Arbitrage Theory In Continuous Time Oxford Finance

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Arbitrage Theory in Continuous Time Springer Science & Business Media
This book is intended for graduate students and advanced undergraduates studying finance, mathematicians looking for an introduction to mathematical finance, and practitioners working in financial markets.
Stochastic Calculus and Financial Applications Springer Science & Business Media
Publisher Description
Fundamentals and Advanced Techniques in Derivatives Hedging OUP Oxford
Readership: Undergraduates and researchers in probability and statistics; applied, pure and financial mathematics; economics; chaos.
Problems and Solutions in Mathematical Finance Routledge
In 1994 and 1998 F. Delbaen and W. Schachermayer published two breakthrough papers where they proved continuous-time versions of the Fundamental Theorem of Asset Pricing. This is one of the most remarkable achievements in modern Mathematical Finance which led to intensive investigations in many applications of the arbitrage theory on a mathematically rigorous basis of stochastic calculus. Mathematical Basis for Finance: Stochastic Calculus for Finance provides detailed knowledge of all necessary attributes in stochastic calculus that are required for applications of the theory of stochastic integration in Mathematical Finance, in particular, the arbitrage theory. The exposition follows the traditions of the Strasbourg school. This book covers the general theory of stochastic processes, local martingales and processes of bounded variation, the theory of stochastic integration, definition and properties of the stochastic exponential; a part of the theory of Lévy processes. Finally, the reader gets acquainted with some facts concerning stochastic differential equations. Contains the most popular applications of the theory of stochastic integration Details necessary facts from probability and analysis which are not included in many standard university courses such as theorems on monotone classes and uniform integrability Written by experts in the field of modern mathematical finance
Continuous-Time Models in Corporate Finance, Banking, and Insurance Oxford University Press
The book is the first monograph on this highly important subject.
Risk-Neutral Valuation Springer Science & Business Media
An introduction to economic applications of the theory of continuous-time finance that strikes a balance between mathematical rigor and economic interpretation of financial market regularities. This book introduces the economic applications of the theory of continuous-time finance, with the goal of enabling the construction of realistic models, particularly those involving incomplete markets. Indeed, most recent applications of continuous-time finance aim to capture the imperfections and dysfunctions of financial markets—characteristics that became especially apparent during the market turmoil that started in 2008. The book begins by using discrete time to illustrate the basic mechanisms and introduce such notions as completeness, redundant pricing, and no arbitrage. It develops the continuous-time analog of those mechanisms and introduces the powerful tools of stochastic calculus. Going beyond other textbooks, the book then focuses on the study of markets in which some form of incompleteness, volatility, heterogeneity, friction, or behavioral subtlety arises. After presenting solutions methods for control problems and related partial differential equations, the text examines portfolio optimization and equilibrium in incomplete markets, interest rate and fixed-income modeling, and stochastic volatility. Finally, it presents models where investors form different beliefs or suffer frictions, form habits, or have recursive utilities, studying the effects not only on optimal portfolio choices but also on equilibrium, or the price of primitive securities. The book strikes a balance between mathematical rigor and the need for economic interpretation of financial market regularities, although with an emphasis on the latter.
Introduction to Option Pricing Theory Elsevier
This concisely written book is a rigorous and self-contained introduction to the theory of continuous-time stochastic processes. Balancing theory and applications, the authors use stochastic methods and concrete examples to model real-world problems from engineering, biomathematics, biotechnology, and finance. Suitable as a textbook for graduate or advanced undergraduate courses, the work may also be used for self-study or as a reference. The book will be of interest to students, pure and applied mathematicians, and researchers or practitioners in mathematical finance, biomathematics, physics, and engineering.
The Complete Guide to Capital Markets for Quantitative Professionals Springer Science & Business Media
The second edition of this popular introduction to the classical underpinnings of the mathematics behind finance continues to combine sounds mathematical principles with economic applications. Concentrating on the probabilistics theory of continuous arbitrage pricing of financial derivatives, including stochastic optimal control theory and Merton's fund separation theory, the book is designed for graduate students and combines necessary mathematical background with a solid economic focus. It includes a solved example for every new technique presented, contains numerous exercises and suggests further reading in each chapter. In this substantially extended new edition, Bjork has added separate and complete chapters on measure theory, probability theory, Girsanov transformations, LIBOR and swap market models, and martingale representations, providing two full treatments of arbitrage pricing: the classical delta-hedging and the modern martingales. More advanced areas of study are clearly marked to help students and teachers use the book as it suits their needs.
The Mathematics of Arbitrage Springer Science & Business Media
Discover foundational and advanced techniques in quantitative equity trading from a veteran insider In Quantitative Portfolio Management: The Art and Science of Statistical Arbitrage, distinguished physicist-turned-quant Dr. Michael Isichenko delivers a systematic review of the quantitative trading of equities, or statistical arbitrage. The book teaches you how to source financial data, learn patterns of asset returns from historical data, generate and combine multiple forecasts, manage risk, build a stock portfolio optimized for risk and trading costs, and execute trades. In this important book, you'll discover: Machine learning methods of forecasting stock returns in efficient financial markets How to combine multiple forecasts into a single model by using secondary machine learning, dimensionality reduction, and other methods Ways of avoiding the pitfalls of overfitting and the curse of dimensionality, including topics of active research such as "benign overfitting" in machine learning The theoretical and practical aspects of portfolio construction, including multi-factor risk models, multi-period trading costs, and optimal leverage Perfect for investment professionals, like quantitative traders and portfolio managers, Quantitative Portfolio Management will also earn a place in the libraries of data scientists and students in a variety of statistical and quantitative disciplines. It is an indispensable guide for anyone who hopes to improve their understanding of how to apply data science, machine learning, and optimization to the stock market.
Martingale Methods in Financial Modelling Springer Science & Business Media
The book presents models for the pricing of financial assets such as stocks, bonds, and options. The models are formulated and analyzed using concepts and techniques from mathematics and probability theory. It presents important classic models and some recent 'state-of-the-art' models that outperform the classics.
Financial Calculus World Scientific
This book is an introduction to the mathematical analysis of probability theory and provides some understanding of how probability is used to model random phenomena of uncertainty, specifically in the context of finance theory and applications. The integrated coverage of both basic probability theory and finance theory makes this book useful reading for advanced undergraduate students or for first-year postgraduate students in a quantitative finance course. The book provides easy and quick

