INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2017

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.

Luke Hatter
Chair of the Board of Examiners
July 2017

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).

   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.

   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, i.e. 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 because the answer is purely generic with no obvious attempt to actually think they score poorly.

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

1. Overall the performance was reasonable with some very good papers. Responses showed that time pressure was as issue for a few candidates who either struggled with completing the papers or rushed the answers.

2. Responses to question 8 were generally poor given the basic skills being tested and the number of marks available for some basic calculations and observations. A number of students completely ignored motor bodily injury claims. A number wrote about how to reserve for individual large losses (rather than how to allow for them in the overall reserving exercise). Very few candidates were able to understand or apply the ACPC method.

3. The questions on proposed regulatory regimes in question 7 were poorly answered by most candidates. A number of candidates failed to comment on the drawbacks of the regimes so missed out on a number of easy marks. Generally there was insufficient idea generation to score well.

4. The balance of the paper was generally answered well, particularly the bookwork questions. Strong candidates were able to differentiate themselves by linking examples to the specifics in the question (particularly in questions 4, 5 and 6) although there were a number of candidates who did not understand the reserving cycle. Question 6 was the best answered question on the paper.

C. Pass Mark

The Pass Mark for this exam was 61.

Solutions

Q1 The substitution of one party for another as creditor, with a transfer of rights and responsibilities. [1]

It applies within insurance when an insurer accepts a claim by an insured, thus assuming the responsibility for any liabilities or recoveries relating to the claim. [½]

For example, the insurer will be responsible for defending legal disputes and will be entitled to the proceeds from the sale of damaged or recovered property. [½]

[Max 1]

> A number of students struggled with this question which was straightforward bookwork. Many candidates were trying to describe salvage rather than subrogation.

Q2 Pros:

- Ease of access to Asian market in a relatively short timeframe [½]
- Diversificaion credit for writing business in Asian market [½]
- Use of Lloyd's licence to access markets which might otherwise be inaccessible (e.g. China) [½]
- Lloyd's name (and Central Fund) potentially giving access to risks which might otherwise be unattainable (e.g. if EComProp is considered too small or insecure individually) [½]
  …due to strong credit rating [½]
  …and/or strong brand [½]
- EComProp can make use of expertise of others… [½]
  …by being part of the follow market (rather than lead) – subscription market [½]
  …by being able to consider other areas for diversification both geographically and to other lines of business [½]
  …by being managed by a turn-key managing agent [½]
- *Additional marks for other sensible comments (½ each) [1]*

Cons:

- Set up of a Lloyd's Syndicate is unfamiliar to EComPop … [½]
  …it will take at least 3 years before they can control its own managing agency [½]
  …Lloyd's are likely to place restrictions on the amount of business the Syndicate can write which may not be in line with the strategy [½]
  …there will be a time delay whilst they obtain Franchise Board approval [½]
  …there are costs associated with setting up the new Syndicate [½]
  …the accounting system at Lloyd's will be different to experience (e.g. Open Years of Account and SAOs)
- There are risks associated with diversifying into a new area if EComProp do not have sufficient expertise [½]

- The capital requirements at Lloyd's may be more stringent than EComProp are currently maintaining… [½]
  …Syndicate's must hold an uplift to UK capital requirements to maintain the overall Lloyd's credit rating [½]
- Additional currency risk [½]
- Potential additional catastrophe exposure (not understood) [½]
- Reinsurance may not be readily available [½]
- Additional marks for other risks (claims, legal, operational, political – ½ each) [1]
- Potential for increased regulatory burden [½]
- May be tax implications in market [½]
- *Additional marks for other sensible comments (½ each) [1]*

[Max 5]

> This was well answered by the majority of students. Some students demonstrated a lack of understanding about the Lloyd's market. Others concentrated more on the benefits of diversifying as opposed to the benefits of using this particular approach to diversify.

