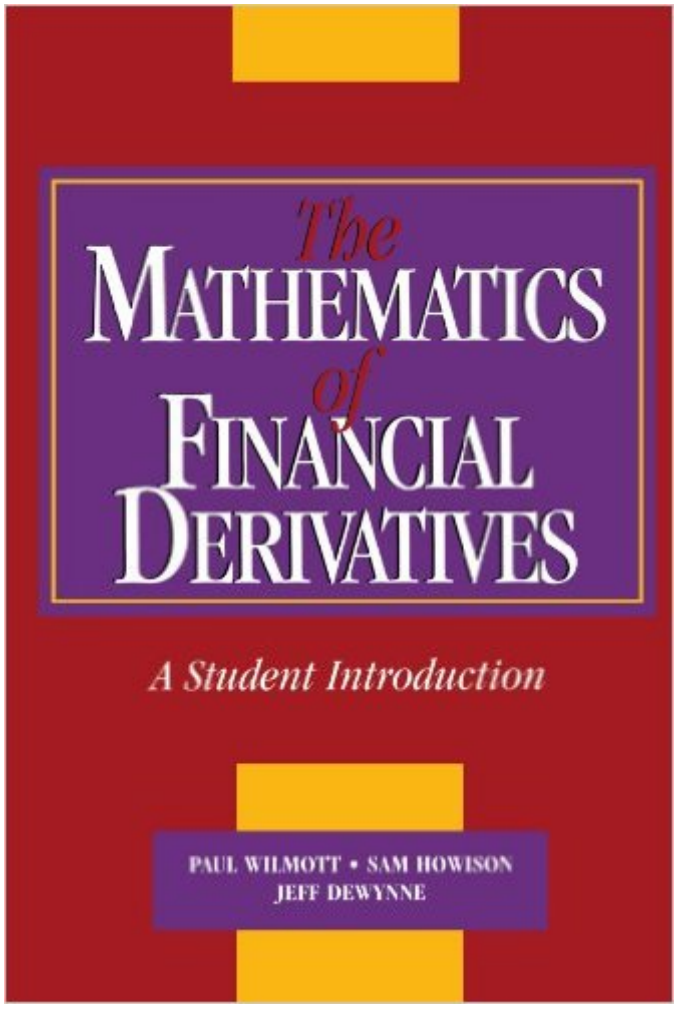
The Mathematics Of Financial Derivatives: A Student Introduction



Synopsis

Finance is one of the fastest growing areas in the modern banking and corporate world. This, together with the sophistication of modern financial products, provides a rapidly growing impetus for new mathematical models and modern mathematical methods. Indeed, the area is an expanding source for novel and relevant "real-world" mathematics. In this book, the authors describe the modeling of financial derivative products from an applied mathematician’s viewpoint, from modeling to analysis to elementary computation. The authors present a unified approach to modeling derivative products as partial differential equations, using numerical solutions where appropriate. The authors assume some mathematical background, but provide clear explanations for material beyond elementary calculus, probability, and algebra. This volume will become the standard introduction for advanced undergraduate students to this exciting new field.

Book Information

Paperback: 317 pages

Publisher: Cambridge University Press; 1 edition (September 29, 1995)

Language: English

ISBN-10: 0521497892

ISBN-13: 978-0521497893

Product Dimensions: 6 x 0.7 x 9 inches

Shipping Weight: 1.3 pounds (View shipping rates and policies)

Average Customer Review: 3.5 out of 5 starsÂ Â See all reviewsÂ (26 customer reviews)

Best Sellers Rank: #311,981 in Books (See Top 100 in Books) #81 inÂ Books > Science & Math > Mathematics > Reference #128 inÂ Books > Business & Money > Investing > Options #867 inÂ Books > Business & Money > Investing > Introduction

Customer Reviews

Contrary to what many readers believe, this book explains the pricing of derivatives much better than Hull. Hull gives an overview of the mechanics and properties of the derivative pricing industry, along with its pricing methodologies, and this book provides an in depth method to one of the pricing methods.Financial derivatives can be priced by a wide range of methodologies, among some the elegant equivalent martingale measure approach (or risk-neutral pricing), replication, multinomial tree approximation, Monte Carlo simulation, partial differential equations etc etc.This book gives an excellent introduction, and an insight to the PDE approach. Although being a big fan of the Girsanov-change-of-measure method myself, these analytical methods often fail in the valuation of

highly complex derivatives like the exotics. Pricing americans prove to be hard and inefficient too, even with simulation and the risk-neutral approach.This is where PDE methods come in. Since most derivatives (or term structures) have a PDE describing its evolution, solving the PDE seems to be a good (or sometimes the best) way, no matter how complex the derivative can get. PDEs on the other hand, have very robust and easy methods for solving. Therefore, this book brings the reader through basic PDE solving methods, analytical solutions, techniques for fast and efficient numerical approximations as well as rigorous technical explanations for some of the mathematics of partial differential equations (which arise in the financial industry).The authors are famous for their research in the field of Industrial and Applied Mathematics, and this book continues to be a classic for undergraduates in mathematics in Oxford. If you want to have an overview of the pde approach to option valuation, without the hassle of learning up Radon-NikodÃƒÂ m and martingales, I highly recommend this book!

