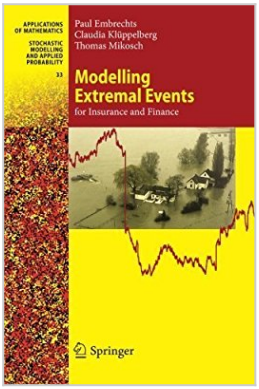

Modelling Extremal Events: for Insurance and Finance (Stochastic Modelling and Applied Probability)

By Paul Embrechts, Claudia Klüppelberg, Thomas Mikosch

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In insurance and finance applications, questions involving extremal events play an important role. This book sets out to bridge the gap between existing theory and practical applications both from a probabilistic as well as statistical point of view.

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Editorial Review

Review

From the reviews:

JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION

"…excellent, comprehensive treatise on the subject of extremal events modeling. The authors have responded well to the demands of extreme value practitioners for such a text. Although it was clearly and admittedly motivated by practical questions of workers in finance, insurance, and reinsurance, [the book] contains the mathematical rigor and generality that will interest the extreme value theoretician…An understanding of modes of convergence, specifically weak convergence, is essential to fully appreciate the text, but the authors' intuitive writing style makes most of the basic ideas accessible even to the uninitiated…The authors do an excellent job of organizing these topics and also provide a very useful 20-page 'Reader Guidelines' section…[the book] makes an excellent contribution to unifying important concepts in extreme value theory and modeling of extremal events. Aside from its obvious use as a reference for practitioners and theoreticians alike, this text may be used to teach a graduate-level course in mathematical finance or a special topics course in stochastic processes with or without a financial emphasis…As the authors point out this may not be the kind of book that you want to tackle form cover to cover initially, but it is my bet you will eventually discover that you have done just that as you repeatedly reference this hefty volume throughout the years."

MATHEMATICAL REVIEWS/MATHSCINET DATABASE

"A reader's first impression on leafing through this book is of the large number of graphs and diagrams, used to illustrate shapes of distributions, to plot sample paths of various processes and to show real data examples in various ways. A closer reading reveals a nice mix of theory and applications, with the copious graphical illustrations alluded to. Such a mixture is of course dear to the heart of the applied probabilist/statistician, and should impress even the most ardent theorists with the range of applications of the subject. While there are a number of books available which cover most of the topics herein, I know of none which presents such a range of theory and applications of extremal processes in one volume, at a level easily understood by users of the methodology. I highly recommend the book to all who work in the area, or in related areas. (...) The combination of skills and expertise of the three authors of this book is impressive. Their reading covers not only the traditional and classical works in the area but a great deal of the modern development, too. (They give 646 references to books and articles in the literature.) Their book concludes with copious appendices setting out the basic probability theory and some of the regular variation theory required for understanding the rest of the development. In summary, this is a worthwhile book in an extremely important area."

SIAM REVIEWS

"(...) This book impresses me as being exceptionally well written, scholarly beyond question, more than a little daunting, and likely to become a classic in its field."

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"The book is the first in the area that strikes a proper balance between mathematical rigor and scope (...) and

the statistically-oriented applications for the practitioner."

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"(...) the indispensable starting point for anyone interested in contemporary applications and extensions of classical EVT."

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"Given the nature of the subject (...) the book is easy to read.(...) The narrative style is marvellous, invariably connecting theoretical concepts to the real world objects they are supposed to describe, (...)."

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"There are a number of texts available on Extreme Value Theory (EVT). This is the essential one to read. It is authoritative and extremely well written…A nice feature of Embrechts et al is an opening 20-page ‘reader guideline’ that gives an overview of the material before the start of the main text."

From the Publisher
Mathematical Reviews /MathSciNet database, R. A. Maller.

