



Institute
and Faculty
of Actuaries

Fellowship Qualification

General Insurance

Reserving and Capital Modelling (SP7)

Specialist Principles

Syllabus for the 2024 Examinations

April 2023

General Insurance Reserving and Capital Modelling (SP7)

Syllabus for the 2024 Examinations

This syllabus includes information to support the study of this subject. It will guide you through what you need to learn, application of learning as well as the skills that you need to develop. Information regarding the assessment of this subject is also included.

This syllabus includes:

- Aim of the subject
- How this subject links across the Qualifications
- Subject topics and topic weightings
- Subject objectives
- Assessment information

Aim

Apply relevant actuarial principles and techniques to reserving and capital modelling within general insurance companies, and understand how reserving and capital modelling link to other business processes within a general insurance company.

Links across the qualifications

Fellowship Qualification

General Insurance Reserving and Capital Modelling Specialist Principles (SP7), General Insurance Pricing Specialist Principles (SP8) and General Insurance Specialist Advanced (SA3) are a trio of subjects for actuarial work specific to General Insurance. Each subject develops a specific set of skills and knowledge needed by actuaries working in or who wish to work in General insurance. The subjects are related as follows:

- General Insurance Reserving and Capital Modelling Specialist Principles (SP7) covers relevant actuarial principles and techniques for reserving and capital modelling within general insurance companies, and how these link to other business processes such as data, business planning, pricing, reinsurance and investment.
- General Insurance Pricing Specialist Principles (SP8) covers relevant actuarial principles and techniques for pricing of general insurance and reinsurance products, and how these link to other business processes such as data, risk management, business planning, reserving, capital setting, reinsurance and catastrophe modelling.
- General Insurance Advanced (SA3) builds upon the skills and knowledge covered in SP7 and SP8, applied to more complex scenarios. It covers general insurance markets, regulation, legislation, taxation, financial management, monitoring and strategies.

Topics and topic weightings

1. General insurance products and general business environment [20%]
2. Risk, uncertainty and regulation [15%]
3. Reserving [30%]
4. Capital modelling [17.5%]
5. Data, investigations, reinsurance and investment [17.5%]

Objectives

1 General insurance products and general business environment [20%]

Understand the main features of general insurance markets and both insurance and reinsurance products, along with consideration of customer needs and risks posed to the insurers. Understand the implications of key aspects of the general business environment on general insurance companies.

- 1.1 The main types and features of general insurance markets and products considering:
 - the needs of customers
 - the financial and other risks for the general insurer including their capital requirements and possible effect on solvency
- 1.2 The main types of reinsurance products for general insurers and the purposes for which they may be used
- 1.3 Implications of the general business environment on general insurers in terms of:
 - Marketing strategies
 - Fiscal regimes
 - Inflation and other economic factors
 - Legal, political and social factors
 - Climate and environmental factors
 - Professional guidance
 - Technological change
- 1.4 The key features of the Lloyd's market

2 Risk, uncertainty and regulation [15%]

Understand the major areas of risk and uncertainty in relation to reserving and capital modelling within general insurance companies as well as the regulatory framework for general insurers.

- 2.1 The major areas of risk and uncertainty for general insurers with respect to reserving and capital modelling, in particular those that may threaten profitability or solvency
- 2.2 The regulatory framework for general insurers, including the purpose of regulation and methods of regulation

3 Reserving [30%]

Understand reserving methods, bases and issues, including the evaluation of reserving results and analysis and communication of uncertainty in reserving.

- 3.1 The reasons for calculating general insurance reserves
- 3.2 Understand and analyse the issues that can affect reserving work using triangulations and how to manage them
- 3.3 Appropriate reserving bases for general insurance business including:
 - Different reasons for calculating reserves
 - Appropriate assumptions in each case
 - When to calculate reserves at class level, at individual policy level or at claim event level
 - Why assumptions may differ from a rating exercise
 - Allowance for future inflation
 - Whether or not to discount for investment income
 - Approach for additional unexpired risk reserve
 - Communication of the reserving basis

3.4 Stochastic reserving processes including:

- Uses of stochastic reserving methods
- Likely sources of reserving uncertainty
- Types of stochastic reserving methods:
 - Analytic methods
 - Simulation-based methods.
- Mack's model and the ODP model
- Applying bootstrapping to these two models
- Issues, advantages and disadvantages of each of the models
- Aggregate the results of stochastic reserving across multiple lines of business, and methods of correlation

3.5 Reserving result analyses

3.5.1 Factors to consider in assessing the reasonableness of the results of a reserving exercise

3.5.2 Typical diagnostics commonly used to assess the reasonableness of the results of a reserving exercise

3.5.3 Factors to consider in assessing the reasonableness of changes in results of a reserving exercise over time

3.5.4 Analysis of experience in the context of a reserving exercise

3.5.5 How alternative results of reserving exercises can arise and professional issues in resolving them

3.6 Uncertainty and its communication in reserving

3.6.1 'Best estimate' reserve

3.6.2 Approaches to estimating ranges of reserves:

- Stochastic models
- Scenario tests
- Use of alternative sets of assumptions

3.6.3 Issues to consider when communicating reserve ranges and uncertainties

4 Capital modelling [17.5%]

Understand capital modelling techniques, parameterisation issues, and methods for assessing different risk types, including considerations relevant to undertaking a capital modelling exercise.

