



Institute
and Faculty
of Actuaries

Subject CA1 Actuarial Risk Management

Syllabus

for the 2018 exams

1 June 2017

Aim

The aim of the Actuarial Risk Management subject is that upon successful completion, the candidate should understand strategic concepts in the management of the business activities of financial institutions and programmes, including the processes for management of the various types of risk faced, and be able to analyse the issues and formulate, justify and present plausible and appropriate solutions to business problems.

Links to other subjects

Each of Subjects CT1–CT8 provides principles and tools that are built upon in Actuarial Risk Management.

The Specialist Technical Subjects ST1–ST9 and the Specialist Applications Subjects SA1–SA6 use the concepts developed in this subject to solve complex problems, to produce coherent advice and to make recommendations in specific practice areas.

Objectives

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

1 How to do a professional job

- 1.1 Describe how actuaries can contribute to meeting the business needs of their clients and other stakeholders.
- 1.2 Describe the statutory roles that may be required of actuaries in pensions and insurance, both in the public and private sectors.
- 1.3 Outline the professionalism framework of the Institute and Faculty of Actuaries and the Financial Reporting Council.
- 1.4 Describe the factors and issues to be taken into account when doing a professional job.
- 1.5 Describe the Actuarial Control Cycle and explain the purpose of each of its components.
- 1.6 Demonstrate how the Actuarial Control Cycle can be applied in a variety of practical commercial situations, including its use as a Risk Management Control Cycle.

2 Stakeholders and their needs

- 2.1 Identify the clients that actuaries advise in both the public and private sectors and the stakeholders affected by that advice.
- 2.2 Describe how stakeholders other than the client might be affected by any actuarial advice given.
- 2.3 Describe the functions of the clients and potential clients that actuaries advise and the types of advice that actuaries might give to their clients.

- 2.4 Explain why and how certain factual information about the client should be sought in order to be able to give advice.
- 2.5 Explain why subjective attitudes of clients and other stakeholders – especially towards risk – are relevant to giving advice.
- 2.6 Distinguish between the responsibility for giving advice and the responsibility for taking decisions.
- 2.7 Describe the main providers of benefits on contingent events.
- 2.8 Describe how products, schemes, contracts and other arrangements can provide benefits on contingent events which meet the needs of clients and stakeholders.
- 2.9 Describe the ways of analysing the needs of clients and stakeholders to determine the appropriate benefits on contingent events to be provided by financial and other products, schemes, contracts and other arrangements.

3 General environment

3.1 Risk environment

- 3.1.1 Describe the risk management process for a business that can aid in the design of products, schemes, contracts and other arrangements to provide benefits on contingent events.
- 3.1.2 Describe how risk classification can aid in the design of products, schemes, contracts and other arrangements that provide benefits on contingent events.
- 3.1.3 Discuss the difference between systematic and diversifiable risk.
- 3.1.4 Discuss risk appetite and the attainment of risk efficiency.
- 3.1.5 Describe credit risk and the use of credit ratings.
- 3.1.6 Describe liquidity risk.
- 3.1.7 Describe market risk.
- 3.1.8 Describe operational risk.
- 3.1.9 Describe business risk.
- 3.1.10 Describe attitudes to and methods of risk acceptance, rejection, transfer and management for stakeholders.
- 3.1.11 Discuss the portfolio approach to the overall management of risk, including the use of diversification and avoidance of risk concentrations.

- 3.1.12 Distinguish between the risks taken as an opportunity for profit and the risks to be mitigated.
- 3.1.13 Describe the principle of pooling risks.
- 3.1.14 Describe the methods of transferring risks.
- 3.1.15 Describe how enterprise risk management can add value to the management of a business.
- 3.1.16 Describe the risks and uncertainties affecting:
 - the level and incidence of benefits payable on contingent events
 - the overall security of benefits payable on contingent events

3.2 Regulatory environment

- 3.2.1 Describe the principles and aims of prudential and market conduct regulatory regimes.
- 3.2.2 Explain the concept of information asymmetry.
- 3.2.3 Explain how certain features of financial contracts might be identified as unfair.
- 3.2.4 Discuss the implications of a requirement to treat the customer fairly.

