

thor is presented in a simple situation at the beginning of Chapter 2 [formulas (2.5) and (2.11)]. This provides a unified way to carry out computations. The following chapters are devoted to particular models: standard least squares regression (Chap. 4), models with heteroscedasticity and correlation and SURE and panel data models (Chap. 5), time series models (Chap. 6), and simultaneous equations models (Chap. 7). An appendix collecting many useful basic results is provided at the end of the book.

The book has two major strengths. First, it presents finite-sample results in a unified way, and it can be used as a basic reference by graduate students and researchers in econometrics and statistics. Second, it covers important econometric models by providing finite-sample results where these are available. From these points of view, this book is unique.

What is missing? One could argue that a good transparent approximation based on asymptotic theory might sometimes be preferable to a complex exact finite-sample result. This is typically the case with saddlepoint approximations (Daniels 1954; Field and Ronchetti 1990), which are mentioned only briefly. There has been significant research in this field in the past 20 years, and these techniques can now be applied beyond the original simple case of the mean. In fact, very accurate approximations are available in general setups, including, for instance, multivariate M-estimators (see the references in Ronchetti 1997). Related to this and missing is the nice exact formula for the density of a maximum likelihood estimator in a general parametric model (see Skovgaard 1990; Hillier and Armstrong 1999). From the point of view of presentation, the book focuses on analytic results, and numerical results and computational aspects are scarce.

This book is a good reference on exact finite-sample results in econometrics and is a valuable addition to any statistical library. It can be used as a text in a special graduate level course in econometrics and statistics. It would also be a useful reference for a researcher in these fields.

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REFERENCES

Daniels, H. E. (1954), "Saddlepoint Approximations in Statistics," *The Annals of Mathematical Statistics*, 25, 631-650.  
 Field, C., and Ronchetti, E. (1990), *Small-Sample Asymptotics*, Hayward, CA: Institute of Mathematical Statistics.  
 Hillier, G., and Armstrong, M. (1999), "The Density of the Maximum Likelihood Estimator," *Econometrica*, 67, 1459-1470.  
 Ronchetti, E. (1997), "Introduction to Daniels (1954), Saddlepoint Approximations in Statistics," in *Breakthroughs in Statistics*, Vol. III, eds. S. Kotz and N. L. Johnson, New York: Springer-Verlag, pp. ??-??.  
 Skovgaard, I. M. (1990), "On the Density of Minimum Contrast Estimators," *The Annals of Statistics*, 18, 779-789.

**Practical Genetic Algorithms (2nd ed.).**

Randy L. HAUPT and Sue Ellen HAUPT. Hoboken, NJ: Wiley, 2004. ISBN 0-471-45565-2. xvii + 253 pp. + CD. \$74.95.

The authors note in the Preface that the "book was written for the practicing scientist, engineer, economist, artist, and whoever might possibly become interested in learning the basics of GAs." Statisticians will appreciate the increase in the number of references in the literature to optimizations that use the flexibility and power of genetic algorithms (GAs). A quick search in the *Current Index of Statistics* confirms a multitude of diverse applications for this powerful tool in many facets of design and analysis.

Although not specifically geared to the statistical audience, this book admirably presents the basics of GAs for both the discrete and continuous optimization cases, as well as some of the recent refinements to the algorithms that have greatly enhanced its efficiency and applicability to a broader range of disciplines. The jargon used in GAs, which so often can be a significant hindrance to mastering the subject, is carefully introduced and explained and is complemented with a detailed glossary. Chapters 1-6 work through the very basics of the algorithm via sophisticated examples. The conclusion of each chapter presents a rich up-to-date list of references to help guide the reader to a more detailed understanding of the topics discussed.

Chapter 7 changes focus with overviews of a handful of other global optimizing algorithms that are competitors to genetic algorithms. The "no free lunch theorem" says that the averaged performance of all search algorithms over all problems is equal (Wolpert and Macready 1997), and hence at least a cursory understanding of different approaches to optimization may lead to a more advantageous selection of a best algorithm for a particular problem. In the Appendix, sample MATLAB code is provided for a variety of GAs and other optimization routines.

GAs have proven to be an effective tool for finding global optima in a broad range of statistical and scientific applications. In the coming years, the role and impact of GAs should increase, and this book is an excellent introduction to the world of optimization with its distinct vocabulary and tools.