Q3 Exclusions are clauses to limit the circumstances in which a claim can be made… [½]
…SportInsure will be aiming to limit its risk to injury sustained during and as a result of specific international matches only. [½]

Key exclusions and restrictions include:

- Injury caused by sickness, disease or any naturally occurring condition… [½]
  …to avoid rehabilitation costs outside of the match itself. [½]
- Players with a recurrence of an injury within a specified timeframe… [½]
  …or who arrive for international duty already injured [½]
  …as otherwise MCs could send partially injured players in the hope that SportInsure will cover the costs of rehabilitation [½]
- Coverage restricted from reporting for training for the match to end of match only... [½]
  …excluding any injury sustained in leisure time (e.g. paying MegaBall on the beach) [½]
  …and to avoid claims for injury once player has returned to their MC or when not directly preparing for MegaBall match. [½]
- Basis of indemnity restricted to rehabilitation costs and salaries only… [½]
  …any impact on future sales, sponsorship, television rights, position in league tables etc. should be excluded as the impact is likely to be ambiguous [½]
- In the event of a career ending injury, cost restricted to rehabilitation cost plus salary within players contract (including agreed value of any bonuses)… [½]
  …additional impact on future sales, sponsorship, television rights, position in league tables etc. again should be excluded as likely to be covered by separate insurance contract [½]
- Exclusion related to reckless injury or due to deliberate player action [½]
  …e.g. player is involved in an on the pitch brawl and is injured in the aftermath [½]
- Introduction of excess and/or upper limit to claim amounts [1]

- Use of agreed clinics for treatment [½]
- 3rd Party sign-off of injury and treatment [½]
- Claim notification period [½]
- Restrictions on equipment (safety gear) [½]
- Aggregate exclusions (e.g. terrorist activity, entire team accident etc.) [½]
- *Additional marks for other sensible comments (½ each) [1]*

[Max 6]

> Well answered by most students who were able to think widely and generate a number of points.

Q4 (i)

Too much risk written in one particular area… [½]
…reduce large exposures to loss event impacting geographical area. [½]
Too much risk of one particular type has been underwritten… [½]
…for example giving rise to claims arising from same economic event. [½]
…such as a concentration of risk to one industry [½]
…or a concentration of risk to one product subject to a regulatory change [½]
…or a concentration of risk within a particular demographic exposing to pandemic / epidemic [½]
…or a concentration of risk for a particular supply chain [½]
Risks where claims may arise under different classes of business... [½]
…such as an explosion that gives rise to losses across marine and property.[½]
Inward reinsurance should be considered alongside direct as possibly common exposures. [½]
Additional marks for other sensible comments (½ each) [1]

[Max 3]

(ii)

Availability of reinsurance. [½]
Opportunities available to find co-insurers. [½]
Perceived value for money of additional reinsurance... [½]
...modelling may indicate more capital efficient to retain risk [½]
Security status of the available reinsurers. [½]
Regulatory environment… [½]
...in particular any reduction in statutory capital requirements. [½]
Underwriting cycle [½]
Inflation rates and uncertainty [½]
Scope of cover available [½]
Availability of alternatives to reinsurance [½]
Broker relationships impacting cost / placement [½]
Cost of capital [½]
Economic conditions (level of free reserves) [½]
Potential currency considerations [½]
Potential for tax advantages [½]

[Max 3]

(ii) Important consideration is the extent of group support – may need little in the way of reinsurance… [1]
...particularly if little correlation with business written by parent company. [½]
Exposed to large weather events e.g. US hurricane so cat XL protection important… [1]
…and may consider need for aggregate XL [½]
Should determine if protection is just for US or both countries depending on cat exposures. [½]
New company so likely to use quota share to reduce capital strain... [1]
...particularly if this is a new class of business to the group. [½]
Unlikely to use surplus treaties as risks are generally small… [½]
...although risk XL may be purchased to protect against large individual losses. [½]
Facultative protection could be time consuming to negotiate and given risks small may not be appropriate. [½]
Financial reinsurance unlikely to be appropriate given simple product & cost [½]

[Max 5]
[Total Max 11]

Part (i) – candidate responses were generally good. Discussion of the types of reinsurance to buy were not relevant to this part. Reading the whole question before writing anything would have revealed that this aspect should have been saved for part (iii).

Part (ii) was again generally answered well. Some candidates appeared to be answering a question about the market conditions that might influence the pricing of the underlying product rather than of the decision about reinsurance purchase.

Part (iii) was still generally well answered but started to differentiate the better candidates who thought about being part of a group, the characteristics of the products and the company from those who just listed all types of reinsurance possible.

