EXAMINATION

April 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.

M Flaherty
Chairman of the Board of Examiners

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1 *This question asked candidates to consider the risk premium. Those who spent time talking about expenses, commission etc did not gain marks for such comments. On the whole though this question was answered very well.*

Policy Data

For each policy

Dates on cover
Dates of endorsements and change in cover

All rating factor details:

- Trade / Industry / Occupation
- Turnover
- Number of employees
- Health and safety policies
- Source of business
- Materials handled
- Processes involved
- Location
- Payroll
- Exposure
- Cover / exclusions
- Limit of indemnity
- Past claims experience
- Size of deductible

Details of risk premiums charged, may need to be a proxy

Claims Data

Date of occurrence

Date claim reported

Date of re-opening

Dates and amounts of payments

Estimates, if they exist, of amounts outstanding

Rating factor details as they were at the time of the claim and/or

Link to policy information

Type of claim, i.e. injury or disease

Type of peril

Dates of settlement

Other data

Industry statistics to back up own data where it is sparse

Changes in underwriting / claims handling / policy conditions

Inflation statistics for wage inflation, court award inflation and care inflation

Information about any legislative changes which will have impacted in past and any that may impact future experience

2 *This question asked for the differing claims characteristics. Many candidates listed claims characteristics without identifying how they differed between the two types of business. Some candidates also described claims characteristics and then said that they would be similar. Neither of these approaches would have gained many marks if any.*

Coach fleet may take longer to settle small claims as the insured may be unwilling to take a coach out of service to rectify minor cosmetic damage.

This will depend on how busy the company is.

Lower theft claim frequency likely for coach fleet

Overall claim frequency could be higher or lower depending upon circumstances, e.g. mileage travelled, area driven, area kept.

If a coach fleet has a total loss this will be a large claim.

Also if all coaches are stored together overnight there is potential for an aggregation of risk, e.g. fire. This is less likely to be a risk for a car fleet. Leads to a more skewed claims cost distribution.

Average claims size of coach fleet third party property damage claims will be higher than for a car fleet.
This will include some total losses in respect of third party vehicles.

Hence settlement delays will be greater for coach fleets.

For a coach fleet there is a potential accumulation of risk

There will generally be fewer vehicles per fleet for coaches and hence more random claims experience.

Likely to be more overseas exposure for coaches and hence possible notification delays and currency issues.

Fewer small claims for coaches as generally higher excesses on the policies.

May be different legislation impacting upon coach passenger claimants compared with car fleets.

If a coach was full of passengers and had an accident could be many individuals hurt or killed which could lead to much larger claims than if a car had a similar accident.

Dealing with such a coach claim would take a long time and be very expensive.

Again if a coach hit another vehicle it could do more damage than a car and so bodily injury claims are more likely and likely to have a higher average cost.

3 *There were many points that could be made in the solution to this question. Several candidates however concentrated on the issue of over / under charging and effect upon expenses. Hence they missed out on several of the other points. Marks for this question were generally very low.*

Policy, claims and expense data are essential for reserving …
… to ensure sufficient funds are retained to pay future claims …
… and to highlight any concerning trends

This is also likely to be required for insurance Regulatory purposes, accounts or otherwise both to satisfy reserving requirements and to demonstrate that the company is run in a sound manner, e.g. with regards to investment strategy, capital use and planning.

Similar data is also required for pricing to ensure that there is no adverse selection and to aim to maximise profits. More accurate / complete data enables better pursuit of these goals

Relevant, accurate data is required both for assessing appropriate levels of reinsurance and to provide to reinsurers in order to maximise the chance of obtaining the desired cover for an appropriate premium.

Such data is also required for persistency, portfolio movements and quote strike rate management information to assess the business you have on your books at any particular time.

In a competitive market such as motor, improved data can give the edge in terms of more accurately pricing risks to win more profitable business and help avoid the less profitable categories. Without relevant accurate data, poor underwriting decisions become more likely

Customers will not appreciate providing irrelevant information and will not want to take the time. So the company must restrict info requested to just the minimum to enable underwriting, in order to ensure volumes of business are optimised.

Exclusions / Excesses must be recorded correctly to ensure that the correct policy cover information is applied in the event of a claim.

This information underpins management decisions. Poor data may result in poor decisions being made

Relevant, accurate information may help to prevent fraudulent behaviour

4 *This question was generally well answered with some candidates scoring nearly full marks.*

Purpose is to indemnify the policyholder against loss or damage to their commercial property e.g. office, shop, factory. In addition there may be business interuption cover

Benefit is the amount indemnified for loss or damage subject to limits or excess.

