

EXAMINATION

September 2005

Subject ST3 — General Insurance Specialist Technical

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.

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Chairman of the Board of Examiners

29 November 2005

1 *Most candidates had no problems with this question.*

- (i) Accident year accounts consider all income earned and outgo incurred in a year and permit the release of profit at the end of the year. Funded accounts consider the business written in each year and do not permit the release of profits until the end of a subsequent year (usually the third year).
- (ii) Where underwriting year is fundamentally important
 - Lloyd's market
 - Reinsurance written on a policies incepting basis
 - Significant delays in premium payment and claim settlement and in making recoveries
 - Marine and aviation business
 - Regulatory requirement

2 *Credit for (i) part b was given to students who used the alternative definition of 'Making the insured event more likely to happen as a result of being insured, e.g. a household contents policyholder not taking as much care in checking that doors and windows are locked.*

Many candidates could not define suretyship and hence missed out on a few of the points in part (ii) or added points that were not relevant to this type of insurance.

- (i) (a) Insurance to provide a guarantee of performance or for the financial commitments of the insured.
- (b) The risk that an insured may attempt to take an unfair advantage of the insurer, for example by suppressing information relevant to the assessment of risk or by submitting a false claim.
- (ii) Good underwriting
 - Suitable policy wording / exclusions
 - Provisions of suitable cover ...
... including any limits and excesses
 - Data sharing with other companies
 - Analysis of claims information ... may highlight patterns
 - Regular contact with insured to build confidence and understanding

Expert claims handling.

Double trigger

Obtain relevant info regarding financial status and obligations of the insured

3 *Most candidates managed to make a reasonable attempt at this question.*

- (i) Reserving analysis to check the expected ultimate liabilities for each line of business

An analysis of the expenses and levies attributed to each line of business to check their allocation

An analysis of cashflow for each line of business in order to work out the net present value of underwriting profits from each line of business.

Determine the required level of capital to support the business

Allocation of the required capital amongst the various lines of business
Determine the return on capital for each line of business.

Investment risk based on asset risk to assess default risk

Investigation of bad debts on each class

Investigation of reinsurance to assess cost effectiveness

Investigate the effect of the insurance cycle for each class to see effect of likely profitability

Investigate change in mix of business within each class to assess effect upon changing profitability

Investigate the effect that the occurrence of large claims may have had on each line of business

- (ii) The amount of risk that can be retained safely having regard to the insurer's solvency position.

The extent of likely exposure to accumulations of risk

The need for catastrophe reinsurance and the appropriate upper and lower limits for such cover

The extent for possible need for reinstatement covers

Competitiveness of reinsurance prices and availability of cover and technical assistance

Check on strength and solvency of reinsurer.

Competitors reinsurance structure

Regulatory requirements

Alternatives to reinsurance

Cost and effectiveness of commuting existing covers

Past reinsurance cost / benefit

- 4** *This question generally resulted in either almost full marks or nil. Many candidates gaining only 1 or 2 marks with the initial definitions but not being able to carry out the calculation.*

- (i) Probability of Ruin is approximately equal to $\text{Exp}(-RU)$ where

U = Capital required

R = adjustment coefficient = $\alpha - \lambda / c = \alpha \theta / (1 + \theta)$

μ = \$1m.

$\alpha = 1 / \mu = 1$

$\theta = 1 / 0.6 - 1 = 0.6667$

$R = 1 * 0.6667 / (1 + 0.6667) = 0.4$

Probability of Ruin = $\text{Exp}(-0.4 * U) < 0.5\%$

- $0.4 * U < \ln(0.5\%)$

- $0.4 * U < -5.2983$
 $U > 13.25.$

I.e. the capital required is greater than \$13.25m

- (ii) Return on Capital = $0.2 * 0.6667 / 13.25 = 1.0\%$

- (iii) Model not appropriate

Approximations used not correct or not appropriate

Regulatory requirements may be different

Ignores other business that may be written by the company

Future experience different from past

- 5** *This question was on the whole better answered than the examiners had expected. The better candidates were able to show that they had considered many ways in which the fraudulent behaviour could be reduced.*

X-check policy cover dates against date of accident

Look for multiple claims from the same claimant, surname, address, postcode, etc.

Tighten underwriting criteria

Check previous claims history of the policyholder at inception

Introduce some form of experience rating

Increase / introduce excesses

Spot checks on claims of various sizes

Set up confidential fraud line with possible incentives

Write indemnity only policies

Set up fraud department

Attempt to identify any oddities about the claim, such as flood damage on a dry day

Corroborate info provided by claimant with independent sources. E.g. witnesses

Review previous claims history — any repeat claims in internal data

Consider data sharing with other companies — E.g. highlight any double coverage

Collaborate with police, media and other insurers to advertise penalties for fraud using specific example cases previously discovered

Use of in-house / appointed repairers / loss adjusters

Use of own home service sales force

Settle claims by replacement items rather than cash settlement

Ensure policy wording is as tight as can be with appropriate declarations of facts provided

Send out claims handler to view claim incident where economically viable

Ensure claims handlers are well trained and receive regular refreshers

Maintain good links / relations with relevant police and related authorities and share information

Require original receipts to demonstrate value

Require medical evidence from recognised professional

Highlight penalties for fraud on policy wording

Use of voice recognition techniques and recording of telephone calls for purposes of lie detection / claim verification

6 *Again the examiners were pleased with the general standard of answers for this question with candidates demonstrating that they could apply their knowledge to a non standard GI product.*

(i)

- Type and mix of crops grown
- Geographic region in which the crops are grown
- Size of the farm
- Availability / method of irrigation
- Pest control techniques used
- Level of excess
- Claims history
- Sum insured.

