

Subject ST3 — General Insurance Specialist Technical

September 2009

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

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Comments for individual questions are given with the solutions that follow.

1

Manufacturing cost,

retail price of the hampers

shipping costs

to set claim cost per hamper

Obtained from supermarket and retailers

Historic sales volumes of each type of hamper.

and sales forecasts

for exposure measure

from the supermarket

Past hamper loss frequency

to estimate loss frequency & hence loss cost

Data could be obtained from postal service

Hampers sent worldwide and so the weights to apply to different territories will have to be estimated, using client past data if available

Data splits (e.g. territories)

Internal claims data unlikely unless you have written this type of business before

Costs of administering this business, policy issuance costs, claim administration costs.

Need to know by how much to load the policy to recover expenses.

Exclusions (e.g. territories/strikes) including deductibles

Length of contracts

Recoveries (e.g. from postal services) or subrogation on damage

Available internally.

Need company profit targets,

and any relevant taxes

to know how to load the policy.

Available internally

Competitor information and other market research

to assist in setting the premium at a level appropriate for current market

While students were generally able to generate a reasonable number of points on data sources required to estimate future claims, very few clearly explained why these data would be required as per the command word of the question. Many candidates spoke as if the product has been around for some time using phrases such as "full policy download" or "full list of rating factors". Although these forms of data could be available, the question is fairly clear that this a new product, and therefore other sources of data would be needed, and a fairly simple approach to pricing was needed. Many candidates did not clearly identify the sources of data as requested. Few candidates went beyond the claims information to consider the wider data required such as expenses and commission in order to complete the rating process.

2

(i) Loss ratio = Claims Incurred/Earned Premium

2006: $17.3/25.5 = 67.8\%$

2007: $36.5/38.2 = 95.5\%$

Can give expense ratio credit if commission excluded explicitly or calculated in separate ratio

Expense ratio = Expenses Paid (including commission) /Written Premium

2006: $(3.5+5.5)/26 = 13.5\% + 21.1\% = 34.6\%$

2007: $(4.5+7)/40 = 11.3\% + 17.5\% = 28.8\%$

Alternatively, if calculated using earned premium:

*Expense ratio = Expenses Paid (including commission) less change in DAC
/Earned Premium*

2006: $(3.5+5.5-1.5)/25.5 = 29.4\%$

2007: $(4.5+7-2.5)/38.2 = 23.6\%$

No credit for operating ratio if commission excluded

Operating ratio = claims ratio + expense ratio

2006: 102.5% (or 97.3% if expense ratio is on an earned basis)

2007: 124.3% (or 119.1% if expense ratio is on an earned basis)

Solvency ratio = (Assets – Liabilities) / written premium

2006: $14.5/26 = 55.8\%$

2007 $13.5/40 = 33.8\%$

Generally well answered although a few mistakes by either using incorrect formulae or in calculation

(ii) *General comments*

- Ideally we would want to consider more than two years' worth of data before reaching any firm conclusions about possible trends.
- Ideally we would want to calculate the ratios for each class separately, which would help to analyse performance at sub-account level.

Loss ratio

- The loss ratio has worsened substantially.
- This is most likely to be a result of a catastrophe in 2007.
- However, premiums have also risen substantially at the same time
- ...which could indicate that the company is writing poorer quality business.
- Further causes could include:
 - Generally very poor claims experience, such as many large liability claims.
 - Poor underwriting.
 - Inadequate premiums.
 - Severe deterioration in claims controls.
 - A strengthening of reserves for outstanding claims or IBNR.
 - A change to the level of reinsurance cover
 - Failure of one or more reinsurers.

Expense ratio

- The expense ratio has improved...
- ...particularly the commission element.
- Administrative expenses could be lower as a proportion of premium because of:
 - An increased volume of business over which the expenses have been spread.
 - Cost reduction initiatives.