A reader's first impression on leafing through this book is of the large number of graphs and diagrams, used to illustrate shapes of distributions, to plot sample paths of various processes and to show real data examples in various ways. A closer reading reveals a nice mix of theory and applications, with the copious graphical illustrations alluded to. Such a mixture is of course dear to the heart of the applied probabilist/statistician, and should impress even the most ardent theorists with the range of applications of the subject. While there are a number of books available which cover most of the topics herein, I know of none which presents such a range of theory and applications of extremal processes in one volume, at a level easily understood by users of the methodology. I highly recommend the book to all who work in the area, or in related areas. [...] The combination of skills and expertise of the three authors of this book is impressive. Their reading covers not only ! the traditional and classical works in the area but a great deal of the modern development, too. (They give 646 references to books and articles in the literature.) Their book concludes with copious appendices setting out the basic probability theory and some of the regular variation theory required for understanding the rest of the development.

In summary... a worthwhile book in an extremely important area.

SIAM Review, Roger Pinkham, Stevens Institute of Technology.

[...] This book impresses me as being exceptionally well written, scholarly beyond question, more than a little daunting, and likely to become a classic in its field.

Kwantitiewe Methoden, Casper de Vries (Erasmus University, Rotterdam).

The book is the first in the area that strikes a proper balance between mathematical rigor and scope on the probability side, and the statistically oriented applications for the practitioner. [...] The authors mostly rely on financially oriented examples, but the coverage of methods is such that anyone using extreme value technique should consult the book. [...] It is an exceptional book, recommended to practitioners, students and researchers alike.

Mathematics Today, Mark H. Robson (Bank of England).

This large, recently published volume has already established itself as the indispensable starting point for anyone interested in contemporary applications and extensions of classical extreme value theory.

Extremes, Anders Martin-Löf (Stockholm University).

This is an encyclopedic handbook of theory and statistical praxis, of great value to actuaries and statisticians in the fields concerned, which gives an up to date picture of this fast developing field, and at the same time a useful and well motivated text book for those who need a guide for entering the area without getting lost either in pure theory or messy practice.

ASTIN Bulletin, Ragnar Norberg (London School of Economics).

This long-awaited volume gathers and systematizes a huge material, parts of which were hitherto scattered around in journals. [...] Given the nature of the subject, which is highly technical, the book is easy to read.[...] The narrative style is marvellous, invariably connecting theoretical concepts to the real world objects they are supposed to describe, with ample illustrations (100 figures) and discussions of authentic cases and data. An amazing amount of knowledge, also on the practical side, is generously shared with the readers here. Mathematical rigour is never compromised, but is still exercised in measured amounts; proofs are given when they serve an educative purpose, and adequate references are given otherwise. The list of 646 references opens virtually unlimited access to supplementary reading.

From the Back Cover
Both in insurance and in finance applications, questions involving extremal events (such as large insurance claims, large fluctuations, in financial data, stock-market shocks, risk management, ...) play an increasingly important role. This much awaited book presents a comprehensive development of extreme value methodology for random walk models, time series, certain types of continuous-time stochastic processes and compound Poisson processes, all models which standardly occur in applications in insurance mathematics and mathematical finance. Both probabilistic and statistical methods are discussed in detail, with such topics as ruin theory for large claim models, fluctuation theory of sums and extremes of iid sequences, extremes in time series models, point process methods, statistical estimation of tail probabilities. Besides summarising and bringing together known results, the book also features topics that appear for the first time in textbook form, including the theory of subexponential distributions and the spectral theory of heavy-tailed time series. A typical chapter will introduce the new methodology in a rather intuitive (tough always mathematically correct) way, stressing the understanding of new techniques rather than following the usual "theorem-proof" format. Many examples, mainly from applications in insurance and finance, help to convey the usefulness of the new material. A final chapter on more extensive applications and/or related fields broadens the scope further. The book can serve either as a text for a graduate course on stochastics, insurance or mathematical finance, or as a basic reference source. Its reference quality is enhanced by a very extensive bibliography, annotated by various comments sections making the book broadly and easily accessible.

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From reader reviews:

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