Q5 (i) Underwriting Cycle is the process occurring over a period of years where premium rates for a given class of business oscillate… [½]
…between a high level at the top of the cycle (a "hard market") where the business written is typically profitable… [½]
…and a low level at the bottom of the cycle (a "soft market") where the business written is typically unprofitable. [½]

The process of the underwriting cycle is as follows:

In a hard market, where premium rates are high and the business written is typically profitable premium rates tend to fall as: [½]

- additional capacity enters the market in order to gain a slice of the profitable business… [½]
  …thus increasing supply and therefore putting pressure on rates to fall) [½]

- existing insurers cut rates in an attempt to increase their own market share of this profitable business [½]

This process continues until premium rates have fallen to a level where they are no longer sustainable and the business written no longer proves to be profitable (the soft market). [1]

At this point, rates begin to harden as insurers either withdraw from the market (thus reducing capacity/supply and putting the pressure on rates to rise)… [½]
…or those that remain typically start to increase their rates [½]
The speed at which the bottom of the cycle is reached and rates begin to harden is often increased by external factors… [½]
…such as large catastrophe claims, which can reduce profitability and increase the pressure on rates to harden [½]
…*Additional marks for other sensible examples of external factors (½ each)* *[1]*
…and speed may vary by class of business / region [½]
[Max 6]

(ii) Reserving Cycle is highly correlated with the Underwriting Cycle [½]

Reserve Cycle shows, in the soft market, incurred claims development patterns are slower to develop (or longer tailed) than in a hard market… [½]
…so an unadjusted projection can underestimate ultimate claims in a soft market (and equivalently overestimate them in a hard market) [½]

Potential reasons include:

- effect of weakened terms and conditions [½]
- an increasing tendency to dispute claims [½]
- business plan optimistic [½]
- increased tendency for writing multi-year contracts [½]
- a possibly less conservative approach to case reserving when results are worse [½]
- a less conservative approach to reserving basis to artificially inflate profitability of business [½]
- *Additional marks for other sensible comments (½ each)* *[1]*

[Max 3]

(iii) Trends in Ultimate Loss Ratios observed:

- 2008–2009 YoA ULRs stable for the past three years but all subsequent YoAs have improved… [½]
  …potentially reflecting the benign claims experience but could be change in reserving basis which needs to be investigated [½]
- Peak in ULR during 2012 increasing from 2008 suggests potential impact from Financial Crisis… [½]
  …and/or changes in business written / mix which need to be understood [½]
- ULRs from 2013 onwards reducing with trend ongoing to 2016… [½]

…in the context of a softer rating environment, selections should be justified against changes in pricing and/or business written [½]

- Overall shape ULRs providing evidence of underwriting cycle which should be considered in selections. [½]
- *Additional marks for other sensible comments (½ each) [1]*

Discussions with stakeholders required:

- Reserving actuary should discuss with underwriters…
  …needs to understand what types of liability business has been written (e.g. PI, EL, PL etc.)… [½]
  …as well as different geographical locations (e.g. US vs UK)… [½]
  …as they likely would exhibit different claims characteristics. [½]
  …needs to understand changes in T&C, deductibles etc. over time to adjust for profitability / coverage as well [½]
- Reserving actuary should discuss with claims… [½]
  …to understand any changes in case reserving strength so trends are not misinterpreted / can be adjusted for [½]
  …to understand any large claims or prospective claims which should be allowed for specifically within analysis [½]
  …to discuss cause of benign claims development (industry wide issue, specific to Monoline or otherwise) [½]
- Reserving actuary should discuss with pricing… [½]
  …to obtain rate indices and plan loss ratios… [½]
  …including bridging from one year to the next including claim inflation, pure rate, underwriter impact etc. so reasonableness of loss ratio progress can be assessed in this context [½]
  ..,to understand pricing basis in order to allow for consistency [½]
- Reserving actuary should discuss with management/finance… [½]
  …to understand any strategic changes in business written… [½]
  …including adequacy of data (historical issues with data)… [½]
  …and changes in reserving basis / strength over time [½]
- *Additional marks for other sensible comments (½ each) [1]*

Any allowance for the underwriting / reserving cycles:

