

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

March 2015

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

### **Paper One and Two**

#### **Introduction**

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. 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.

A possible model with an audit trail and summary is 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.

F Layton  
Chairman of the Board of Examiners

June 2015

## **PAPER ONE**

### **Modelling**

There were 31 marks available for accurate completion of the modelling steps and appropriate data checks. Most candidates produced a reasonable model for checking data and comparing the actual and expected claims. The better prepared candidates were able to develop their model further to determine the premium rates and expected premium in 2016.

The quality of the graphs produced was high and most candidates scored well for these questions.

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

Very few candidates however scored well for the “other (non data) checks” where 7 marks were available. It is important that checks are carried out at each stage of the model to make sure that the results are correct or in the right ballpark. It is not sufficient to say that the results are “as expected” – candidates are expected to explain why the results are as expected to show understanding.

### **Audit Trail**

Most candidates prepared audit trails that followed the order of their model, starting with an overview of the model and stating assumptions when they were required for the calculations. Some candidates struggled to understand how to determine the factors and premiums that were required but as their audit trail explained their calculations in sufficient detail for a fellow student to be able to correct them, they still scored well. This is in contrast to those students who just stated the three formulae set out in the “Additional Guidance” with no further explanation. The formulae may explain **what** factors and premiums have been calculated, but the audit trail needs to set out **how** the model has actually calculated them.

Almost all candidates were able to signpost 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.

Overall, the successful candidates scored more heavily in the “Audit content” part of the audit trail, where up to 32 marks were available. In particular, their audit trail provided more detail not only about what was modelled but how the calculations were carried out. The successful candidates were also able to comment on the results by referring to reasonableness checks carried out and explaining the results obtained.

## **PAPER TWO**

### **Modelling**

There were 15 marks available for accurate completion of the modelling steps set out above and most candidates were able to understand the model and then develop it for the extra scenario. The quality of the graphs produced was very good and most candidates scored well for these questions.

### **Summary**

All candidates prepared a summary that followed the same order of the items they had been requested to include in the summary, which is what was expected.

While it is pleasing to see candidates using their initiative, it was disappointing that most candidates only stated the assumptions that were listed in the audit trail provided, and did not add any further assumptions of their own.

The successful candidates were able to explain the methodology that had been used to produce the break even price, the NPVs, and the two further scenarios in enough detail for the reader to understand what had been done. Many candidates lost straightforward marks by not setting out the values of the parameters used in the model, e.g. the risk discount rate, the expense inflation.

Most candidates included all the results in the summary that had been requested. Candidates should make sure that all questions are answered to avoid losing summary results marks (especially if the results had already been produced by the accompanying model).

Generally, the conclusions included in the summaries were poor and did not suggest that the candidates understood the results that the model had produced. Many of the candidates' conclusions simply stated the results as an observation (for example, a higher mortality improvement rate reduces the NPV) or that the results were "as expected". Many straightforward marks were lost here. As a reminder, candidates are expected to show that they understood the results produced by the model by explaining them.

For the list of next steps, this was also not answered well. Too many candidates relied on short bullet points that were too generic, for example, "use stochastic modelling" only makes sense if this recommendation is tailored to the appropriate part of this particular model. There were plenty of variables used and assumptions stated for a good list of next steps to be produced.

## **END OF EXAMINERS' REPORT**