

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2020 Examinations

Subject SP8 – General Insurance Pricing Specialist Principles

Introduction

The Examiners' Report is written by the Chief Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision

Mike Hammer
Chair of the Board of Examiners
April 2020

A. General comments on the *aims of this subject and how it is marked*

1. The aim of this General Insurance: Pricing Principles subject is to instil in successful candidates the ability to apply, in simple pricing analysis situations, the mathematical and economic techniques and the principles of actuarial planning and control needed for the operation on sound financial lines of general insurers.
2. Subject SP8 deals with applications of general insurance pricing techniques across many different types of product. Candidates should expect the examiners to draw these applications from all parts of the syllabus in order to test as wide as possible a range of skills and, in particular, to achieve a fair balance between personal and commercial lines.
3. Examiners will sometimes require the use of standard general insurance actuarial and statistical techniques that are covered in earlier subjects. Candidates should ensure that they are familiar with these when preparing for the SP8 examination.
4. As well as pricing techniques, SP8 also covers the workings and use of reinsurance products, so candidates should also expect the examiners to set questions on these aspects.
5. In questions with an element of calculation, different numerical answers may be obtained from those shown in these solutions depending on whether figures obtained from tables or from calculators are used in the calculations. Candidates are not penalised for this. However, candidates may lose marks where excessive rounding has been used or where insufficient working is shown. Where questions require looking up values in tables, candidates are expected to interpolate between two values if reasonable to do so, even when this is not stated in the question.
6. Where examples are given in the solution to illustrate the points made, marks were awarded to candidates who gave these particular examples or an equally valid alternative.
7. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

B. Comments on student performance in this diet of the examination

1. The general performance of candidates was slightly better than that seen in the last sitting. Most candidates demonstrated a good knowledge of the subject areas examined and scored well in basic bookwork questions. Questions that required application of this knowledge and tested higher order skills proved more challenging, and candidate responses to these questions generally lacked breadth and detail. There was no evidence of time pressure in this paper, although some candidates appear to have managed their time poorly.
2. Bookwork questions were generally well answered, and better prepared candidates successfully tailored their answers to the questions, and were able to generate a wide range of points. Candidates did not score so well on application and higher order skills questions, in particular questions 4, 5 and 7(iii). Those who did well on these parts tended to do better overall.
3. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to concentrate their revision in these areas.

C. Pass Mark

The pass mark for this exam was 60.

274 candidates presented themselves and 111 passed.

Solutions

Q1

As B's book is small, the data may be at lower level of granularity than the insurance company is used to ... [½]

... for example, it may not distinguish between detached, semi-detached and terraced houses [½]

The rating factors may be banded/coded in such a way that makes it incompatible with the insurance company's data ... [½]

... for example, year of construction may be grouped differently [½]

There may be a high level of errors in the data, ... [½]

... or it may be incomplete with lots of missing information [½]

It may not have information on all the rating factors that A uses [½]

It may lack information to allow understanding of development patterns [½]

Claims may be classified differently ... [½]

... for example, freeze claims may be classified as escape of water [½]

Also, as B's book is small, the claims data may not split out the cost of buildings and contents claims on a combined buildings and contents policy [½]

The claim amounts may not be compatible with that of the insurance company ... [½]

... for example, they may include loss adjuster fees and it would be difficult to eliminate them if required. [½]

... different IBNR or case reserve philosophy or different claims handling [½]

Data may not be recorded in a way that A can use easily, e.g. perhaps some records are not digital [½]

If cover is different, for example one covers trace and access costs or is indemnity only, it may be inappropriate to merge the datasets [½]

Lack of supporting documentation, e.g. data dictionary [½]

May find B's systems are not compliant with data protection laws e.g. inherit data that should have been deleted. [½]

[Total 4]

This question was reasonably well attempted. Many answers got the main points, but only a few candidates gave a wide enough range of answers and examples to score close to full marks. A noticeable number of candidates gave responses which were not specifically "data" issues, which did not score.

