BOOK REVIEW

JAN BEIRLANT, JOZEF L. TEUGELS and PETRA VYNCKIER (1996): *Practical Analysis of Extreme Values.* Leuven University Press. ISBN 90 6181 768 1.

This short book aims to introduce the reader to some of the practical methods of handling extreme value statistics, with a particular leaning towards actuarial applications. The emphasis is on graphical methods of fitting and comparing different types of distribution, and the estimation of extreme value index parameters.

The first chapter begins with elementary introductions to such concepts as density and distribution functions, and lists some of the numerous parametric distributions applied to non-life insurance data. In general this is accurate and informative, though the reader should be cautioned that the authors' definition of the "generalized Pareto" distribution is not the same as the one adopted by other writers on extreme value theory. The latter part of the chapter describes a number of graphical methods for choosing among distributional families.

The next three chapters concentrate on methods of estimating three different definitions of the extreme value index: the Pareto index (chapter 2), the index of the general extreme value distribution (chapter 3) and Weibull indices (chapter 4). The main method of chapter 2 is the so-called Hill estimator, applied to the largest order statistics of a sample. The most important practical issue with this estimator is how many of the largest order statistics to include, and the authors provide a good discussion of the mathematical principles underlining this choice. I am less convinced of their proposed practical solution to the problem: it is based on a method only recently introduced by the authors themselves, and it seems to me that more experience is needed before recommending it to practising actuaries. Chapters 3 and 4 are written in similar style, though I really feel that the authors should have made it clear that the general form of extreme value distribution is due, modulo changes of notation, to the original foundational papers of Fisher and Tippett (1928) and Gendenko (1943), and not, as the text implies, to a 1995 paper by two of the present three authors!

The final chapter 5 is a nice survey of the actuarial applications of extreme value theory. There are also a number of data sets reproduced in an Appendix.

I feel that this book provides a useful survey of statistical techniques which will be accessible to readers without much background in statistics. The desirable background in mathematics is somewhat greater, though the reader who does not feel at home in the language of regularly varying functions or Tauberian theorems can skip over those sections without losing much of the statistical thread. The book's main weakness is that it hardly gives any hint of the vast array of probabilistic and statistical extreme value theory which lies outside the rather narrow boundaries to which the authors have confined themselves here.

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