<<金融市场数学>>

图书基本信息

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前言

This work is aimed at an audience with a sound mathematical background wishing to learn about the rapidly expanding field of mathematical finance. Its content is suitable particularly for graduate students in mathematics who have a background in measure theory and probability.The emphasis throughout is on developing the mathematical concepts required for the theory within the context of their application. No attempt is made to cover the bewildering variety of novel （or exotic） financial in- struments that now appear on the derivatives markets; the focus through- out remains on a rigorous development of the more basic options that lie at the heart of the remarkable range of current applications of martingale theory to financial markets.The first five chapters present the theory in a discrete-time framework. Stochastic calculus is not required, and this material should be accessible to anyone familiar with elementary probability theory and linear algebra.The basic idea of pricing by arbitrage （or, rather, by non-arbitrage） is presented in Chapter 1. The unique price for a European option in a single-period binomial model is given and then extended to multi-period binomial models. Chapter 2 introduces the idea of a martingale measure for price processes. Following a discussion of the use of self-financing trad- ing strategies to hedge against trading risk, it is shown how options can be priced using an equivalent measure for which the discounted price pro- cess is a martingale. This is illustrated for the simple binomial Cox-Ross- Rubinstein pricing models, and the Black-Scholes formula is derived as the limit of the prices obtained for such models. Chapter 3 gives the funda- mental theorem of asset pricing, which states that if the market does not contain arbitrage opportunities there is an equivalent martingale measure. Explicit constructions of such measures are given in the setting of finite market models. Completeness of markets is investigated in Chapter 4; in a complete market, every contingent claim can be generated by an admissible self-financing strategy （and the martingale measure is unique ）. Stopping times, martingale convergence results, and American options are discussed in a discrete-time framework in Chapter 5.

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内容概要

本书旨在讲述研究现代金融市场衍生证券，如期权、期货和交换业务等所需的数学知识。
建立在著名的Black-Scholes理论基础上的理想化连续时间模型需要对现代微积分有较深的了解。
然而，书中许多潜在的知识点完全可以在离散时间的框架内理解。
本书是在第1版的基础上做了较多增补，使得连续时间理论应用范围更加广泛，更加详细地介绍Black-Scholes模型及其推广、期限结构和消费投资问题。
增加的内容有：一致性风险测度及其在对冲中的应用；一般离散市场模型中资产估价的第一基本定理；不完全离散市场的套利区间；完全离散市场的特征；Black-Scholes模型中的风险、回报和灵敏度。
本书内容安排相当谨慎、详细，而不是泛泛罗列所有尽可能多的内容，对期权的处理相当精辟。
通过本书的学习，读者也可以了解更多的科研动态。
目次：套利定价；鞅测度；第一基本定理；完全市场；离散时间美国期权；连续时间随机计算；美国卖方期权；债券和期限结构；消费投资策略；风险度量。
读者对象：数学专业的研究生、科研人员以及具有一定数学背景的金融爱好者。

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书籍目录

章节摘录

插图：The unreasonable effectiveness of mathematics is evidenced by the fre- quency with which mathematical techniques that were developed without thought for practical applications find unexpected new domains of appli- cability in various spheres of life. This phenomenon has customarily been observed in the physical sciences; in the social sciences its impact has per- haps been less evident. One of the more remarkable examples of simulta- neous revolutions in economic theory and market practice is provided by the opening of the worlds first options exchange in Chicago in 1973, and the ground-breaking theoretical papers on preference-free option pricing by Black and Scholes [27] （quickly extended by Merton [222]） that appeared in the same year, thus providing a workable model for the rational market pricing of traded options.From these beginnings, financial derivatives markets worldwide have become one of the most remarkable growth industries and now constitute a major source of employment for graduates with high levels of mathemat- ical expertise. The principal reason for this phenomenon has its origins in the simultaneous stimuli just described, and the explosive growth of these secondary markets （whose levels of activity now frequently exceed the un- derlying markets on which their products are based） continues unabated, with total trading volume now measured in trillions of dollars. The vari- ety and complexity of new financial instruments is often bewildering, and much effort goes into the analysis of the （ever more complex） mathematical models on which their existence is predicated.

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