

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2018

Subject ST7 – General Insurance: Reserving and Capital Modelling Specialist Technical

Introduction

The Examiners' Report is written by the Principal 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
December 2018

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

1. The aim of this General Insurance Reserving and Capital Modelling Specialist Technical subject is to instil in successful candidates the ability to apply, in simple reserving and capital modelling 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. Candidates who are well prepared generally appear to perform reasonably on ST7, although a number of candidates do not appear to be adequately prepared, or show poor exam technique. The following points are always worth considering to improve performance:
 - 2.1. Lists are hugely valuable for breadth of point generation but candidates should always exercise judgement when applying them. In many instances questions will be specifically designed to render a number of the standard points inappropriate and marks (often generous multiple marks) will be available for identifying and articulating these nuances well.
 - 2.2. Calculation questions will come up on a regular basis within ST7, as candidates can clearly observe from examination of historical papers. Candidates should always be prepared for such staples as balance sheet preparation, triangle manipulations & projections and reinsurance layer calculations (along with being able to carry out any necessary adjustments including inflation, exposure, earning distortion and time period issues). Further, if the examiners cannot follow candidate's logic they cannot give partial credit for incorrect calculations. Therefore a clear audit trail should be left to help secure appropriate method marks where the calculations are incorrect.
 - 2.3. Capital questions should be expected on every paper and represent a sufficient proportion of the course content that candidates should not expect to be able to pass on their reserving knowledge alone. Those who do not encounter capital work in their professional lives should be particularly careful to ensure that they take time to familiarise themselves with this element of the course.
 - 2.4. Candidates should aim to be able to give near exact glossary definitions as incoherent or vague descriptions will not score marks. If candidates struggle to remember definitions verbatim they should take the time to properly analyse the glossary definition to ensure they have fully absorbed all the nuances of the definition.
 - 2.5. It is important to always read the question properly and to answer only what you are asked.

- 2.6. Always assume that question content is there for a reason. If something is pure bookwork, it should be obvious as such as it will generally go straight to a question with little or no specific context. These are the only sorts of questions where you should expect to provide generic answers. Otherwise you will need to make reference to the situation posed in the question to score well. For example if lines of business, types of insurance entity, a specific set of regulatory requirements or anything else is mentioned they have been chosen as they have an impact on the answer. If numbers are mentioned, they are there because we expect you to look at them, think about them and offer some comment or display some ability to notice unusual features of a table of numbers (a key skill for an actuary). Every exam there will be a significant number of candidates who are clearly extremely well prepared, who write very long answers that clearly display all the base knowledge one might require to be able to think intelligently about a question, but they score poorly because the answer is purely generic with no obvious attempt to actually address the question scenarios.
3. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

B. General comments on *student performance in this diet of the examination*

1. Overall the performance was reasonable with a handful of excellent, very high scoring papers. Responses showed that time pressure was an issue for a few candidates who either struggled with completing the papers or rushed the answers.
2. Responses to question 5 were generally somewhat below the good standard seen on the other questions. This was perhaps partly down to time pressure.
3. As usual strong candidates distinguished themselves by linking examples to specifics in the question whereas weaker candidates seemed to repeat learned material often out of context.
4. It was identified that this was an easier paper. Therefore the Board of Examiners agreed the pass mark and marks awarded to all candidates would receive a two mark downward adjustment.

C. Pass Mark

The Pass Mark for this exam was 65.

Solutions

Q1

Likely to have risk XoL in place across all lines of business [1]
 All of these lines are likely to have some large individual limits in place [½]
 . . . although depends on the line & limit profile of the syndicate [½]
 . . . may be smaller if taking small follow participations [½]
 . . . or if writing through delegated authorities [½]

May well have programmes in place that span a number of these lines, subject to reinsurer appetite [1]
 . . . unlikely to have marine XoL included in this as this would be retrocession business [½]

Potentially might have some form of facultative or surplus arrangement in place if there are any particularly large lines in place [1]
 . . . this is likely in the case of energy [1]

May be limited reasons to have quota shares in place [1]
 . . . depending on line sizes vs syndicate size [½]
 . . . need for reinsurer support / expertise [½]
 . . . may be most grounds for marine & energy liability to manage the tail [½]

Very high aggregation potential across these lines of business [1]
 . . . marine XoL will aggregate with all these lines [1]
 . . . also likely to be accumulations between the direct [1]
 . . . e.g. contractors implicated in a platform loss [1]

Will need some form of clash / aggregation protection in place to manage this [1]

Potentially a stop loss might serve a similar function depending on availability and structure [1]

May be limited need for any CAT XoL on most lines depending on locations [1]
 . . . liability unlikely to have CAT exposures [1]

[17, max 7]

[Total 7]

A straightforward question that was generally well answered.