Wilmott's book was one of the first to tackle options pricing from a PDE point of view. The original book (now out of print) was a little more detailed and later superseded by this cheaper "Student Edition" overview on one hand and the "Wilmott on Quantative Finance" 3-volume set on the other hand. A per its title, this is an applied mathematics book, and therefore a minimal level of math is expected from the reader (so please, do not compare with Hull...).Taking a PDE approach, the book aims at presenting various methods for pricing financial options. While the first few chapters are pretty good at skimming the surface of the theory and laying down the key principles of options pricing, the book, in general, lacks depth. Many results (prices of barrier, lookback, asian, etc...) are given without real development or simply with a little "hand-waving". As soon as things get a little complicated, Wilmott just outlines the way forward and drops buzz-words.In that sense, the book, while attempting go beyond introductory level topics in some details, does not provide great insight into the more difficult areas of option pricing and, lacking courage, simply goes through what has become the standard presentation without adding much value. Not for beginers, but not for more advanced readers either !It is nonetheless an acceptable quick overview if you are looking for a refresher of key concepts. For a more thorough mathematical introduction to options pricing, You-Lan Zhu's book (for example) does a much better job at covering the PDE approach rigorously (proving for example some of the convergence criterias for the finite difference method, covering the linear complementarity approach as well as presenting other numerical techniques) without being overly formal.

If you want an introduction, read another book like Hull. If you want to learn how to apply Partial Differential Equations (PDEs) approach to finance then it is a useful book. However, it is better to read an elementary PDEs book before reading this book. At least, learn how to solve parabolic PDEs analytically because the technical notes in the book would not help much.

Before buying this book I opened some others which frightened me a little. As a pure mathematician, I wanted something that's mathematically 'juicy', and I really liked it. It's rigourous enough so that you know where the formulas come from, but fortunately not too formal (anyway there are great technical points for those who do want more details). This book has given me the motivation to learn more about financial derivatives, and I think that after I've read it, I'll probably go towards less mathematics-oriented books.

The statement on the back this book that all the reader needs is some basic calc and a bit of probability is, as when you see it on most other similar books, false. To truly understand what is going on you need a prior knowledge of PDEs as well as some stochastic calculus. If you read this book after you have studies these you will learn a lot from it, but without this prior knowledge the book is too difficult to follow. I would recommend it to a reader who has seen the martingale approach to the subject before, and has at least studied ODEs and has a book on PDEs to refer to when the PDEs become too difficult to follow. The book manages to cover a lot, but you can't read a chapter and expect to have a good understanding from only reading the material. Most derivations, and even formulas, are left as exercises, and you need to complete at least 30% of the end of chapter exercises to firmly understand the material that the authors have covered. If you already have a good grasp of mathematical finance, this book can be a good way to further enhance your understanding, but don't buy this as an introductory book unless you are very strong in PDEs.

Derivatives Introduction to the Mathematics of Finance: From Risk Management to Options Pricing (Undergraduate Texts in Mathematics) A Primer For The Mathematics Of Financial Engineering, Second Edition (Financial Engineering Advanced Background Series) Risk Takers: Uses and Abuses of Financial Derivatives (2nd Edition) Traders, Guns and Money: Knowns and unknowns in the dazzling world of derivatives Revised edition (Financial Times (Prentice Hall)) Student Solutions Manual for Derivatives Markets Student Solutions Manual for Options, Futures, and Other Derivatives Introduction to Derivatives and Risk Management (with Stock-Trak Coupon) Quantitative Methods in Derivatives Pricing: An Introduction to Computational Finance Derivatives Essentials: An Introduction to Forwards, Futures, Options and Swaps (Wiley Finance) How to Bake Pi: An Edible Exploration of the Mathematics of Mathematics The Birth of Mathematics: Ancient Times to 1300 (Pioneers in Mathematics) Practical Problems in Mathematics for Heating and Cooling Technicians (Practical Problems In Mathematics Series) Practical Problems in Mathematics for Heating and Cooling Technicians (Applied Mathematics)