- Use of rate index deriving IELR for credibility method… [½]
  …caution in selection of appropriate index as typically only available for renewal business so need to consider differences between new/renewal [½]
  …indices can be constructed based on subjective information [½]
  …allowance for T&Cs, limits, deductibles also impact profitability but may not be reflected in indices but reflect phases of underwriting cycle [½]
  …as the market hardens, insurers remove or reduce the more optional (and often expensive) parts of the cover, and these then gradually come back in again as the market softens. [½]
  …In an ideal world any rate index should attempt to take account of these changes, which are inevitably more difficult to quantify than pure changes in the premium charged. [½]

- The reserving actuary should consider the qualitative as well as quantitative information about the position in the underwriting / reserving cycle when making their selections… [½]
  …as well as questioning underwriters on the profitability of the business and changes in business written (including T&Cs, limits etc.) [½]
- *Additional marks for other sensible comments (½ each) [1]*

[Max 6]

[Total Max 14]

Part (i) was well answered in general by prepared students. A sufficient level of detail needed to be provided and some answers fell short of this.

Part (ii) – the stronger candidates knew what the reserving cycle was and scored well. However, a number clearly didn't understand the reserving cycle.

Part (iii) – whilst the stronger candidates were able to generate a wide range of points, responses to this question were weak in parts. It was surprising that many students did not identify that there was an underwriting cycle which peaked at 2012 given the early part of the question and the information provided. Some students focussed more on what the reserving actuary might consider when reporting her results rather than the information she would need in order to do the reserving exercise. Not many listed the stakeholders let alone described the discussions and responses to (c) were weak.

Q6 (i) Insurance risk... [½]
...risk of loss arising from the inherent uncertainties about the occurrence, amount and timing of insurance liabilities, expenses and premiums. [1]
… split between underwriting, reserving, cat risk [½]
Market risk… [½]
…risk that, as a result of market movements, a firm may be exposed to fluctuations in the value of its assets or the income from its assets. [1]
Credit risk… [½]
…risk of loss if another party fails to meet its financial obligations, or fails to perform them in a timely fashion. [½]
Operational risk… [½]
…risk of loss resulting from inadequate or failed internal processes, people and systems or from external events [½]
Liquidity risk… [½]
…risk that a firm is unable to meet its obligations as the fall due as a consequence of having a timing mismatch or a mismatch between assets and liabilities. [½]
Group risk… [½]
…risk that a firm experiences from being part of a group as opposed to being a standalone entity. [½]

[Max 5]

(ii) Most common method is to produce operational risk scenarios… [½]
…material operational risks (within risk register) discussed during a brainstorming session to directly derive an operational risk capital charge at particular confidence levels. [1]
Stochastic techniques used infrequently as firms rarely have enough history of extreme operational failures in order to utilise stochastic methods…. [½]
…Instead judgements made about degree of loss that each risk may give rise to, the type of event that may cause the loss and the frequency of such a loss occurring. [1]
…In addition, we may consider each loss gross and net of any mitigating controls. [½]
Broad-brush measures (setting an operational risk capital charge to be a defined percentage of other risk charges) are not generally accepted… [½]
…as this does not demonstrate a thorough assessment of operational risk. [½]
Marks available for description of statistical methods used (at markers discretion) [1]
[Max 3]

(iii) Administration risk... [½]
...risk of error or failure associated with the administrative aspects of firm's operations… [½]
…heightened for PersonalCo due to recent acquisition (integrating different systems)… [½]
…risk also increased for PersonalCo as a result of new business lines being written so risk of adequate information not being captured… [½]
...risk increased for PersonalCo as a cross European operation so administrative aspects complex (potentially different requirements for different territories) [½]

Compliance risk... [½]
...risk of non-adherence to legislative and internal firm requirements. [½]
…risk increased for PersonalCo as a result of new business strategies which may not be fully embedded and processes / requirements may not be known [½]

Event risk... [½]
...significant event that occurs and has significant impact on firm's operations. [½]
…for example a natural disaster closing PersonalCo's offices where the claims staff are based meaning claims cannot be processed and resulting in reputational damage [½]

Fraud risk... [½]
…risk associated with the deliberate misappropriation of funds. [½]
…increased risk for PersonalCo who have a change in management (new team) and additional personnel (new business line personnel) changes so may be gaps which need to be filled [½]