(ii)

- Most claims will be reported at the end of the growing season although some will be notified during the season.
- Most claims will be settled quickly, i.e. very soon after the growing season
- Claims size will be related to the size of farms in the country.
- Claim frequency likely to be low in most years
- There will be significant accumulations of claims from adverse weather conditions / pest epidemics.
- Accumulations might occur from the same geographic region or type of crop.
- If a period of drought / disease / pest extends over several years, then the insurer could face several years of high losses.

- Potential for fraudulent claims if a farmer does not tend his crops properly and then claims under the insurance policy.
 - Potential for moral hazard as farmer does not aim for highest sale price for crop as insurance will pay anyway
 - Short tail, therefore relatively little impact from claims inflation.
 - Quick reinsurance recoveries
 - Potential for claim disputes regarding definition of drought / cause of crop failure.
- (iii) Likelihood of accumulations and catastrophes.

Volatility of claims experience

Level of uncertainty from poor data quality for pricing

Liquidity risk

Credit risk from reinsurers / policyholders / third parties

The level of premiums charged in relation to expected claims (loading factor / risk margin)

Desired level of ruin probability.

Expected volume of business

Level and variability of expenses

Level and variability of investment income that the insurer is expected to generate

Reinsurance structure and price.

Regulatory requirements. There may be minimum capital requirements.

Rating agencies. The insurer may wish to achieve a particular rating.

Implicit or explicit guarantees from the government with regard to capital support in future.

Required profitability

Dividend policy

7 *Credit was given in either part of the candidates' answer for valid comments listed below in both parts (i) and (ii).*

Although most candidates were able to list the required technical reserves, there was generally not enough discussion as to the matters to be considered in calculating such reserves. Most candidates did comment upon the fact that the company had only been in business for 3 years but did not go into enough detail as to how to deal with this.

A few candidates failed to realise that third party liability insurance also covered third party liability to property damage and instead only considered third party liability to bodily injury claims.

- (i) All technical reserves to be stated on a gross and net basis

Consideration of any regulatory issues

Consideration of level of margin in reserves

Consistency with existing methods

Consider currency of reserves

Unearned Premium Reserve

365ths method most accurate ...

... when risk is evenly spread

Calculates unearned premium by multiplying office premium ...

... by ratio $(365 - \# \text{ days since inception}) / 365$

But requires computer records, which should be available

24th / other similar methods less accurate

Risk may not be evenly spread though ...

... need to investigate claims experience to date ...

... and probably industry data ...

... to devise a suitable earnings formula

DAC

UPR may be directly reduced for acquisition costs ...

... or a DAC can be created as an asset to offset the overstatement

Additional Unexpired Risk Reserve

Required where initial premium is considered insufficient to cover the estimated ultimate claims outgo

Might assume not required, if confident in original pricing basis

However, could compare with industry claims experience ...

... there may be recent trends apparent since business written

O/S Reported Claims Reserve / IBNER

Case estimation likely to prove most fruitful ...
... as low frequency, high severity expected for this class ...
... and because the company is very young
Separate allowance is required for IBNR

Chain ladder techniques unlikely to be of any use for bodily injury...
... as too little data available ...
... and not even close to being fully run-off

Chain ladder could be considered for property damage but need to consider any changes in settlement procedures

Bornhuetter-Ferguson method may be helpful though...
... but must be confident in ultimate loss ratios

Allowance for discounting

If using an average cost per claim method then need to allow for changes in nil claims

IBNR

Could take a simple proportion of premium / o/s claims reserve ...
... however, not very robust as loss ratio may not be stable / affected by adverse claims experience

Delay table method not viable as insufficient stats available

Projection method likely to be of most use, ...
... but need an ultimate loss estimate ...
... perhaps there are industry stats available to help.

Re-opened claims reserve if not included within O/S reported reserve

Claims Expense Reserve

With case estimation of o/s claims can include allowance for direct expenses

Or can look at industry estimates to assess a proportional addition

Indirect expenses will need to be based on prior estimates from business plan / model projections ...
... as the business is still very young

- (ii) Split the data between bodily injury and property damage

Try to use several different methods for estimating each reserve to ensure that the resulting reserves are sensible

Approach reinsurers for technical assistance, as they are likely to have significantly more experience on which to base estimates.

Actuarial consultants can provide similar assistance.

More frequent reviews of claims and expense stats will ensure that most up-to-date info can be fed into the process

Future inflation may be different to past inflation in which case would need to allow explicitly for inflation in projections

May have been trends in the past which need to be allowed for, e.g. in respect of legislative changes. All claim costs would be required to be put onto the same basis.

