EXAMINATIONS

April 2003

Subject 303 — General Insurance

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.

Mrs J Curtis
Chairman of the Board of Examiners

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The examiners were pleased with a slightly higher standard of solutions given by candidates in this exam compared with recent diets. Comments on individual questions are given below.

The examiners would like to remind candidates of the importance of reading the front cover of the answer booklet and complying with the instructions. The examiners were pleased with a significant overall improvement in handwriting. Examiners marking scripts are under severe time pressure in marking all scripts by the deadlines given. Good handwriting helps. An additional factor which seems to be creeping into some candidates scripts is the failure to indicate the question number of the question that is being answered, or in some cases indicate the wrong question number. Clearly examiners take this into account when marking but such additional identification of which question is being answered does delay the marking process.

The examiners would also like to remind candidates not to write their solutions in pencil, only use the right hand side of the page and do not return scrap paper with the answer booklet.

1 *Most candidates were able to describe the terms deductible and excess, but only the better candidates highlighted the differences. Being able to apply the definitions to a particular case seemed to cause a lot of confusion. In particular some candidates managed to get the calculations the wrong way around even though they got the definitions correct. The examiners would like to emphasise to candidates that application of knowledge is as important as the knowledge itself.*

(i) Deductible is the amount deducted from a claim which would otherwise have been payable, i.e. it is borne by the policyholder. An excess is the sum that the insured bears before any liability falls on the insurer. The primary difference is that the deductible eats into the sum insured whereas the excess sits below the sum insured. Hence on a policy with a deductible the maximum the insurer will be liable to pay is the sum insured less the deductible.

(ii)

	Insurer	Insured
Policy A	£3,000,000	£1,000,000
Policy B	£2,500,000	£1,500,000

2 *This question was generally very well answered, with many candidates scoring more than 5 marks out of a maximum of 7.*

(i) A model with distributions is required as the mean and variance are required. Stochastic is the most likely.

(ii) Clarify purpose of investigation / specify the objective
Collect data
Modify data
Not necessary to group data as homogeneous
Choose a suitable frequency and severity density functions
(correlations should not be an issue as one homogenous portfolio)

Specify / estimate parameters
check goodness of fit of distributions
Allowance for change in new business volumes
construct model
run model multiple times and collect each outcome
sensitivity test the model
summarise the results — mean, variance and distribution of outcomes

3 *The examiners were disappointed with many of the answers to this question which resulted in most candidates scoring less than half marks. Many candidates mentioned the change in the net liabilities but did not go on to comment about the effect upon the assets held.*

Need to meet liabilities as they fall due so tend to match assets to liabilities by nature, term, amount, currency
Changing reinsurance programme may impact the profile of the net liabilities and therefore the assets that would match them
….although the company may not be following a closely matched policy, particularly if free reserves are large
Removing the excess of loss cover will cause the impact of large losses on net claims to increase
Large claims tend to be bodily injury claims
Therefore average term of net liabilities may increase if remove XL cover….
…and payments for the bodily claims tend to be longer tailed e.g. court cases
So more inflation protection may be required….
….bodily injury claims inflation may be higher than damage claims inflation
So might wish to move to longer term assets that give good inflation protection e.g. equities
Greater variation in retained claims cost
Removal of reinsurance may increase required statutory solvency so less investment freedom
However with more exposure to random large loss movements, may need to choose assets that are liquid

4 *Most candidates scored reasonably well on this bookwork question.*

(i) **Companies**

Public or private insurance— limited liability, capital, distribute profits by dividends.

Captives — usually wholy owned Co. used by the owner to manage its risks. Larger reinsurance contracts are then placed by the captive.

Self retention groups/Mutuals eg P&I clubs — Companies owned by the participants — not for profit groups whose aim is to give value for money to their members.

Government – as insurer of last resort / high uncertainty

Lloyd's syndicates — capital provided by individual or corporate names to one year ventures who underwrite on their behalf. Unlimited liability for individual names, limited liability for corporates. All change here!

(ii) Intermediaries — brokers, banks
Retail linked to other sales — travel insurance, extended warranty, mortgage payment protection
Purchase another insurer
If captive, direct from parent
Employed sales staff
Mass marketing — mailshots, newspaper TV and Radio ads.
Direct to customer internet, telesales

5 *Although the solution given in part (I) was the one the examiners were looking for alternative solutions with a slightly different interpretation of the information given in the question were accepted. The main problem encountered by candidates was the correct understanding of who pays what commission and expenses in such an arrangement.*

(i)

Premium	40%	4,000,000 (40% of £10m)
• Claims	65%	2,600,000 (65% of £4m)
• Commission	25%	1,000,000
• Ins Exp	7.50%	300,000
• Brokerage	2.50%	100,000
• Own expenses	2%	80,000
Profit	–2%	(80,000)

Assume no investment income or other sensible alowance.
Expense allocation is accurate
Loss ratio will be as expected.
Sales targets are met

No tax
No other prior reinsurance
No profit commission terms

(ii) 2% deficit. Realistically insurers expenses, brokerage, own expenses too small to recoup deficit

suggest reducing commission to A.
Insurer may have fixed commission then difficult.
Insurer may have variable commissions with scope for reduction
Suggest sliding scale commission, or lower initial commissions with a profit commission.