Governance risk... [½]
…risk associated with senior management not effectively performing roles.[½]
Strategic risk… [½]
…risk arising from the inability to implement appropriate business plans and strategies, make decisions, allocate resources or adapt to changes in the business environment [½]
…both Governance and Strategic are an increased risk for PersonalCo who have an entirely new management team who have embarked upon strategic change which has not yet been evaluated [½]

Technological risk… [½]
…risk of error or failure associated with the technological aspects of its operations [½]
…as well as increased risk given new acquisition outlined above, PersonalCos business is high quote volume and in the public eye and likely to be highly reliant on technology (i.e. website sales, quote systems, rating as well as claims recording etc.) as a result, damage associated with technological risk high [½]

Pension scheme risk… [½]
…risk that the firm is required to make good any shortfall in pension scheme assets relative to its liabilities [½]

Additional Marks available for name of other risks (½ each) [1]
… Additional Marks available for description of other risks (½ each) [1]
… Additional Marks available for reason for other risks (1 each) [2]

[Max 8]
[Total Max 16]

This was the best answered question on the paper.

Part (i) was bookwork that was well answered by most candidates although some listed the risks with no description so lost easy marks.

Part (ii) – better prepared candidates answered this question well however a number failed to mention risk registers and considered broad brush methods to be appropriate.

Part (iii) was answered well by most with the better prepared candidates being able to generate a wide number of ideas linked to the question specifics. The worse prepared candidates failed to link to the specific business situation in the question.

Q7 (i) To correct market inefficiencies and to promote efficient and orderly markets [½]

To protect consumers of financial products [½]
To maintain confidence in the financial system [½]
To help reduce financial crime [½]

[Max 2]

(ii) Restrictions on the type / amount of business a general insurance company can write / classes of business it is authorised to write. [½]

Initial authorisation of new insurance companies. [½]

Limits on premium rates that can be charged. [½]
Restrictions on information that may be used in underwriting and premium rating. [½]

The requirement to deposit assets to back claims reserves. [½]

The requirement to maintain a minimum level of solvency. [½]

Restriction on the type or amount of certain assets allowed to demonstrate solvency. [½]

Restrictions on the currency, domicile and duration of assets allowed to demonstrate solvency *(or mismatching reserves).* [½]

The use of prescribed bases to calculate premiums, asset values and liabilities to demonstrate solvency. [½]

Licensing agents to sell insurance and requirements on the method of sale. [½]

The requirement for risk-based capital calculations & ICA analyses. [½]

Requirement to pay levies to consumer protection bodies. [½]

Legislation to protect policyholders should general insurance companies fail, e.g. Financial Services Compensation Scheme. [½]

Cooling off period, e.g. fourteen day cancellation rules on policies issued. [½]

Regulations with respect to treating customers fairly. [½]

Restriction on countries a general insurance company can write business in. [½]

Restrictions with respect to anti-competitive behaviour. [½]

Requirement to file / publish premium rates before they can be used. [½]

Mandatory restrictions on cover e.g. no deductible on EL. [½]

Requirements to offer cover e.g. even in high-risk flood areas / motor 3rd party liability. [½]

Statutory requirement to purchase certain cover e.g. EL & Motor 3rd Party Liability. [½]

Disclosure / transparency of reporting requirements. [½]

Requirement for a Statement of Actuarial Opinion to be produced by an approved actuary. [½]

Requirements for management to be fit and proper. [½]
Restriction on the type of reinsurance that may be used. [½]

Restriction on discounting of liabilities and discounting rates that can be used. [½]

Prohibiting illegal products from being sold. [½]

Custodianship of assets [½]

Prevention from holding certain assets [½]

Prescription to hold certain assets [½]

Requirement for general insurance companies to be audited. [½]
[Max 8]

(iii) This is a very low cost approach as it uses information that is already available in the audited accounts… [1]
… which may be welcomed by a small industry that may have little appetite for high regulatory costs or onerous regulatory regimes… [½]
…but it appears to offer no protection above that provided anyway as part of the company's reporting and accounting requirements. [½]