Q2

- | | | |
|-------|--|-------------|
| (i) | Relative expected return (net of fees) | [½] |
| | Riskiness of different investments | [½] |
| | Tax treatment of different investments | [½] |
| | Economic outlook | [½] |
| | Ethical considerations | [½] |
| | Statutory valuation requirements / accounting standards | [½] |
| | Regulatory requirements, including solvency / capital requirements | [½] |
| | Rating agency requirements / views | [½] |
| | Peer behaviour / standard practice in the market | [1] |
| | Risk appetite of investors | [½] |
| | Inflation rates | [½] |
| | Assets available for purchase in the market | [½] |
| | | [6½, max 4] |
| (ii) | An insurer owned by policyholders ... | [½] |
| | ... to whom all profits ultimately belong. | [½] |
| | | [1, max 1] |
| (iii) | Expected low claim frequency. | [½] |
| | 500/50,000 x 50% suggests 0.5% claim frequency | [1] |
| | Claims will usually be reported quickly. | [1] |
| | Retirement will prompt person to make claim. | [½] |
| | Possible that some claims may take longer to be reported, e.g., pilot forgets about insurance (or other reason) | [½] |
| | Claims likely to be settled quickly once reported. | [1] |
| | Determining whether the claim is valid likely to be straight-forward – documentation showing retirement and the reason. | [½] |
| | Possible some claims may take longer to settle, e.g., if there are policy exclusions, and the insurer needs to determine whether these apply | [1] |
| | Benefits are a fixed \$50,000 payment – no need to determine the size of loss. | [1] |

Potential for fraudulent claims, e.g. exaggerate stress levels. [½]
 [8, max 3]

(iv) Increasing the allocation to growth assets will increase long run expected return. [½]

This is likely to be the case even after increased investment fees associated with growth investments (or other comment about fees) [½]

Comments assume there are no unusual tax treatments to consider (or other comment about tax) [½]

This could allow X to fund part of its expenses with investment earnings, and reduce premium rates for members. [½]

Amount of rent saved may exceed the returns available from bank deposits, reducing Insurer X's expense ratio. [1]

This may also help reduce premiums, noting the very high expense ratio, possible due to the small scale of the business. [½]

Compared to the current asset allocation, proposed asset allocation is likely to be associated with:

- a higher risk of capital loss. [½]
- more variable returns. [½]
- higher regulatory capital requirement. [½]
- higher internal capital target. [½]
- lower credit rating. [½]
- accounting treatment of assets may be unfavourable to insurer X [½]
- less liquidity (especially the property investments) [½]

These issues are unlikely to be of significant concern, given:

- the capital position appears to be very strong – assets exceed liabilities by \$110 million, more than 10 times revenue. [½]

- the regulatory capital position appears to be very strong – net assets exceed regulatory minimum capital requirement by \$100 million, or ten times revenue. [½]

- it is unlikely the insurer requires a particular credit rating. [½]

The owners of the business (the policyholders) may not be concerned (or even aware of) short term investment volatility [½]

The new portfolio continues to include large amounts of liquid assets [½]

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The amount of liquid assets in the portfolio appears sufficient given the amount of business written and the nature of the claims [½]

Necessary to consider economic outlook, in general and for each asset class [½]

Insurer may wish to consider peer behaviour, for example, asset allocation of any other insurers catering to the same market [½]

However there is no requirement to follow peer practices [½]

Consider whether suitable assets are available [½]

For example, is the current office accommodation for sale [½]

Consider return on capital target of both portfolios [½]

However it is possible the mutual insurer may not use return on capital metrics [½]

Consider opportunity cost, for example, whether other strategies could be more valuable for members [½]

Consider Board risk appetite, and whether each portfolio is consistent with risk appetite [½]

Comments reflect known information – possible there are other factors which could be relevant to the decision. [½]

The proposed allocation would improve diversification [1]

The current allocation may have a higher concentration with individual counterparties increasing credit risk [½]

The proposed allocation would lead to a mismatch in assets and liabilities in terms of their nature [½]

A currency mismatch may be introduced depending on denomination of assets held in proposed strategy [½]

Suitable conclusion (backed by supporting comments) *1*
[18, max 6]
[Total 14]

Mostly well answered. In (iv) weaker candidates failed to appreciate that with such a huge surplus of assets matching liabilities was largely an irrelevance.