- Commission rates may be lower due to:
 - Renegotiation of rates with the distributor.
 - Increased use of a different sales channel.
 - An expansion in one of the classes that has a lower commission rate.
 - Reduction in profit-related commissions due to deteriorating results.

Operating ratio

- The operating ratio has worsened, primarily due to a worsening loss ratio.
- The fact that the denominators for the loss ratio and expense ratio may be different can lead to a distorted picture if the business is growing or shrinking rapidly.
- However, there does not appear to be significant distortion in this case.
- Written and earned premium have grown similarly, which suggests that the bulk of the growth took place in late 2006/early 2007.

Solvency ratio

- Solvency has worsened significantly.
- The level of free reserves may not support the rapid increase in business going forward.
- This is because net assets have reduced whilst written premiums have increased
- The poor claims experience has probably contributed to this

Generally well answered with the best answers being those that worked methodically through the four ratios, commenting on each in turn and generating a wide range of ideas for the reasons for the changes in ratios from 2006 to 2007. Some candidates did not appear to have read the question thoroughly, and commented more generally on all of the figures provided rather than just the four ratios specified. Some labelled their ratios by year correctly in part (i) but then reversed the direction (i.e. seemed to assume that 2006 came after 2007!) in their comments in part (ii) although would have gained some credit for valid observations.

3

(i)

Employers' Liability

Very large number of employees/volunteers will be working on the event

Bodily injury claims of various sizes depending on nature of accident

These could be very large e.g. in the event of the permanent disablement of a high earning employee.

...and can take a long time to settle due to litigation/medical evidence

May be reporting delays as the injury may not deteriorate for some time

..therefore the claims cost will be impacted by level of inflation

In the extreme, could be latent claim issues such as exposure to toxic substances

Possibility that liability claims are re-opened

Public Liability

Large number of attendees (or other people near venues) at the events so possible claims for slips/trips or more significant injuries

Also claims for damage/theft of property from negligence of organisers; these will be settled more quickly

Frequency may be expected to be higher than for EL as a very large number of spectators expected

Accumulation of claims as same event will impact many people

Financial Protection

Losses could arise from non-performance/insolvency of subcontractors

Or the failure of a commercial sponsor of the event

Potential could be very large and lead to lengthy legal actions as contracts likely to be complex

Directors & Officers

Could be significant claims against the organisers for maladministration of the event

Likely to be large and potentially notified long after the event

Construction

If organiser is responsible for construction of venues, likely to be claims for damage/delay to unfinished stadia

Commercial Property

Potential for catastrophe losses from weather event e.g. flood

Significant potential for terrorist attack as high profile event – could give rise to significant damage/injury claims especially if negligence proved

Variable cost distribution – extreme case: loss of stadium

Much shorter reporting and settlement delay as cause likely to be identifiable quickly

..but still potential for disputes e.g. damage due to negligence of architect rather than storm

If cover included for business interruption this will be longer tailed

Contingency

Non-appearance of pop stars at concert could lead to significant losses if event cancelled

Sponsors losing revenue from events

Likely to be very short tailed as will know of loss very quickly and cost of making refunds etc.

Motor

Both bodily injury and property damage claims could arise as the organisers are likely to operate motor fleet

PD claims small, consistently distributed, injury claims subject to delays but less so than EL

Likelihood of seasonality of claims as more accidents in wet weather

Competitors PA & Belongings Cover

Fixed benefit for athletes competing at event

Amounts high depending on event and extent of athlete's earnings

Goods In Transit

Covers for delivery of merchandised items/equipment to venues around the country

Possibility of moral hazard if economic conditions worsen

Product Liability

Indemnifies against loss caused by defect in event-branded merchandise

Computer Cover

Indemnifies against loss caused by virus/criminal hacking of the event website

..or losses arising from failure of event-booking engine

Fidelity Guarantee

Loss caused by theft/criminal act of employee

The better answers were those which worked through a thorough list of relevant insurance covers plus descriptions of their characteristics tailoring each carefully to the specific scenario described. Students were expected to demonstrate understanding of the relative importance of different types of cover in such a situation and some wasted time giving a lot of detail on relatively minor covers. Many of the claims descriptions were too vague.

