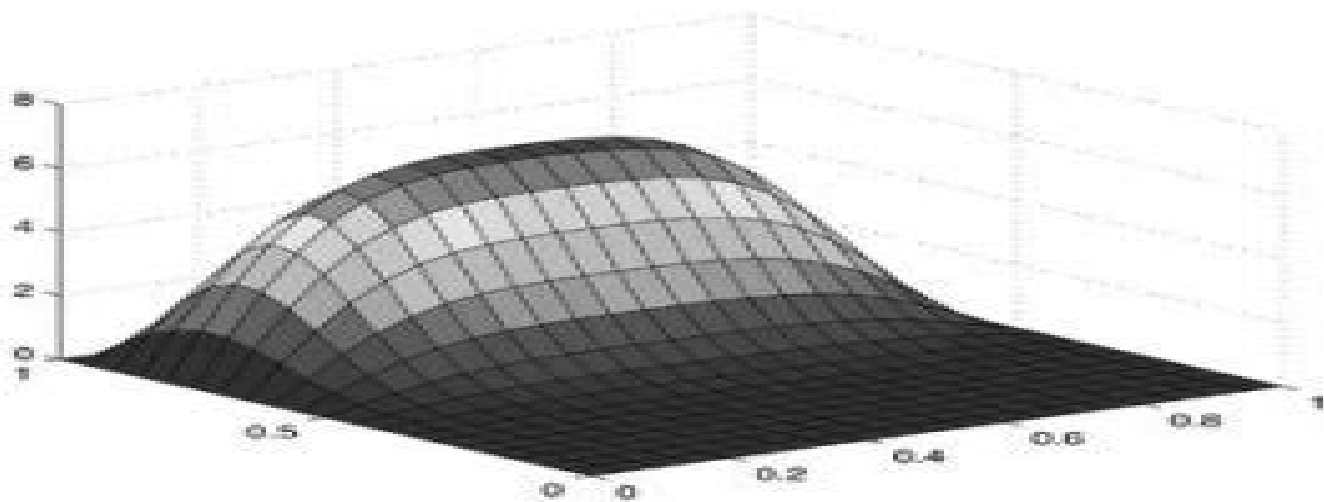


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Helpful appendices on the basics of MATLAB and probability theory round out this balanced coverage Accessible for students yet still a useful reference for practitioners Numerical Methods in Finance offers an expert introduction to powerful tools in finance

Computational Finance George Levy, 2003-12-17 Computational Finance presents a modern computational approach to mathematical finance within the Windows environment and contains financial algorithms mathematical proofs and computer code in C C The author illustrates how numeric components can be developed which allow financial routines to be easily called by the complete range of Windows applications such as Excel Borland Delphi Visual Basic and Visual C These components permit software developers to call mathematical finance functions more easily than in corresponding packages Although these packages may offer the advantage of interactive interfaces it is not easy or computationally efficient to call them programmatically as a component of a larger system The components are therefore well suited to software developers who want to include finance routines into a new application Typical readers are expected to have a knowledge of calculus differential equations statistics Microsoft Excel Visual Basic C and HTML Enables reader to incorporate advanced financial modelling techniques in Windows compatible software Aids the development of bespoke software solutions covering GARCH volatility modelling derivative pricing with Partial Differential Equations VAR bond and stock options Topics in Numerical Methods for Finance Mark Cummins, Finbarr Murphy, John J.H. Miller, 2012-07-15 Presenting state of the art methods in the area the book begins with a presentation of weak discrete time approximations of jump diffusion stochastic differential equations for derivatives pricing and risk measurement Using a moving least squares reconstruction a numerical approach is then developed that allows for the construction of arbitrage free surfaces Free boundary problems are considered next with particular focus on stochastic impulse control problems that arise when the cost of control includes a fixed cost common in financial applications The text proceeds with the development of a fear index based on equity option surfaces allowing for the measurement of overall fear levels in the market The problem of American option pricing is considered next applying simulation methods combined with regression techniques and discussing convergence properties Changing focus to integral transform methods a variety of option pricing problems are considered The COS method is practically applied for the pricing of options under uncertain volatility a method developed by the authors that relies on the dynamic programming principle and Fourier cosine series expansions Efficient approximation methods are next developed for the application of the fast Fourier transform for option pricing under multifactor affine models with stochastic volatility and jumps Following this fast and accurate pricing techniques are showcased for the pricing of credit derivative contracts with discrete monitoring based on the Wiener Hopf factorisation With an energy theme a recombining pentanomial lattice is developed for the pricing of gas swing contracts under regime switching dynamics The book concludes with a linear and nonlinear review of the arbitrage free parity theory for the CDS and bond markets

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Implementing Models in Quantitative Finance: Methods and Cases Gianluca Fusai, Andrea Roncoroni, 2007-12-20 This book puts numerical methods in action for the purpose of solving practical problems in quantitative finance The first part develops a toolkit in numerical methods for finance The second part proposes twenty self contained cases covering model simulation asset pricing and hedging risk management statistical estimation and model calibration Each case develops a detailed solution to a concrete problem arising in applied financial management and guides the user towards a computer implementation The appendices contain crash courses in VBA and Matlab programming languages

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securities the authors explain how to establish the adequate PDE boundary value problems for different sets of derivative products vanilla and exotic options and interest rate derivatives For many option problems the analytic solutions are also derived with details The second part is devoted to explaining and analyzing the application of finite differences techniques to the financial models stated in the first part of the book For this the authors recall some basics on finite difference methods initial boundary value problems and having in view financial products with early exercise feature linear complementarity and free boundary problems In each chapter the techniques related to these mathematical and numerical subjects are applied to a wide variety of financial products This is a textbook for graduate students following a mathematical finance program as well as a valuable reference for those researchers working in numerical methods in financial derivatives For this new edition the book has been updated throughout with many new problems added More details about numerical methods for some options for example Asian options with discrete sampling are provided and the proof of solution uniqueness of derivative security problems and the complete stability analysis of numerical methods for two dimensional problems are added Review of first edition the book is highly well designed and structured as a textbook for graduate students following a mathematical finance program which includes Black Scholes dynamic hedging methodology to price financial derivatives Also it is a very valuable reference for those researchers working in numerical methods in financial derivatives either with a more financial or mathematical background **MATHEMATICAL REVIEWS Computational Methods in Finance** Ali Hirs, 2016-04-19

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