Whilst the cost of this approach may appear low they need to consider the potentially large cost to the industry of industry and regulatory failures… [½]
…the requirement to use audited accounts ensures that they represent a true and fair picture of the company's financial state… [½]
…but this may leave considerable freedom on the exact basis used to value the assets and liabilities… [½]
… making it difficult to ensure consistency and compare the relative level of solvency of market participants. [½]

Though a regime similar to SII can be complex and costly particularly if companies elect to assess capital using a full internal model… [½]

… such a regime also provides for a simpler and more cost effective approach for smaller companies which is still consistent with the overall aims… [½]
…e.g. use the standard formula approach if their risk profile permits. [½]

The proposal does not require any assets be held in excess of the value of the liabilities as a margin to protect against the risk of experience turning out worse than expected in the basis used by the accounts… [1]
…which increases the risk of insolvency and may reduce the amount available for distribution to policyholders on insolvency. [½]

There are no restrictions on the assets that can be held to back the liabilities… [½]
…which may result in inappropriate levels of concentration risk, liquidity risk and mis-matching risk. [1]

A new and rapidly growing market is at risk of growing in an uncontrolled and disorderly manner leading to poor underwriting and risk practices… [½]
… a sound and comprehensive regulatory environment may mitigate some of this risk. [½]

Regime does not ensure continuous solvency (or facilitate timely intervention) [½]

Retrospective (rather than prospective) regime [½]

May not attract investment [½]

No incentive to manage risk [½]

Same criteria for insurers / reinsurers [½]

Ignores risks faced by individual companies (market, operational etc.) [½]

Ignores volatility of insurance vs reinsurance [½]

Does not take into account diversification by class / riskiness of classes [½]
[Max 6]

(iv) Measure 1:

As this measure aims to made good any policyholder shortfall on insolvency it reduces the risk that policyholder liabilities will not be met. [½]

The levy seems to have so upper limit which could make it very costly... [½]
… and it is unclear what happens if the levy for a particular year proves to be inadequate… [½]
e.g. insurers have to make good the shortfall or deficit is borne by the policyholders. [½]

Having the same percentage levy for premiums and reserves has the benefit of simplicity… [½]
…though it may be more appropriate to have a different change for premiums and reserves. [½]

The fees for start-up insurers may be too low relative to their risk of insolvency as they are likely to have relatively low levels of premiums and reserves… [½]
…but could carry a relatively high risk of insolvency being a new company in a regime that does not require a minimum solvency margin. [½]

As the levy is set in advance insurers will know the annual cost in advance and can be plan accordingly… [½]
… but this requires an estimate of the expected annual cost… [½]
… which may lead to the fee being excessive or inadequate. [½]
The insurance industry may not have the ability or desire to indemnity the cost of insolvency failures of their competitors… [½]
… and the existence of the scheme might act as deterrent to potential new market entrants. [½]

Additional marks for other sensible comments (½ each) *[1]*

Measure 2:

It is doubtful if they could find a reinsurer to offer this type of cover at acceptable premiums and terms… [½]
…as the reinsurer would effectively be providing stop-loss cover to each participant in the industry…
…including those who may have just assets equal to liabilities… [½]
…and covering all types of risk including operational and business risks. [½]

This may solve the problem of having no upper limit on the cost… [½]
…as the risk of premium inadequacy is passed to a third party… [½]
…but if the loss experience is poor, the premium for the next year may rise significantly or there may be no reinsure willing to provide cover. [½]

There is a risk of reinsurer default which could still result in a shortfall for policyholders on default… [½]
… and the loss of the premium paid by the insurers for cover which is not provided. [½]
Additional marks for other sensible comments (½ each) *[1]*
[Max 6]
[Total Max 22]

This was the one of worst answered question on the paper, particularly the latter half.

Part (i) – answered well by the well prepared candidates.

> Part (ii) – generally this part was answered well. Although this was a "list" question, students should make sure their answers are not so brief as to be insufficient to demonstrate the point. One- and two-word answers are unlikely to give enough information to score the marks.
>
> Part (iii) was poorly answered by most candidates. A number of candidates failed to comment on the drawbacks of the regime (in particular that the regime did not require any assets be held in excess of the value of the liabilities) so missed out on a number of easy marks.
>
> Part (iv) was again generally poorly answered. A number made little or no attempt to answer this part. Better prepared candidates were able to generate a wider range of ideas but there was generally insufficient breath for high scores here.