(ii) Number of venues

Number of competitors

Number of employees

Number of concerts

Length of sporting event

Cost of rebuilding venues (including sum insured)

Size of motor fleet

Payroll

Capacity of venues

Number of attendees at the concert/event

Expected ticket price of concert

Turnover of organisers

Number of subcontractors

Cost of work undertaken by subcontractors

Total merchandising sales

Website traffic

Number of sponsors

Amount paid by each sponsor

The best answers were those that worked methodically through their list of covers in part (i) realising that more than one exposure measure could be applicable for each. Some candidates wrote the same exposure measure repeatedly for different covers rather than identifying a range of factors.

(iii) Amount of risk that will be retained by organisers – cover might only be required for really large losses

Extent of support from government – they may provide cover for any losses related to terrorism

Expert reports from surveyors or health & safety consultants

The projected value of completed venues against those still under construction at 1/1/10

Reinsurance cover available

Capital availability/margins

Investment (in risk context)

Expense risk (in context)

Diversification/how the product fits in with rest of business written

While premium is paid over three years, the risk is much higher during the period of the event itself

Experience of organisers in holding similar events though due to scale may not be appropriate comparison

Could use data from previous events to determine historic claim costs

..but likely to be difficult as not publicly available or covered by state

Could consider previous reliability of performers at concert and if event has enough so that one or two withdrawing would not matter

Location of buildings (including aggregations) would impact cost of rebuilding/repair

Future economic growth projections could be used to judge likelihood of supplier insolvencies

Fire prevention measures installed in venues

Number of security personnel/technology available to prevent possible terrorist attacks

Size of event could lead to skilled labour shortage and therefore cost of carrying out repairs could be much higher than anticipated

Any aggregation within sectors of the event sponsors – e.g. if they are all banks will increase risk

A challenging question that required candidates to think widely round the problem. It was generally poorly answered with many missing that the product is over three years which would be expected to be a key consideration. Other simple things were missed, e.g. what data are available to price.

(iv) To select rating factors

To determine premiums using experience rating procedures

To estimate the effect of changing the level of cover by changing the level of deductibles

- To demonstrate the effect of reinsurance
- To estimate likely variability of claims experience
- For reserving (including estimating possible effect of industrial diseases on reserves).
- Statutory requirements
- To assess the degree of solvency
- To determine and allocate capital to different classes/categories of business

- To value portfolios for purchase/sale
- To estimate cash flow to determine investment strategy
- Investigations to draw out trends that may impact profitability
- Budgeting and business planning for future years, including staff planning

This was well answered by those who had learned the bookwork thoroughly. The question is written generically (stating "a GI company"), not about the specific scenario and it also clearly asks for the reasons to be stated. However, some students did not appear to have read the wording carefully and instead gave a discussion of claims modelling under the scenario described previously in the question.

4

- (i) To maximise the long-term return for policyholders/shareholders
 - Subject to meeting future liabilities and solvency requirements
 - ..subject to satisfying the company's risk appetite
 - e.g. covering any shortfall in assets

A bookwork question that was well answered by those who knew the Core Reading but very vaguely and imprecisely answered by many.

- (ii) A
 - £200m free reserves is significant so more investment freedom to invest in riskier assets
 - Could invest £400m in secure assets to match liabilities by term
 - Suitable assets include cash/short bonds/index-linked gilts
 - Free reserves could be placed in higher risk investments to maximize return
 - Some examples could include equities or property
 - Mixture of long and short term investments good match for liabilities arising from motor business
 - Consider matching the nature of the liabilities

Use longer term assets to match bodily injury claims

Short term assets appropriate match for property damage claims

B

Less investment freedom as low free reserves of £15m

in absolute terms and relative to liability

Commercial property claims can be volatile..