Q3

- (i) Moral hazard refers to the action of a policyholder who behaves differently from the way they would behave if they were fully exposed to the consequences of that action. [1]
- The policyholder behaves less carefully than they would otherwise, leaving the insurer to bear some of the consequences of the action. [1]
- Moral hazard is related to information asymmetry, with the policyholder having more information than the insurer who bears the consequences. [1]
- Specific example of moral hazard, eg policyholder not taking care to lock up house as covered by insurance. [1]*
- Fraud results from deliberate falsification of information either when applying for insurance or making a claim. [1]
- [5, max 4]
- (ii) *Detecting an increase in fraudulent claims*
- Unexpected increase in frequency or cost of claims [1]
- ... particularly if in a specific type of claim while other costs are remaining more predictable [1]
- ... especially if the claim type can be relatively difficult to prove conclusively, e.g. whiplash [1]
- Distortions to normal claim composition, e.g. increase in incidents with multiple passengers in a car all sustaining whiplash injuries [1]
- Emerging geographical hotspots of high activity [1]
- Concentrations from particular law firms or claims management companies [1]
- Re-use of content across multiple claims [1]
- Patterns of discrepancies between claimant recollection of incidents and defendant [1]
- Increase in particular type of incident that could potentially be staged, e.g. low speed collision resulting in whiplash outcomes and high damage [1]
- Unusual behaviour from claimant at time of incident, e.g. vacating scene rapidly with minimal exchange of details and no police involvement in spite of significant subsequent claims [1]
- Suspicious claims characteristics e.g. high damage on low speed collision [1]

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Low quality of supporting evidence provided by claimant [1]

Exaggerated costs for claim components [1]

Changes to nil settlement rates [1]

Red flag / suspicious claim screening processes by claims team [1]

Technology solutions e.g. voice stress analysis [1]

Credit also available for up to 2 other plausible suggestions and up to 2 other appropriate ratios

[20, max 8]

(iii) *How to reduce fraud*

Share data with other insurers / industry databases [1]

Invest in technology, e.g. voice stress systems [1]

Software to detect suspicious claim patterns [1]

Claims screening processes to flag suspicious claims [1]

Increase claims investigations [1]

. . . particularly on claims flagged as suspicious [1]

Take more claims to court [1]

Offer lower value settlement for suspicious claims in expectation that fraudulent claimants won't wish to contest in court [1]

Publicise fraud prosecutions [1]

Educate policyholders re consequences [1]

Phone lines for tip offs [1]

Tighten T&C, e.g. need police report [1]

Lobby Government for tougher penalties [1]

Credit also available for up to 2 other plausible suggestions

[15, max 7]

[Total 19]

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There were far more marks available than points that needed to be made to score maximum marks. In this context answers to (ii) were a little disappointing where too many candidates failed to cover a wide enough range of ways to detect fraudulent claims.

