

1. Record Nr.	UNINA9910829940203321
Autore	Fries Christian <1970->
Titolo	Mathematical finance [[electronic resource]] : theory, modeling, implementation // Christian Fries
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Interscience, c2007
ISBN	1-280-97434-6 9786610974344 0-470-17978-3 0-470-17977-5
Descrizione fisica	1 online resource (544 p.)
Disciplina	332.601 332.6015195
Soggetti	Derivative securities - Prices - Mathematical models Securities - Mathematical models Investments - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 503-510) and index.
Nota di contenuto	Mathematical Finance: Theory, Modeling, Implementation; Contents; 1 Introduction; 1.1 Theory, Modeling, and Implementation; 1.2 Interest Rate Models and Interest Rate Derivatives; 1.3 About This Book; 1.3.1 How to Read This Book; 1.3.2 Abridged Versions; 1.3.3 Special Sections; 1.3.4 Notation; 1.3.5 Feedback; 1.3.6 Resources; I Foundations; 2 Foundations; 2.1 Probability Theory; 2.2 Stochastic Processes; 2.3 Filtration; 2.4 Brownian Motion; 2.5 Wiener Measure, Canonical Setup; 2.6 Ito Calculus; 2.6.1 Ito Integral; 2.6.2 Ito Process; 2.6.3 Ito Lemma and Product Rule 2.7 Brownian Motion with Instantaneous Correlation 2.8 Martingales; 2.8.1 Martingale Representation Theorem; 2.9 Change of Measure; 2.10 Stochastic Integration; 2.11 Partial Differential Equations (PDEs); 2.11.1 Feynman-Kac Theorem; 2.12 List of Symbols; 3 Replication; 3.1 Replication Strategies; 3.1.1 Introduction; 3.1.2 Replication in a Discrete Model; 3.2 Foundations: Equivalent Martingale Measure; 3.2.1 Challenge and Solution Outline; 3.2.2 Steps toward the Universal Pricing Theorem; 3.3 Excursus: Relative Prices and Risk-Neutral

Measures; 3.3.1 Why relative prices?
 3.3.2 Risk-Neutral Measure II First Applications; 4 Pricing of a European Stock Option under the Black-Scholes Model; 5 Excursus: The Density of the Underlying of a European Call Option; 6 Excursus: Interpolation of European Option Prices; 6.1 No-Arbitrage Conditions for Interpolated Prices; 6.2 Arbitrage Violations through Interpolation; 6.2.1 Example 1 : Interpolation of Four Prices; 6.2.2 Example 2: Interpolation of Two Prices; 6.3 Arbitrage-Free Interpolation of European Option Prices; 7 Hedging in Continuous and Discrete Time and the Greeks; 7.1 Introduction
 7.2 Deriving the Replications Strategy from Pricing Theory
 7.2.1 Deriving the Replication Strategy under the Assumption of a Locally Riskless Product; 7.2.2 Black-Scholes Differential Equation; 7.2.3 Derivative $V(t)$ as a Function of Its Underlyings $S_i(t)$; 7.2.4 Example: Replication Portfolio and PDE under a Black-Scholes Model; 7.3 Greeks; 7.3.1 Greeks of a European Call-Option under the Black-Scholes Model; 7.4 Hedging in Discrete Time: Delta and Delta-Gamma Hedging; 7.4.1 Delta Hedging; 7.4.2 Error Propagation; 7.4.3 Delta-Gamma Hedging; 7.4.4 Vega Hedging
 7.5 Hedging in Discrete Time: Minimizing the Residual Error (Bouchaud-Sornette Method)
 7.5.1 Minimizing the Residual Error at Maturity T ; 7.5.2 Minimizing the Residual Error in Each Time Step; III Interest Rate Structures, Interest Rate Products, and Analytic Pricing Formulas; Motivation and Overview; 8 Interest Rate Structures; 8.1 Introduction; 8.1.1 Fixing Times and Tenor Times; 8.2 Definitions; 8.3 Interest Rate Curve Bootstrapping; 8.4 Interpolation of Interest Rate Curves; 8.5 Implementation; 9 Simple Interest Rate Products; 9.1 Interest Rate Products Part 1: Products without Optionality
 9.1.1 Fix, Floating, and Swap

Sommario/riassunto

A balanced introduction to the theoretical foundations and real-world applications of mathematical finance. The ever-growing use of derivative products makes it essential for financial industry practitioners to have a solid understanding of derivative pricing. To cope with the growing complexity, narrowing margins, and shortening life-cycle of the individual derivative product, an efficient, yet modular, implementation of the pricing algorithms is necessary. Mathematical Finance is the first book to harmonize the theory, modeling, and implementation of today's most prevalent pri
