made.
Amounts based systems depend upon the total amount of claims made.

(ii) Prospective vs retrospective
Broker network with many customers (personal lines) means prospective may be easier to apply
Retrospective less risky to insurer
Retrospective more difficult to apply as there is uncertainty as to the amount of some claims (e.g. subsidence)
Prospective means quotes change at the time of underwriting — more likely to have desired impact
Prospective requires more data up-front — 12 years should be okay
Retrospective deals better with new customers
Prospective therefore rewards loyalty
Numbers vs Amounts
If claims frequency is small then neither is ideal
Numbers based more likely to discourage "costly" small claims
Numbers more appropriate when claims size is very variable
Amounts could be capped to make this more usable

Points for picking (my money is on prospective numbers (NCD))

(iii) Potential large movements in individual premiums at point of renewal
Customers may not like the volatility introduced by such a system
May cause an exodus of policyholders; good and bad
In general, poorer risks see an increase in premiums
Leave and go to cheaper competitors
Company doesn't lose money on poor risks that leave

Better risks see a reduction in premiums — more likely to stay, even at "high" premiums relative to actual risk cost
Likely to attract better risks from other insurers too
Increased likelihood of attracting better risks if system can be applied to new customers too
Important to get rates correct, or may be selected against
Need to monitor profile of any new business closely
Rapid growth from new business could cause new business strain — impacting on insurer's solvency
Rapid growth from new business could cause poor service to customers resulting in loss of business and ability to write business in future
Take care to ensure underwriting and claims systems are capable of capturing necessary information
Costs of changing UW and claims systems capability
Education of brokers is required
Business may be more complex to administrate — may lead to restructured commission
Difficult to apply for new business as may need to rely on honesty of policyholder especially as no other insurer uses such a system

(iv) new business
analyse the proportion of new quotes taken up, and/or the volume of business growth
lapses or renewal
analyse the proportion of policies renewed each calendar year
endorsements
analyse the rate at which policies are changed during the year
mid-term cancellations
analyse the rate at which policies are cancelled during the year
conversion rate
analyse the proportion of quotes taken up

All of the above need to be analysed by rating factor to monitor the changing nature of the portfolio.

Compare actual with expected