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Book Selection

Edited by U Aickelin

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Dynamic Portfolio Strategies: Quantitative Methods and Empirical Rules for Incomplete Information

N Dokuchaev

Kluwer Academic, 2002. 199 pp. £77.00
ISBN: 079237648X

This monograph addresses a number of topics in portfolio selection, which is the branch of financial economics that is concerned with the design of portfolios of risky financial assets. This is a nicely written and well-presented monograph. It is not absolutely essential reading for those interested in portfolio selection. However, it does contain some interesting ideas and so reading it is recommended.

As the author points out, the so-called optimal strategies are optimal only for given models of price evolution and their accompanying probability distributions. His contribution is to examine five different but related problems. The first of these is the case where a time series of security prices is available, but there is no model for their joint probability distribution. The four other cases all assume that prices evolve according to Îto's equation, which is a standard stochastic process widely used in continuous time finance. These four cases are differentiated from each other by various assumptions about the state of knowledge of the parameters of model based on Îto's equation.

The book begins with a chapter that sets out the Îto equation in some detail and then summarizes related theory that is used in subsequent chapters. The main chapters, of which there are 13, are devoted to the five cases summarized above and to various applications in portfolio selection. Briefly, these applications are concerned with portfolios that consist of (i) stocks and interest bearing cash; (ii) stocks and bonds; and (iii) financial options.

This book should be of some interest to anyone concerned with the theory of portfolio selection. It also offers some interesting ideas on portfolio construction that seem to be easy to implement and test. As an example, Chapter 2 describes procedures that allow the user to switch between stocks and cash. The procedures are easy to implement because they rely only on price and interest rate data.

I found this monograph to be a challenging read in several ways. In places, it requires the reader to be knowledgeable about continuous time stochastic processes—to the level of Girsanov's theorem and beyond—in order to understand some of the theory that is presented. However, I also generally found it quite easy to follow subsequent applications of the theory. In short, for readers concerned with applications, much of the more technical material can be skimmed without missing too much.

More interesting challenges, for me at least, arose from the fact that the monograph often raised more questions than it answered. For the stock/cash portfolios of Chapter 2, for example, three cases, each in effect a trading rule, are presented. All look interesting, trading rules with potential perhaps. But, in each case there are data for just 100 days and there are quite strong trends in the stock data in the periods shown. What, I wondered, would a test of all 100 FTSE stocks over a 20-year period reveal?

A few irritations kept me alert. Some 'notation creep' meant that the same symbols had more than one meaning. Sometimes notation was not defined and its meaning implied by context. One or two theoretical parts floated in space and, although usually quite interesting in their own right, seemed not to be connected to what followed. Reverting to my normal role as a journal editor, I did think there was a case for tighter refereeing in one or two places.

Overall, although, I found this an interesting and thought-provoking book. Definitely a case of '*mérite un détour*' although perhaps not quite '*vaut le voyage*'.

University of Sheffield C Adcock

Elements of Applied Stochastic Processes (Third Edition)

UN Bhat and GK Miller

John Wiley, 2002. 461 pp. £70.50
ISBN: 0471414425

This new version of Bhat's well-received 1984 text is not so much an update as a complete repackaging of familiar materials. Gone are the 21 chapters artificially divided into theoretical and practical sections. Instead, in their place are just 12 chapters in which theory and applications are now mostly integrated. The effect is to make the book appear much more practitioner-oriented—and as Bhat and Miller suggest—'instructor-friendly'.

As before, the text's treatment of Markov processes is extremely thorough.[1] Indeed, the analytical presentation is impressive throughout, other key areas including branching and renewal processes and time series analysis. However (inevitably, perhaps), some detail has been lost in the restructuring. In particular, references and recommendations for further reading are no longer as comprehensive as they were and many of the solutions to the varied set problems have now been dropped.

Applications still range from queuing, inventory management, combat, consumer behaviour, human resource management, replacement, reliability, sampling inspection and social mobility making the reference potentially of much greater value than its title might immediately imply.

Also on the plus side, the new edition—with 25% fewer pages—is more compact than its predecessor and the last chapter, overviewing for the first time the role of simulation methods in the modelling of stochastic processes, is a worthwhile and welcome addition.

A few minor typo errors are present but, these apart, the volume is professionally and attractively produced. A small quibble is the appearance in the book of details on M/G/1 queues well before those correspondingly on M/M/s ones. This seemed odd—but perhaps the problem here lies with your unreconstructedly conservative reviewer!

All in all, then this is a book that would usefully grace the bookshelf of any self-respecting operational researcher and even at over fifteen pence per page is definitely to be recommended.

J Freeman

Reference

1 Barrett AA (1985). Review of elements of applied stochastic processes. *J Opl Res Soc* **39**: 969.

Single-Facility Location Problems with Barriers

K Klamroth

Kluwer Academic, 2002. 201 pp. £52.50
ISBN: 0387954988

This is a very focused book on single facility continuous location problems in which travel through certain regions, and thus also locating, are forbidden. It is generally well written as a highly technical book. The mathematical rigor is not compromised and several explanatory illustrations help to gain insight into the geometrical aspects of these specific set of problems. The book contains four parts. The first part, which includes four chapters, provides preliminaries and background in distance functions, location problems with barriers and their relationships to no-barrier location problems. The second part concentrates on location problems with special types of barriers—polyhedra (not necessarily convex) (Chapter 5), single circular (Chapter 6) and line width passages (Chapter 7). In Chapters 5 and 6, there are no specific assumptions made on the underlying objective function, which is a nice property of the theoretical analyses presented, and Chapter 7 considers minisum problems. The third part looks at the special cases with convex polyhedra barriers under minisum objective-block norms (Chapter 8) and minimax objective-rectangular distance (Chapter 9), and multi-objective models, but including a solution methodology only for bi-objective location models. Chapters 8 and 9, being special cases, rely heavily on Chapter 5. However, they include improved solution procedures obtained by exploiting the specific assumptions made regarding the distance functions and the convexity of the polyhedra. We note that Chapter 5 also discusses the use of mixed integer programming for single-facility location problems and multi-facility minisum models in the presence of polyhedral barriers. The fourth part is a short chapter presenting an application on a minisum model with line barrier-two passages under rectangular distance.

A good amount of the material presented in Part 2 and Chapter 3, which actually cover the underlying new theory, is regarding the reduction of the overall non-convex location problems due to barriers to convex sub-problems via decomposing the feasible region into cells. The results are used to devise efficient exact and approximation algorithms that rely on efficient search methods over cells to identify the optimum.

The theoretical analyses and methodologies also utilize several concepts from computational geometry, corroborat-