access to the field of theoretical finance by linking the study of applied probability and its applications to finance theory all in one place. The coverage is carefully selected to include most of the key ideas in finance in the last 50 years. The book will also serve as a handy guide for applied mathematicians and probabilists to easily access the important topics in finance theory and economics. In addition, it will also be a handy book for financial economists to learn some of the more mathematical and rigorous techniques so their understanding of theory is more rigorous. It is a must read for advanced undergraduate and graduate students who wish to work in the quantitative finance area.

A Course in Financial Calculus World Scientific Publishing Company

Modern option pricing theory was developed in the late sixties and early seventies by F. Black, R. e. Merton and M. Scholes as an analytical tool for pricing and hedging option contracts and over-the-counter warrants. How ever, already in the seminal paper by Black and Scholes, the applicability of the model was regarded as much broader. In the second part of their paper, the authors demonstrated that a levered firm's equity can be regarded as an option on the value of the firm, and thus can be priced by option valuation techniques. A year later, Merton showed how the default risk structure of cor porate bonds can be determined by option pricing techniques. Option pricing models are now used to price virtually the full range of financial instruments and financial guarantees such as deposit insurance and collateral, and to quantify the associated risks. Over the years, option pricing has evolved from a set of specific models to a general analytical framework for analyzing the production process of financial contracts and their function in the financial intermediation process in a continuous time framework. However, very few attempts have been made in the literature to integrate game theory aspects, i. e. strategic financial decisions of the agents, into the continuous time framework. This is the unique contribution of the thesis of Dr. Alexandre Ziegler. Benefiting from the analytical tractability of contin uous time models and the closed form valuation models for derivatives, Dr.