3.3 External environment

Describe the implications for the main providers of benefits on contingent events of:

- legislation – regulations
- State benefits
- tax
- accounting standards
- capital adequacy and solvency
- corporate governance
- risk management requirements
- competitive advantage
- commercial requirements
- changing cultural and social trends
- demographic changes
- environmental issues
- lifestyle considerations
- international practice
- technological changes

3.4 Investment environment

- 3.4.1 Discuss the cashflows of simple financial arrangements and the need to invest appropriately to provide for financial benefits on contingent events.
- 3.4.2 Demonstrate a knowledge and understanding of the characteristics of the principal investment assets and of the markets in such assets.
- 3.4.3 Explain the principal economic influences on investment markets.
- 3.4.4 Describe the main features of the behaviour of market price levels and total returns and discuss their relationships to each other.
- 3.4.5 Discuss the theoretical and historical relationships between the total returns and the components of total returns, on equities, bonds and cash, and price and earnings inflation.

3.5 Capital requirements

- 3.5.1 Discuss why the main providers of benefits on contingent events need capital.
- 3.5.2 Describe how the main providers of benefits on contingent events can meet, manage and match their capital requirements.
- 3.5.3 Discuss the implications of the regulatory environment in which the business is written for provisioning and capital requirements.
- 3.5.4 Discuss different measures of capital needs.
- 3.5.5 Discuss the relative merits of looking at an economic balance sheet in order to consider the capital requirements of a provider of benefits on contingent events.
- 3.5.6 Discuss the use of internal models for assessment of economic and regulatory capital requirements.

4 Specifying the problem

4.1 Contract design

- 4.1.1 Discuss the factors to be considered in determining a suitable design for financial structures e.g. products, schemes, contracts or other arrangements that will provide benefits on contingent events in relation to:
 - the characteristics of the parties involved
 - the risk appetite or risk aversion of the parties involved
 - the level and form of benefits to be provided
 - any options or guarantees that may be included
 - the benefits payable on discontinuance or transfer of rights

- the method of financing the benefits to be provided
- the choice of assets when benefits are funded
- the charges that will be levied
- the capital requirements

4.1.2 Describe how the design of products, schemes, contracts and other arrangements can be used to help develop corporate human resource strategy.

4.2 Project planning and management

4.2.1 Describe the process of project management.

4.2.2 Show how actuarial techniques can be used in the assessment of capital investment projects and cost-benefit analyses.

4.2.3 Discuss how the risks of the project are taken into account in project management.

5 Data

5.1 Discuss the data requirements for determining values for assets, future benefits and future funding requirements.

5.2 Describe the checks that can and should be made on data.

5.3 Describe the circumstances under which the ideal data required might not be available and discuss ways in which this problem may be overcome.

5.4 Describe how to determine the appropriate grouping of data to achieve the optimal level of homogeneity.

6 Risk management

6.1 Discuss the issues surrounding the management of risk.

6.2 Describe the tools that can be used to aid the management of risk.

6.3 Discuss the methods of measuring risk that can be used by the main providers of benefits on contingent events.

6.4 Describe how risks with low likelihood but high impact might be managed.

6.5 Discuss the use of scenario analysis, stress testing and stochastic modelling in the evaluation of risk.

7 Producing the solution

7.1 Modelling

7.1.1 Describe the approaches available to produce the solutions.

7.1.2 Describe the use of actuarial models to support the methodology used in terms of:

- the objectives of and requirements for building a model
- the basic features of a model required to project future cash and revenue flows
- the use of these models for:
 - pricing or setting future financing strategies
 - risk management
 - assessing the capital requirements and the return on capital or the funding levels required
 - assessing the provisions needed for existing commitments to provide benefits on contingent events
 - pricing and valuing options and guarantees
- how sensitivity analysis of the results of the models can be used to help decision making

7.2 Assumption setting

Describe the principles behind the determination of assumptions as input to a model relevant to producing a specific solution having regard to:

- the types of information that may be available to help in determining the assumptions to be used
- the extent to which each type of information may be useful, and the other considerations that may be taken into account, in deciding the assumptions
- the level of prudence in the assumptions required to meet the objectives of the client

7.3 Expenses

7.3.1 Describe the types of expenses that the providers of benefits on contingent events must meet.

7.3.2 Describe how expenses might be allocated when pricing products, schemes, contracts or other arrangements.

7.4 Developing the cost and the price

7.4.1 Discuss how to determine the cost of providing benefits on contingent events.

7.4.2 Discuss the factors to take into account when determining the appropriate level and incidence of contributions to provide benefits on contingent events.

