The series aims to publish books that reflect changes and developments in the curriculum. This book certainly fulfils that objective. Bowers *et al.* (1997) was the first text to eschew the use of commutation functions in the face of increasing use of spreadsheets. This text continues that trend and also plays down the use of life tables and compound interest tables. However it does not take the natural next step of linking the topics discussed to the more comprehensive modelling software that has been developed in the last decade.

BOWERS, N.L., GERBER, H.U., HICKHAM, J.C., JONES, D.A. & NESBITT, C.J. (2nd Edition 1997). *Actuarial Mathematics*. The Society of Actuaries, Schaumburg, Illinois.

CMI Tables Program (STP) for Windows (Version 3.3 2009). Institute of Actuaries, London.

Table Manager Version 3.0. Society of Actuaries. Schaumburg, Illinois.

PHILIP COOPER

Nonlife Actuarial Models, Theory, Methods and Evaluation. By YIU-KUEN TSE (Cambridge University Press, 2009. 544pp. ISBN: 9780521764650)

Based on the UK CT6 (previously 106) exam or the North-American Society of Actuaries exam C, Non-Life Actuarial Models puts a more mathematical framework in place for those students who want to know more than just how to pass the exam. Starting from basic concepts of distribution theory it progresses on to mixture distributions, aggregate loss models, ruin theory and how each of these can be put in to practice in real life.

The book is split into 4 sections: *Loss distributions, Risk and ruin, Credibility, and Model construction and evaluation.*

The loss distribution section discusses the two components of modelling any claim losses; that is claim frequency and claim severity. The book quickly moves on from these concepts, bringing them together to discuss both individual risk models and the collective risk model.

The section on risk and ruin discusses a subject that we are all familiar with; the discussion of risk and what is meant by the term risk together with its measurement and the likelihood of ruin. A variety of risk measures are discussed alongside the definition of a coherent risk measure, a concept not widely known in the actuarial profession. In the chapter on ruin theory the author constructs the surplus random variable and probes the sensitivity of this random variable to time, initial surplus and claim distribution.

Section three deals with the important aspect of data and the level of credibility to which we can hold such data. This section is dealt with in a very statistical setting, asking the question how recent, more relevant, experience

can be used together with a more aggregate wide spread of data for the production of more appropriate assumptions.

Having dealt largely with theory in the first three sections, section four discusses how theory can actually be used in practice. A variety of approaches are discussed on model selection, fit and evaluation together with random number generation and variance reduction techniques in Monte Carlo simulation.

The four sections outlined above are split into 15 chapters covering the most elegant parts of the mathematics covered in the above exams, from credibility theory, Lundberg's inequality and ruin probability. Each chapter starts with key learning objectives with a large array of worked examples for the reader to go through and concludes with exercise questions to test knowledge, some taken directly from old exam papers and modified as necessary. For completeness and to ensure the text is self contained, an appendix covering all the statistical results required throughout the book is included.

The book itself is well written and well set out with key concepts, names of key results and theorems being written in bold. It is written from a mathematical background but all mathematical formulae are easy to follow and where new notation is introduced this is unambiguous and easy to pick up.

Not only offering full coverage of the syllabus for exam C, it also covers a wide array of other topics which are either met separately from the exams or covered in later examinations, for example Brownian motion, and more in-depth discussions on risk and how an appropriate risk measure may be constructed. Written as a text book, this book is a valuable resource for, not only students, but also teachers and can be used for any undergraduate course on this topic, with pre-prepared slides and training material available from the author upon request. The author goes to great lengths to ensure the reader grasps the often quite abstract concepts, through demonstrating first hand with the use of Excel and the in-built functionality. The reader is helped with screen shots of Excel for those unfamiliar with the software.

This book is a valuable resource for those studying the mathematical exams but covers the topic in far more depth than the syllabus requires, although this broader material may serve to motivate students' real interest rather than just rote-learning. Overall it is a refreshing and worthwhile addition to any mathematical actuary's book shelf.

NICK WOODWARD

Loss Models — from data to decisions (3rd edition). By STUART A. KLUGMAN, HARRY H. PANJER and GORDON E. WILLMOT (John Wiley & Sons, 2008. 726 pp. ISBN: 9780470187814)

This textbook provides individuals or actuarial students with a good insight into different statistical techniques involved with modelling the loss