Perils covered are fire principally but also including explosion, lightning, theft, storm and flood. In addition there may be business interuption.

Exposure used is the sum insured year
however there are two complications:

- Stock amounts may fluctuate considerably. Stock may be covered on a declaration basis, determined retrospectively with an adjustment premium.
- No standard way of allowing for inflation in the policy.

Claims characteristics

Claims arise from sudden and determinable events (except subsidence)

Notification delays are short apart from subsidence

Different inflation rates affect buildings, contents and business interuption sections

Possible accumulations owing to location

Generally low claim frequency compared with other property insurance

Many claims likely to be impacted by reinsurance arrangements

Good estimates of claims amounts can be made

Settlement delays are generally short but can be increased if there is a need to verify the value of the stock held in a commercial property or the validity of a claim.

Claims distribution is skewed as claims are fairly consistent in size with few total losses but more varied than domestic properties as the properties insured are less homogeneous.

Exposed to moral hazard especially in an economic downturn.
Claims may be reopened.

Large claims will be subject to negotiation / arbitration about the amount of the claim

Rating factors

The main rating factors are monetary value, location, trade / business. Other rating factors which may be used are:

- EML
- Age of building
- Fire protection equipment
- Number of floors / floor area
- Surveyors report / score
- Construction type
- Excesses
- Indemnity period for business interuption
- Security / links to police station
- Claims history

5 *Alternative approaches to this question gained marks regarding the detailed amount of information given as the examiners felt that the question did not make it clear when the actuarial investigations were due to take place. Marks were not given however for investigations of a non-actuarial nature. Even allowing for the alternative approaches most candidates mentioned only a few of the investigations that would be carried out. Many candidates concentrated on aspects of getting the data rather than investigations e.g. trends.*

Claims related:

- Frequency and Average Cost trends
- by Accident year, Development year and Payment year
- to highlight any potential new developments
- cost per unit exposure analysis
- large loss ratio

Probably only have statutory accounts and returns available

Need to investigate reserving trends in conjunction with the claims related trends

- e.g. UPR, (A)URR, OSCR, IBNR
- compare with previous years. Are there any noticeable trends?

Also, investigate trends in

- claims handling costs and associated reserve.
- solvency levels and free reserves
- statutory solvency requirements / levels of coverage
- market share
- portfolio movements
- new business levels / premium volume
- premium rates charged if obtainable / industry premium levels
- the asset mix and any associated changes

Funding of the takeover
Alternative use of funds
Restrictions on purchase – anti-competitive laws.
Other accounting ratio investigations important

- Loss/Claims ratio, Expense/Combined ratio, Commission rates, Investment returns, Profit margin, Return on capital employed, Share price / p.e. ratio

- reinsurance purchased, recoveries made, reinsurers security
- goodwill
- taxation and regulation
- policy conditions

Check for any trends in the wording of audit statements – has there been any apparent weakening in the sign-off

Investigate recent or possible future legislation changes that may impact the business.

Investigate similar trends in other potential companies

Investigate the credit standing of the company

Investigate the combined model office

Investigate the synergies that the combined operation will have.

Investigate the effect upon the benefit schemes of the two organisations.

Investigate the impact upon data owing to different ICT and product structures.

Investigate any savings in claims handling expenses

Investigate the benefit of any diversification by location, different industries and different materials handled etc.

6 *Part (i) of the question asked for relevant limits. Most candidates failed to give sufficient limits with many not giving any at all. Some candidates did give limits but selected very high proportion of equities which even for a GI company writing long-tail business is not appropriate, especially if it is small. A lot of the answers were regarding general comments about investments for a GI company rather than the instructions given to the investment mangers. Parts (ii) and (iii) were generally well answered.*

(i) Content will include:

- guidelines for the split of assets, giving ranges for each major asset class
- this will most likely give maximum and minimum ranges
- indicate mean duration, mean maturity, maximum maturity permitted, etc.

- Cash (20%–30%)
- Fixed interest (50%–70%)
- Index linked (20%–40%)
- Equity (0%–20%)
- Indirect property (up to 10% of the 20% max for equity)
- No direct property investment
- Domestic currency only

>80% of Fixed interest must be Govt guaranteed

The remainder of Fixed interest must be AA or better

Benchmark for investment return

Limit equities to bluechip or equivalent

Funds under management should be split broadly equal between at least two different investment managers

For Cash — no more than *w*% of funds under management with any one deposit holder.

For other assets — no more than *x*% of the insurers total assets should be invested in any one company in aggregate, etc.

