Institute and Faculty of Actuaries

Fellowship Qualification

Enterprise Risk Management (SP9) Specialist Principles

Syllabus for the 2024 Examinations

April 2023

Enterprise Risk Management (SP9)

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

Gain a detailed understanding of the main principles of Enterprise Risk Management (ERM) within an organisation, including governance and process, as well as quantitative methods of risk measurement and modelling. This subject is a requirement to attain the Chartered Enterprise Risk Actuary (CERA). credential.

Links across the Qualification

Associateship Qualification

Enterprise Risk Management (ERM) draws from across Associate Qualification subjects, in particular:

- Foundational statistical modelling techniques developed in Risk Modelling and Survival Analysis (CS2)
- The principles of actuarial modelling as used in the quantitative measures of risk in Economic Modelling (CM2)
- Understanding the nature of risks and how to manage these risks is vital for business entities and other organisations. Actuarial Practice (CP1) provides a fundamental background to different types of risk from an actuarial perspective and how these risks can be managed.

Chartered Enterprise Risk Actuary (CERA)

Chartered Enterprise Risk Actuary (CERA) is a global credential for risk management professionals. It is awarded by the IFoA on behalf of the CERA Global Association (CGA).

Associates or Fellows can obtain the CERA credential if they pass (or have an exemption to) SP9 and attend the CERA seminar. For more information, please see the IFoA website.

Topics and topic weightings

1. ERM concept and framework [15%]
2. ERM process [10%]
3. Risk categories and identification [10%]
4. Risk modelling and aggregation of risks [15%]
5. Risk measurement and assessment [15%]
6. Risk management tools and techniques [20%]
7. Capital management [15%]

Objectives

1 Enterprise Risk Management (ERM) concept and framework [15%]

An introduction of the key principles and concepts of ERM, how it is applied in an organisation, and how external and regulatory risk frameworks can influence an organisation's approach to ERM.

1.1 Explain the principal terms in Enterprise Risk Management (ERM)

1.2 Describe the concept of ERM

- 1.2.1 Define what is meant by ERM
- 1.2.2 Describe the role of the following concepts in ERM
  - The holistic approach
  - Downside and upside risks
  - Measurement of risk
  - Unquantifiable risks
  - Responses to risk and risk management
- 1.2.3 Describe the benefits of ERM

1.3 Discuss the framework for risk management and control within a company

- 1.3.1 Recommend an appropriate framework for an organisation's ERM
- 1.3.2 Propose best practice ERM approaches in compliance and corporate governance
- 1.3.3 Discuss governance issues including market conduct, audit and legal risk
- 1.3.4 Evaluate an organisation's risk management culture, including risk awareness, accountabilities, collaboration, incentive compensation, communication and the problem of bias

1.4 Demonstrate an understanding of risk frameworks in regulatory environments

- 1.4.1 Explain the role of regulators in ERM and effective management of the supervisor relationship
- 1.4.2 Describe the Basel Accord and Solvency II frameworks, including their underlying principles and approaches to risk measurement
- 1.4.3 Outline the requirements and underlying principles of Sarbanes–Oxley and other regulatory risk frameworks
- 1.4.4 Demonstrate awareness of how different parts of an organisation and different parts of a portfolio may be subject to different capital adequacy standards

1.5 Demonstrate an understanding of the perspectives of credit rating agencies

- 1.5.1 Describe the role of credit rating agencies in the evaluation of risk management functions, including the risk management grading criteria used
- 1.5.2 Assess the relevance of these criteria

2 ERM process [10%]

Implementation of an ERM framework across an organisation with consideration of key stakeholders, and both operational and strategic issues, and reviews past real-life examples.

2.1 Demonstrate an understanding of the relevance of ERM to all stakeholders

- 2.1.1 Compare the relevance of risk measurement and management to various stakeholders
- 2.1.2 Explain contagion and how it affects different stakeholders
- 2.1.3 Explain risks arising from any misalignment of interests between different groups of stakeholders

2.2 Demonstrate how to determine and articulate risk appetite, risk capacity, risk tolerances, desired risk profile and risk objectives

2.3 Evaluate the elements and structure of a successful risk management function

2.3.1 Describe the ERM roles and responsibilities of the people within an organisation and how the different groups should interact

2.3.2 Recommend a structure for an organisation's risk management function

2.4 Assess the implications of financial and other risks and opportunities for strategic planning and the selection of strategy

2.5 Demonstrate the application of the risk management control cycle, including the relevance of external influences and emerging risks, such as climate risk and cyber risk

2.6 Describe methods for the identification of risks and their causes and implications

2.7 Discuss important past examples of both good risk management practices and of risk failures, for financial and non-financial entities, including proposing solutions for how better risk management might have prevented these failures

2.8 Propose an ERM process that creates value for an organisation

3 Risk categories and identification [10%]

How risks can be defined and classified, including any difficulties that may arise

