

EXAMINATIONS

September 2003

Subject 403 — UK Fellowship General Insurance

Paper One

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The examiners are mindful that a number of interpretations may be drawn from the syllabus and Core Reading. 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.

The report does not attempt to offer a specimen solution for each question — that is, a solution that a well prepared candidate might have produced in the time allowed. For most questions substantially more detail is given than would normally be necessary to obtain a clear pass. There can also be valid alternatives which would gain equal marks.

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Chairman of the Board of Examiners

25 November 2003

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- 1** *This question was largely bookwork and as such many candidates scored very well. The only area of concern seemed to be the lack of number of points which some candidates were making.*

Policy/ claim numbers and linking

Wrong claim number — claim details allocated to wrong claim number initially
Wrong claim number — claim details allocated to wrong claim number reopened
No policy number to link to — orphan claims
Link to non-existent policy number
Claim allocated to wrong policy number
Reinsurance linking wrong
Wrong claim accumulation code
Linked to wrong policy section

Dates

Wrong claim date
Wrong payment dates
reopened date not recorded
settled date not completed
Wrong or no reported date
Wrong processing date

Amounts

case estimates not systematically updated
case estimates not consistently updated
Case estimate history not recorded — current position only
Incorrect amounts recorded
Amounts in wrong currency
Wrong exchange rates used
Inconsistent treatment of nil claims
Type of payment not recorded

Header fields

wrong insured name
wrong policy year
wrong branch / sub branch codes

Detail fields

Wrong peril code
Wrong involvement code
Claim description wrong / insufficient detail
Poor description of large claims
Poor / missing catastrophe code
No status flag

Processing delays

Paper records not yet input
Claim settled but not input on the system
Reinsurance collected but not booked

Control Errors

No use of check digits
No use of validity limits
No consistency checks
No use of compulsory fields
No warning messages

Others

Poor training
High staff turnover
Poor management / supervision

2 *As with question 1, this was largely bookwork and most candidates were able to demonstrate their understanding of the difference between Facultative and Treaty reinsurance.*

(i) Facultative

each risk offered to reinsurer separately
no obligation for reinsurer to write
no obligation for cedant to cede
terms quoted for that particular risk

Treaty

covers multiple risks
Reinsurer obliged to accept risk within treaty terms
Cedant may have to cede risks (oblig/oblig)
or Cedant may not have to cede (fac/oblig)
treaty slip or wording sets out details

(ii) Advantages/ Disadvantages

-ve fac time consuming/costly
-ve fac no certainty cover available
-ve fac no certainty as to price/terms
-ve fac cedant may need to get reinsurance before accept inwards
- lose standing
- slow/inefficient

+ve fac no compulsion for cedant to cede
+ve fac no compulsion for reinsurer to accept
+ve fac reinsurer can charge terms appropriate to risk
+ve fac reinsurer can change terms quickly if market changes
-ve treaty reinsurer can't quickly change terms
cedant may be obliged to cede risks it would like to keep
reinsurer obliged to accept all relevant risks

+ve treaty easy/straightforward/cheap
cedant has cover available
cedant knows price/terms
cedant can act immediately to accept inwards business
can provide portfolio financing
stronger relationship with reinsurer, e.g. technical assistance
facilitates planning / projection

3 *Whilst most candidates could define reciprocity correctly and therefore go on to outline its effect, some candidates got confused with co-insurance and hence missed out in part (ii) regarding the issues of default by one of the parties.*

- (i) Reciprocity is an arrangement between two insurers who agree to reinsure risks with each other.
- (ii) Increases net premiums by accepting reinsurance, if the alternative is not to accept reinsurance
Increases gross premiums and hence market share
Also improve market standing / reputation
Obtain a more diversified portfolio
May increase stability of results
May improve expense ratio
May increase financial strength by effectively merging resources
Possibility of improved investment returns
Provides opportunities of entering markets and gain experience / data without the necessary investment in sales/marketing and admin infrastructure

