

EXAMINATIONS

September 2000

Subject 403 — UK Fellowship General Insurance

Paper One

EXAMINERS' REPORT

This question was generally well answered with additional marks being given for any valid points not mentioned below providing the candidate clearly stated the advantages and disadvantages.

1	SMSM	Advantages	Takes into account each company's individual experience Simple to administer
		Disadvantages	Penalises companies with adequate reserves and/or adequate premiums No recognition of different mix of business within class, and thus riskiness No recognition of different mix of business by class, except health etc. No distinction between insurers and reinsurers
	RBC	Advantages	Takes into account risk profile of business And thus volatility inherent in business Penalises poorly reserved companies and those with inadequate premiums
		Disadvantages	Need definition of profit Need definition of volatility Need to define period over which volatility is measured Need an allowance for reinsurance and security of reinsurers Question of whether SM should be same for all companies as % of volatility

Although this was a fairly straightforward investment / cash flow question many candidates failed to mention enough points to score more than half marks.

2 Fixed Interest Stocks

Income and redemption proceeds are known amounts and terms, (unless variable term).

May need to allow for risk of default, if security is not impeccable.

Will probably ignore the possibility of sale.

Equities

Will know the current income stream.

Will allow for predicted future dividend increases.

This should be consistent with assumptions for inflation and economic growth.

This assumes that portfolio is not sold.

May need to sell equity holdings to meet liability outgo.

Will then need assumptions about the market value of equities at a future date.

Investment of cash flows are arising from new business and investment.

Future yields.

Investment policy.

Constraint of solvency margin.

This question was generally well answered with most candidates scoring over half marks. Most candidates were able to demonstrate their knowledge of the motor market and information needed to write such business.

3 (i) Factors about the market

- Do any insurers offer comprehensive policies?
- What is the typical cover in the market?
- How many insurers operate in the market?
- Does an individual buy all his cover from one insurer or can he, for example, buy third party from one insurer and fire/theft/own damage from another?
- What is the market split of claims between third party bodily injury, fire and theft, property damage and other claims?
- What is the cost of motor parts and repairs?
- How are bodily injury claims settled? What is the general level of claims amounts in these cases? What, if any, trend is there in these amounts?
- Are there any residual pool facilities?
- Can insurers select risks, or must they accept all proposals?
- Do other insurers use any experience rating programs, such as NCD or bonus malus?
- Are any rating factors currently used in the market by other insurers?
- Are there any agreements such as knock for knock?
- What is the cost to the user of medical facilities?
- Does the insurer have to pay the costs of the emergency services in the event of an accident?
- What are current market loss ratios?
- Are there any legal restrictions on premium rates?
- What distribution channels are used in the market

Data to obtain for analysis

- How do Company X's premiums compare with the average market premium?
- What is the general trend in the company's experience?
- Is the product currently priced third party, fire and theft separately, or are all risk categories bundled together?
- If each cover is priced separately, and claims data is available then look at the burning cost of each section of the policy.
- Claims and exposure data for the last three years are required, the exposure to be calculated on a calendar year basis and claims to be matched with it.
- Exposure data should include location, sex of the driver, and type of vehicle. Note that sex will be available only if this is obvious from the name of the insured.

Claims should be split by:

- third party property damage
- third party bodily injury
- fire, and
- theft

Information on the claims estimates, IBNR, and any other bulk reserve adjustments.

Historical figures on large claims and any multiple claim events.

(ii) **Cover to offer**

Comprehensive

Windscreen

Consider a named driver product rather than the current any driver product.

motor own damage cover

Minimum legal cover

Legal expenses

Uninsured loss recovery

Malicious damage

Courtesy car

Motor rating factors

Type of cover

Mileage / use of car

Excess

Age of the vehicle

Age of driver/age of youngest driver

Occupation of the driver

How many other drivers

Sex of main driver

Make of vehicle / modifications

Location

Age of the policy

Claims history (NCD)

Whether or not the vehicle is usually garaged.

Security devices

Convictions

Period since passing test

Data and potential problems

Is any market specific data available from that country? Consider the products offered by the rest of the market.

Consider the relevance of the data from other countries, taking account of factors such as the density of the traffic, the differences in the legal systems, the state of the roads, the cost of repairs, the general attitude and mentality of drivers, and attitudes to road safety. Be aware that other countries' data can be used only as a guide.

