



Institute  
and Faculty  
of Actuaries

# EXAMINERS' REPORT

CM2 - Financial Engineering and Loss  
Reserving

Core Principles

Paper B

April 2023

## Introduction

The Examiners' Report is written by the Chief Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

For some candidates, this may be their first attempt at answering an examination using open books and online. The Examiners expect all candidates to have a good level of knowledge and understanding of the topics and therefore candidates should not be overly dependent on open book materials. In our experience, candidates that spend too long researching answers in their materials will not be successful either because of time management issues or because they do not properly answer the questions.

Many candidates rely on past exam papers and examiner reports. Great caution must be exercised in doing so because each exam question is unique. As with all professional examinations, it is insufficient to repeat points of principle, formula or other text book works. The examinations are designed to test "higher order" thinking including candidates' ability to apply their knowledge to the facts presented in detail, synthesise and analyse their findings, and present conclusions or advice. Successful candidates concentrate on answering the questions asked rather than repeating their knowledge without application.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Sarah Hutchinson  
Chair of the Board of Examiners  
July 2023

### **A. General comments on the *aims of this subject and how it is marked***

The aim of Subject CM2 is to develop the necessary skills to construct asset liability models, value financial derivatives and calculate reserves for insurance or guarantees. These skills are also required to communicate with other financial professionals and to critically evaluate modern financial theories.

The marking approach for CM2 is flexible in the sense that different answers to those shown in the solution can earn marks if they are relevant and appropriate. Marks for the methodology are also awarded including marks for using the right method even if an error in an earlier part of the question prevents the final answer from being correct. The marking focusses on rewarding candidates' understanding of the concepts, including their ability to articulate arguments clearly.

### **B. Comments on *candidate performance in this diet of the examination.***

Candidates who scored well were those who were able to set out their workings clearly and follow through later question parts even if they had made a mistake in an earlier part. This allowed them to score marks for their method even if their final answers were not correct.

This paper was answered fairly well, with slightly higher average marks than the A paper. Question 3, about producing a delta and gamma hedged portfolio, proved to be the trickiest question on the paper with many candidates calculating correct option values but not valid portfolios.

Candidates should note that showing their full calculations is vital in the B paper, including explaining any goal seek or other methods used. Any answers without workings scored zero marks.

### **C. Pass Mark**

The Pass Mark for this exam was 57  
1297 presented themselves and 540 passed.

## Solutions for Subject CM2B April 2023 Please refer to Excel file

### Q1

*Most candidates scored well in this question despite some common slip-ups in formulae.*

*The explanation in part (iv) was often the weakest part of a candidate's answer - to score strongly here we needed a comparison of the reinsurance options based on the insolvency probabilities from earlier question parts and more broadly based on how each might affect the insurer's business model.*

### Q2

*This question was mostly answered well, with finding the certainty equivalent in parts (iv) and (v) proving to be the trickiest part.*

*Unlike Question 1, the 'wordy' part (vi) was answered well with many candidates scoring close to full marks.*

### Q3

*This proved to be the trickiest question on the paper, with most candidates calculating the correct options values but far fewer deriving the correct portfolios. A few candidates scored well but missed out on full marks by not calculating delta accurately - this needed to be derived either formulaically or from a very small change in share price.*

### Q4

*This question was answered moderately well but caused more difficulty than expected.*

*It was easy to slip up in the matrix calculations and many candidates were unable to produce the correct figures in part (ii), though they were still awarded full marks in parts (iii) and (iv) if the calculations in those parts were correct.*

*Most candidates suggested some good ideas in part (iv) to improve the bank's finances.*

**[Paper Total 100]**

## **END OF EXAMINERS' REPORT**



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