

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

November 2015

### **Subject CA2 – Model Documentation, Analysis and Reporting**

#### **Introduction**

The Examiners' Report is written by the Principal 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.

Possible models with an audit trail or summary are posted on the website. It should be noted that these include more detail than would ordinarily be possible within the time allowed for the examination.

The specimen solutions are based on one possible approach to modelling the assignment set but the examiners gave credit for any alternative approach or interpretation which they considered to be reasonable.

F Layton  
Chairman of the Board of Examiners  
February 2016

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

1. The aim of this subject is to ensure that the successful candidate can model data, document the work (including maintaining an audit trail for a fellow student and senior actuary), analyse the methods used and outputs generated and communicate to a senior actuary the approach, results and conclusions.
2. The subject is split into two papers, the first covers the objectives:
  - analysis of data.
  - development of a model with clear documentation.

The second paper covers:

- ability to analyse the methods used and the model's outputs.
  - ability to apply and interpret the results.
  - communication of the approach, results and conclusions to a senior actuary.
3. As the focus of the subject is on communication the majority of the marks are for the documentation and outputs generated rather than for technical modelling skills. For example, a technical mistake is only penalised once and students can still earn marks for accurate and clear communication of what was done.

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

**PAPER ONE**

**Modelling**

There were 29 marks available for accurate completion of the modelling steps and appropriate data checks.

Most students were able to identify and correct the data errors. A significant proportion of candidates were unable to successfully convert the data from square miles to square km. Few students went beyond the basic data checks to check for trends in the data or to calculate response rates and reasonableness.

Most candidates were able to calculate and compare the bird population for 1985 and 2015, however many candidates struggled to comment as to whether a northerly migration was present. The better prepared candidates were able to project the bird density figures to 2025. A wide range of approaches to the 2025 projection calculations was accepted.

The quality of the graphs produced was good.

Most candidates demonstrated reasonable modelling techniques and scored well in this area (up to 7 marks available).

Very few candidates managed to score well for the “other (non-data) checks” where 8 marks were available. A large number of candidates are failing to score anything here. Candidates should be asking themselves whether the results they are seeing appear reasonable and what makes them reach that conclusion. For example, the candidates should have been able to comment on how the density figures had changed from 1985 to 2015 and whether it was in line with what they expected. This would have showed understanding of the model.

### **Audit trail**

The audit trails were mostly well structured. Most candidates prepared audit trails that followed the order of their model, starting with an overview of the model and stating assumptions that were required for the calculations. The stronger candidates provided sufficient detail explaining their calculations with the very strongest also explaining why steps were being performed. The audit trail for the projections section was less well explained than the earlier parts.

Almost all candidates were able to signpost in which sheet the calculations could be found, but the better prepared candidates were able to provide more signposting by saying where in the sheet specific calculations could be found, either by reference to tables or a combination of columns and rows, for example “in column F the population is calculated by ...”.

## **PAPER TWO**

### **Modelling**

There were 15 marks available for accurate completion of the additional modelling and production of the required charts. The modelling was mostly well done however a large proportion of the candidates did not include self checks on their calculations. The quality of the graphs produced was good.

### **Summary**

The structure of the summary produced was generally completed to a high standard. The examination question effectively provides an outline for the summary and the points to be included. The vast majority of candidates prepared a summary that followed the same order of the items they had been requested to include in the summary.

Candidates could in general explain the different portfolio options that were modelled but most candidates did not include information regarding the fund statistics. Most assumptions provided were a repetition of the assumptions provided in the questions, only the stronger candidate were able to produce value added assumptions.

A number of candidates tended to reproduce portions of the audit trail in the methodology section of the summary. Whilst selective re-use of parts of the audit trail is acceptable, candidates are reminded that the audit trail and summary have different purposes so differences in style and depth are expected.

Most candidates reproduced the charts in the results section but few also included information regarding the fund statistics and details of the actual performance figures that had been achieved.

The discussion of the results was an area that let students down. Most candidates are failing to explain their basic observations. For example, many candidates were able to comment that the fund with the higher projected value would have a higher Internal Rate of Return but only the better prepared candidates were able to link the results back to the fund statistics and explain why the options provided the results they did.

Often no overall conclusions were made (with conclusions sometimes just being restated results). A good candidate would be able to explain the results and also summarise any overall conclusions that can be drawn from the report.

Most candidates are able to produce a list of next steps, however only the better prepared candidates were able to tailor the next steps fully to the questions and score strongly in this section.

45 of the marks are available for the commentary on the results, the conclusions and the next steps. Candidates are expected to show that they understand the results produced by the model by explaining them. A large number of candidates do not spend enough time on this section given how many marks are available here.

**C. Comparative pass rates since the format of the exam was amended**

<i>Year</i>	<i>%</i>
November 2015	53
September 2015	68
May 2015	55
March 2015	52

**Reasons for any significant change in pass rates in current diet to those in the past:**

The November 2015 pass rate was in line with earlier exams set in 2015. Generally, the quality of the exam submissions was lower compared to September, and the students did not seem as well prepared this time compared to the September exam (the date of which was very close to the main session exams).

**END OF EXAMINERS' REPORT**