Suggest Insurer writes to a lower loss ratio

- insist on tighter wordings or min rate rises.
- difficult to guarantee, rate rises may lead to anti selection

6 *Candidates showed that they generally understand the issue of expenses relating to general insurance business. The examiners were looking for the distinctions between fixed/ variable and direct / indirect. Many candidates also wrote at length regarding claims expenses, investment expenses etc and credit was given for this approach.*

(i) Split fixed/variable.
Fixed expenses are those that do not vary with business volumes e.g. CEOs basic salary.
Variable expenses are those that vary directly according to the level of insurance business that is being handled at that time and may be linked to the number of policies or claims or the amount of premiums or claims.
Split direct/indirect.
Direct expenses can be identified directly as belonging to a particular class of business.
Indirect expenses are those that do not have a direct relationship to any one class of business
All variable expenses are direct
but fixed expenses can be direct or indirect.
Split according to functionality
e.g. investment, acquisition, renewal etc.

(ii) How use
Allocate as you wish the premium rates to be split,
so for personal business will split at least by product and possibly by cover
Link to business written or to claims..
Separate fixed and variable
Apportion indirect expenses across classes
Separate new business and renewal in theory if not practice
Why to get accurate costs / to cover expense costs overall
to get accurate rates
understand the level of cross subsidy in the rates

e.g. renewals subsidise new business if there aren't different premium rates for each with the expenses split
understand the cost of writing business even if its not sold at the theoretically correct rate

7 *Credit was given in part (I) where candidates used a credibility formula or incurred BF approach. Even though the question asked for a formula for 'Ultimate claims', some candidates failed to give a formula and in several cases omitted to include the current paid in their solution. Part (iii) turned out to be a good question to separate those candidates who knew the topic and those who understood it.*

(i) Let PBF=ultimate from paid Bornhuetter-Ferguson method
cdf = selected factor to ultimate
EULR = expected ultimate loss ratio
Prem = ultimate earned premium

Then PBF = current paid + EULR * Prem * (1−1/cdf)

(ii)

- The older the accident year, generally the more developed an account is and hence the smaller the cdf.

- For small cdfs, 1/cdf is large and therefore (1−1/cdf) is small. Therefore BF ultimate become close to current paid. Meanwhile paid chain ladder becomes closer to paid

(iii) (a)

+ Provides independent estimates
+ May reflect market rate changes and inflation effects as well as trends in claims frequency and average cost
+ less need of own data which may be lacking or not credible
− Mix of business likely to be different for every company
− Need to check treatment of premiums is consistent (i.e. gross or net of commission)
− Need to check consistency of reinsurance cover
- Market info not available
- Market info out of date

(b)

+ Gives some credit to the account's own experience with its unique portfolio of risks
+ Can be sure that premiums and claims are calculated on the same basis
+ simple to apply
− May want to adjust for inflation and premium rate changes
− Year *x* may be an untypical year (e.g. exceptional large loss)
− Dependant on own estimate of previous year
− May be unreliable on long tail business

(c) – Expected loss ratio would not be independent from claims on that year….
– If use paid chain ladder loss ratio as expected loss ratio, PBF becomes equal to paid chain ladder.
+ Could possibly use for reported BF projections

8 *With so many rating factors to choose from which the examiners accepted as possible main factors as those factors adopted by insurers do vary, most candidates scored full marks on part (I). The examiners would like candidates to note that the question asked for 12 and therefore were not expecting candidates to produce a list of more than 12. Part (iii) onwards of this question sorted out the better candidates from those not so well prepared in demonstrating their understanding. The poorer candidates gave answers which were not much more than repeating the details in the question.*

(i) Excess
Cover
vehicle use
Vehicle age
Stated miles
driver address
driver occupation
claims record / NCD
years since passed test
gender of main driver
marital status
additional drivers
age of main driver
driving restricted to named drivers
make & model of vehicle
not in use location — garaged
parked on or off street
security features
modifications
convictions / endorsements to licence

(ii) (a) traffic density where car driven **To** kept location
driver ability **To** claims record/age/sex/occupation
theft risk **To** driver address/not in use location/make & model
actual mileage **To** stated mileage

(b) Rating factors must be capable of being objectively measurable. In the cases above the risk factors can not be rating factors as they are not objectively measurable and hence alternative rating factors are used.