Q2

(i)

Occurs when there is a linear dependency among the observed covariates (equivalently, aliasing can be defined as a linear dependency among the columns of the design matrix X .) [1/2]

There are three types of aliasing:

Intrinsic [1/2]

- Arises due to dependencies inherent in the definition of the covariates, [1/2]
- Common whenever categorical factors are included in the model [1/2]

Extrinsic [1/2]

- Arises when the dependency results from the nature of the data rather than the inherent definition of the covariates [1/2]
- Most common when the level of one factor is perfectly correlated with the level of another factor. [1/2]

Near aliasing [1/2]

- Same as extrinsic but rather than being perfectly correlated, the levels of two factors are closely correlated [1/2]
- Can lead to model convergence problems [1/2]

(ii)

An offset can be included in a GLM when the effect of an explanatory variable is known. [1]

e.g. if the use of a particular factor is restricted, such as to comply with regulation [1/2]

or where the effect is pre-defined/fixed [1/2]

e.g. no claims discount levels [1/2]

Offsetting is also used where a hierarchy of models is needed, [1/2]

e.g. fitting an initial model, offsetting the whole model, and then fitting a further model to explain residual patterns in the data [1/2]

Offsetting can be useful in model validation when comparing a final model to a 'hold-out' sample of data ... [1/2]

... the predictiveness of the model is judged by how well it performs against this test set, by comparing the observed values directly to the fitted values from the offset model [1/2]

Also used to see whether a new explanatory factor can add anything over and above an existing model [½]

To override counter-intuitive model results that may occur on factors that policyholders self-select, *eg* protected NCD status [½]

To set the relativities for a new factor for which there is little data available, e.g. based on benchmarks or actuarial judgment. [½]

[Total 7]

Part (i) was very well answered with high scores. Many gave responses that were much more detailed than required for the number of marks available.

Part (ii) was mostly well answered, although there was evidence that some candidates knew the theoretical definition (part i) but had little idea of their application (part ii).

Q3

- (i) Rating factors help to categorise policyholders into homogeneous risk groups ... [½]
... so that premium rates are appropriate to the relative risk of each such sub-group [½]

This helps us to avoid unintentional cross-subsidies ...
... and ensure that profitability is not dependent on having a particular mix of business. [½]

Categorising into homogeneous risk groups also enables us to understand better the risks being handled, allowing more accurate profitability analysis. [½]

May be used to optimise premiums to charge an amount that the customer is willing to pay, not necessarily reflective of the risk. [½]

An appropriate set of rating factors will reduce the likelihood of anti-selection by policyholders. [½]

- (ii) Desirable characteristics of a good rating factor include:

- Define the risk clearly [½]
- Does not correlate too closely with other rating factors / improves predictiveness of model [½]
- Practical to obtain / record [½]
- Objective [½]
- Verifiable / factual [½]

- Acceptable to the policyholder [½]
 - Acceptable to the market/regulator/legal [½]
 - Cannot be manipulated [½]
- (iii) ANOVA/one-way/two-way [½]
 . . . A one-way, two-way or multivariate ANOVA helps investigate the amount of variability explained by each factor and the correlations between any two or more factors. [½]
- Chi-Squared Statistics [½]
 . . . Two nested models (that is, one is a subset of the other) can be compared using a chi-squared test as the change in scaled deviance [½]
- F-statistics [½]
 . . . In cases where the scale parameter for the model is not known, its estimator is distributed as a χ^2 distribution, and the ratio of χ^2 distributions is the F-distribution [½]
- AIC [½]
 The AIC looks at the trade-off of the likelihood of a model against the number of parameters ($AIC = -2 \times \log \text{likelihood} + 2 \times \text{number of parameters}$): the lower the AIC, the better [½]
- Consistency over time [½]
 Assess consistency over time by measuring the statistical significance of the interaction between the rating factor in question and a time-related factor, e.g. policy year. [½]

[Total 8]

Candidates had mixed success with part (i). A common mistake was to describe rating factors in general, and not explaining clearly enough how they are used to help improve profitability.

Part (ii) was well answered with many scoring full marks.

Part (iii) was also well answered, although a number gave tests that were not truly statistical.

