



Institute
and Faculty
of Actuaries

SP9 – Enterprise Risk Management Specialist Principles

Syllabus

for the 2023 exams

June 2022

SP9 – Enterprise Risk Management Specialist Principles

Aim

The aim of the Enterprise Risk Management (ERM) Specialist Principles subject is to instil in successful candidates the key principles underlying the implementation and application of ERM within an organisation, including governance and process as well as quantitative methods of risk measurement and modelling. The candidate should gain the ability to apply the knowledge and understanding of ERM practices to any type of organisation. The successful candidate will also have satisfied many of the requirements to achieve the Chartered Enterprise Risk Actuary (CERA) accreditation.

Competences

On successful completion of this subject, a candidate will be able to:

- 1 understand the main principles and techniques that are relevant to ERM.
- 2 apply these principles to given situations, for both financial and non-financial organisations.
- 3 analyse hypothetical scenarios, including using judgement to assess the implications of possible actions and to develop appropriate proposals or recommendations in relation to ERM.

Links to other subjects

CS2 – Risk Modelling and Survival Analysis

CM2 – Financial Engineering and Loss Reserving

CPI – Actuarial Practice

Syllabus topics

- 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%)

These weightings are indicative of the approximate balance of the assessment of this subject between the main syllabus topics, averaged over a number of examination sessions.

The weightings also have a correspondence with the amount of learning material underlying each syllabus topic. However, this will also reflect aspects such as:

- the relative complexity of each topic and hence the amount of explanation and support required for it.
- the need to provide thorough foundation understanding on which to build the other objectives.
- the extent of prior knowledge that is expected.
- the degree to which each topic area is more knowledge or application based.

Skill levels

The use of a specific command verb within a syllabus objective does not indicate that this is the only form of question that can be asked on the topic covered by that objective. The Examiners may ask a question on any syllabus topic using any of the agreed command verbs, as are defined in the document 'Command verbs used in the Associate and Fellowship written examinations'.

Questions may be set at any skill level: Knowledge (demonstration of a detailed knowledge and understanding of the topic), Application (demonstration of an ability to apply the principles underlying the topic within a given context) and Higher Order (demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, taking into account different points of view, comparing and contrasting situations, suggesting possible solutions and actions and making recommendations).

In the SP subjects, the approximate split of assessment across these three skill types is 25% Knowledge, 50% Application and 25% Higher Order skills.

Detailed syllabus objectives

1 ERM concept and framework (15%)

- 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 of Sarbanes-Oxley and other regulatory risk frameworks and their underlying principles.
 - 1.4.4 Demonstrate an 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%)

- 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 the 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.
- 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%)

- 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 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%)

- 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%)

- 5.1 Demonstrate an understanding of common risk measures.
- 5.1.1 Describe the properties and limitations of the following:
- 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.

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- 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%)

- 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%)

- 7.1 Demonstrate an understanding of 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.

8 Solving problems

- 8.1 Analyse hypothetical examples and scenarios in relation to the application of ERM, in both financial and non-financial contexts, covering any or all of the risk types identified in 3.2.1.
 - 8.1.1 Propose solutions and actions that are appropriate to the given context and balance benefit against inherent cost, with justification where required.
 - 8.1.2 Suggest possible reasons why certain actions have been chosen.
 - 8.1.3 Assess the implications of actions within a given scenario.
 - 8.1.4 Discuss the advantages and disadvantages of suggested actions, taking into account different perspectives.

Assessment

The assessment of this subject will consist of one examination, which is three hours and twenty minutes and is timed and online.

If the candidate wishes to gain the CERA qualification, the candidate will also need to attend the CERA seminar.

Please read the latest version of the IFoA Examinations Handbook and IFoA Examination Regulations on the IFoA website before sitting any IFoA examination.

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