3.1 Explain what is meant by risk and uncertainty, including different definitions and concepts of risk

3.2 Demonstrate an understanding of risk categories

3.2.1 Identify the risks faced by an entity, including market risk, economic risk, interest rate risk, foreign exchange risk, basis risk, credit risk, counterparty risk, liquidity risk, insurance risk, operational risk, environmental risk, legal risk, regulatory risk, political risk, agency risk, reputational risk, project risk, strategic risk, demographic risk and moral hazard

3.2.2 Analyse the financial and non-financial risk exposure arising from an organisation's current and emerging risks, including climate risk and cyber risk, within a given context

3.2.3 Discuss risk taxonomy, including an awareness of how individual risks might be categorised in different ways

3.3 Describe the relationship between systematic risk, non-systematic or specific risk and concentration of risk

4 Risk modelling and aggregation of risks [15%]

How risks can be modelled in practice, and how suitable models can be used as part of the overall ERM process, including the risks that are introduced by their use.

4.1 Assess the extent to which each of the risks in 3.2.1 can be amenable to quantitative analysis

4.2 Demonstrate an understanding of the use of correlation measures

4.2.1 Demonstrate enterprise-wide risk aggregation techniques incorporating the use of correlation

4.2.2 Comment on the relative merits and implications of different correlation measures

4.3 Discuss the use of scenario analysis and stress testing in the risk measurement process, including the advantages and disadvantages of each

4.4 Demonstrate understanding of the use of copulas as part of the process of modelling multivariate risks

4.4.1 Evaluate different types of copula for a given purpose

4.4.2 Recommend an appropriate copula for a given situation

4.5 Explain the importance of the tails of distributions, tail correlations and low frequency/high severity events

4.6 Demonstrate how extreme value theory can be used to help model risks that have a low probability

4.7 Demonstrate an understanding of model and parameter risk

4.8 Discuss the use of models in the overall ERM decision-making process

4.8.1 Describe the development and use of models for decision-making purposes in ERM

4.8.2 Explain how the decision-making process takes account of the organisation's risk appetite and corporate governance and builds on the results of stochastic modelling, scenario analysis, stress testing and analysis of model and parameter risk

4.8.3 Evaluate different types of model for a given purpose

5 Risk measurement and assessment [15%]

The different methods of assessing risk, building on concepts from earlier topics, and considering the different risk types.

5.1 Understand common risk measures

5.1.1 Describe the properties and limitations of the following risk measures:

- Value at Risk (VaR)
- Tail Value at Risk (TVaR)
- Probability of ruin
- Expected shortfall.

5.1.2 Determine risk exposures and tolerances using these measures

5.2 Describe how to choose a suitable time horizon and risk discount rate

5.3 Analyse univariate and multivariate financial and insurance data (including asset prices, credit spreads and defaults, interest rates and insurance losses) using appropriate statistical methods

5.4 Recommend a specific choice of model based on the results of both quantitative and qualitative analysis of financial or insurance data

5.5 Assess different types of market risk

5.6 Assess credit risk

5.6.1 Describe what is meant by a credit spread and its components

5.6.2 Discuss different approaches to modelling credit risk

5.7 Assess operational, liquidity and insurance risks

6 Risk management tools and techniques [20%]

Understand how assessed risks can be managed and optimised and considers risk management approaches specific to different types of risk.

6.1 Demonstrate risk optimisation and responses to risk

6.1.1 Explain how to optimise an objective, possibly subject to constraints

6.1.2 Demonstrate risk optimisation and responses to risk using illustrative examples

6.1.3 Analyse the risk and return trade-offs that result from changes in the organisation's risk profile

6.2 Recommend approaches which balance benefits against inherent costs that can be used to manage an organisation's overall risk profile

6.2.1 Describe how to reduce risk by transferring it

6.2.2 Describe how to reduce risk without transferring it

6.2.3 Analyse the residual risks and new risks arising following risk mitigation actions

6.2.4 Explain how an organisation's ability to manage risk is affected by regulatory, capacity and cost constraints

6.2.5 Explain how an organisation will choose to accept certain risks and the controls it might adopt for these retained and residual risks

6.3 Demonstrate strategies for the management of market risk

6.3.1 Recommend strategies for the reduction of market risk using financial derivatives

6.3.2 Demonstrate an awareness of the practical issues related to market risk hedging, including dynamic hedging

6.4 Demonstrate the use of tools and techniques for identifying and managing credit and counterparty risk

6.5 Demonstrate possible strategies for the management of operational, liquidity, insurance and other key risks

7 Capital management [15%]

Understand how risk models can be used to allocate capital across an organisation

7.1 Demonstrate an understanding of and perform capital calculations

7.1.1 Describe the concept of economic measures of value and capital and their uses in corporate decision-making processes

7.1.2 Evaluate different risk measures and capital assessment approaches

7.1.3 Demonstrate the ability to develop a capital model for a representative financial firm

7.2 Propose techniques for allocating capital across an organisation

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 enterprise risk management. 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, 55% to application and 30% 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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