Q4

(i)

General Points

Lacks information on inflation/trends/business goals/other external influences [½]

It seems inconsistent to add an expense ratio based on one year to a loss ratio averaged over 5 years to get the combined ratio [1/2]

Consistency of definitions, e.g. is treatment of RI consistent across all the metrics [1/2]

Definition of metrics/ratios themselves are unclear [1/2]

Loss ratio is on an underwriting year basis and expense ratio is on calendar year [1/2]

Proportion of Premium

The proportion of premium is based on the latest underwriting year. We do not have information about the increasing or decreasing trend in the volume. [1/2]

The current underwriting year may not be a full year so seasonality could distort the proportions [1/2]

This might include some large one-off deals that are unlikely to be repeated. [1/2]

Some contracts may be multi-year such as construction projects, so 2020 may not be representative. [1/2]

Loss Ratios

The loss ratios are based on the historical 5-years. This may be a short period of time if the classes have volatile results. [1/2]

This is especially true for classes which have the potential for large losses. [1/2]

The loss ratios may not have been adjusted for IBNR. [1/2]

Long tailed classes like Casualty may not have developed fully in 5 years. [1/2]

We can't see the trends in the loss ratios as we only have averages over time [1/2]

It's unclear if the loss ratios are just simple averages over the last 5 years or if they have been adjusted to allow for e.g.:

- Changes in policy terms and conditions / coverage [1/2]
- Unusual experience [1/2]
- Rate changes / claims inflation [1/2]

No information on volatility which has an impact on riskiness and capital [1/2]

There may be differences in prudence of case estimates between classes [1/2]

Expense Ratios

The expense ratios are based on the latest financial year. The ratios are probably calculated based on FY expenses divided by FY earned premium in the financial year. [1/2]

They will be affected by the lag in earnings, e.g. if the volume of business is decreasing, the expense ratio might look lower due to earned premiums being higher than written. [1/2]

With a planned increase in business volume, fixed expenses will reduce as a proportion of premium. [1/2]

Ensure that expense ratios include cost of reinsurance cover / commission [1/2]

. . .and other operational expenses like policy administration, CHE. [1/2]

There could be one-off expenses e.g. the cost of hiring a consultant to improve the profitability for a line of business. [1/2]

Would be better to get a split of fixed and variable costs to reflect new volumes appropriately [1/2]

Planned changes in expenses should be allowed for e.g. hiring of specialist energy claims team. [1/2]

(ii)

Investment returns on each line of business. [1/2]

Capital allocation for each line of business i.e. capital intensive lines of business should have a lower combined ratio. [1/2]

Correlation across the classes [1/2]

Consider each line's impact on regulatory / rating agency capital (credit rating). [1/2]

Risk appetite and whether altering between base period and future projection point [1/2]

Known concentrations of risk / need for diversification. E.g. may not want to expand volumes of property business in Florida if already have too much exposure. [1/2]

Premium changes must be compared with current reinsurance program, [1/2]

. . . subsequently allowing for future changes in reinsurance structure. [1/2]

Loss ratios split by attritional, large and cat	[1½]
. . .or consider market loss ratios by line of business	[1½]
If appropriate, more granular splits, e.g. by channel and/or product and/or territory and/or peril	[1½]
The current position in the insurance cycle	[1½]
Planned rate changes	[1½]
Expected change in number of competitors in the market	[1½]
Quality of technical staff i.e. underwriters, claims team, specialist surveyors, etc.	[1½]
Insurer’s reputation and broker relations for specific lines of business	[1½]
Market share for each line of business, ...	[1½]
. . . might indicate areas with growth potential	[1½]
Price sensitivity/elasticity by rating segment	[1½]
Strike rates / renewal rates / persistency	[1½]
Target lines with lower market loss ratios	[1½]
Understand why own performance is different from market	[1½]
Policy terms and conditions changes	[1½]
Distribution changes and possible impact on expenses	[1½]
New deals/products in the pipeline	[1½]
Budget for advertising / marketing	[1½]

[Total 8]

Parts (i) and (ii) are closely linked and it was common for candidates to make points in part (i) that appear in part (ii) of this report, and vice versa. This did not stop candidates from receiving full credit for valid points.

Most candidates made a reasonable attempt at this question, however responses were mixed. Some focussed on the actual figures rather than discussing their suitability. Successful candidates considered a wide range of different ideas.