Q4

- (i)
- | | |
|--|-------------|
| Fit for purpose | [½] |
| Adequately documented | [½] |
| Follows professional guidelines | [½] |
| Not overly complex | [½] |
| Flexible | [½] |
| Understandable by managers | [½] |
| Reflects risk profile | [½] |
| Uncertainty should be verifiable | [½] |
| Parameters should be identified and justified | [½] |
| Complete | [½] |
| Appropriate parameters | [½] |
| Can be validated | [½] |
| Rigorous and self-consistent | [½] |
| Sufficiently detailed to deal adequately with key risk areas and capture homogeneous classes of business without being excessively complex | [1] |
| Be capable of being run with changed parameters for sensitivity testing | [1] |
| Use a sufficient number of simulations | [½] |
| Have a robust software platform | [½] |
| | [9½, max 4] |
- (ii) *Advantages of stochastic:*
- | | |
|--|-----|
| Can test a wider range of scenarios | [½] |
| Including those that might otherwise not have been considered | [½] |
| Easier to explore knock-on effects of the crystallisation of a risk event | [½] |
| Can apply a number of different risk measures, so can communicate more information | [½] |
| Regulator may require use of a stochastic model | [½] |
| Different stakeholders may have different risk appetites or be interested in types of outputs (e.g. mean profit, solvency requirement, volatility of results) | ½ |
| Explores all possible combinations of individual stresses, combines and ranks their likelihood (using chosen risk measures), this would be difficult to do alone | [½] |
| Probability distribution of potential outcomes can be derived and confidence intervals can be calculated. | [½] |
| Assumptions are subject to parameter error, but these can be tested | [½] |
| Allow for uncertainty which important when what you are modelling is highly variable | [½] |
| e.g. financial guarantees | [½] |
- Advantages of deterministic:*
- | | |
|---|-----|
| Usually easier to design and quicker to run | [½] |
| More straightforward to quicker to build | [½] |
| Less computation power needed | [½] |

So can introduce more detail, e.g. complex features of reinsurance programmes [½]
 Can intelligently select limited scenarios we are interested in [½]
 Could be more efficient than stochastic scenario where we hope a particular important scenario is generated [½]
 May better model relationships better as can consider cause and effect rather than relying on correlations [½]
 Stress and scenario tests are commonly used for those risks that cannot easily be modelled quantitatively and where more subjective judgment is required. [½]

This allows concentration on the more important areas of the distribution of outcomes for the key risks when a full specification of the distributions is subject to substantial potential error [½]
 Can be integrated more closely with risk management "what-if" analysis and scenario planning [½]
 Can be easily linked to the risk register, integrating it more easily into risk management [½]
 Easy to communicate and give users comfort in their reasonableness [½]
 Especially if design stresses and scenarios in conjunction with users of results which could increase the ownership users would perceive themselves having over the model [½]
 Easier to explain as a concept than probability distributions [½]
 Increased perceived ownership and understanding is likely to lead to the model being more widely used and adopted [½]
 However if the model is more limited than a stochastic model then the uses may be more limited [½]
 Which could potentially lead to the model being viewed as more simplistic than it is and could lead to the model being used incorrectly by other groups, leading to a loss of confidence in the model or poor business decisions [½]
 Good for checking / validating a stochastic model [½]
 Can be used with a stochastic model to provide additional context [½]

[15, max 6]

- (iii) Class groups that the businesses are using elsewhere: [1]
 It is useful to have consistent definitions of classes across the business to avoid confusion when discussing inputs / outputs / results [½]
 The inputs you receive may be on a pre-existing structure so you need to consider the practicality of splitting or aggregating them and the impact of that, for example when looking at reserves or business planning [½]
 Reinsurance programmes will usually apply to specific parts of the book only so it is usually a good idea to modelled these splits as a minimum [½]
- Size of classes: [1]
 Too many classes and the parameter error will be large and the maintenance will be onerous [½]
 Too few classes and model may not be able to help inform business decisions [½]

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Similarity of claim behaviour: [1]
 Correlations with other claims / economy / etc. [½]
 Volatility of results within the proposed class [½]

Purpose of model: [1]
 If the model will be used as part of any targets for remuneration it is important to consider who is underwriting the different classes [½]
 The model may be used to compare plans to risk appetite, so results would need to be able to be available at this level [½]

Sophistication of the model may constrain class groupings [1]
 Regulatory requirements [½]
 [10, max 4]

(iv) *Things that will be material:*

Correlations are important in any model as they decide how likely it is that extreme individual events happen together [1]
 The company is planning to write property in the US and so it is likely that catastrophe model inputs will be material [1]
 As the company is new, writing in catastrophe areas, has limited assets, it is likely that they will want to purchase a large amount of reinsurance so reinsurance programme inputs will be material [1]
 Business plan (including projected premiums, claims and expenses etc) is likely to be material so that any premium concentrations are known as if a material amount of premium is concentrated in one area, this could lead to that area becoming a key driver of risk [1]
 Parameters for attritional and large losses are likely to be material as these (other than catastrophe loss payments) will be the main expected outflows [1]
 Liquidity risk inputs could become material due to new business strain depending on cashflow expectations [1]
 Operational risk parameters could become material in some areas as a new firm is likely to be small so there will quite high dependence on key team and personnel. [1]
 However this should reduce over time [1]
 Capital requirements [1]
 Assumed currency exchange rates and fluctuations [1]
 Tax [1]
 Economic drivers [1]