The insurer should not hold more than *y*% of any particular issue

The insurer should not hold more than *z*% of any one company's total debt in aggregate (counter-party risk), etc.

(ii) **Advantages**

Returns may be higher, in which case the company would improve its overall investment performance

Equity may be better matched for real, long term liabilities

If currently low level of equities then to increase holding could be appropriate for diversification

Disadvantages

Returns may be lower, in which case the company would see worse investment performance

Equity has a greater volatility of potential returns, which means there is an increase in risk

Equities too long to match most liabilities

Capital requirements are likely to be risk-based, which means equity treated as higher risk

Equity is less liquid, which is disadvantageous in GI business where funds may be needed at short notice to cover unexpectedly high levels of claims

Equity is less secure, so greater risk of default

(iii) **Advantages**

Inflation link offers some protection for real liabilities
Highest level of security
Long term should be a suitable match
Lower volatility, so generally lower risk than equity
Possible lower level of dealing expenses

Disadvantages

Appropriate term may not be available
The inflation link may not be suitable (wrong inflation)
Overall expected returns are lower
Possibly less liquid / smaller volumes available

7 *Most candidates managed to make a reasonable attempt at the first 2 parts of this question which involved a non standard product. Part (iii) proved very difficult for most candidates and hence overall the marks for this question were generally on the low side. The solution below to part (iii) was not the only one that would have been accepted by the examiners, in particular using different terms in the Taylor Series expansion would have given a different answer.*

(i) **Advantages**

Guaranteed funding in the event of a large catastrophe enabling the agency to concentrate on relief efforts rather than fund raising.

Certainty about the amount available for relief efforts.

Enables better planning and budgeting as there is no need to build up contingency funds etc.

Controls cash flow

Disadvantages

$10m dollars may be perceived to be a high annual cost for insurance and the relief agency does not have the funds.

Contributions may not be as forthcoming if contributors realise that their money is being paid over to an insurance company.

If event is near the end of the term of the policy may be difficulty in determining if the 500 deaths occur during the term of the policy.

If there are no large catastrophes during the year, then the agency will lose the premium.

The insurance provider is likely to add margins and profit loadings on the premiums and thus the premium for the policy is likely to be higher than the expected benefit to the agency.

There may very few providers of such policies in the market i.e. Demand may outstrip supply and this may lead to the insurance provider overcharging for the policy.

There may be delays in receiving the funds from the insurance provider as it may want evidence of the loss of life etc.

The agency may be able to raise the required funds anyway from public sympathy for the victims of the disaster.

Man made disasters such as civil war would not qualify for benefit under the policy.

The relief agency will be working to prevent loss of life and so may in some situations not get the benefit under the policy due to its own success. In such situations, the relief agency may request some financial compensation. This may lead to disputes with the insurance provider.

Need for a clear definition of what constitutes a natural disaster.
Many of the events that the relief agency is concerned with may not result in great loss of life but may still be large catastrophes in terms of the numbers of people requiring assistance.

Effects of inflation may reduce real level of cover

Risk of insurer default.

Number of deaths is not indicative of size of loss

Payment is irrespective of number of deaths once it reaches 500.

(ii) **Advantages**

Fixed benefit payable on occurrence of an event leading to a valid claim.

Short tailed

Selling such a policy would bring in income from a new source and possibly open up the possibility of selling such policies to other relief agencies.

There may be marketing advantages to being associated with the relief agency.

The policy would bring catastrophe exposure to parts of the world that the provider is unlikely to be selling much insurance to. Therefore it would not aggregate much with its other catastrophe exposures (i.e. diversification).

Pricing may be attractive as few companies in the market would be willing to write such policies.

Disadvantages

The definition of loss under the policy is somewhat subjective. There may be difficulties in establishing the loss of life from an event. This could lead to disputes with the relief agency.

It may be difficult to price such a policy as good data may not exist on the frequency of such events (i.e. there is a greater risk that claims could exceed premiums than in other situations).

The relief agency would have an incentive to exaggerate the loss of life from a particular disaster. Independent verification may be difficult to obtain.

An event may occur in a part of the world where the relief agency does not operate. In such a situation, the insurer would end up paying out even through the relief agency does not spend that money providing any assistance to the victims.

Difficult to reinsure at reasonable rate

Volatile claims experience

Liquidity issue in event of a claim

Political downside if do not pay out.

