

excessive reliance on nonstandard acronyms; a partial listing is MLRM, RLRM, DOOLSE, DOWELSE, NRM, RLTM, RIM, RSM, and LTM. Significant omissions are transfer function models, generalized linear models and the previously mentioned state-space model. To summarize, the book may be useful for building a bridge connecting classical fixed function regression to modern functional data analysis, but it is not the place to learn about some of the more modern approaches to time-series regression.

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Colin Rose and Murray D. Smith (eds), *Mathematical Statistics with Mathematica*
New York: Springer, 2002. 481 pages. Price €56.95

The first thing to say is that this book comes with software in the form of two CDs: one provides a trial copy of the computer algebra software *Mathematica*, the other provides the additional *Mathematica* packages, mathStatica, about a 100 extra functions developed for the book. Each of these items of software requires the user to obtain a password before they can be used, for example via the web and e-mail. The website involved is <http://www.mathstatica.com>; there, more about the book, software and upgrades can be found. Once these packages and passwords are installed, then the whole resource – book, examples and illustrations – is available electronically and interactively with hyperlinks using the *Mathematica* front end Notebooks – one for each chapter of the book. This interactive feature means that, for those new to *Mathematica*, it is very easy to pick up the syntax by activating the examples in the text, with altered content if desired. The Appendix provides some useful commentary on various commonly needed constructions in writing *Mathematica* input lines.

For those familiar with *Mathematica* but not familiar with statistics, the easy interactive experimentation with methodologies and concepts using the examples identified through the Table of Contents or Index makes it possible to progress in a self-study mode very effectively. For those familiar with both *Mathematica* and the statistical topics covered in the book, the opportunities of developing course materials or applications are wide ranging and made very efficient.

The chapter titles are more or less what might be hoped for in a book that could serve as a modern second-year text in mathematical statistics, or equally as a user's guide to doing statistics in real situations – namely, solving problems rather than dwelling on proofs. Chapter titles are: 1 Introduction, 2 Continuous Random Variables, 3 Discrete Random Variables, 4 Distributions of Functions of Random Variables, 5 Systems of Distributions, 6 Multivariate Distributions, 7 Moments of Sampling Distributions, 8 Asymptotic Theory, 9 Statistical Decision Theory, 10 Unbiased Parameter Estimation, 11 Principles of Maximum Likelihood Estimation, 12 Maximum Likelihood Estimation in Practice, Appendix, Notes, References, Index. Used as a course text, the added power of *Mathematica* extends enormously the scope of difficulty that may be expected by tutors in problem solving; it generates graphics and animation for exploration and illustration and, moreover, its feature of providing output in TEX form is a help in generating good-quality illustrated reports. A lecturer could, of course, with a computer projector, present live interactive use of the chapter Notebooks during a class, demonstrating derivations and illustrating with graphics and numerical calculations.

This reviewer happened to be considering certain aspects of bivariate gamma distributions and Fisher information at the time the book arrived. On calling the Index Notebook Index.nb into *Mathematica*, a scroll down to the item *bivariate Gamma pdf (McKay) 248* yielded a link which loaded Chapter6.nb open at page 248 with information about this distribution – here actually in the form of a structured exercise that is rather easy to perform in *Mathematica*. Also provided in the text is a link to a plot of the McKay distribution, animated through a range of the dispersion parameter. If we click on *Fisher Information 326–332* in the Index, up comes the start of Chapter 10, *Unbiased Parameter Estimation*. Here Fisher information is introduced and its alternative form is described together with explanation and illustrative examples. Included among these is one demonstrating the regularity constraints on the use of the alternate definition – involving a change of order of differentiation and integration.

In mathStatica, one of the 100 or so special functions is FisherInformation which computes analytically Fisher information on a given probability density function with arbitrarily many parameters. As with built-in *Mathematica* functions. FisherInformation is integrated into the online Help facility: entering the command ?FisherInformation yields a description of the function and how to use it. That reveals that we may choose to use the alternate definition, which is faster but requires the regularity condition to be met. This kind of attention to detail is very comforting and the fact that the very powerful resources of *Mathematica* are on hand to experiment with a given real situation helps the user to gain confidence and facility very quickly.

The book seems to contain very few errors, though doubtless, more are there. It may be that the whole document with most of its formulae being actually written inside a *Mathematica* environment means that formulae and derivations are easily checked for properties stated. Similarly, few users of the book would be likely to be seriously disadvantaged by residual errors.

I liked the book and, on mentioning it to a colleague in an applied science department, he immediately bought a copy. It is a valuable reference for anyone who needs to use mathematical statistical methods for teaching or practice. It is only fair to point out that there is an implicit extra cost for those who do not already have *Mathematica*; the CD provided with the book gives only a trial version, subsequent to which a licence would be needed.

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Eric Zivot and Jiahui Wang (eds), *Modeling Financial Time Series with S-PLUS®*
Springer-Verlag, 2003. ISBN 0-387-95549-6

This econometrics of financial time series has become a hot topic in recent years, bringing forth several new textbooks and monographs. Zivot and Wang's text is distinctive in two respects: it has very wide coverage and doubles as a user's guide for Insightful Corporation's S+FinMetrics package, now available as a module in the popular S-PLUS 6 statistical software package.

This book contains 17 chapters, the first two being introductions on how S-PLUS deals with and manipulates time series. These are followed by chapters covering the standard topics of time-series analysis: ARMA modelling, unit-root tests, regression, univariate and multivariate GARCH modelling, systems of equations, and VARs and cointegration. Interspersed with these, however, are chapters on modelling extreme values, long memory, technical analysis, state-space modelling, and robust outlier detection, plus separate chapters on factor models of asset returns and the term structure of interest rates. These topics are not often encountered in other texts and their inclusion makes the book a very useful addition to the literature. Each of the chapters contains extensive examples of S+FinMetrics commands, these being used for both generating simulated series and fitting models to actual time series. Moreover, S+FinMetrics incorporates functions from other sources: for example, S+GARCH, the EVIS and EVANESCE libraries for modelling extreme values, and the *SsfPack* library of state-space modelling functions. Since S+FinMetrics is contained within S-PLUS, all the routines of that package are also available, so that, for example, there is access to the excellent TRELIS graphics.

Unfortunately, there are downsides to this integration of methodological discussion with software documentation. Perhaps unavoidably, jumping from one to the other makes for a difficult read in places, particularly as detailed development of methodology is often sacrificed for computational aspects. This is exacerbated by the exposition being rather poor in places and by the, quite frankly, tortuous syntax of many of the S+FinMetrics function commands. This latter point is rather important, as current users of econometric packages such as *Econometric Views* will be loathe to give up the ease and convenience of modern