INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

20 September 2023 (am)

Subject SP7 – General Insurance Reserving and Capital Modelling Specialist Principles

Time allowed: Three hours and twenty 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.

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1 A general insurance company, Company K, has been writing motor insurance business for the past 10 years. It writes a mix of motor Own Damage (OD) and motor Third Party Liability (TPL) policies.

(i) Suggest reinsurance covers that would be suitable for the TPL and the OD policies. [3]

Company K's reinsurance programmes have changed every 2 to 3 years. A new actuary has joined the company and observes that the triangles for reserving are only available at a net of reinsurance basis.

(ii) Describe the risks to Company K of performing the Incurred But Not Reported (IBNR) estimation on a net of reinsurance basis for its motor insurance business. [4]

[Total 7]

2 (i) Outline possible reasons for differences between the ultimate claim amounts calculated using the paid chain ladder and incurred chain ladder methods. [3]

Company A is a general insurance company. It started writing marine insurance business 3 years ago. It is starting to observe negative incremental paid and incurred claim amounts for the past several development quarters.

(ii) List the possible reasons for negative incremental paid and incurred claim amounts for Company A. [3]

Due to the negative claim development, the Chief Risk Officer (CRO) has proposed the following controls on the reserving methodology for the marine portfolio:

- Negative IBNR reserves held for an Accident Year (AY) should not exceed 10% of the case reserves held for that AY.
- The selected cumulative loss development factors used for reserving techniques cannot be less than 1.00 from the eighth development quarter onwards.

(iii) Comment on the CRO's proposed controls. [6]

[Total 12]

3 Country D is prone to natural disasters and its government is seeking insurance to provide protection to government infrastructure, for example government buildings, public transport vehicles and stations, in the event of damage from natural disasters.

(i) Discuss the advantages and disadvantages of insurance based on parametric triggers compared to indemnity-based insurance for the government of Country D. [5]

Company B is a large property insurer in Country D, and currently the only book of business where natural catastrophe is covered is in its domestic household buildings book. Company B has agreed to provide the required insurance cover to the government on an indemnity basis.

(ii) Discuss how Company B's capital requirements would change when providing natural catastrophe cover to the government. [5]

After 2 years of having the insurance coverage on an indemnity basis, the government has now decided to move to a parametric basis of insurance.

(iii) Discuss the changes to Company B's capital requirements when providing the insurance cover based on parametric triggers. [3]

[Total 13]

4 A mid-sized general insurance company, Company E, started writing general liability business 3 years ago with a strategy for the combined ratio to be between 105% and 110%.

(i) Outline possible reasons why Company E may want to underwrite business with an expected combined ratio greater than 100%. [4]

(ii) Discuss the risks for Company E in following this strategy over the long term. [4]

Company E's actuarial team calculates IBNR reserves at an Underwriting Year (UwY) level, but also holds a significant IBNR reserve loading at a total company level in addition to UwY-specific IBNR reserves.

(iii) Suggest reasons why the company may be holding the additional IBNR reserve loading. [3]

A new regulation that is in effect means that Company E cannot hold the IBNR loading at the total company level. The regulation also mandates disclosing the movements in the IBNR reserves separately for each UwY and, therefore, not allowing the offsetting of IBNR reserves between underwriting years.

(iv) Suggest possible reasons for the introduction of the new regulation. [4]

(v) Outline the possible impacts of the new regulation on Company E's financial statements. [3]

[Total 18]

5 Reinsurer R is a reinsurance company that has been providing a quota share reinsurance treaty to Company J, an insurance company, on its motor portfolio for many years. The quota share is written on a risk attaching during basis. Reinsurer R is to be sold to another reinsurer who specialises in run-off risks.

Company J is considering a commutation with Reinsurer R that would relieve Reinsurer R of all of its liabilities to Company J, provided the payment terms are favourable.

Describe the considerations that Company J would need to take into account in forming a view on the appropriate level of payment under the commutation arrangement. [7]

6 A general insurance company, Company L, writes a large domestic portfolio of property, environmental liability and public liability insurance.

(i) Outline the potential risks arising from climate change to each of Company L's lines of business. [6]

The regulator has asked Company L to perform stress and scenario tests to understand the impact of climate change on the profitability of the company.

(ii) Describe the key challenges for Company L when undertaking these stress and scenario tests. [4]

A sizeable proportion of the company's premium comes from residential buildings situated along the coast, and this business has been highly profitable. Company L's board is concerned about the impact of climate change on this business.

The underwriting team has decided to gradually reduce its exposure to business underwritten in the coastal areas.

(iii) Suggest possible ways in which Company L can reduce its exposure to this business. [3]

(iv) Outline the impact of the underwriting team's decision on Company L's capital requirements. [3]

[Total 16]

7 Company P is a large multinational general insurance company writing three lines of business: residential property, engineering and employers' liability. Nearly half of Company P's revenues come from Country G. Company P is considering buying Company Q, which is a large insurer writing the same lines of business but only in Country G.

A director of Company P is concerned about the accumulations of risk the combined entity may be exposed to in Country G.

(i) Describe possible accumulations of risk:

(a) across the three lines of business.

(b) in the individual lines of business.

[4]

(ii) List the data Company P will require from Company Q to investigate accumulations of risk in the property class of business. [3]

(iii) Suggest possible actions Company P could take to mitigate the accumulation of risk across its business. [3]

[Total 10]

8 (i) List the characteristics of latent claims. [2]

(ii) Describe three actuarial reserving techniques that could be used to determine the ultimate loss amounts for latent claims. [6]

A general insurance company, Company N, has been writing product liability insurance for 5 years. Company N has begun to get notifications of claims emerging from a rare disease caused by the consumption of a contaminated drug sold 4 years ago by a pharmaceutical firm it insures. Claimants are reporting serious health effects including permanent disability in many cases.

(iii) Discuss the factors an actuary should consider when setting reserves for the newly reported claims related to the contaminated drug. [5]

Company N's financial statements as at the end of the financial year in which the disease claims were first reported show the following results:

- Paid claim amount: $12 million
- Claims reserves amount: $200 million.

(iv) Calculate the survival ratio for Company N. [2]

(v) Outline how the survival ratios technique could be used to estimate the reserves for Company N. [2]

[Total 17]

END OF PAPER