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REFERENCE

Wolpert, D. H., and Macready, W. G. (1997), "No Free Lunch Theorem for Optimization," *IEEE Transactions on Evolutionary Computation*, 1, 67-82.

TELEGRAPHIC REVIEWS

**Handbook of Statistics, Vol. 23: Advances in Survival Analysis.**

N. BALAKRISHNAN and C. R. RAO (Eds.). Amsterdam: Elsevier, 2004. ISBN 0-444-50079-0. xxv + 795 pp. \$175.00.

As the editors note in the Preface, "survival analysis has become an increasingly active and very important area of research." This is the first volume in this series to focus on survival analysis, and it complements some of the work presented in Volume 20, *Advances in Reliability*. This volume, comprising 40 chapters and divided into 18 parts, contains recent research in a diverse collection of areas related to survival analysis. The 18 parts cover general methodology, censoring and truncated data, hazard rate estimation, comparison of survival curves, competing risks, proportional hazards, accelerated and frailty models, general models, multivariate survival analysis, recurrent events and current status data, disease progression, gene expression, quality of life, flowgraphs, and repair models.

The book provides broad coverage of many key areas in survival analysis and a detailed look at many current survival analysis research areas. As is typical in the Handbooks of Statistics volumes, the chapters have varying levels of detail and are intended for different audiences. This can induce a feel of uneven-

ness; however, for those starting with survival analysis or for veterans wanting to stay current, this is a valuable reference.

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**Skew-Elliptical Distributions and Their Applications: A Journey Beyond Normality.**

Marc G. GENTON (Ed.). Boca Raton, FL: Chapman & Hall/CRC, 2004. ISBN 1-58488-431-2. 396 pp. \$89.95.

Elliptical distributions, like the multivariate  $t$ , have proven to be useful models for going beyond multivariate normality. A next natural step in the quest for more realistic models is to introduce skewness, and doing so in such a way that computational feasibility is preserved. This volume presents numerous contributions with this goal in mind. Topics included range from distributional theory together with inference in such models to various applications in diverse fields such as economics, time series analysis, Kalman filtering, astronomy, and mul-

tivariate survival analysis. This very readable text will no doubt prove very useful.

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**Data Envelopment Analysis: Theory and Techniques for Economics and Operations Research.**

Subhash C. RAY. New York: Cambridge University Press, 2004. ISBN 0-521-80256-3. xii + 353 pp. \$75.00.

Data envelopment analysis (DEA) as a theory fits into a long tradition of nonparametric analysis of efficiency using linear programming in economics. It has its roots in the work of Farrell (1957). In the author's words, "The principle objective of this book is to deal comprehensively with DEA for efficiency measurement in an expository fashion for economists. At the same time, it seeks to provide the economic theory behind the various DEA models for the benefit of an OR/management science analyst unfamiliar with neoclassical production theory." Besides providing an excellent overview of the theory, the author also discusses several examples applying DEA. A final chapter on stochastic DEA and a list of open problems make this text ideal for practitioners, students, and researchers.

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REFERENCE

Farrell, M. J. (1957), "The Measurement of Productive Efficiency," *Journal of the Royal Statistical Society*, Ser. A, 120, 253–290.

**Carpenter's Complete Guide to the SAS Macro Language (2nd ed.).**

Art CARPENTER. Cary, NC: SAS Institute, 2004. ISBN 1-59047-384-1. xxii + 476 pp. \$52.95 (P).

SAS users know that the strategic use of a macro can make statistical programming both more efficient and considerably less frustrating. The author has written a thoroughly readable book that will help both novice and experienced SAS users write and use macros. The book can be effectively used as a reference or as a "teach yourself" text, complete with simple to advanced exercises (and their solutions). The book should be most valuable to experienced SAS programmers who want a comprehensive guide to expand their knowledge and to help make their macros more efficient.

Divided into three parts ("Macro Basics," "Using Macros," and "Advanced Macro Topics, Utilities, and Examples"), each with four chapters, this well-written book is rich with annotated examples explaining the syntax, logic, and use of macro writing. Its careful treatment of dynamic programming issues is particularly helpful for making macros more adaptable to data of different forms and dimensionality. The chapter "Building and Using Macro Libraries" will help users manage their macros. The appendixes are thoughtfully organized to make it easier to track reoccurring examples, utilities, and macros throughout the book.

Overall, this is an important book for those who write a moderate to extensive amount of SAS code. It is approachable and well organized, and contains a wealth of valuable information important for a large number of statisticians and programmers.

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