Things that won't be material:

Reserves will not be a material input as the firm is new [1]
 Will become more material over time but property is generally short tail and less volatile than lines such as casualty [1]
 Investment inputs are not likely to be material as the company has few assets to invest [1]
 [15, max 6]

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- (v) Board/Management [½]
 - use of model is likely to depend on how brought into the model the Board are, if they aren't brought in then other areas of the business are unlikely to engage [½]
- Underwriting/Pricing teams [½]
 - the model is only as good as the parameters that go into it, without gaining knowledge from the underwriting teams on the business they are writing it is unlikely that the outputs will reflect the business [½]
- Reinsurance team [½]
 - if the company purchases a reasonable amount of reinsurance, it is likely that the reinsurance will have a material impact on the final capital result [½]
 Reinsurance purchasing is often a key model use and to do this well, data from this team will be needed in advance [½]
- Reserving/Claims teams [½]
 - these teams are likely to provide all of the reserving parameters and so it will be important to develop a good relationship to ensure timely parameters, they are also likely to have a good understanding of cashflow timings which can be used to help assess liquidity risk [½]
- Finance/Investment team [½]
 - the model can be used to understand the impact of different business mixes on capital requirements [½]
- The Risk team [½]
 - are often involved in the validation of the model and so it is important to get their buy in so that the validation processes is smooth and that there aren't surprises. [½]
 The risk team will also have a good understanding of key and emerging risks in the business so can be useful in understanding any areas where your model may have gaps [½]
- IT team [½]
 Capital models require specialist software and can require high spec machines. Buy-in from IT should enable the team to purchase compatible software. [½]
- Regulators [½]
 Many regulators now require companies to undergo stochastic modelling and it is good business sense to clarify what the regulator expects in detail. [½]
 [9, max 5]
[Total 25]

This question was well answered overall.
Part (iii) was a weak spot for some candidates who focussed on theoretical issues rather than considering practicalities such as classes used elsewhere in the business and the size

of classes and hence the availability and reliability of the data. On the other hand most answers to part (v) did demonstrate that candidates appreciated the realities of using such models in practice.

Q5

- (i) The event giving rise to a claim for damage to buildings or contents usually occurs suddenly (as for fire or burglary) and the cause is easily determinable. [½]
- Notification is then also made promptly [½]
- A reasonably good estimate of the claim amount can be made when the claim is notified. [½]
- Subsidence claims are an exception to this. [½]
- Settlement is in many cases by a single payment. [½]
- Larger claims can take longer and may be settled with intermediate payments [½]
- For example, as the building project to repair or replace the building proceeds. [½]
- Delays may be greater where it is necessary to verify the value of an insured asset, for example, household valuables. [½]
- Domestic property claims will tend to be fairly consistent in size and distribution. [1]
- There will be a large number of relatively small claims. [½]
- There will be a small number of larger, total-loss claims. [½]
- There may occasionally be liability losses. [½]
- Accumulations can occur. [½]
- Claims tend to experience seasonality. [½]
- Claims are exposed to various different inflationary pressures. [½]
- This class is also exposed to moral hazard (fraudulent claims). [½]
- There is also the risk of exposure to catastrophe, for example, after severe storms or floods. [½]
- [8.5, max 5]
- (ii) Computer capabilities are constantly increasing. It is possible a computer system could be developed to process all claims. [1]
- If this is not possible now, it may be possible in the near future. [½]
- Some household claims appear relatively simple to automate [1]

For example, there are a large number of claims for small, known amounts [1]

The methods currently applied by claims staff to assess such simple claims could be programed into the computer, which would apply those rules instead of staff. [1]

You would include rules to identify possible fraudulent claims. [1]

The process will be subject to audit (5%) of claims, and computer algorithms can be revised if systemic issues are identified. [1]

Even if there are a high volume of referrals to a claims handler initially, there should be scope to reduce this over time [1]