Q5

More detail required for Personal Lines generally / data requirements more granular [1/2]

Details of individual drivers, such as age/licence held years/driving history, is more likely for personal lines ... [1/2]

... although some personal lines policies may be “any driver” [1/2]

Personal lines is likely to make driver checks on named drivers which is less likely for fleet [1/2]

Personal lines will obtain details of the vehicle being insured (or vehicles if multi-car policy) [1/2]

Motor fleet is unlikely to capture as many details about the vehicles, depending on size of fleet [1/2]

Personal lines may be able to take advantage of national databases of vehicles [1/2]

National databases of vehicles may not be available for the types of vehicles covered by fleets [1/2]

Personal lines vehicles are likely to be fairly standard [1/2]

Fleets may cover a wide range of different types of vehicles [1/2]

Personal lines will have limited interest in the use of the vehicle, unless used for commercial purposes [1/2]

Motor fleet insurers will be interested in what the vehicles are being used for [1/2]

Data on goods carried, e.g. value of goods in transit [1/2]

For both, mileage will be important [1/2]

For personal lines, the insurer will be interested in where the car normally resides [1/2]

For motor fleet, vehicles may have no fixed location and/or the insured may have several sites [1/2]

Depending on use, fleet vehicles may also spend significant time abroad [1/2]

Personal lines will be able to capture detailed information from each policyholder/driver on previous claims ... [1/2]

... this may also be available via industry databases [1/2]

For motor fleet, detailed previous claims information is less likely to be captured from the insured [1/2]

... the insurers themselves may capture claims information in different levels of detail [1/2]

Personal lines is likely to carry out credit checks on the policyholder ... [1/2]

... motor fleet is likely to carry out checks on the company requesting cover, such as financial performance [1/2]

Personal lines insurers may capture more information from policyholders in order to assist with marketing/cross-selling activity [1/2]

Motor fleet insurers are unlikely to do this, especially as the business usually comes via brokers [1/2]

There may be more restrictions on what data can be used for pricing in personal lines than in motor fleet / Data regulation may be more onerous for PL [1/2]

Experience rating for PL is more likely to need data on number of claims, whereas fleet might base it on claim amounts [1/2]

Fleet may have some group-specific data requirements not relevant to PL (e.g. driver training, vehicle maintenance, security at depot(s), quality of management) [1/2]

Accumulation possible on Fleet e.g. due to depot where parked [1/2]

Changes in exposure required for motor fleet if retrospective pricing used. [1/2]

[Total 9]

Responses to this question varied. Although most made a good attempt, many did not score well as they merely listed data items. Those who compared the data requirements, as instructed, tended to score better.

Q6

(i)

- Separate frequency and severity trends need to be applied to losses [1/2]
- Project historical frequencies and severities in line with assumed trends [1/2]
- ... to current values [1/2]
- ... and then project to the mid-point of the future exposure period [1/2]

- Apply an index rather than a constant annual trend rate [1/2]
- Trends will depend on factors such as exchange rates (or other example) [1/2]
- Severity trending usually applied at ground-up individual loss level [1/2]
- ... whereas frequency trending is applied to claim frequencies for each historical policy year [1/2]

(ii)

- Before payments are made to unknown / unusual bank accounts, employees should be encouraged to telephone the payee ... [1/2]
- ... using historic contact information (rather than any contact information included with the payment request) [1/2]
- Controls should also be in place surrounding the implementation of new supplier bank and contact information [1]
- Changes to this data should not be implemented by junior / inexperienced members of staff [1]
- Large payments to unknown bank accounts must be verified / authorised by two employees with both employees reviewing the supporting documentation. [1]
- Ensure all staff within the organisation are trained about /alerted to ... [1/2]
- ... these types of fraud and are watchful for key warning signs [1/2]
- Impose a waiting period before payments are made [1/2]
- Any suspicious payments should be referred to a dedicated fraud team, or reference fraud/criminal activity database [1]

(iii)

Risk premium can increase [1/2]

... if the fraudsters use this technology to imitate key senior personnel, both frequency and severity can increase [1]

...fraudsters could use technology to create fake claims [1]

It could cause an increase in the frequency of fraudulent transfer instructions if criminals make use of the technology to imitate staff. [1/2]

Severity could increase if the technology allows them to successfully imitate senior personnel in a position to authorise large transactions [1/2]

But the effect on severity depends on the strategy the criminals adopt, e.g. they could instead make a large number of small transfer requests, as these are likely to be subject to fewer checks, in which case severity might decrease [1/2]

On the other hand, risk premium can decrease [1/2]

... if companies can use this technology to develop better barriers against deep fakes then frequency and severity can decrease [1]

Risk premium may be less accurate because past data will be less relevant, if use of ‘deep fake’ technology becomes common. [½]

[Total 10]

Part (i) was well attempted with most scoring well. Some candidates gave far more than would be expected for a 3 mark question.

