

EXAMINATIONS

April 1999

Subject 403 — UK Fellowship General Insurance

Paper Two

EXAMINERS' REPORT

- 1** *This was a fairly straightforward question regarding a premium rating exercise for a well known line of business. The question had been worded to direct the candidate into making points on particular aspects of the rating exercise.*
On the whole this question was answered better than the other two. However, some candidates produced far too much information and so ran out of time for the remaining questions. Most candidates scored good marks on the basic points as listed in the core reading. However, some candidates went little beyond the basic points and hence their solutions did not focus on the particular problem being set. Most candidates failed to mention the modelling approaches available other than referring to additive and multiplicative models.

Internal data

Split data between buildings and contents policies

Compile data over past, say, 5 years (consider a trade-off between how out-of-date the data is, and whether or not it is fully run off).

Claims and exposure data must have a link between them so that they can be matched together.

Claims data should include amounts and dates of payments, identify the peril and include any unpaid reported claims.

Make sure that the exposure identifies any changes in cover or risk details over the period.

It is generally fairly common to use accident year as the definition of year - although this experience will have policies written in more than one rating series, the claims experience is better developed than that of an underwriting year.

Decide on your measure of exposure - normally sum insured or number of bedrooms.

Establish whether or not the claims data includes claims handling expenses (both internal and external).

Data checks / exploratory initial analysis

Large claims – take account of the peril. A large claim on one peril could be an average-sized claim on another peril.

Reconcile claims and exposure data with another source of data such as management accounts.

Is the claims experience unusually light or heavy in respect of any particular year? Did you expect the data to show this or are there claims missing from the data set?

Carry out spot checks on the data at individual policy level – are the claims and exposure data correct?

Ensure that new business and lapses in a year contribute the correct amount of exposure to the calendar year.

Do you have good data for all the potential risk factors you want to investigate?

Coding of the data - is the coding of data for potential risk / rating factors reasonable? Are these fields well-populated?

External data

Consider the possibility of augmenting the internal data with external data . For example, if data by peril is sparse, market data will give useful support to the insurer's own data.

Reinsurers or external data providers may be able to provide other data to help in the assessment of the risk. For example: crime statistics; flood assessment systems.

Competitors' rates will be needed for comparison, to assess the likely volume of sales. In this regard, it is necessary to compare the terms of the cover offered, the level of risks underwritten, and whether differences in structure explain differences in loadings for expenses and profit. Also consider the time period of this data.

ABI data to assess trends in, for example. fire and theft claims.

Adjusting the base data

The base data may need to be adjusted to allow for:

- changes in risk or cover
- trends in experience
- the large claims you have identified

Allowance needs to be made for any IBNR claims.

You may also want to adjust for unusually heavy or light experience or, alternatively, you can make an adjustment to the calculated risk premium after the base data has been modelled.

Consider trends in the claims experience.

Consider any inadequacies in the adopted estimates.

Adjusting the base risk premium

Allow for expected inflation in claims from the base period to the period over which the policies will be in force.

Allow for changes in the expected average sum insured, or other way exposure is measured.

Also allow for any expected changes in cover or policy terms and conditions.

You may make the adjustment here for trends in claims experience - consider frequency and severity separately.

Modelling the experience

Construct separate models for buildings and contents.

Consider whether certain perils should be investigated separately.

There are three broad approaches available:

- model claim frequency and average claim amount separately, using a stochastic approach for each
- model claim frequency stochastically and apply the expected claim amounts which have been obtained deterministically
- model aggregate claim amounts deterministically

Additive / multiplicative modelling will be investigated.

Suitable probability distributions might be Poisson for frequency and lognormal or Pareto for claim amounts.

Parameters required by the distributions are estimated, and statistical methods are used to test their goodness of fit.

The stochastic models would be run a number of times to show the distribution of the modelled results. These will then form the basis of the risk premiums

A generalised linear model can be used to investigate the potential rating factors.

When looking at possible rating factors, the current market factors should be considered together with other factors which it is felt could be used in practice in the market place. The number of factors which can be investigated is very dependent on the amount and reliability of the base data.

Possible rating factors which could be investigated are :

- policyholder age
- property type
- property age
- presence of NHW / alarms / locks
- location

However, some factors which are important for buildings may be unimportant for contents, and vice versa.

Calculating the theoretical office premium

Make adjustments to allow for:

- expenses & commission,
- investment return (i.e. income and capital growth where relevant) (allowing for how the business is sold and whether it is paid on an annual or a monthly premium),
- profit, and
- cost of reinsurance (this should cover the net cost of purchasing reinsurance).

This can be done by either:

- a fixed percentage to the risk premium rate, or
- a more detailed adjustment allowing for fixed and variable expenses which allow for the size and nature of the business. The fixed expenses could be allowed for by margins in the premium calculations.

Initial expenses are generally incorporated into the overall level of expenses based on the assumed level of new business and its expected duration.

If discounts are given for certain groups of policyholders then you need to ensure that the policy expense loadings are still met. This can be achieved either by increasing the fixed loading in the formula to allow for the average level of discount, or by charging a separate policy fee to cover fixed expenses with no discount applying to the fee. Generally the policy fee approach is not taken in practice as it seems unacceptably high to policyholders compared with the cost of the risk.

Consider minimum premium - cost of some risks may be very small and you want to charge a little bit extra to at least cover a small contribution to fixed expenses. This can be done by applying a minimum sum insured (also helps to prevent under-insurance by policyholders).