For example assessment of frequently rejected claim types [1]

Success depends on the quality of the software selected, and other insurer factors (for example, staff training) [1]

Large or unusual claims are likely to require more judgement [1]

It may take time to determine the insurer's liability, and the amount to be paid. [1]

The individual circumstances of the claim may need to be considered in detail. [1]

It will therefore be more difficult to develop software which will appropriately assess these claims. [1]

There will likely continue to be significant human involvement for large or unusual claims. [1]

The computer could still be used to apply initial checks, for example, that the policy is in force, and the claim relates to an insured peril. [1]

For example, liability claims are likely to require individual assessment. [1]

Computer support may be particularly helpful following catastrophe events, to help the insurer deal with large numbers of claims. [1]

In conclusion it is likely that a high proportion of claims can be assessed automatically, however there will be human involvement for large or unusual claims. [Or other conclusion with supporting reasons.] [1]
[18.5, max 7]

(iii) ***(a) Average time taken to pay claims***

Should be faster claim adjudication process, if the new system works as intended. [1]

However claim payment speeds could be slower for a range of reasons [1]

System failure, i.e. not working as intended [1]

High proportion declined incorrectly, which are then resubmitted increasing overall time to payment [1]

Number of staff maintained may not be sufficient to review the claims which are rejected, or require audit [1]

Even if claims are determined quickly, insurer may decide not to actually pay the policyholder sooner (for cashflow reasons / marginal investment return benefit). [1]

Overall impact can go either way [1]

(b) Policyholder satisfaction

May be no impact – change in insurer “back office” processes may not be apparent to customers [1]

May increase satisfaction due to:

- Faster adjudication of claims [½]
- More consistent adjudication of claims [½]
- Fewer errors [½]

May reduce satisfaction due to:

- Slower adjudication (if system not working as planned) [½]
- More errors in claim decisions (if system not working as planned) [½]

- Some customers may prefer to speak with claims staff, and be dissatisfied if this is no longer possible [½]

- Possible bad publicity for insurer due to redundancy of claims staff [½]

- Insurer needs the ability to deal with large numbers of claims following a catastrophe event [½]

- This may be enhanced by the use of the software, for example, possibility to run software on multiple computers at peak times [½]

- Alternatively loss of human expertise (fewer claim staff) may reduce ability to respond [½]

(c) Profitability

Depends on how the cost of operating the computer system compares to the savings due to fewer claims staff [1]

Would also need to consider other differences in operating costs [1/2]

E.g., less office space required (or other example of cost saving other than wages) [1/2]

There may be some additional ongoing costs, for example, extra IT staff (or other example of additional cost, other than IT hardware/software) [1/2]

Reasonable to assume ActSure has introduced system because it expects it to lower operating costs [1/2]

Although main reason for introducing could have been to improve customer service [1/2]

May have decided to use savings to reduce premium rates (to be more competitive) rather than increase profits in the short term. [1/2]

e.g., because proportion of claims processed electronically is lower than expected (or other reason) [1/2]

New system may provide superior analytics to business, providing further opportunity to increase profits. [1/2]

System may allow claims staff to focus on the most material claims (because smaller claims are automated) [1/2]

This may result in a better financial outcome. [1/2]

There may be more fraudulent claims than before, reducing profitability [1]

Alternatively, new systems may be better at detecting fraud than claims staff [1/2]

Business case for computer processing may have allowed for some additional fraud, and found the initiative to still have potential to increase profitability. [1/2]

If there is an impact on customer satisfaction this would also ultimately impact profitability [1]

For example, if system leads to dissatisfied customers, retention rates (and therefore profits) may decline (or other example). [1/2]

[22.5, max 9]

- (iv) A statistical method of estimating outstanding claims, whereby the weighted average of past claim development is projected into the future. [1]

The projection is based on the ratios of cumulative past claims, usually paid or incurred, for successive years of development. [1]

These ratios are referred to as development factors. [½]

If appropriate, the method can be applied to past claims data that have been explicitly adjusted for past inflation. [½]

Further variations on this original theme are now in wide usage. [½]

Development data (based on past experience) is tabulated in the form of a run-off triangle or development table. [1]

The rows of the triangle correspond to the years (or other period) of origin, whose definition will depend on the choice of cohort. [½]

