INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

22 April 2021 (am)

Subject SP7 – General Insurance Reserving and Capital Modelling Specialist Principles

Time allowed: Three hours and fifteen minutes

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

If you encounter any issues during the examination please contact the Assessment Team on T. 0044 (0) 1865 268 873.

1 (i) Define credit risk. [1]

(ii) Give examples of potential sources of credit risk that an insurance company may face. [3]

A small London Market insurer has experienced an increase in the volatility of its profits in recent years. In order to reduce some of this volatility, the Chief Financial Officer has proposed that the company should purchase more reinsurance cover.

(iii) Discuss how this proposal is likely to impact the company's capital requirements, by risk type. [6]

[Total 10]

2 An insurance company is currently going through the Internal Model Approval Process (IMAP) with its Regulatory Supervisor. A key part of the IMAP process is the Use Test, which requires the company to demonstrate how the internal capital model is used by the insurer day-to-day to help manage the business.

(i) Describe, with examples, how the company may use its capital model as part of its day-to-day operations. [5]

A member of the insurance company's board has asked why the company is going through the IMAP process, when it can instead simply use a standard formula model that has been provided by the Regulator.

(ii) Explain why the company may have chosen the IMAP approach rather than the standard formula approach. [5]

[Total 10]

3 (i) Suggest possible reasons why a general insurance company may wish to include a loading on top of its best estimate reserves. [3]

A large personal lines insurer mainly writes Household insurance business. Historically, the insurer has booked the Chief Actuary's best estimate reserves. However, the insurer is now considering adding an additional margin for uncertainty on top of the best estimate reserves.

(ii) Describe three possible approaches that the company may take to calculate such a margin for uncertainty. [6]

(iii) Discuss the advantages and disadvantages of each of the approaches in part (ii). [6]

[Total 15]

4 (i) Describe the main features of P&I Clubs. [2]

(ii) Discuss how subrogation can affect a P&I club's profitability. [3]

Company C is a medium-sized commercial property insurer with an annual premium income of $500m. Recently, a large claim amounting to $120m has been reported to the insurer. The loss has been caused by a private luxury cruise ship hitting a port insured by Company C, causing heavy damage to property, cargo and machinery at the port.

Company C believes that it has the legal right to recover this amount from the ship's P&I club through the subrogation clause, but this is not guaranteed. However, as the primary insurer of the port, it will have to pay the claim amount first.

It is close to the year-end valuation, and the port claim recovery is expected to take several months. Company C's Reserving Actuary is concerned about the impact of this claim on the financial position of the company and suggests that a negative Incurred But Not Reported (IBNR) be booked to account for the potential recovery, resulting in a nil incurred value for this claim for the year-end reporting.

(iii) Discuss the Actuary's proposed solution with regards to the impact on the adequacy of reserves. [6]

(iv) Discuss how your answer to part (iii) would change if Company C had an excess of loss cover for this policy with a retention of $20m. [3]

[Total 14]

5 (i) Outline the possible risks covered by Professional Indemnity cover for lawyers. [3]

Insurance company K starts writing Professional Indemnity (PI) insurance for all members of the National Lawyers' Association of Country L on 1 January 2020. The median policy duration for the lawyers' PI contract is 5 years. This is the first time Company K has written PI insurance.

As at 31 December 2020, there have been very few claims on the PI insurance for lawyers' line of business, and the Reserving Actuary has decided to use an Expected Loss Ratio (ELR) method to estimate the IBNR claims for this portfolio for the year-end reserving exercise.

(ii) Outline how the Reserving Actuary could estimate the initial ELR for the PI insurance for lawyers. [4]

(iii) Discuss the advantages and disadvantages to Company K of using the ELR method for the PI insurance for lawyers. [4]

[Total 11]

6 (i) Describe latent claims using an example. [2]

(ii) Outline the issues an insurer is likely to face when reserving for latent claims. [2]

(iii) Describe, using a numerical example, the Bornhuetter–Ferguson (BF) method for IBNR estimation. [4]

A general insurance company started writing a new Employers' Liability (EL) line of business 2 years ago. The company is aware that this line of business could have exposure to latent claims.

The Reserving Actuary of the company is using the Chain Ladder method for the first origin period, and the BF method for the most recent origin period, for the estimation of IBNR claim reserves for the EL line of business.

(iv) Assess the impact of the choice of reserving methods on the adequacy of the IBNR reserves for this EL line of business. [4]

[Total 12]

7 Company P has purchased excess of loss reinsurance cover from the same reinsurer since it started writing motor insurance business in 2017. The reinsurance rate (defined as reinsurance earned premium divided by gross earned premium) charged by the reinsurer has stayed the same until 2020. No recovery has been made by Company P from this reinsurance cover so far.

A Senior Actuarial Analyst at Company P has been asked to perform some analysis making use of the following gross of reinsurance data and assumptions as at 31 December 2020. The premium shown includes both own damage and third party liability covers.

Accident year	*Gross earned premium*	*Gross incurred Year to Date (YTD)*	*Gross initial ELR (%)*	*Proportion of gross incurred claims developed YTD (%)*
2017	3,000	3,000	60	72.9
2018	6,000	2,000	60	52.1
2019	8,000	1,000	60	28.9
2020	8,500	1,600	60	12.6

(i) Calculate, showing all workings and stating any assumptions, the gross Ultimate Loss Ratio (ULR) for each of the accident years. [4]

(ii) Justify the choice of reserving method used for each of the accident years in part (i). [2]

For the reinsurance renewals commencing on 1 January 2021, the reinsurer has proposed a rate increase for this policy (keeping the same coverage, attachment and limits).

The Senior Actuarial Analyst's Manager has mentioned that the implied ratio of net ULR to gross ULR would increase from 106% to 120% due to the proposed rate increase by the reinsurer.

(iii) Calculate, showing all workings and stating any assumptions made, the percentage change in the reinsurer's proposed reinsurance rate, to two decimal places. [4]

(iv) Comment on the effectiveness of the reinsurance programme in place. [4]

[Total 14]

8 Company XYZ is a general insurance company that will be required to do its financial reporting based on a new accounting standard in a couple of years. As part of this new standard, it is prescribed that claims liabilities must be discounted using a suitable yield curve, with the discounted reserves being reported in the company's balance sheet. The company's current approach is to report the reserve amounts in its balance sheet on an undiscounted basis.

(i) Discuss the factors that Company XYZ should consider when discounting its claims liabilities. [4]

The new accounting standard requires quantification of the impact that movements in the chosen yield curves have on claims liabilities from one year-end to the next when producing the company's income statement. The impact on assets must also be considered, with the combined impact on both assets and liabilities then disclosed in the company's income statement. Movements in claims liabilities due to movements in yield curves introduces additional volatility into the company's income statement.

(ii) Discuss how this volatility may be reduced when the impact of movements in yield curves is considered for both assets and liabilities in aggregate. [4]

The company expects that on average its assets will be of shorter duration than its corresponding claims liability exposures.

(iii) Describe the impact of a downward movement in yield curves on the company's income statement. [3]

(iv) Suggest two possible actions Company XYZ could take in relation to the duration of its assets and liabilities as a result of a greater than expected increase in yield curves. [3]

[Total 14]

END OF PAPER