Q8 (i) Commercial property large claims relate to damage to property… [½]
...while commercial motor large claims are likely to relate to bodily injury. [½]

Commercial property large losses can arise from fire e.g. total loss of building… [½]
...or from weather or other catastrophic event. [½]

Motor individual large losses unlikely to be weather related unless extremely high value vehicle or specialist commercial vehicle. [½]

Size of motor claims likely to depend on number and extent of injuries caused... [½]
…property claims the value of building and contents… [½]
…although business interruption can be significant for this class. [½]

Commercial property large claims will be indemnification of insured… [½]
...while commercial motor large claims likely to be third party liability. [½]

Motor claims likely to be much longer tailed than property… [½]
...as lengthy court proceedings and medical evidence on extent of injury… [½]
...although property claims can also be subject to legal disputes e.g. underinsurance, breaches of terms and conditions. [½]

Both classes prone to accumulations if number of risks cited in same area. [½]

Writing 100% vs taking the whole lot. [½]

Commercial motor might be more fleet. [½]

Property might be more heterogeneous, [½]

Different ways of settling claims e.g. annuity. [½]

Unlimited liability for motor vs capped liability for property

Commercial property can have a liability component. [½]

Property and Motor subject to different types of inflation [½]

Additional marks for sensible examples at markers discretion across question (½ each) [1]

[Max 5]

(ii) 1 Leaving large claims in triangles and projecting without adjustment. [1]

Advantage:
simple and quick [½]
gives allowance for future large losses [½]
works well if level of large losses stable [½]

Disadvantage:
Leads to over/under projection depending on large loss experience [½]

2 Extract large losses and their history if over a certain threshold. [1]

Advantage:
triangles won't be distorted by volatile numbers of large losses [½]

Disadvantage:
Will need to regularly restate history of triangle as claims rise above/fall below threshold [½]
Must ensure that sufficient reserve is held for future large losses. [½]
Static threshold meaning fewer large losses extracted in past compared to current years [½]

3 Extract large losses & history based on "once large always large" principle [1]

Advantage:
less restatement required as losses move between large and non large definitions [½]
able to track both increases and decreases in large loss population [½]

Disadvantage:
Large claim population may be made up of claims that were not ultimately large so more difficult to estimate average costs etc. [½]

4 Only extract claim from point it becomes large (leave history as is) [1]

Advantage:
Simpler to process as don't need to keep restating history. [½]
Development profile relatively stable as history doesn't keep changing. [½]

Disadvantage:

Large claim population may be made up of claims that were not ultimately large so more difficult to estimate average costs etc. [½]

5 Other relevant method (e.g. indexation or capping and removing over threshold, or loss ratio etc.) (½ for each method) [2]

Explanation of method (½ for each explanation) [2]

Advantage (½ for each advantage per method) [2]

Disadvantage (½ for each disadvantage per method) [2]
[Max 8]

(iii) Incurred claims used for oldest periods as triangle suggests little further development expected from this point. Case estimates best indication of reserve. [1]
Incurred chain ladder used for middle periods as triangle indicates further IBNR to be projected but reasonably developed so should be reasonably stable base to project from. [1]

Incurred data at early stages of development volatile as injury claims so reasonably long development. [½]

Therefore method such as ACPC (or BF) that doesn't rely on incurred to date appropriate. [½]
[Max 3]

(iv) **Incurred Claims:**
2011 gross ultimate claim cost of 2,100 [¼]
2012 gross ultimate claim cost of 2,756 [¼]

Incurred Chain Ladder:
No trends in data observed so assume volume all (or other assumption at markers discretion) [½]
Assume no tail factor required for incurred chain ladder method [½]
Carry out an incurred chain ladder and calculate ultimate claims costs [½]
2013 gross ultimate claim cost of 4,205 (or equivalent based on derived development profile) [¼]
2014 gross ultimate claim cost of 4,345 (or equivalent based on derived development profile) [¼]