... and need value of assets > value of liabilities so avoid volatile assets

Writes cat exposed business so may need more liquid assets

Largest class of business is in US so consider matching by currency

Suggest mainly short-dated assets (to match liabilities by term)

Some longer delays arising from business interruption claims

Suitable examples are secure assets e.g. cash/short bonds

Possibly small proportion in equities/indirect property/longer bonds

For both companies need to consider:

Investment expertise available (may be less for B as small)

The company's risk appetite

Level of investment expenses of alternatives

The impact on each company's tax liabilities

Availability of assets to purchase in the market

Level of reinsurance held by each company

Future growth plans (availability of premium income)

The level of non-investible assets that each company holds

The influence of the supervisory authority on investment policy

The need to invest the statutory minimum margin short

Economic Outlook

Diversification of assets

The better answers here were those that considered each of Company A and Company B in turn, and then general factors that would impact both. Students were expected to tailor their answers to the detailed information provided, so those that simply stated generically e.g. that investment mix should depend on financial strength would not have gained any credit. Many students wrote about the short- tail versus long-tail nature of different liabilities written, but did not always clearly relate these to the need to invest in short and longer term assets respectively. Despite the heavy hint in part (i) of the question,

relatively few students clearly identified a strategy for the investment of the free reserves separately from the investment of the assets backing the liabilities.

(iii) What basis has been used for calculating Assets and Liabilities

...if too cautious, could constrain investment policy too much

What premium income is expected in the future?

...if high then could use income stream to help pay out liabilities, meaning greater investment freedom

Are companies A and B 'stand-alone' or part of a larger group?

If they have access to funds from a larger parent, this may give more investment freedom

What is the required Statutory Minimum Solvency Margin?

What modelling has been done for the future liability outgo?

...gives assurance that taxes, dividends and timing issues have been considered

What assets competitors are investing in

Other classes of business written

Split out the figures to provide more detail (e.g. split of Motor PD & BI)

Marks given were generally low but most candidates made some comments about the additional information that may be desirable.

5

(i) Ensure a certain percentage of reserves are reviewed

Commercial Property class covers a significant proportion of the premium written (38%) so important

Historic loss ratios show likely to be cat exposed – significant source of uncertainty for class

And USA and Asia exposure that might be particularly prone to cats

Large proportion of the Motor RI account written in Turkey – possibly very different claims profile

Also non-standard technique used (contract by contract approach) so worth investigating

IBNR is significant part of reserves for both Motor RI, PI and PL classes so value added from actuarial investigation

Marine 2008 ULR looks unusually low compared to recent years

Review classes of business that have large reserves

Look at PI class as potential concentration of risk by industry (all global law firms)

..and relying on someone else's report

Investigate inconsistency between reserve amounts and WP in PI class

Product Liability class has only been written for two years so uncertainty due to little historic data

Review the long-tailed/liability classes such as Product Liability and PI as claims may emerge over a long period

Suggest spending less time on Household business as relatively small class with stable results

The results from the other class look unusual as the same loss ratio booked on all years – worth further investigation especially as method is vague

General Points

Expertise of the team that has produced the results – if new actuary looking at some classes may need to review more

Any issues with currency conversions

If an external actuarial consultant has reviewed reserves may give more comfort in these areas

The time available and resources to complete audit in professional manner

Any issues that senior management have raised regarding individual classes or the actuarial function in general

Any other significant inconsistency observed

The best answers were those that worked methodically through each of the classes of business, identifying two or three specific areas of concern for each using the information provided. Many candidates ignored virtually all the information in the question despite many marks being available for pulling the key points from both the numerical data and the descriptions. Very few queried why the ULR for Other was 80% for all years.

(ii) Basis that the reserves are calculated on – best estimate or prudent

Are the reserve figures quoted IBNR + outstanding or do they include UPR, AURR or other contingency reserves?

Have ranges been calculated in addition to point estimates?

What risks are written in the other class of business?

Is the report from the US parent for the PI class of a reasonable quality?