There may have been a large individual or catastrophe claim in the three years. Would need to adjust the data for this by e.g. removing such an item from the base data and making a separate allowance at the end.

Obtain any industry data

- 8** *This was a bookwork question aimed at a particular class of business. Many candidates managed to only mention a few of the adjustments required and even fewer examples.*

Part (iii) of the question called for a comparison of a renewal premium with a new business premium at a point in time. Some candidates interpreted the question to mean how the renewal premium for an individual policyholder would be derived from the new business premium the policyholder was charged the previous year. The examiners considered this interpretation but did not consider it valid.

- (i)
- Unusually light / heavy experience. Claims experience fluctuates over time. An example in household is that some years suffer from storms more than others. If the experience of the base period does not appear typical the insurer must choose another base period, aggregate more years experience or apply an adjustment factor to the affected base year. Factor will be subjective.
 - Large / exceptional claims. Have to decide whether to leave claims in, truncate them or remove them. This will depend on the extent to which

claims of this type are expected to occur in future. Examples in household would be a large public liability claim or a total loss of a large property.

- Trends in claims experience. Investigate any trends in base data to see if they are likely to occur in future. If so need to project the trend and include. If not likely to occur in future then exclude. Rate of increase of cost of building work is likely to be a trend in household business.
- Changes in risk over time can be very difficult to deal with. Could be dealt with as trends. Or may separate them out, project and combine with explicit assumptions about the future mix of these risks. This will also need to be done for different types of claims if the mix of claims is changing significantly. Example is that due to global warming the risk presented by weather is changing over time with wetter more flood prone winters.
- Changes in cover can also be difficult to allow for. If perils are no longer insured the insurer may be able to exclude from the base data all claims that wouldn't be covered in future. Example if subsidence stopped being covered then all claims of this type could be excluded from the analysis. However if a new peril is introduced then it is harder to make an adjustment. Here external data will need to be used such as market stats, government data or consumer stats.

If the change is to the level of limits or excesses then it is more complicated. May be possible to allow for increases in these by looking at individual claims e.g. if household excess increases from \$50 to \$100 then add the old \$50 excess onto amount insurer paid out and then adjust for the effect of the new excess before analysing the claims.

If the detailed claims information is not available then an approximation will have to be made using the claims cost distribution. Many insureds will not inform the insurer of losses that occur below the excess point.

- Changes in the impact of reinsurance will need to be allowed for e.g. cat XL retention changes assuming the calculations are performed net of reinsurance.

- (ii) Once a burning cost premium has been calculated it will need to be projected forwards to give the future risk premium. This is a central risk estimate of the cost of future claims.

Claims inflation needs to be allowed for from the mean payment date of claims in the base period and the mean payment date of claims arising during the exposure period of the new rating series.

Ideally the insurer will be able to adjust claims values by a specific index for the loss type.

In order to get to a risk premium rate the projected claim cost must be divided by a corresponding projected value of the exposure. Again need to project at an appropriate rate of inflation. This could be very different to what is used for the claims.

Commission is usually a percentage of premium and would be loaded in this way. If a different way of paying commission is used this should be reflected in the premiums.

Expenses, divide into fixed and variable. Often load these separately. May also here load only the expenses incurred in writing a piece of new business. Also include tax, levies and any industry wide compensation schemes.

Allow for smoothing across rating cells.

Allow for new business and/or joint policy discounts.

Allow for any regulatory issues which may affect what rates may be charged.

Investment return should be allowed for by discounting expected claims payments and expenses to the date on which the premium is received. As household is not a long tail class this is less important. Allowance should be made for whether premiums are payable monthly or annually.

Reinsurance costs should be allowed for. Usually loaded as a percentage. As household insurance as a minimum there would be catastrophe XoL cover.

Contingencies should be allowed for. Often a percentage loading, this can be considered with the profit loading.

Return on Capital / Profit Margin. Need to load a profit margin having regards to what is required to give a reasonable return on the capital needed to support the risks underwritten. Rate of return should correspond to the risk to which the capital is exposed.

Competitive considerations may affect premiums. Insurer may decide to take a smaller return in order to sell more policies and therefore make a lower \$ profit than otherwise. Need to consider where we are in the insurance cycle. Also look at competitors prices and assess likely volumes. Household insurance is not as price sensitive as motor insurance. Compare to previous rating series and assess effects of changing to new set.

(iii) Renewals different as:

- Expenses could be different, costs less to renew a policy than write a new one. Could reflect in premium.
- Case by case underwriting could be applied at renewal if not possible at new business e.g. business acquired through the internet.

- Commission paid could be different
- Competitive considerations, if policyholder is likely to renew then may increase premium to more than would charge a new customer. And vice versa.
- Business plan, may prefer to retain business at a lower margin, especially if seen as a good risk / will enhance risk profile.
- May be gradually moving to a new rating set so no direct correspondence between new business and renewal rates.
- May have a team who have premium flexibility in order to maximise retention of business, this will again make premiums different from new business ones.

END OF EXAMINERS' REPORT