The columns of the triangle correspond to the claims development period [½]

The claims development is usually cumulative (that is, total claims for cohort accumulated to development period). [½]

The key assumptions underlying the chain ladder method are:

The assumed pattern of development derived from past experience will remain appropriate in the future. [1]

The first cohort is fully run-off, or that its development to an ultimate position can be predicted with some confidence. [1]

If the latter is the case, a “tail factor” will be required. [1½]

Where the triangle used is unadjusted for the inflation which is present in the data, the method builds in an implicit assumption that a weighted average of past inflation will be repeated in the future. [1]
[9.5, max 6]

- (v) Claim processing changes likely to mean that historical development speeds are no longer a reliable indicator of future payment speeds. [1]

Therefore need to either adjust the chain ladder method to allow for the change in claim processing approach [1]

And/or use an alternative method to estimate outstanding claims [1]

Adjustment of development factors

Change is effective 1 January, so there may be no data available to observe the impact on claim payment speeds [1]

The estimate of 31/12/18 outstanding claims may not be needed until later in 2019 [½]

If the final estimate is not required until, say, February or March, the actuary could wait until some experience is available, and consider whether this should be reflected in the outstanding claim estimate [½]

The actuary could prepare a draft estimate as usual, and then update once further information is available [½]

This approach will not be practical if estimates are required shortly after 1 January [½]

Identify how much of the total time between a loss occurring and a payment is due to reporting delay, and how much reflects the time taken by the insurer to assess the claim [1]

Reasonable to assume reporting times will be unchanged, and actuary can estimate impact on payment speeds. [½]

Consider whether Actsure has estimated the impact on payment speeds [1]

For example, as part of business case for IT investment, Actsure may have estimated the proportion of claims that will be processed by the computer, and the time savings [½]

Trials of the computer system may have been performed, which could provide insights for the outstanding claims assumption [½]

Note it is the value, not the number of claims, which is important for adjusting outstanding claims assumptions. [1]

The computer may process a high proportion of claims by number, but a much lower proportion by value if complex claims are still to be adjudicated [½]

The actuary will need to consider whether any estimates provided by the company are reasonable [1]

The actuary may decide to adjust the estimates provided, or include margins. [½]

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Actsüre writes multiple lines of business. Consider whether this technology has previously been used by Actsüre for other classes, and what the experience was. [1]

Consider whether experience is available relating to similar changes made by other insurers. [1]

If the above information is not available, actuary may need to develop an estimate of payment speed impact [½]

This could be done by interviewing staff or reviewing computer specifications, and estimating the impact on assessment and payment speeds [½]

The actuary can make an adjustment to the historical development patterns based on this information. [1]

The household claims data can be split into homogenous groups before applying the chain ladder method. [½]

The actuary should identify the extent to which each of the groupings will be impacted by the change. [1]

For example, subsidence claims may be reviewed separately. The actuary may decide no adjustment is appropriate for those claims, if the claims assessment process is unchanged. [½]

For example, the change in processing speeds will likely be greater for groupings of small, simple claims, as a high proportion will now be assessed by computer. [½]

The actuary can prepare a range of outstanding claim estimates using different methods and assumptions. [1]

The range of estimates will demonstrate the uncertainty arising from the change in assessment processes [½]

This will help to ensure the level of uncertainty is clearly communicated to the Board [½]

Level of analysis will depend on whether the outstanding claims for this class of business is material to Actsüre's overall financial results. [1]

Change may not be material if this is a relatively small class of business for Actsüre. [1]

[23, max 8]
[Total 35]

Answers to this question were well below the standard seen on the other questions with many answers to part (v) being particularly poor.

Part (i) was knowledge based and answered reasonably well.

Part (ii) was not well answered with many candidates failing to secure even half marks despite the significant number of marks available for relevant observations.

Part (iv) was knowledge based and well answered.

In part (v) the best candidates used the knowledge tested in part (iv) to generate lots of valid observations. Specifically they looked at which of the key assumptions underlying the workings of the basic chain ladder method would now be compromised. Unfortunately most candidates did not do this and scored very low marks.

Candidates would do well to remember that parts of the same question are usually related. Bearing this in mind should lead to more balanced and complete answers than simply considering each part of the question in a silo.

END OF EXAMINERS' REPORT