Part (ii) was generally well answered. Those who generated a wide range of different points tended to be more successful.

Answers to part (iii) varied, with many failing to show clearly how a “deep fake” would affect the risk premium / frequency / severity.

Q7

(i)

a) Quota Share

We should cede a minimum: $1 - \frac{25}{90} = 72.23\%$. [1]

b) Surplus

We should set a maximum retention of \$25m. [½]

The minimum number of surplus lines needed: $\frac{90}{25} - 1 = 2.6$ [1]

c) Risk XoL

Maximum attachment point = \$25m [½]

Limit = \$65m (also accept \$90m – the upper limit) [½]

(ii)

Quota share is likely to have the maximum ceded premium since 72.23% of the total business has to be ceded out. [½]

Ceded premium for surplus will be cheaper than QS because the insurer will not cede premium on smaller risks. [½]

The average percentage ceded is likely to be less than 72.23%. Only the largest risks will need ceded percentages in this region. [½]

Risk excess of loss is likely to have the lowest amount of ceded premium ... [½]

... since it doesn't participate in smaller losses from the large risks. [½]

The profit margin or capital loading for risk excess of loss will be the highest.
However, this is not expected to be large enough to affect the ranking. [½]

(iii)

The student is correct regarding the point that had the EML been set higher than under most circumstances, the reinsurer would have had to pick up a larger proportion of the given risk [1]

Eg where the insurer aims to retain as much of the risk as possible up to a specified maximum retention limit [½]

The proportional split may, however, be unchanged under certain circumstances... [½]

... e.g. if the increased EML is still below any minimum retention limit (in which case nothing is reinsured) [½]

However, the argument that regular underestimation of EMLs will not trouble the reinsurer is invalid [1]

This could be an indication that the insurer is not able to estimate its risks correctly ... [½]

... thus the insurance premiums would be too low [½]

Even though the premium is shared proportionally with the reinsurers, if the premium is too low they will receive too little premium [1]

If the insurer and reinsurer have underestimated the risk from outset, the reinsurer may also have agreed to pay too much reinsurance commission [1]

It might exceed the risk tolerance or retro limits for the reinsurer [½]

May not have written the business at all if not within appetite or target size [½]

It could also indicate that the cedant is selectively passing on the more volatile risks, or the ones where it is difficult to estimate the EML. [½]

[Total 11]

Many scored highly in part (i). Some candidates spent time describing each of the three types of reinsurance which was not asked for.

Most identified Risk XoL as the cheapest in part (ii). The better answers also considered Quota Share and Surplus.

Part (ii) appeared to be quite challenging, and answers varied. The more successful responses tended to break down the student’s comments into parts, and comment on each in turn.

Q8

(i)

- (a) Where the regulator has significant influence over the rates [½]
 Regulator will either set fixed rates or provide little flexibility to insurance companies in deciding rates [½]
 Rates may have to be filed with regulator / rating changes need their approval [½]
 Minimum and maximum premium rates may be set by the regulator [½]
 The companies have to differentiate themselves on the basis of marketing and qualitative factors like improved claims processing. [½]

- (b) Where we cannot determine the ‘correct’ price purely by numerical analysis [½]
 so we must take account of subjective factors / judgment of underwriters [½]
 Might be because of heterogeneous risks or new products. [½]
 Or if data is incomplete or sparse or prone to errors [½]

- (c) If sufficient data is available, prices are set based on statistically driven analysis [½]
 Premium is the cost of expected claims loaded for expenses, profit, etc. [½]

(ii)

- What pricing action has the insurer taken over the last 12 months ... [½]
- ... and how does that compare to what action competitors have taken [½]
- Has the product changed, making it less attractive ... [½]
- ... such as increasing compulsory excess... [½]
- ... or have competitors released more attractive policy features [½]
- ... or declining more due to tighter underwriting [½]
- Is the problem with new business conversion / investigate strike rates [½]
- Or is the problem with retention of existing customers / investigate renewal rates [½]
- Is there a new channel attracting the business that the insurer is not operating in [½]
- Have more insurers entered the market [½]
- Has the company been the victim of bad publicity/poor customer service/erosion of brand [½]
- Has the insurer cut back on marketing [½]
- Have mid-term cancellations increased – investigate why [½]