Open to default from other party
If comps. operate in same field may not diversify/catastrophe position may not be improved.
Business ceded may be more profitable than business received.
Exchange of business may result in disclosure of market knowledge
May need to spend much time and expense underwriting reinsurance received.
Demands on management time, especially if several agreements in place
New types of management problems e.g. dealing with business in other currencies

4 *Risk Based Capital is an ever increasing aspect of running a General Insurance Business account. Many candidates could not discuss enough factors which would affect the level of capital required to underwrite a new class of business.*

- (i) The assessment of the capital requirement for a general insurance company by considering the risk profile of the insurance business written and of any other operations
- (ii) Desired volumes.
 - the capital requirements will generally be directly proportional to this.Likely risk exposure profile / claims runoff
 - the later the exposure period and claims runoff, the more the new business can be financed by the premium takenLikely claims volatility e.g. Catastrophes / latents
 - the greater the potential volatility, the more capital is requiredCurrent / future solvency requirements
Desired solvency levels
 - the more stringent the requirements / desired levels, the more capital will be required

Existing range of business underwritten, which may provide synergies with the new class

- the wider the range of classes underwritten, the less impact any volatility in experience will have on capital requirements

- the greater the volumes of business in the new class compared with existing classes, the greater impact the new class will have and the greater the capital requirements

Anticipated future profitability

- the greater the expected profitability, the less stringent capital requirements are likely to be

Assets to be held to back the liabilities

- the better matched the assets to liabilities the lower the capital required

Effects of taxation

Need to model the effect of future cashflows in respect of the different categories of risk

Reinsurance purchased and security of reinsurers

Operational risk of claims control

Country of where business is written could give rise to currency risk exposure

Stage in economic / insurance cycle

Data availability and reliability

5 *Whilst many candidates had a reasonable understanding of the four statistical methods for reserving purposes as mentioned in the question, there was a lack of detailed knowledge in many of the solutions presented.*

(i) Chain ladder method

could be based on incurred or paid data

- Tabulate claims on a cumulative basis by development year/origin year
- Calculate the development ratios and applying these ratios to complete the table
- Apply tail factor if appropriate
- From the cumulative results, find the amounts expected to be paid in each future development year / origin year cell
- The inflation adjusted chain ladder can be used if explicit inflation assumption is required
- Method useful where volume of data is large and development stable

Average cost per claim method

- This method requires development tables for both total claim amounts and claim numbers
- A third development table, of the average claim amounts, is then formed by dividing the figures in the corresponding cells of the first two tables
- Projection of figures in the average claims and number of claims tables, using either grossing-up factors or development factors
- Calculate ultimate claims costs from projected ACPCs and numbers

- Projected ultimate claims can be calculated by subtracting all payments to date in respect of claims relating to the data of the table
- Method useful when trends in frequency and average are different and want to project effects separately

Loss ratio method

- Estimate a loss ratio for the given class of business
- Multiply the earned premium for each accident year by the loss ratio to obtain the ultimate loss for each accident year
- Deduct the paid claims to date to give the required outstanding claims reserve
- Method useful when new class or future development uncertain

Bornheutter-Ferguson methods

Could be based on incurred or paid data

- Determine the initial estimate of the total ultimate claims from each origin year using premiums and loss ratios — external source for loss ratio
- Divide these estimates by grossing up factors (f) determined, in a normal manner, from a claims development table to obtain estimated of the claims that should have developed to date
- Subtract these amounts from the corresponding total ultimate claims figures to give an estimate of the amount of claims that are yet to develop
- Future claims development = Premium \times Estimated Loss Ratio $\times (1 - 1/f)$
- Method useful when want to weight loss ratio and development methods

(ii) Exposure Based Methods

- This is where the policy profile of every insured that is exposed to claims arising from the products in question is examined.
- Scenarios of losses of various sizes are examined and the impact on the policies is determined.
- The model used to generate the loss scenarios could be subject to great uncertainty and the estimate will be highly correlated to the robustness of this loss generation model
- All the policies may not have been identified for a particular insured
- All policyholders that may be impacted may not have been identified.

