

Book review

Avellaneda, M., Laurence, P.: Quantitative Modeling of Derivative Securities. Chapman & Hall/CRC, London, 2000, 322 pp., \$39.99, ISBN 1-58488-031-7

Many useful textbooks on derivatives in financial markets have been published in the last years. The present book is one of them with some interesting properties. It originated in lecture notes for the course Mathematics of Finance which Marco Avellaneda has taught at the Courant Institute of Mathematical Sciences in New York since 1993. His student Peter Laurence presented parts of these lecture notes in a doctoral course on finance at the University of Rome in 1996. A broader audience in view, Avellaneda and Laurence created together a coherent text in more than 2 years of close collaboration, that is of value to both theorists and practitioners now.

The mathematical style of the book is informal without trivializing the mathematical level. Lacking to be self-contained, the main mathematical ideas are introduced shortly provided with some solid bibliographical references. An overly technical mathematical treatment which would obscure the underlying financial ideas is avoided.

The contents of the book seem to be structured as usual. It is essentially divided into two parts. The first eight chapters are mostly dealing with discrete lattice models. The following seven chapters present continuous-time finance, modeling the term-structure of interest rates and pricing fixed-income derivatives:

1. Arbitrage Pricing Theory: The One-Period Model
2. The Binomial Option Pricing Model
3. Analysis of the Black-Scholes Formula
4. Refinements of the Binomial Model
5. American-Style Options, Early Exercise, and Time-Optionality
6. Trinomial Model and Finite-Difference Schemes
7. Brownian Motion and Ito Calculus
8. Introduction to Exotic Options: Digital and Barrier Options
9. Ito Processes, Continuous-Time Martingales, and Girsanov's Theorem
10. Continuous-time Finance: An Introduction
11. Valuation of Derivative Securities
12. Fixed-Income Securities and the Term-Structure of Interest Rates
13. The Heath-Jarrow-Morton Theorem and Multidimensional Term-Structure Models
14. Exponential-Affine Models
15. Interest-Rate Options

A special feature of the book is to link the arbitrage pricing theory with the practical aspects of risk-management. The authors' 2 years' experience in Wall Street at a foreign-exchange options department and at a fixed-income derivative products group probably led to the inclusion of a lot of examples, tables and figures from practice, up to special derivative products as e.g. the USD/JPY 90 Day Range-Accrual Option on the front cover. Therefore, the authors go further than Martin Baxter and Andrew Rennie in their well-known book *Financial Calculus* which also focuses on the valuation principles that are common to most derivative securities.

This book is written for and may be highly recommended to readers who are interested in pricing new financial products and measuring their market risk as well as in developing multifactor models that deal with several underlying securities.