4.1 Capital modelling and application of relevant capital modelling techniques for general insurers

- Approaches to capital modelling:
 - Deterministic models
 - Stochastic models
- Issues with parameterisation of capital models:
 - Developing assumptions
 - Validation
- Approaches to assessment of capital requirements for the following risk types:
 - Insurance risk
 - Market risk
 - Credit risk
 - Operational risk
 - Liquidity risk
 - Group risk

4.2 The importance of diversification in capital modelling

4.3 Practical considerations of undertaking capital modelling

5 Data, investigations, reinsurance and investment [17.5%]

Understand the use of data and key actuarial investigations in reserving and capital modelling. Understand reinsurance programmes including purchasing decisions and reserving. Understand investment and asset-liability management and methods and principles of accounting as applicable to a general insurer.

5.1 Data in reserving and capital modelling:

- Types of data that are used
- Main uses of data
- Requirements for a good information system
- Possible causes of data errors
- Effects of inadequate data

5.2 The major actuarial investigations and analyses of experience undertaken with regard to reserving and capital modelling for general insurers

5.3 Factors that influence the choice of an appropriate reinsurance programme for a general insurer

5.4 Appropriateness of alternative reinsurance structures for a general insurer

5.5 The impact of capital management on reinsurance purchasing decisions

5.6 The main approaches to reserving for outwards reinsurance and when to apply them

- Gross less net
- Application of standard techniques to reinsurance data
- Use of appropriate factors
- Application of detailed contract terms

5.7 Suitable approaches to reserving for inwards reinsurance

5.8 Investment and Asset Liability Management (ALM) considering:

- The principles of investment
- The asset-liability matching requirements of a general insurer
- How projection models may be used to develop an appropriate investment strategy

5.9 Methods and principles of accounting specific to a general insurance business and interpret the accounts of a general insurer

Assessment

The assessment of this subject will consist of one examination.

Candidates can expect to answer a number of questions of varying marks, using Microsoft Word to construct and type their answers. The duration of this examination is three hours and twenty minutes and is timed and online. This time includes reading time.

Candidates will be expected to be able to apply knowledge and skills from across the syllabus topics to scenarios and questions proposed by the examiners and produce coherent solutions and actions, including:

- Analysis of complex problems in terms of actuarial, economic and financial factors to a level where appropriate analytical techniques may be used.
- Assess the implications and relevance of such factors, integrating the results into a coherent whole.
- Evaluate the results critically in a wider context, drawing appropriate conclusions.
- Propose solutions and actions, or a range of possible solutions and actions, based on this evaluation.

Topic weighting

The topic weighting percentage noted alongside the topics is indicative of the volume of content of a topic within the subject and therefore broadly aligned to the volume of marks allocated to this topic in the examination. For example if a topic is 20% of the subject then you can expect that approximately 20% of the total marks available in the examination paper will be available on that topic.

Candidates for assessment should ensure that they are well prepared across the entire syllabus and have an understanding of the principal terms used in general insurance reserving and capital modelling. The examination can be composed of questions drawing from any part of the syllabus within any examination sitting and using any command verb. This includes knowledge, techniques, principles, theories, and concepts as specified. Candidates should not rely on past papers alone and should ensure they have covered the entire syllabus as part of their learning and development of this subject. A list of command verbs used in the examinations is included on the IFoA website.

In each examination, candidates will be expected to demonstrate, through their answers, that they have knowledge of, can apply and use higher order skills in this subject:

- Knowledge will be demonstrated through answering questions that assess your understanding of that knowledge as well as through questions that ask you to apply relevant knowledge to scenarios.
- Application will be demonstrated through answering questions which assess that you can identify and apply relevant concepts and skills to solve problems (both numerical and non-numerical).
- Higher order skills will be demonstrated through questions that will assess that you can use relevant knowledge, concepts and skills to solve problems, draw appropriate conclusions, and make meaningful and appropriate comments on those conclusions.

As a guide, in the examination of this subject, you can expect that approximately 15% of the total number of marks for this examination be allocated to the demonstration of knowledge, 60% to application and 25% to higher order.

Qualifications Handbook, Examinations Handbook and Assessment Regulations

Please ensure you read and have understood the Examinations Handbook and Assessment Regulations ahead of your exam as well as the Qualifications Handbook. These are all available on the IFoA website.

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