6 *Marks for this question varied considerably amongst the candidates. This question involved candidates sitting back and thinking about the investigation necessary in such a situation, in particular in respect of how the reserves had been set in the past. Many candidates were able to comment upon the methods etc. that could be used for carrying out their own analysis.*

Look at claims ratio by accident year

Movement by development year — has there been consistent trends?

How have case reserves been set in the past?

What standard estimates were used?

Have they been consistent over time

Have claims practices changed? Have claims counts been consistent —

How have IBNR reserves been set in the past?

e.g. delay table in respect of reporting delays

What reasons are there for delays in reporting in respect of processing, broker involvement, legislation and changes in these over time

What types of claims are usually affected e.g. liability / TP property / own damage

Effects of changes in legislation and judicial trends

Any changes in cut-off date at year-end for reserve assessment

Have both the net and the gross results worsened.

Are there any claims likely to hit the reinsurance retention.

What is this for each year.

What is the inflationary environment in which this motor writer operates. Get hold of industry data.

Look at the exposure by accident year. What is the unit premium rate, what is the unit claims rate?

Have there been any major variations? In which one / by how much

Loss Ratio deterioration — what has caused this?

General underfunding exacerbated by inflation?

Selection against the company

Has any change in claim rate been caused by the frequency or the average claim cost

Look at the major risk factors if this information is available

Split out the data by claim type, separating out the property and the bodily injury claims and look at the run off for each

Look at the distribution of claims throughout the year of exposure.

Are claims spread evenly over the year?

Understand rapid growth in business, e.g. portfolio / movement analyses

Look at large losses by accident year.

Carry out own projections using standard actuarial methods

Look at changes in policy terms

Stage of economic cycle

Look at claims handling expenses

Understand reserving basis and if changed over time

Data quality

Industry data

Loss ratios

Average costs, frequency, development factors, propensity to large losses. Typical large loss costs.

- 7** *There have been a number of questions in recent exams regarding the allowance to be made for investment returns (and inflation) in respect of pricing insurance products. Many candidates were unable to set out sufficient points to the examiners to demonstrate that they had considered all the issues. Most candidates picked upon the point that the term of the policy was quite long, unlike most general insurance products, but failed to tie in the assumptions about the allowance with assumptions about other aspects of the rating basis.*

Office premium = Claims Cost

+ Expenses (per premium, per policy and fixed)

+ Profit margin

+ Contingency Loading

– Investment Return

Term of policy quite long, so allowance for inflation and future investment returns very significant component.

Expected real rate of returns on assets to be held to back the liabilities is of particular importance, rather than the separate inflation and notional investment return components

Risk premium will need to be expressed in present day terms, so future claims will need to be modelled and discounted back at expected real rate of return.

Need to specify base period for which rates will operate to ensure appropriate discounting.

Pricing as a whole needs to be assessed on a mean estimate basis with explicit profit and contingencies loaded separately.

This allows for greater understanding of true underlying risk and premium levels required to achieve profitability

Long term nature of policy will mean that Contingency loading will make due allowance for uncertainty in expected real rate of return on assets.

Levels assumed for inflation and investment returns likely to be a blend of market sentiment and actuaries' own professional opinion and explicitly net or gross of tax for investment returns.

Allowance to be made will consider past economic and investment data, especially more recent.

However, the past is not necessarily a guide to the future, so the assumptions must make due allowance for current and potential future state of the markets / economy.

Need to consider the assets that will be held to back the technical liabilities.

Likely to be varying short — long term fixed and index-linked securities. Index-linked may be suitable for matching real (inflation-linked) aspects of liabilities.

However, likely to be subject to different inflation rates, car producer price inflation, raw materials inflation, mechanic salary inflation, etc.

Exchange rates may be relevant if parts require importing from abroad

Also need to consider solvency levels, which assets are to be used for free reserves and the likely capital allocation to this business

May use equities to match some of free reserves. However, allowance for future returns will need to take account of additional market risk.

Due to the uncertainty regarding the potential claims profile, the risk may more than negate the potential for greater returns.

Asset-liability modelling may be used to assess suitable matching portfolio.