..are the figures used reviewed in any way by the UK team?

Have inflation and premium rate changes been incorporated in methods?

Are appropriate checks carried out on the data before use?

What reserving methods are used for the classes based on CL techniques

Actual vs Expected analysis - including any changes in methodology

If the BF method is used, how are the IELR assumptions derived?

Is the analysis split between large and attritional losses as the development of these can differ?

The actuary's opinion of any trends in the loss ratios

Are the results presented net or gross of reinsurance/retrocession?

Ask for reinsurance resumé (i.e. provide details of the programme)

Have any of the reserves been discounted for investment income?

How have changes in the mix of business or terms and conditions been represented in the methods chosen

Are there any known large losses that are not yet reflected in the data?

Is any separate allowance made for IBNER in Household class as delay table method does not automatically provide this

Are claims and other specialists within the company involved in determining the reserves

Has GN12/appropriate professional guidance been followed

Any more detail considered necessary on data splits and data sources

Any other significant request

This should have been tackled by thinking "what could possibly have gone wrong within the reserving?" and "what is not completely clear from the information provided already?" Reasonably well answered by the better students but many concentrated their answers on just claims issues, such as development patterns, when a broader approach was needed. Few candidates managed to generate a sufficiently wide range of points to score highly on this question. Writing a page about each of three points rather than making a large number of much briefer points is not generally a successful approach in ST level examinations.

6

(i)

- Smooth financial experience over time by reducing claims fluctuations.
 - Particularly since the retention is not very high.
- Reduce the capital requirement due to the reduction in claims variability.
 - Particularly since the upper limit is fairly high.
- Alternatively, increase capacity to write more risks through better use of capital.
- Diversify or further stabilise the portfolio by writing more risks.
- Protect the company's solvency by truncating the effect of catastrophes.
- Protect against accumulations if there are concentrations of risk in certain geographical locations.
- Technical assistance from reinsurance broker.

- This type of cover may be good value compared to other options
- Cover grows with the business as directly related to Sum Insured
- ..therefore saves admin costs as don't need to renegotiate
- Improves market standing (rating agencies/regulator/policyholders)
- The free reinstatement gives protection against second and possibly subsequent events

Although asked regularly, few candidates managed to score full marks.

(ii) Gross claims incurred = $0.67 \times 287 + 19.3 + 33.7 = 245.3$

Assume the sum insured at any point is the weighted mean of the sums insured at the 1 Jan before and after that point (linear change in SI during each year).

Assume that the flood event triggered a reinsurance recovery under the terms of the contract (no RI disputes or defaults).

Assume that the quoted figures for the windstorm and flood losses are ultimate estimated costs and are gross of reinsurance.

Sum insured (€bn) at start of Feb = $(11 \times 56 + 66) \div 12 = 56.83$

Sum insured (€bn) at start of Oct = $(3 \times 56 + 9 \times 66) \div 12 = 63.50$

Retention (€m) Feb = $0.0005 \times 1000 \times 56.83 = 28.42$

Retention (€m) Oct = $0.0005 \times 1000 \times 63.50 = 31.75$

Recovery (€m) = $33.7 - 31.75 = 1.95$ (no recovery from Feb event)

Net claims incurred = $245.3 - 1.95 = 243.3$

Gross loss ratio = $245 / 287 = 85.5\%$

Net loss ratio = $243 / 271 = 89.8\%$

Most candidates were able to determine the gross claims incurred and gross loss ratio correctly, but relatively few performed a thorough calculation of the net claims. Almost all assumed that the sum insured would be constant over the year, but given the information provided this is not a realistic assumption and so would not have gained full credit. Loss ratio calculations often had the wrong denominator. Some candidates did not fully answer the question, calculating only the claims amounts and not also the loss ratios. Some students were not able to interpret the reinsurance layer correctly. Very few gave the assumptions they were making.

(iii)

- The business has moved on over the years but is still using the same programme, which may make it appear that it has not been re-evaluated properly each year.
- Written premiums are projected to grow rapidly over the next two years,

which may mean the insurance risks need to be re-evaluated.