7.4.3 Discuss the factors to take into account when determining the price or the contributions to charge for benefits on contingent events.

7.4.4 Discuss the influence of provisioning or reserving requirements on pricing or setting financing strategies.

7.5 Investment management

7.5.1 Discuss the principles and objectives of investment management and analyse the investment needs of an investor, taking into account liabilities, liquidity requirements and the risk appetite of the investor.

7.5.2 Discuss the different methods for the valuation of individual investments and demonstrate an understanding of their appropriateness in different situations.

7.5.3 Discuss the different methods for the valuation of portfolios of investments and demonstrate an understanding of their appropriateness in different situations.

7.5.4 Show how actuarial techniques and asset/liability modelling may be used to develop an appropriate investment strategy.

7.5.5 Discuss methods of quantifying the risk of investing in different classes and sub-classes of investment.

7.5.6 Describe the use of a risk budget for controlling risks in a portfolio.

7.6 Provisioning

7.6.1 Discuss the different reasons for the valuation of the benefits from financial and other products, schemes, contracts and other arrangements and the impact on the choice of methodology and assumptions.

7.6.2 Discuss how to determine values for provisions in terms of:

- the need for placing values on provisions and the extent to which values should reflect risk management strategy
- the principles of “fair valuation” of assets and liabilities and other “market consistent” methods of valuing the liabilities
- the reasons why the assumptions used may differ in different circumstances
- the reasons why the assumptions and methods used to place a value on guarantees and options may differ from those used for calculating the accounting provisions needed
- the use of replicating portfolios for valuing liabilities
- the use of stochastic deflators and other stochastic discount methods
- how sensitivity analysis can be used to check the appropriateness of the values

and be able to perform calculations to demonstrate an understanding of the valuation methods.

7.6.3 Describe different methods of allowing for risk in cash-flows.

7.6.4 Discuss different methods of allowing for uncertainty in present values of liabilities.

7.6.5 Discuss the purpose of and uses for equalisation reserves.

7.6.6 Describe the influence of comparisons with market values.

7.7 Relationship between assets and liabilities

7.7.1 Describe the principles of investment and the asset/liability matching requirements of the main providers of benefits on contingent events.

7.7.2 Discuss the use of portfolio theory to take account of an investor's liabilities.

7.7.3 Discuss the need to monitor investment performance and to review investment strategy.

8 Living with the solution

8.1 Maintaining profitability

Describe how the main providers of benefits on contingent events can control and manage the cost of:

- payments arising on contingent events
- expenses associated with the payment of benefits on contingent events

8.2 Determining the expected results

8.2.1 Describe how a provider's expected results can be projected.

8.2.2 Discuss the possible sources of surplus/profit and the levers that can control the amount of surplus/profit.

8.3 Reporting actual results

8.3.1 Describe the reports and systems which may be set up to control the progress of the financial condition of the main providers of benefits on contingent events.

8.3.2 Describe the reports and systems which may be set up to monitor and manage risk at the enterprise level.

8.3.3 Discuss the issues facing the main providers of benefits on contingent events relating to reporting of risk.

8.4 Asset management

Describe the principles of asset management and allocation.

8.5 Capital management

Describe the principles of capital management.

8.6 Surplus management

8.6.1 Describe why a provider will carry out an analysis of the changes in its surplus/profit.

8.6.2 Describe how any surplus/profit arising may be distributed.

8.6.3 Discuss the issues surrounding the amount of surplus/profit that may be distributed at any time and the rationale for retention of surplus/profit.

8.7 Insolvency and closure

Discuss the issues that need to be taken into account on the insolvency or closure of a provider of benefits on contingent events.

8.8 Options and guarantees

Discuss the issues surrounding the management of options and guarantees.

9 Monitoring

9.1 Describe how the actual experience can be monitored and assessed, in terms of:

- the reasons for monitoring experience
- the data required
- the process of analysis of the various factors affecting the experience
- the use of the results to revise models and assumptions

9.2 Describe how the results of the monitoring process in the Actuarial Control Cycle or the Risk Management Control Cycle are used to update the financial planning in a subsequent period.

10 Have an understanding of the principal terms used in financial services and risk management.

END OF SYLLABUS