Be aware that rating factor relativities available from other countries will have been calculated in the presence of another rating factors and that not all rating factors are independent.

Steps to consider

Use Company X's own data on location, sex if available, and types of vehicle.

If there is little knowledge available, then introduced only a few factors initially, ideally the ones on which we have data.

Gradually introduced changes. Company X should not have to have particularly large discounts or premium loadings initially. We do not want to be too competitive and unnecessarily give away premium.

If a discount is to be offered, ensure that the overall funding of the business is as required.

Start collecting data on other potential rating factors straight away.

This question was not answered very well by most candidates. In part (I) candidates found it difficult to analyse a set of figures and make sensible comments. Part (ii) was largely bookwork and consequently most candidates scored most of their marks in this part.

- 4** (i) There have been significant increases in written and earned premiums and the number of policies. However, the average premium of policy has fallen from £188 to £168. This is a fall of 11.5%. This is quite a large fall, especially when it is borne in mind that premium rates increased on average by 5 per cent in June. Also large growth in premium in 1998 given the written premium much larger than the earned premium.

It would be interesting to break down these figures by the lines of business. It may be that the split between the two lines / within line of business has changed, but we cannot tell this from the figures. The business is expanding, but it is picking up risks with a lower premium.

Expenses have fallen on a per policy basis, from £40 to £38.32, but have increased as a percentage of premiums, from 21.3% to 22.8%.

The claims ratio has worsened.

The claims incurred have increased by 52%, whereas payments increased only by 38%. Has the reserving practice changed, or have there been any large claims? Or is this simply the normal result of incurred claims increasing before paid claims for a growing portfolio?

Is the company attracting lots of business for which the premiums are inadequate? Or is it simply attracting lower risk business? If it is attracting business where the premiums are inadequate it could lead to an increase in new business, but with a lower average premium and a worsening of the claims ratio and profitability level.

The total volume of business has increased, even though the increase in premium rates was greater than that of the market. It is likely that this is a result of premiums being highly competitive in a certain sector or possibly in general.

- (ii) Analyse each line of business separately, and possibly divided into sub-lines

Claims

The claims analysis should include:

A review of the adequacy of the outstanding claims reserves and the adequacy of IBNR. You would also want to explore any changes in the reserving methodology over the last few years.

Carry out an independent check using different methods.

The period over which the analysis is carried out should be as recent as possible. Look at 3-5 years of data but be aware of lack of development of recent claims if long tail.

The claims and corresponding policy record in force at the date of the incident should be matched.

Treatment of claims.

The definition of the claim should remain consistent across the period of analysis.

Reinsurance recoveries should be recorded separately, so that the analysis can be both gross and net of reinsurance.

Ensure that the inclusion of claims handling expenses is consistent over time.

Large individual or accumulation of claims should be truncated, with the threshold varying by class, or omitted. This avoids the large claims unduly dominating a risk group. In both cases an allowance would be made in the base premium for the extreme events.

Nil claims: it may be better to exclude these from the analysis.

Reopened claims should be allocated to the original claim.

Loss ratios should be calculated with frequency and severity being considered separately. Care should be taken as there was a premium revision in June 1999.

The data should be subdivided by the different risk / rating factors and split by specific types of claim.

One-way and two-way tables should then be produced, and if the volumes of data are sufficient then generalised linear models produced.

Any known reasons that the account has changed should be taken into account when drawing conclusions from the analysis.

Calculate the burning cost for the period of investigation, with adjustments being made for IBNR.

When considering whether or not current rates are adequate, I would want to make adjustments for those burning costs to allow for trends, the absence or presence of large claims (compared with the number expected) and legislative changes.

Portfolio Movements

In the analysis look for evidence of anti-selection / over exposure to certain risks. All data should be analysed on a monthly basis.

Lapses at renewal:

Expressed as a percentage of renewals invited.

Look at figures on a monthly basis.

Allow for some delay in processing lapses. Chain ladder techniques can be used to project the number of lapses to date to the ultimate position..

New business:

Usually expressed as a percentage of renewals invited. Processing delays can cause a problem, but there should not be too many remaining now for 1999. If the data is available, also look at the take-up rate as a percentage of quotations given.

Cancellations:

The exposure is the mean number of policies in-force over the period.

Just look at the cancellation rate over the last two years.