- The Board's risk appetite or performance targets may have changed with the growth of the business.
- The company's capital position may have strengthened recently, lessening the need for reinsurance.

The following are the net loss ratios achieved in years 11–14.

<i>Year</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>
<i>Net loss ratio</i>	75.5%	87.1%	83.5%	72.6%

- The loss ratios in years 12 and 13 are poor compared with surrounding years
- ...so there may not be enough protection against individual large claims.
- Despite buying reinsurance protection, the net loss ratio in year 17 was still poor compared with other years.
- The company has spent around €15m each year on reinsurance but has only recovered €2m over the 7 years.
- With two weather events fresh in the mind, the Board may be worried about continued poor experience if these events become more severe or frequent.
- The price of this form and level of reinsurance might rise following industry-wide weather losses.
- The company might not be getting the best price if cover is always with the same reinsurer.
- The company may be paying too high loading in the premium for the reinstatement element.
- There is a concentration of default risk with a single reinsurer.

Most could see that the programme was not good value, but then couldn't explain further problems with the programme. The fact the company was expanding rapidly should have indicated that the risk profile was changing.

(iv)

- Raise (lower) the attachment point.
 - Reduces (increases) the reinsurance premium.
 - Increases (reduces) the capital requirement.
 - Reduces (increases) the recovery from catastrophes above the

attachment point.

- Reduce (increase) the upper limit
 - Reduces (increases) the reinsurance premium.
 - Increases (reduces) the capital requirement.
 - Reduces (increases) the recovery from extreme catastrophes.
- An alternative is to include an annual aggregate deductible in the contract
- A further alternative to the above is to place less than 100%
Similar impacts to the above.
- Remove the reinstatement.
 - Reduces the reinsurance premium.
 - Could leave the company with insufficient cover remaining following a severe event.
 - This would require replacement cover, which may be difficult or expensive to obtain.
- Pay a reinstatement premium rather than having it free.
 - Defers or removes part of the expected reinsurance premium because the reinstatement premium is only paid if the cover is used.
 - Reduces the effective cover because the recovery will be net of the reinstatement premium.
- Purchase additional reinstatements.
 - Increases the reinsurance premium and may be overkill.
 - Avoids having to purchase replacement cover following severe losses.
- Stop reinsurance altogether
 - But leaves company open to very large catastrophe losses
- Purchase risk excess of loss.
 - Increases the cost of the programme.
 - Increases the company's capacity to accept larger risks.
 - Protects against a cluster of individual large claims that fall outside the catastrophe treaty.
- Purchase quota-share cover.
 - Eases expansion by increasing underwriting capacity from the same capital base.
 - Cedes profit.
- Consider stop-loss cover.
 - Protects against adverse experience, regardless of cause.

- May be unavailable or prohibitively expensive.
- Negotiate a better price with the current reinsurer
 - Cuts costs.
 - May drive the reinsurer to stop offering as much cover.
- Negotiate a better price with an alternative reinsurer
 - Cuts costs.
 - Breaks the relationship with the former reinsurer.
- Use several reinsurers on the programme.
 - May be able to obtain a better price.
 - May weaken the relationship with the former reinsurer.
- Use reinsurers of different strength (credit rating).
 - Enables the company to balance price with risk appetite.
- Consider alternatives to reinsurance, such as raising more capital/parental bail-out or capital market solutions (alternative risk transfers)
 - May cut some costs but ART likely to be expensive for a class this size.
 - May not be consistent with the company's risk appetite

Students did not appear to have left themselves sufficient time to complete this question part, given the number of marks available, and often covered only a relatively narrow range of different options. The examiners were looking for a wide range of possible alternatives although many candidates opted for a scattergun approach of listing other types of reinsurance, whether appropriate or not. Few considered options related to adjusting or re-broking the existing arrangement.

END OF EXAMINERS' REPORT