(iii) <u>ph ads</u>
only pay for cover as needed
potentially lower annual cost

good if drive infrequent long distances

<u>ph disads</u>
may not want to or be able to give 24 hour's notice / inconvenient
illegally driving without insurance cover if forget to arrange
may not include theft / fire damage when not insured
no other drivers allowed
daily cover may seem expensive
above a certain number of days the cost of cover will go above that of a standard policy
may lose NCD within year of insurance

<u>ins co ads</u>
potential to penetrate niche market
could make affinity group deal
gain additional rating data re low mileage drivers
possibility of applying rate changes during the policy year.

<u>ins co disads</u>
additional costs of administration — high if use call centre
high startup costs if use e technology like email or text message and lower ongoing cost.
computer system may not be able to hold all data required
possible disputes over cover if crash occurs when not covered
cover runs midnight to midnight? Or a more specific 24 hrs, if so need to record time and date of cover
more fraudulent claims / increased moral hazard
tendency to increase mileage on days insured

(iv) none of own data therefore need to buy in data or run a pilot
no data on the number of days low mileage drivers use their cars
so daily rate is not known with certainty
people identifying themselves as low mileage drivers may be high/medium mileage drivers so current data may not be reliable.
The expenses and administration costs will not be known with certainty

(v) collect individual dates of cover to collect true exposure period
if "phone data collection then could ask about planned driving times & locations and collect additional data e.g. mileage
bank details for deducting the daily charges — could be different from details first used, or previously used.
Passwords etc to verify caller ID — more important than annual policy as more frequently used.

9 *This question proved to be the most difficult for most candidates. The best solutions numbered the specific risks in part (I) and referred to each in turn in part (ii). Many candidates considered that product liability would be a major risk which would more likely be only of a 2nd order risk. In part (ii) many candidates wrote at length about reinsurance and the different types. Hence they did not pick up on the many different ways of mitigating the risks.*
Time did not seem to be a problem for the majority of candidates.

(i) Anti-selection by:
age
past driving experience
location
vehicle types
Catastrophe risk
Propensity to claim increases as will not worry about next year premium
Increase in moral hazard
Delay in receipt of premiums
Potential for business to be loss making, as small could threaten solvency.
Contact lasts for 3 years so could be tied into loss making rates, also the need to predict inflation for 3 years.
Car sales are seasonal…operational problems as small company doing the admin.
If volumes are small will not cover start up costs
Currency risk as manufacturer may sell in many countries
Difficulty in obtaining appropriate reinsurance cover.
Solvency capital considerations as small company and this is a major motor manufacturer, it will substantially increase new business.
Difficulty in setting the fixed price — long discussion as don't know the mix of business are pricing for.
Small insurance company will not have much useful historic data especially of writing brand new cars from this manufacturer.
Billing mechanism will need the facility for verification so both parties agree how many cars have been sold
Risk that the manufacturer goes bankrupt and the insurance company does not get paid although the cover is given.
Again there is the risk that the insurer itself becomes insolvent.
UPR variable over the 3 years as the risk varies over the term
If the cover is only for the original purchaser this will exacerbate the variability of UPR/earnings.
Need to consider the investment strategy in respect of investing receipts for longer than for an annual policy and risks associated with expected returns and security
Introduction of, or increases in rate of, tax or levies imposed by the government based on earned premiums.

(ii) Ensure the motor manufacturer pays up front to mitigate the risk of the motor manufacturer defaulting after cover has been provided.
Individually rate the business retrospectively when customer and vehicle information is available (make assumptions for information gaps), run rather like a fleet so collect deposit premium based on estimated car sales and

customer mix and then an adjustment premium at the end of the month/quarter based on actual numbers and mix.
Huge caution in the rates, probably means not cost effective for the manufacturer.
Possibility of profit share but this would mean the manufacturer effectively carried a significant proportion of the underwriting risk.
See manufacturers customer profile, e.g. mix by age, by postcode to assess the people who buy their cars.
Say no to protect the company solvency. As the company is small this may be the only response available.
Ensure the insurer has the right to frequent rate changes so the mix can be analysed and changes implemented quickly. Need to consider the expense implications of this frequent analysis and whether the resulting price will be attractive/ acceptable to the motor manufacturer.
Consider the offers that competitors are likely to put forward, if any others are prepared to take this business.
100% reinsure the business, cost? Will it be possible?
Write as admin only with the manufacturer keeping the risk perhaps via a captive reinsurer.
Look at experience of similar schemes, if there are any currently operating in the market.
If the scheme is already operating, get the current claims information and adjust in the usual way adding margins as appropriate.
Use consulting actuaries
Have a short term notice in the contractual agreement to get out
Have a clause in the agreement that if taxes / levies are increased then these are paid by the manufacturer to the insurer