Derivative Pricing in Discrete Time Springer Science & Business Media

This book provides an introduction to the mathematical modelling of real world financial markets and the rational pricing of derivatives, which is part of the theory that not only underpins modern financial practice but is a thriving area of mathematical research. The central theme is the question of how to find a fair price for a derivative; defined to be a price at which it is not possible for any trader to make a risk free profit by trading in the derivative. To keep the mathematics as simple as possible, while explaining the basic principles, only discrete time models with a finite number of possible future scenarios are considered. The theory examines the simplest possible financial model having only one time step, where many of the fundamental ideas occur, and are easily understood. Proceeding slowly, the theory progresses to more realistic models with several stocks and multiple time steps, and includes a comprehensive treatment of incomplete models. The emphasis throughout is on clarity combined with full rigour. The later chapters deal with more advanced topics, including how the discrete time theory is related to the famous continuous time Black-Scholes theory, and a uniquely thorough treatment of American options. The book assumes no prior knowledge of financial markets, and the mathematical prerequisites are limited to elementary linear algebra and probability. This makes it accessible to undergraduates in mathematics as well as students of other disciplines with a mathematical component. It includes numerous worked examples and exercises, making it suitable for self-study.

An Introduction to Continuous-Time Stochastic Processes Princeton University Press

This is a thoroughly updated edition of Dynamic Asset Pricing Theory, the standard text for doctoral students and researchers on the theory of asset pricing and portfolio selection in multiperiod settings under uncertainty. The asset pricing results are based on the three increasingly restrictive assumptions: absence of arbitrage, single-agent optimality, and equilibrium. These results are unified with two key concepts, state prices and martingales. Technicalities are given relatively little emphasis, so as to draw connections between these concepts and to make plain the similarities between discrete and continuous-time models. Readers will be particularly intrigued by this latest edition's most significant new feature: a chapter on corporate securities that offers alternative approaches to the valuation of corporate debt. Also, while much of the continuous-time portion of the theory is based on Brownian motion, this third edition introduces jumps--for example, those associated with Poisson arrivals--in order to accommodate surprise events such as bond defaults. Applications include term-structure models, derivative valuation, and hedging methods. Numerical methods covered include Monte Carlo simulation and finite-difference solutions for partial differential equations. Each chapter provides extensive problem exercises and notes to the literature. A system of appendixes reviews the necessary mathematical concepts. And references have been updated throughout. With this new edition, Dynamic Asset Pricing Theory remains at the head of the field.

Dynamic Asset Pricing Theory Springer Science & Business Media

Continuous-Time Models in Corporate Finance synthesizes four decades of research to show how stochastic calculus can be used in corporate finance. Combining mathematical rigor with economic intuition, Santiago Moreno-Bromberg and Jean-Charles Rochet analyze corporate decisions such as dividend distribution, the issuance of securities, and capital structure and default. They pay particular attention to financial intermediaries, including banks and insurance companies. The authors begin by recalling the ways that option-pricing techniques can be employed for the pricing of corporate debt and equity. They then present the dynamic model of the trade-off between taxes and bankruptcy costs and derive implications for optimal capital structure. The core chapter introduces the workhorse liquidity-management model—where liquidity and risk management decisions are made in order to minimize the costs of external finance. This model is used to study corporate finance decisions and specific features of banks and insurance companies. The book concludes by presenting the dynamic agency model, where financial frictions stem from the lack of interest alignment between a firm's manager and its financiers. The appendix contains an overview of the main mathematical tools used throughout the book. Requiring some familiarity with stochastic calculus methods, Continuous-Time Models in Corporate Finance will be useful for students, researchers, and professionals who want to develop dynamic models of firms' financial decisions.

