Mathematical Techniques In Finance: Tools For Incomplete Markets, Second Edition
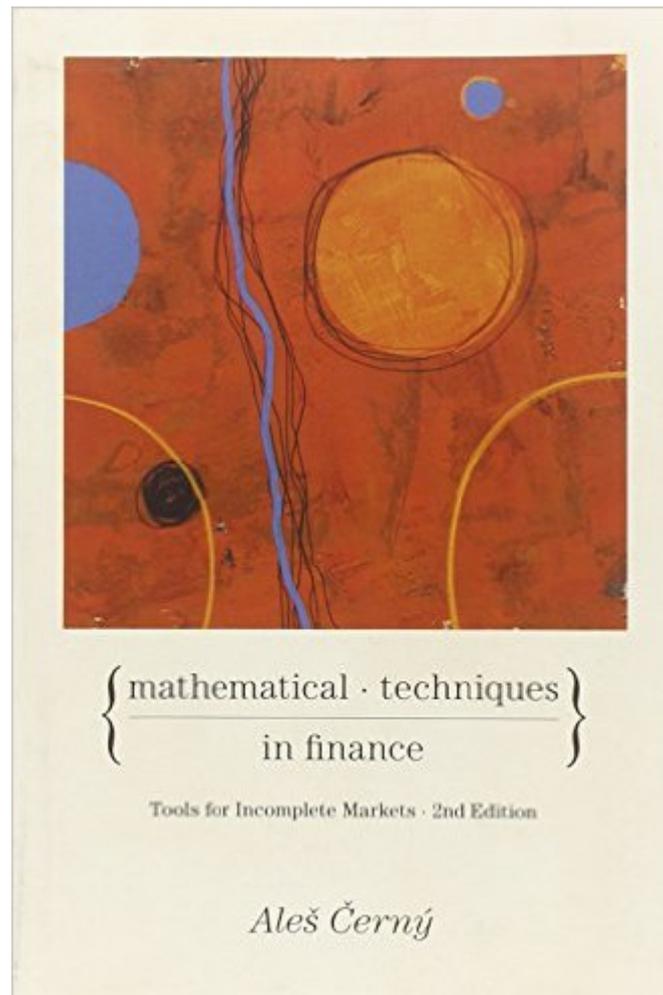
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in finance

Tools for Incomplete Markets · 2nd Edition

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Synopsis

Originally published in 2003, Mathematical Techniques in Finance has become a standard textbook for master's-level finance courses containing a significant quantitative element while also being suitable for finance PhD students. This fully revised second edition continues to offer a carefully crafted blend of numerical applications and theoretical grounding in economics, finance, and mathematics, and provides plenty of opportunities for students to practice applied mathematics and cutting-edge finance. Ales Cerná mixes tools from calculus, linear algebra, probability theory, numerical mathematics, and programming to analyze in an accessible way some of the most intriguing problems in financial economics. The textbook is the perfect hands-on introduction to asset pricing, optimal portfolio selection, risk measurement, and investment evaluation.The new edition includes the most recent research in the area of incomplete markets and unhedgeable risks, adds a chapter on finite difference methods, and thoroughly updates all bibliographic references. Eighty figures, over seventy examples, twenty-five simple ready-to-run computer programs, and several spreadsheets enhance the learning experience. All computer codes have been rewritten using MATLAB and online supplementary materials have been completely updated. A standard textbook for graduate finance courses Introduction to asset pricing, portfolio selection, risk measurement, and investment evaluation Detailed examples and MATLAB codes integrated throughout the text Exercises and summaries of main points conclude each chapter

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Customer Reviews

After reading million books on derivative pricing, this one is the only one which defenitely combines

a practical approach to it. You'll start learning about all the maths you need and all the building blocks, all by examples. And suddenly on Chapter 11, it puts it all together and effortless you can price any option with any payoff you can imagine, I got impress withmyself. I work at Credit Suisse First Boston and we have it in all the Quant's desks.

This is a great little book. I would put it in my category of 'original' books on quant finance, which includes books written by Paul Wilmott, Mark Joshi, Rick Osband and Neftci.The reason being that the author uses a more informal style than most quant books and is very hands-on. If you're interested in understanding quant models and eventually applying them in the real world, then this is the kind of book you want. If you're looking for mathematical beauty and formalism, then look elsewhere.The editors could have done a better job with some of the flow and formatting - maybe next edition (it is sometimes hard to link the text to the figures and tables).Great book.

Consider first, this book's subtitle, "Tools for Incomplete Markets." A "complete market" (the kind assumed by the Black-Scholes-Merton model) is one in which any derivative product can be dynamically replicated by means of cash and the underlying asset. An incomplete market, then, is one is which the world of derivatives and their underlyings do not match each other in the point-by-point replicable manner implied by that definition of completeness. This failure to match makes for a necessary imperfection in hedging. That, of course, is the real world, where traders practice, as Scholes and Merton famously discovered in Greenwich, CT not long ago!A variety of illustrations of this practical emphasis might be adduced. In the preface, for example, Dr. CernÃƒÂ tells us frankly that in his experience "is it hard to understand the ItÃƒÂ´ calculus, but it is possible to get used to it and to apply it quickly and consistently...." [italics in original.]

I had the great pleasure of attending Dr. Cerny's lectures in mathematical techniques in finance. The lectures were structured around this book and were accordingly brilliant. The book starts off gently, to great relief for those who need to cover more basic mathematics in discrete time, before moving on to continous time and later introducing concepts such as Matingales and Browninan Motion. The book shows you how to derive such as the Black Scholes Formula, and introduces the Ito formula which is extensively used in pricing options.Importantly, the book is clearly written and 'recycles' the exercises as it progresses from simple to more complex topics. I found this to be of great use since you already have an understanding of what the exercise is all about, intuitively and 'mechanically', and you can compare the methods and more readily understand what is going on in

the more complex examples.This book does not require a heave maths background. As always, the more the better, however, you can easily make great use of this book only with an understanding of simple calculus like derivatives and integrals. A basic understanding of linear algebra will also prove beneficial.If you are looking for a book that will explain important concepts in finance, then this book is exactly what you are looking for.

Mathematical Techniques in Finance ranks as one of the best finance texts I've ever read. This book provides a good mix of theory and application which is well-suited for a master's level course and for practitioners. It fills the gap between undergraduate/MBA finance texts that focus on applications and Ph.D.-level texts that are in the theorem-proof style. To appreciate this book, I think the reader only needs to know calculus and a little linear algebra. The author is able to describe complex mathematical techniques in relatively easy, understandable terms. More importantly, the author highlights the important things to remember for each of the important concepts. For example, whether the absence of a Type I or Type II arbitrage is necessary for the existence of a solution when markets are complete or incomplete or which state variables play an important role in certain models. Moreoever, I have read many finance books, and this text's discussion of risk-neutral pricing and continuous time finance is one of the best. Aside from providing proofs for the more important concepts, Cerny also provides many numerical examples and MATLAB code (the MATLAB programs are available on the author's website) to implement many of the examples.

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