

## BOOK REVIEWS

S.A. KLUGMAN, H.H. PANJER and G.E. WILLMOT (1998): *Loss Models: From Data to Decisions*. Wiley, New York.

Hogg and Klugmann (1984) gives an excellent introduction into the stochastic modeling of insurance losses. A key feature of that book is the attention given to the special character of insurance data. Rather than having embarked on a second (revised) edition, the present three authors have decided to write a new text, keeping the main ideas of Hogg and Klugman (1984), but adding numerous topics which every actuary, whether practicing or academic, ought to know.

*Loss Models* "is organized around the principle that actuaries build models in order to analyze risks and make decisions about managing the risks based on conclusions drawn from the analysis". It is to be stressed that the text mainly looks at the liability side of insurance: the losses. These are put together in a global risk model where uncertainty may enter at the claim-size level (Chapter 2) and at the claim-frequency level (Chapter 3). Combining these two levels leads to an aggregate model (Chapter 4). The premium side of the coin is treated through credibility theory (Chapter 5). Long term stability questions are discussed via the classical limit theorems for ultimate ruin (Chapter 6).

So far, various existing texts present, at least from a chapter heading point of view, similar material. Where are the novelties? First of all, this text is extensive in its 644 pages. That means that all of the above topics are treated in a fair amount of detail. Secondly, numerical examples together with accompanying exercises and case studies are abundant. On each topic introduced, the reader is asked to calculate actual numbers (i.e. take decisions) based on data. Many of the exercises presented stem from actuarial examination papers. Answers to selected ones are given.

This brings me to the key question: "What is the intended readership?" As the book assumes no specific prerequisites beyond basic courses in linear algebra, analysis and elementary probability and statistics, the readership is broad. Anyone interested in acquiring the basic stochastic techniques which practicing actuaries use daily will find this text useful. The necessary statistical and probabilistic techniques are introduced if and when needed. Computability is always a concern: no theory without numbers. The style of writing is relaxed, yet also concise. A slight loss of conciseness is present towards the end of the text where basic results of Poisson processes and Brownian motion are derived: for instance the proof of the interarrival-time characterisation of the homogeneous Poisson process leaves the critical reader a bit in the cold when it comes to achieving independence (the usual

step-by-step “proof”), also the reader could have benefited from a warning that the reflection principle for brownian motion (figuring on the cover!), though intuitively clear, needs a proof (strong Markov property). Similar warnings could have been made in the chapter on ruin theory. Also, I found the Index, and to some extent the References a bit wanting. These “flaws” however should not diminish my admiration for this book: it is a most useful addition to the actuarial literature. Especially from the more applied, industrial side: If I were recruiting a new, young actuary of which I would know that he or she had a through knowledge of the material treated in **Loss Models**, I would be most glad. As such, this book will no doubt become a classic reference.

#### REFERENCE

HOGG, R. and KLUGMAN, S. (1984) *Loss Distributions*. Wiley, New York.

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