A Game Theory Analysis of Options Springer Nature

This book provides a broad introduction of modern asset pricing theory with equal treatments for both discrete-time and continuous-time modeling. Both the no-arbitrage and the general equilibrium approaches of asset pricing theory are treated coherently within the general equilibrium framework.The analyses and coverage are up to date, comprehensive and in-depth. Topics include microeconomic foundation of asset pricing theory, the no-arbitrage principle and fundamental theorem, risk measurement and risk management, sequential portfolio choice, equity premium decomposition, option pricing, bond pricing and term structure of interest rates. The merits and limitations are expounded with respect to allocation and information market efficiency, along with the classical expectations hypothesis concerning the information content of yield curve and bond prices. Efforts are also made towards the resolution of several well-documented puzzles in empirical finance, which include the equity premium puzzle, the risk free rate puzzle, and the money-ness bias phenomenon of Black-Scholes option pricing model.The theory is self-contained and unified in presentation. The inclusion of proofs and derivations to enhance the transparency of the underlying arguments and conditions for the validity of the economic theory makes an ideal advanced textbook or reference book for graduate students specializing in financial economics and quantitative finance. The explanations are detailed enough to capture the interest of those curious readers, and complete enough to provide necessary background material needed to explore further the subject and research literature.

Arbitrage Theory in Continuous Time Springer Nature

Yielding new insights into important market phenomena like asset price bubbles and trading constraints, this is the first textbook to present asset pricing theory using the martingale approach (and all of its extensions). Since the 1970s asset pricing theory has been studied, refined, and extended, and many different approaches can be used to present this material. Existing PhD–level books on this topic are aimed at either economics and business school students or mathematics students. While the first mostly ignore much of the research done in mathematical finance, the second emphasizes mathematical finance but does not focus on the topics of most relevance to economics and business school students. These topics are derivatives pricing and hedging (the Black–Scholes–Merton, the Heath–Jarrow–Morton, and the reduced-form credit risk models), multiple-factor models, characterizing systematic risk, portfolio optimization, market efficiency, and equilibrium (capital asset and consumption) pricing models. This book fills this gap, presenting the relevant topics from mathematical finance, but aimed at Economics and Business School students with strong mathematical backgrounds.

Advanced Asset Pricing Theory Wiley-Blackwell

Developed for the professional Master's program in Computational Finance at Carnegie Mellon, the leading financial engineering program in the U.S. Has been tested in the classroom and revised over a period of several years Exercises conclude every chapter; some of these extend the theory while others are drawn from practical problems in quantitative finance

Quantitative Modeling of Derivative Securities John Wiley & Sons

Robert C. Merton's widely-used text provides an overview and synthesis of finance theory from the perspective of continuous-time analysis. It covers individual finance choice, corporate finance, financial intermediation, capital markets, and selected topics on the interface between private and public finance.

Quantitative Portfolio Management Arbitrage Theory in Continuous Time

This book is devoted to problems of stochastic control and stopping that are time inconsistent in the sense that they do not admit a Bellman optimality principle. These problems are cast in a game-theoretic framework, with the focus on subgame-perfect Nash equilibrium strategies. The general theory is illustrated with a number of finance applications. In dynamic choice problems, time inconsistency is the rule rather than the exception. Indeed, as Robert H. Strotz pointed out in his seminal 1955 paper, relaxing the widely used ad hoc assumption of exponential discounting gives rise to time inconsistency. Other famous examples of time inconsistency include mean-variance portfolio choice and prospect theory in a dynamic context. For such models, the very concept of optimality becomes problematic, as the decision makers preferences change over time in a temporally inconsistent way. In this book, a time-inconsistent problem is viewed as a non-cooperative game between the agents current and future selves, with the objective of finding intrapersonal equilibria in the game-theoretic sense. A range of finance applications are provided, including problems with non-exponential discounting, mean-variance objective, time-inconsistent linear quadratic regulator, probability distortion, and market equilibrium with time-inconsistent preferences. Time-Inconsistent Control Theory with Finance Applications offers the first comprehensive treatment of time-inconsistent control and stopping problems, in both continuous and discrete time, and in the context of finance applications. Intended for researchers and graduate students in the fields of finance and economics, it includes a review of the standard time-consistent results, bibliographical notes, as well as detailed examples showcasing time inconsistency problems. For the reader unacquainted with standard arbitrage theory, an appendix provides a toolbox of material needed for the book.