	Check that the rating structure is valid/error free (which might otherwise lead to overpricing of some segments)	[1/2]
	Check to see whether the target market is shrinking	[1/2]
	Analyse by channel and other splits to understand if it's a particular segment	[1/2]
	Look at whether initiatives to save customers, such as discounts or vouchers, are being applied as intended, or understand why they're not having the desired effect.	[1/2]
	Comparison to their other books of business – can they use strategies that work elsewhere	[1/2]
	Investigate staff proficiency levels and training requirements	[1/2]
(iii)	$X\beta + \xi$	[1]
(iv)	Error distribution - binomial Link function – logit	[1/2] [1/2]
(v)	$\eta = \ln\left(\frac{p}{1-p}\right)$	[1/2]
	$\frac{p}{1-p} = e^{\eta}$	
	$p = \frac{e^{\eta}}{1 + e^{\eta}}$	[1/2]
	$\eta = -4.5966 + 0.2432 - 0.0276 = -4.381$	[1/2]
	$p = \frac{e^{-4.381}}{1 + e^{-4.381}} = 0.012$	[1/2]
(vi)	Number of competitors quoting	[1/2]
	How quoted premium compares with market premiums	[1/2]
	Rank of quote (if available)	[1/2]
	If customer has any other products sold by the insurer	[1/2]
	Possibly break down channel into finer segments	[1/2]
	Postcode or some kind of geographic identifier	[1/2]
	Type of cover	[1/2]
	Method/frequency of payment	[1/2]
	Value of car or make/type of car	[1/2]
	Occupation	[1/2]
	Gender (if allowed)	[1/2]
	[Total 14]	

Parts (i) and (ii) were generally well answered with many scoring full marks.

Part (iii) was mostly well done, although some confused the offset term with the error term.

Most scored full marks for part (iv).

Responses to part (v) were mixed – candidates either knew how to do this or they did not.

Part (vi) was reasonably well done, however many tended to list factors that generally affect the risk of claiming rather than factors more likely to affect the likelihood of converting to new business.

Q9

- | | | |
|-----|--|-----|
| (i) | Fidelity guarantee | [½] |
| | Business interruption/loss of profits/consequential loss | [½] |
| | Credit insurance | [½] |
| | Creditor insurance | [½] |
| | Legal expenses cover | [½] |

(ii)

Fidelity guarantee

- | | |
|--|-----|
| covers the insured against financial losses caused by dishonest actions of its employees | [1] |
| Includes loss of money ... | [½] |
| ... or goods owned by the insured (or for which the insured is responsible), ... | [½] |
| ... and reasonable fees incurred in establishing the size of the loss | [½] |

Business interruption

- | | |
|---|-----|
| indemnifies the insured against losses made as a result of not being able to conduct business ... | [1] |
| ... usually as a result of property damage | [½] |
| ... but may also include cover in the event of no access, loss of power, other | [½] |
| A fixed sum insured per day will usually be specified in the policy ... | [½] |
| ...payable until the property can be occupied again, or until the term specified in the policy has expired. | [½] |
| There may be a minimum period before a claim can be made. | [½] |
| Often sold with property cover and subject to the same perils | [½] |

Credit insurance

covers a creditor (the insured) against the risk that debtors will not pay their obligations	[1]
cover can be provided for a year or for the length of a project (e.g. building a shopping centre)	[½]
The principal types are trade credit and mortgage indemnity	[½]

Creditor insurance

provides cover to insured who have obligations to repay credit advances or debt (such as personal loans)	[1]
cover is usually against disability or unemployment, on the basis that these would prevent the insured getting an income with which to meet their obligations	[½]
most policies are made to individuals to cover personal loans, mortgage loans or credit card debts	[½]
the policy will pay the regular loan repayments until the insured has a new income, or the debt has been repaid or a maximum number of repayments paid	[½]
often sold with life assurance to pay balance in full if die	[½]

Legal expenses

indemnifies the insured against legal expenses incurred as a result of ...	[½]
... legal proceedings initiated against the insured	[½]
... the need for the insured to initiate proceedings	[½]
normally covers payments made to legal representatives	[½]

(iii)