As part of this exercise will need to project expected future claims

This may involve testing of many different scenarios, and may use stochastic models to gain better understanding of distribution of outcomes.

Important to gain good understanding of potential claims runoff as ten year period is quite long.

Earnings weighted towards end of term

If earnings curve wrong to start with may result in many years worth of unprofitable business written before discovered.

Degree of uncertainty increases with time. This will be allowed for through significant contingency margin

5 year product experience may assist here with adjustments as new car

Assumed rate of return should mirror stated objectives in Business plan, with risk of non-achieving allowed for through contingency margin.

Also, allowance will need to be made of Board's tolerance for risk

- 8** *Although the question asked candidates to consider 3 types of analyses, some only covered 2, although there did not appear to be a time problem with this paper generally. There were many different approaches made by candidates to the calculations and below is just one of the approaches which the examiners awarded marks for. Most candidates scored marks on the calculations, but many failed to go on and give enough comment about the appropriateness of the current risk premium. A few candidates repeated the usual standard answer to any pricing question by considering aspects of the premium to be charged other than the risk premium, which were not required in this case.*

- (i) Observations from the raw data:
 Business volumes have declined
 First development year for most recent year of inception looks high
 Run-off pattern appears to be changing, claims coming earlier

(ii)

YEAR OF INCEPTION	Cumulative Cost DEVELOPMENT YEAR				CLAIMS COST PER POL
	0	1	2	3	
1999	70	170	212.5	225.25	501
2000	80	160	200	212.0	505
2001	100	160	200.0	212.0	530
2002	150	294.0	367.5	389.6	1,039
RATIOS		1.96	1.25	1.06	

On this simple basis the cost per policy for the first three underwriting years look relatively stable.

2002 looks like an outlier.

This could be due to a change in runoff pattern, problems relating to that calendar year or worse underwriting experience.

BCL on its own is unsuitable for estimating in this situation

Suggests range for premium might be £500–£600,

need to try to ascertain cause of recent 2002 experience

YEAR OF INCEPTION	Cumulative Numbers (,000) DEVELOPMENT YEAR				FREQ PER 1000 POLS
	0	1	2	3	
1999	80	155	167.5	170.85	379.7
2000	80	130	146	148.9	354.6
2001	90	120	132.0	134.6	336.6
2002	100	162.0	178.2	181.8	484.7
RATIOS		1.62	1.1	1.02	

Overall claim frequency appears to be on a possible downward trend, with the exception of the most recent underwriting year.

Most recent year looks like an outlier here as well.

Likely future claims frequency estimate between 30% and 40%.
However, as with overall cost, need to ascertain reasons for trends.

<i>YEAR OF INCEPTION</i>	<i>Average Cost per Claim DEVELOPMENT YEAR</i>				<i>AC per Claim</i>
	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	
1999	875	1,333	3,400	3,806	1,318
2000	1,000	1,600	2,500		1,370
2001	1,111	2,000			1,333
2002	1,500				1,500
Avg 1, incl. Most recent diagonal	1,143	1,548	2,895	3,806	1,333
Avg 2, excl. Most recent diagonal	1,000	1,440	3,400	n/a	1,333

Average cost appears to increase by development year, underwriting year and calendar year, so can't just use an overall figure.
Estimating potential frequency using triangulation above, say 90, 40, 15, 5 in respective development years, assuming 400,000 policies, using known average costs above gives estimates of £544 per policy excluding most recent diagonal and £570 including most recent diagonal
However, looking at underlying trends in average cost data, future levels may be significantly different
For example £1,400, £2,500, £3,500 and £4,500 on the same frequency assumptions would give a premium of £750.

However, this approach takes no account of trends in business volumes
Need to look at trends on a per policy basis.
This would also mean less reliance on the assumption for future business volumes.
Also, need to test several different scenarios in order to ascertain degree of potential uncertainty in results.

Given all of the above estimates and the degree of uncertainty involved, it appears likely that £500 is too low.
And the most recent underwriting year and calendar year data shows the potential danger that something significant may have changed, suggesting that a significantly higher premium may be needed.
These features should be investigated further