Consider whether there are any other rating factors which you want to be taken forward into the rates, but for which you don't currently have data on the factors. If they are to provide a discount then an adjustment would be required to the base rate if the discount is to be funding neutral.

Allowance for Insurance Premium Tax to be made.

Consider any loading to be applied if policyholders choose to pay by instalments.

Finally, having calculated a theoretical premium for each risk, a market competitiveness analysis should be done, and premiums are likely to need to be adjusted.

- 2** *Most candidates failed to score sufficient marks as a result of not illustrating in detail the concept of accumulation of risk with reference to the three classes of business given. Instead many candidates wrote too much on issues which were not being asked about in the question.*

This report explains the concept of accumulations of risk within the general insurance market.

An accumulation of risk is the possibility of an occurrence of many claims arising from one event or a series of connected events. The events which are likely to give rise to an accumulation vary by classes of insurance written and can be best illustrated by the following examples.

Mortgage Indemnity Guarantee

An accumulation of risk for this class is likely to arise from a general economic downturn combining increasing interest (mortgage) rates, increasing unemployment and falling house prices. This combination of events have been experienced in the United Kingdom recently and insurers have suffered from this accumulation during the last decade.

A similar result can occur on a smaller scale where the economy of a local area suffers a downturn especially if an insurer has relatively high volume of business in that area. Such an example would be closures of coal mines in the Midlands.

Lesser effects are felt if not all of the above events are experienced at the same time. For example, even if house prices rise, the gains may not be sufficient to offset the extra arrears into which borrowers may have fallen as a result of increasing unemployment.

Domestic Household

An accumulation of risk for this class can arise from any one of a number of events. These events tend to be natural catastrophes but they can also be man-made catastrophes. Examples of natural catastrophes are storms, prolonged periods of cold weather, flooding and subsidence.

These accumulations may be on a local scale, particularly if there is a concentration of risk in the affected area, or over a wide area such as a nationwide storm or severe coastal flood.

An example of a man-made catastrophe is fire or explosion, where a such an event may give rise to the complete destruction of a block of flats and if one insurer has a concentration of business in that block then there will be an accumulation of risk.

Employers' Liability

Events giving rise to accumulation of risk under this form of insurance are likely to be man-made catastrophes or the effect of latent claims (i.e. claims arising from events that were not expected at the time of writing the business).

An example of a man-made catastrophe is explosion.

Examples of latent type claims which have recently led to accumulations are industrial diseases (e.g. asbestosis and deafness). In these cases a few claims tend to be accepted by the courts followed by a sudden rush of claims leading to an accumulation of risk which was not expected at the time of writing the business. Such an accumulation may also arise from a retroactive change in the law.

- 3** *This question was very poorly answered by most candidates, with only the very best candidates scoring above half marks. This question relates to a well known event (which most candidates correctly observed), but there was little evidence of much thought having been given to this particular situation.*
The answers to part (i) on the whole showed that most candidates could not demonstrate that they understand what the different insurance products actually cover.
The answers to part (ii) were generally better but only the best candidates mentioned the points relevant to this particular situation rather than the basic points relevant to most questions on setting reserves.

- (i) This is obviously hypothetical at present, and nobody knows the answer. The following points would have gained high marks.

General points:

The Year 2000 is a foreseeable event.

Insurance is meant to cover sudden and unforeseeable events

The cost of updating systems is maintenance

And therefore not an insurance claim

If companies had recognised and audited systems in time they should have been able to update them in time

Fire and all risks policies pay out only if there is material damage

They do not cover financial loss on its own

Business interruption policies pay out only following physical damage

Product liability does not cover replacement of the product

But damage to third party property or injury

If products have caused injury or damage, claim may be valid

To have to compensate employees who have been injured as a result of equipment failure, the company must be shown to have been negligent.

If written assurances had been given that equipment was Year 2000 compliant, it would be difficult to prove this. The employees might have to sue the equipment suppliers to obtain compensation.

To claim under Professional Indemnity, negligence must be proved

This is unlikely

Was there a specific clause in contract that policy would work on 1 January 2000?

If not, there may be contributory negligence as event was well known.

In some cases, systems set up when memory very expensive .

And software suppliers had explicit instructions to save on it.

If D&Os failed in their duties to take suitable precautions, there may be valid claims.

But less likely if failure is at customer or supplier.

- (ii) Issues to be considered:

What is the potential size of the problem?

Consider amounts already claimed

Are current claimant claiming on same basis

Exposure on similar policies for which claims have not yet been notified

What is the company's general approach to setting reserves when little hard information?

Are the company's reserves in general adequate, sufficient, prudent conservative?

What explicit or implicit margins are there in other reserves?

What is the size of free reserves in relation to potential loss?

What is the likelihood of losing court cases on this issue?

- consider separately for UK and USA.

Are there similar cases which can give guidance?

What are current legal opinions?

What are potential reinsurance recoveries, in terms of validity and amounts?

What are other companies doing?

Is there a joint London Market approach to these claims?

Allowance for inflation

Safest approach is to reserve for total potential loss. However, this is extreme, and might cause insolvency. Even if it does not, it may give completely misleading results.

Assign probability of losing court case to each claim type

By country

By US state also if enough detail

However, some cases may be won or lost case-by-case; it is also possible that either all cases will be won or all lost. Early precedents will make the position much clearer.

May consider loss amounts on same basis

Multiply probability of losing by expected loss

Add amount for legal costs and claims expenses

Add margin, depending on general approach, size of free reserves and other margins.

Consider the materiality of potential losses compared to the total liabilities in the portfolio.