Endorsements:

The exposure is the mean number of policies in-force over the period.

These will affect movements by risk factor, but should not be included as cancellations or new business when analysing movements by rating factor. Look at the rates over the last two years. If there have been significant changes it may be worth analysing the data further.

This solutions to this question varied quite considerably. The best candidates showed a good understanding of the bookwork regarding reinsurance and were able to carry out calculations relating to a reinsurance situation. In cases where the candidate made a numerical slip credit was given for later stages and sensible comments.

- 5** (i) (a) Reinsurance that covers all claims arising from a single cause over a limited period of time, usually 72 or 168 hours
Usually on an excess of loss basis
Covering losses above a certain total amount (the retention)
Up to a certain higher amount (the limit)
- (b) Usually an excess of loss or catastrophe excess of loss reinsurance allows only one full claim.
But will have provision for extending this to a (possibly limited) extra number of claims.
This is known as reinstatement.
Reinstatements may be free or there may be a premium payable.
The premium will be expressed as a proportion of the original premium
and will be payable pro-rata on partial exhaustion of the layer.
- (c) In excess of loss reinsurance with re-instatements,
the first amounts of losses in monetary terms otherwise payable under the policy may not be payable.
This is known as an aggregate deductible.

- (d) A clause in an excess of loss contract in which the retention and/or the limit is linked to some defined index of the value of money.

- (ii) To stabilise the technical result.
 To limit the effect of catastrophes.
 To limit the concentration or accumulation of risk by region, by peril, by risk.
 To enable larger risks to be accepted than would otherwise be possible.
 To obtain technical help.
 To reduce the statutory minimum solvency margin.
 Reinsurance may be good value for money.
 It may be possible to get reciprocity.
 To protect the free reserves.

- (iii) \$100,000,000 earthquake exposure at present

<i>Return period (years)</i>	<i>Frequency</i>	<i>Damage as % of sum insured</i>	<i>Damage \$</i>	<i>Mean loss calculation</i>	<i>Variance calculation</i>
10	10%	1	1,000,000	100,000	100,000,000,000
50	2%	3	3,000,000	60,000	180,000,000,000
100	1%	5	5,000,000	50,000	250,000,000,000
250	0.4%	10	10,000,000	40,000	400,000,000,000
1000	0.1%	15	15,000,000	15,000	225,000,000,000
	13.5%			265,000	1,155,000,000,000

Mean loss	\$265,000
Standard deviation	\$1,041,525
Premium required	\$473,305

With \$50,000,000 additional earthquake exposure:

Additional mean loss	\$132,500	as means are additive
Standard deviation of loss portfolio	\$1,562,288	50% higher: dependent events so additive
Additional standard deviation	\$520,763	
Additional premium required	\$236,653	

With \$50,000,000 hurricane exposure:

Additional mean loss	\$132,500	as above since risk profiles identical
Variance of loss portfolio	\$1,355,969	million: independent events so variances additive
Standard deviation of loss portfolio:	\$1,164,461	
Additional standard deviation	\$122,935	
Additional premium required	\$157,087	

Since the market premiums for the two risks are the same, the company should write the hurricane exposure.

- (iv) This model has no specific allowance for:
- brokerage
 - internal expenses

- reinstatement premiums received
- losses eliminated by reinstatement
- profit loading /contingency margin
- Investment return

The method is order-specific, so that the attractiveness of a piece of business depends on the existing portfolio.

It does include a loading that depends on the variability of results.

(v) By the same procedure:

<i>Return period (years)</i>	<i>Frequency</i>	<i>Damage as % of sum insured</i>	<i>Damage \$</i>	<i>Mean loss calculation</i>	<i>Variance calculation</i>
10	10%	1	900,000	90,000	81,000,000,000
50	2%	3	2,900,000	58,000	168,200,000,000
100	1%	5	4,900,000	49,000	240,100,000,000
250	0.4%	10	9,900,000	69,600	392,040,000,000
1000	0.1%	15	14,900,000	14,900	222,010,000,000
	13.5%			251,500	1,103,350,000,000

Mean loss	\$251,500
Standard deviation	\$1,019,852
Premium required	\$455,470

Our expected loss is reduced by \$13,500 and our target premium by \$17,835. \$50,000 looks expensive for this cover. Most years we make no recovery as we have no loss.