(iii) Loss cost for Company A = 100 * 0.1 = 10m
Loss cost for Company B = 100 * 0.0833 = 8.33m

Company A Premium = 10m + 10% * Capital
Company B Premium = 8.33m + 15% * Capital

The Capital is set such that exp (−Capital * R) is approximately equal to 0.1. where

R is the root of $\lambda M(R) - \lambda - cR = 0$
$\lambda M(R) - \lambda - 100\lambda(1 + \theta)R = 0.$

$M(R) = \exp(100R) = 1 + 100R + 5000R^2$ using the Taylor Series expansion

Therefore R is the root of $1 + 100R + 5000R^2 - 1 - 100R - 100R\theta = 0.$
$\Rightarrow R = 0.02\theta$ where θ is the safety load

Using the approximation probability of Ruin = exp(−R * Capital) = 0.1
$\Rightarrow$ exp(−0.02θ * Capital) = 0.1
$\Rightarrow$ Capital = 115.13m / θ

In the case of Company A, θ = 10% * Capital / 10m
$\Rightarrow \theta^2$ = 115.13m / 100m =
$\Rightarrow \theta$ = sqrt(1.1513) = 1.073

So Premium = 10m * (1 + θ) = 10 * 2.073 = 20.73m

In the case of Company B, θ = 15% * Capital / 8.33m
$\Rightarrow \theta^2$ = 115.13m / 55.53m =
$\Rightarrow \theta$ = sqrt(2.0731) = 1.4398

So Premium = 8.33m * (1 + θ) = 8.33 * 2.4398 = 20.32m

Hence company A will be more expensive.

8 *Most of the candidates made a good attempt at this question, particularly part (i). The examiners were encouraged by this as this type of question has been poorly answered in the past. It demonstrated an understanding and interpretation of accounts. There was some confusion regarding at which point in time the figures related to, even though the question stated that all figures are as at end 2003.*

(i) **Class A**

GWP is decreasing sharply

NWP is decreasing even faster than GWP.

This could be because the reinsurance premium is rising as a % GWP or that the company is buying more reinsurance as the size of the portfolio decreases.

NEP = NWP so all the policies are written on the first day of the accounting period.

Loss ratio is increasing over time.

Small proportion of claims are paid ⇒ a long tail class

Lots of IBNR/IBNER which increases (as % of WP) as get closer to the future as would expect.

Expenses are not falling as fast as premium.

Could be due to claims handling costs as claims are long tail.

Commission is stable at 15% of GWP, or increases from 20% to 25% as % of NEP

Investment return is decreasing very slowly.

Investment return is high as % of GWP

Again consistent with a long tail class as substantial reserves will be held and these will be fairly stable.

Profit has decreased in amount over time but as a percentage of GWP has increased over time.

This is a result of the decrease of GWP with a stable reserve pot and higher proportion of investment return.

Class B

GWP is increasing sharply, in fact at the rate that it is falling in class A

NWP is also increasing at the same rate as GWP.

Percentage of GWP paid in reinsurance is constant at 5%.
NEP for 2000 is the same as NWP.

Could mean that same volumes were written in 1999 as in 2000.

NEP for subsequent year suggests that the average policy is written mid way through the year i.e. that policies are written evenly over the year.

Commission is again stable at 15% of GWP, or around 17% of NEP.

Expenses start at 10% of GWP and increase slightly over time to 12% by 2003.

Investment return is relatively stable at circa 3% of premium. Increasing slightly as a % GWP.

Proportion of claims paid is far greater than class A i.e. this class is shorter tailed.

IBNR/IBNER moves over time as expected.

Looks like there is a large notified but not paid claim in 2001.

2001 loss ratio for this year deviates sharply from the average.

Profitability has declined over time as % GWP, consistent with the rapid growth company has undertaken.

Growth at this speed is often not possible without a decline in profit.

(ii) Class A EL, PL anything else long tailed with reasons

Class B any short tailed class, household due to large claim / weather / subsidence event in 2001

(iii) **Issues**

Expenses are increasing over time. Need to investigate why this is happening and identify any opportunities to reduce expenses.

Reinsurance costs on class A seem to be increasing. Need to investigate why and consider whether current reinsurance arrangements are the most appropriate.

Profit for A as % of WP increasing in revenue accounts but underwriting profitability of business written is decreasing, cannot rely on the investment returns on long tailed class. Look at bringing class B back into profitability.

Changes in mix of business within each class owing to rapid expansion / contraction.

Investigate whether the reduction in volume in class A and increase in class B is intentional

Investigate investment strategy.

Investigate capital requirements

Staff and systems, class A will need experienced staff to handle a class that is clearly decreasing over time. Staff may leave for another company once they see they have no long term future. Need plan to retain and reassure staff otherwise will lose ability to service business.