A number of insurers may have left the market / reduced their market share (e.g. due to low levels of profitability) and competition has reduced ...	[½]
Regulation may require higher levels of cover to be provided	[½]
A recession may drive higher levels of unemployment ...	[½]
... so higher claim frequency on creditor insurance	[½]
A recession may also mean defaults on credit are more common ...	[½]
... and employees may be more likely to be dishonest	[½]
A recession may also mean insurers are unable to make high returns on their investments	[½]
High inflation of legal expenses	[½]
Regulatory changes may require insurers to hold higher levels of capital	[½]
Insurers' expenses may have risen	[½]

Increased litigiousness or court award inflation [½]

Recession could alter demand for products/services that cover financial loss therefore increasing demand [½]

Rates for creditor may have hardened due to insurers in this line trying to recoup losses resulting from large-scale compensation payouts to those mis-sold PPI in the past. [½]

A court case may have led to claim types being covered under business interruption that had previously been assumed outside the scope of cover, e.g. business unable to operate due to ransomware attack. [½]

Forced closure of premises due to a pandemic may have led to many unexpected business interruption claims (which might be covered depending on policy conditions). [½]

[Total 14]

Most candidates answered parts (i) and (ii) well, however candidates did not always describe the products in the detail required for 8 marks. A small number described finite risk reinsurance rather than financial loss insurance, and therefore performed poorly.

Part (iii) was generally well attempted, however most answers lacked the range of ideas needed to score highly. Better answers included points specific to the financial loss products.

Q10
(i)

Loss Amount	Sum Insured	Loss as % of Sum Insured
1,500,000	8,000,000	19%
450,000	10,000,000	5%
5,000,000	6,000,000	83%
3,600,000	6,200,000	58%
3,510,000	5,500,000	64%
1,320,000	7,700,000	17%
2,090,000	6,000,000	35%
3,130,000	14,600,000	21%
1,250,000	4,200,000	30%
2,990,000	6,600,000	45%

A % of Sum Insured (x)	B Total Value of losses ≤ x% of SI	C Losses > x% of SI (capped at x% of SI)	D Accumulated Losses at x% (B + C)	E Empirical Exposure Curve (D / Total Claims)
20%	3,270,000	9,820,000	13,090,000	52.7%
40%	9,740,000	9,720,000	19,460,000	78.3%
60%	16,330,000	6,900,000	23,230,000	93.5%
80%	19,840,000	4,800,000	24,640,000	99.2%
100%	24,840,000	0	24,840,000	100.0%

1 mark for the first table

2 marks for each column in the second table (B-E)

(ii)

Current Premium = 2.5% x 10,000,000 = 250,000 [1/2]

Proposed Premium Proportion =

$$= \frac{G(80\%) - G(20\%)}{G(80\%) - G(0\%)} \quad [1]$$

$$= 46.88\% \quad [1/2]$$

where $G(x)$ is the empirical exposure curve

Proposed Premium = 46.88% x 250,000 = 117,200 [1]

Alternatively – assuming upper limit taken to be £6m (mark allocation same as above)

$$\text{Proposed Premium} = \frac{G(60\%) - G(20\%)}{G(80\%)} \times 250,000 = 41.15\% \times 250,000 = \text{£}102,900$$

(iii)

Being a small reinsurer, the data sample is fairly limited, hence reducing the credibility of empirical curves. [1/2]

Open Claims/ IBNER – some of the historical claims may not be settled, hence the ultimate claim amount is not known. [1/2]

Claims may not follow the same inflation trend as Sum Insured, hence the relativities from older years might be distorted. [1/2]

Inflation might be different for different loss sizes, in which case the shape of the curve may have changed over the past five years. [1/2]

The historical losses may already have been subject to deductibles and limits hence further adjustment may be needed. [1/2]

The curve may be suitable for only a small homogeneous group of risks (e.g. particular occupancy, construction type and size of risk) [½]

Empirical curves based on EML may be more appropriate for facultative reinsurance risks. [½]

With the lack of other suitable alternatives, the empirical curve might still give reasonable results. [½]

Assumes profit loading remains the same % for different deductibles and limits [½]

It's unclear whether the curve makes appropriate allowance for extreme losses [½]

[Total 15]

Responses to part (i) were mixed, although many achieved full marks. A common error was incorrectly calculating column C in the solution above.

Part (ii) was generally well done. As is standard, full credit was given for a correct calculation even if it used an incorrect exposure curve from part (i).

In part (iii), most gave 1 or 2 of the points above, but answers tended to lack variety and detail.

END OF EXAMINERS' REPORT