BOOK REVIEWS

J. B. DOUGLAS (1980). *Analysis with Standard Contagious Distributions.* International Co-operative Publishing House, Burtonsville, Maryland 20730, xiv+520, $35.00

The subject of this book is the specification and estimation of discrete distributions which can be interpreted as compound distributions based on a discrete counting distribution combined with a discrete severity distribution. Such compound distributions are conveniently described by probability generating functions. Much space is devoted to the specification and interpretation of such distributions, especially the Neyman distribution. The tractability of parameter estimation by means of method of moments or maximum likelihood are demonstrated and illustrated with real data, mostly biological in nature. Some data of the insurance field are also used, however. The statistical inference is performed using the APL-language, which is the major reason for the tractability. Various APL-functions are presented for parameter estimation and goodness of fit testing.

As regards parameter estimation, my curiosity was guided to the question how a Bayesian approach, requiring numerical integration, would work out for such distributions like Neyman and Poisson–Pascal, especially for ill-conditioned samples where method of moments and maximum likelihood break down.

For actuaries, the virtue of this book will be to learn about tractable alternatives to the negative binomial distribution. For instance, the Poisson–Pascal distribution is shown to be a good description for the distribution of the number of policies with a given number of claims.

The reading of this book was a refreshing experience to me and I can recommend the book to all actuaries who study discrete frequency phenomena.

P. TER BERG

P. ALBRECHT (1981). *Dynamische statistische Entscheidungsverfahren für Schadenzahlprozesse.* Veröffentlichungen des Institutes für Versicherungswissenschaft 17, vii+520, Karlsruhe: Verlag Versicherungswirtschaft e.V.

This is the latest in a series of impressing monographs that have come out of the Schloss of Mannheim. The book contains the following chapters (titles translated):

1. Introduction
2. Bases of Statistical Inference
3. Models for the Claim Number Process
4. Statistical Decision Analysis for the Homogeneous Poisson Process
5. Statistical Decision Analysis for the Non-Homogeneous Poisson Process
6. Statistical Decision Analysis for the Mixed Poisson Process
7. Outlook on Further Statistical Procedures for the Claim Number Process
8. Summary

The heart of the book are Chapters 4, 5 and 6. Here, various statistical techniques (introduced in Chapter 2) are used to formulate and answer questions that arise in connection with the Poisson process and its generalizations.

The author ties his presentation in with numerous references: The bibliography has some 400 entries. This is one of several reasons why the monograph will be very useful to anyone working in the field or having a strong desire to get acquainted with it.

H. U. GERBER

DAVID SHPILBERG (1982). *Statistical Decomposition Analysis of Industrial Fire Loss*. Huebner Foundation Monograph 11. xxi+102, $14.95. Richard D. Irwin, Inc. Homewood, Illinois 60430

This book is based on the author's doctoral dissertion, conducted at the Massachusetts Institute of Technology in the years 1974 and 1975. The topic studied in this book is claim *size* analysis, the *frequency* of claims is not studied. This remark is important because the approach uses the analysis of binary events which easily is misinterpreted as being utilized for the analysis of claim frequency data.

The methodology is as follows. Given a particular risk group and a certain number of claims with known claim size, the frequency that these claim sizes exceed a predetermined threshold level is determined. The next step is the logit transformation of the relative frequency. The value of this logit is explained by means of a linear model with dummies, characterizing the risk group, as explanatory variables. Parameters are estimated by means of weighted least squares. By varying the threshold level and repeating this procedure it is possible to form an estimate of the cumulative distribution function of fire loss for a particular risk group. Finally this estimate is used to fit the lognormal distribution as a model for fire loss size.

The reason for the approach with the logit transformation was that it does not require an assumption on the shape of the probability distribution of fire loss size. The logit itself is a disguised assumption on this shape, however. And afterwards it is used to fit the lognormal specification. Home is the wanderer!

It would have been much simpler to start from the very beginning with the specification of lognormality and applying least squares with log claim size as the variable to be explained. This would utilize the information in the data in an efficient way, without loss of information.

I cannot recommend the approach in this book for the analysis of claim size.

P. TER BERG