

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2021

CM2 – Financial Engineering and Loss Reserving Core Principles Paper B

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.

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
December 2021

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 similar average marks to the A paper. The question causing the most difficulty seemed to be question 4 using state price deflators and the notes later in this report give more detail on this. It is worth noting that the topic had not been examined before in this format.

Candidates should note that showing their full calculations is vital in the B paper. Any answers without workings scored zero marks.

C. Pass Mark

The Pass Mark for this exam was 63
1,398 presented themselves and 682 passed.

Solutions for Subject CM2B – September 2021 – please refer to excel file

Q1

This question tended to be answered well. The most common mistakes were in calculating the variance in part (i) and this was sometimes obvious when the chart in part (ii) had an unusual shape. The other most common mistake was not correctly capping x_A at 1 in part (v) in order to avoid short-selling asset B.

Q2

Parts (i) and (ii) of this question were answered well by most candidates. In part (iii) the model solution solves a quadratic equation but many candidates used goal seek instead. This was a valid approach but only if it was explained – an answer in the workbook with no explanation scored zero. It was also necessary to recognise that there are two solutions and prove that the one found by goal seek was the lower of the two to score full marks.

Q3

This question was fairly standard and was answered well by many candidates. The most common mistakes were applying inflation incorrectly in the last couple of steps of the solution, or providing the sum of all future claims instead of just those from accident year 2020 as the question asked for.

Q4

This was the trickiest question on the paper, with many candidates struggling to answer part (i) which required using state price deflators. Candidates who produced the correct answer via other means were given partial credit but not full marks since the question explicitly asked for a state price deflator approach.

Parts (ii) and (iii) were answered better on the whole. Using a goal seek in the Black-Scholes calculator was allowed as an alternative way to answer part (ii), though this approach meant that parts (ii) and (iii) produced the same answers which made part (iv) tricky to answer for those candidates.

[Paper Total 100]

END OF EXAMINERS' REPORT