Average Cost Per Claim – Frequency:
Given 2011–2013 appear close to fully developed use these years as the basis of the average. [½]
Assuming no increasing trends in frequency [½]
Assuming no increases in exposure over time. [½]
Average of 2011–2013 loss numbers is 4… [½]
…so select ultimate claim numbers for 2014-2016 as 4 [½]

Average Cost Per Claim – Severity:
Calculate incurred average costs [½]
Note incurred average costs for 2011 and 2015 are outliers and factor into selections (e.g. exclude 2011 from average period and add an extra expected claim to 2015 given incurred average cost is high) – marks given at markers discretion if given appropriate justification [2]
Calculate average costs based on selected ultimates for 2011-2014 [½]
Assume an appropriate inflation rate (e.g. 5% inflation based on market knowledge) [½]
Inflation adjust costs to 2016 terms [½]
Select an average cost in 2016 terms based on assumptions (e.g. 1,096) [½]
Select equivalent average cost for 2015 (deflating the 2016 selection) [½]

Average Cost Per Claim:
Calculate gross ultimate claim cost using selected Average Cost Per Claim Frequency and Severity Derived [½]
2015 gross ultimate claim cost of 5,219 (or equivalent based on derived assumptions) [¼]
2016 gross ultimate claim cost of 4,384 (or equivalent based on derived assumptions) [¼]

Total Ultimate Claims Cost:
Calculate total gross ultimate claim cost for all years of 23,008 (or equivalent based on derived assumptions) [½]

Example Calculation (marks captured above):

	Development						
AY	**1**	**2**	**3**	**4**	**5**	**6**	**ICL**
2011	1,000	1,556	2,045	2,095	2,100	2,100	2,100
2012	1,210	2,125	2,698	2,756	2,756	2,756	2,756
2013	1,817	3,138	4,121	4,201	4,205	4,205	4,205
2014	2,121	3,321	4,250	4,340	4,345	4,345	4,345
2015	2,075	3,350	4,333	4,424	4,429	4,429	4,429
2016	1,100	1,805	2,334	2,383	2,386	2,386	2,386
						Total:	**20,221**
LDF (All)		**1.6405**	**1.2933**	**1.0212**	**1.0010**	**1.0000**	
CDF (All)		**2.1689**	**1.3221**	**1.0223**	**1.0010**	**1.0000**	

AY	ITD	No	Inc Av.	ICL	Ult No. Select	Ult Av.	Ult Av 16 Term	Ult Av. Select	ACPC	Method	Ult	IBNR
2011	2,100	4	525	2,100		525	670			ITD	2,100	-
2012	2,756	3	919	2,756		919	1,117			ITD	2,756	-
2013	4,201	5	840	4,205		841	974			ICL	4,205	4
2014	4,250	4	1,063	4,345	4	1,086	1,197			ICL	4,345	95
2015	3,350	2	1,675	4,429	5			1,044	5,219	ACPC	5,219	1,869
2016	1,100	1	1,100	2,386	4			1,096	4,384	ACPC	4,384	3,284
	17,757	**19**	**935**	**20,221**							**23,008**	**5,251**
	Av: 11-13	4				**Av: 12-14**	**1,096**					
						Inflation	5%					

[Max 8]
[Total Max 24]

Responses to the final question were generally weak given the basic skills being tested and the number of marks available for some basic calculations and observations. This was the worst scoring question on the paper.

Part (i) – although the question clearly specified that only the large individual losses were relevant here, a number of students completely ignored the motor bodily injury claims and just focussed on the smaller damage claims missing out on easy marks. Better prepared candidates scored relatively well here.

Part (ii) – a number appeared to mis-read the question, writing about how to reserve for individual large losses (rather than how to allow for them in the overall reserving exercise). A minority misunderstood even more and wrote about methods of reserving for reinsurance. The responses here were generally poor.

Part (iii) – this was generally the best answered part of the question. A proportion of candidates stated that the motor claims would be short-tailed, despite the figures relating specifically to the large (i.e. bodily injury) losses only.

Part (iv) – this was relatively well answered apart from the ACPC method. A number of candidates didn't even attempt it and it was very disappointing that very few candidates were able to understand or apply the ACPC method. This particularly related to frequency where the majority assumed no future claims. Only the best scoring candidates considered inflation in their severity selection.

END OF EXAMINERS' REPORT