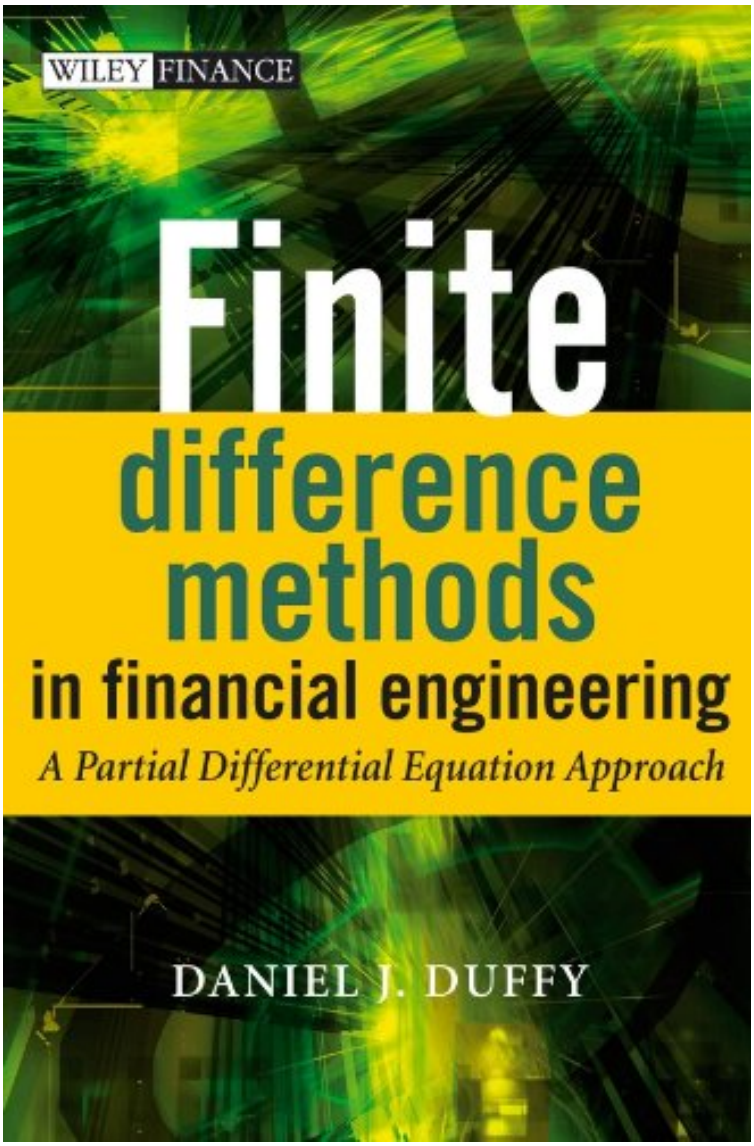
Finite Difference Methods in Financial Engineering: A Partial Differential Equation Approach (The Wiley Finance Series)

Daniel J. Duffy
*audiobook | *ebooks | Download PDF | ePub | DOC*



#3060230 in eBooks 2007-12-10 2007-12-10File Name: B000Q7ZFI4PDF # 1 | File size: 18.Mb

Daniel J. Duffy : Finite Difference Methods in Financial Engineering: A Partial Differential Equation Approach (The Wiley Finance Series) before purchasing it in order to gage whether or not it would be worth my time, and all praised Finite Difference Methods in Financial Engineering: A Partial Differential Equation Approach (The Wiley Finance Series):

4 of 7 people found the following review helpful. A practical approach to finite difference methodsBy Kindle CustomerThis book proved to be a useful reference for practical implementation of finite-difference methods for PDEs: several one- and multi-factor financial derivatives pricing models, including local volatility models and models with stochastic volatilities. The methods described in the text are stable, accurate and reasonably efficient. Stability of FD methods is obviously of top concern to the author (as it should be to readers as well), and he goes into extensive detail evaluating the stability of various techniques. The writing is clear and consistent, though a "notational" index or glossary would have been helpful, particularly in the early going. The author provides several practical examples, which lends a refreshing degree of concreteness to the book.0 of 1 people found the following review helpful. We have this book in our library and I wanted ...By Kaushik DesarkarWe have this book in our library and I wanted to use it for a financial engineering course.I have gained sufficient traction in solving PDEs using the Explicit FDM approach - learnt from Paul Wilmott's Quantitative Finance.Armed with that knowledge, I opened the book and sat to read and see if I could enhance my skills further. Unfortunately after upteen attempts, I am lost because I am unable to find a natural progression through the chapters. The book may appeal to someone with in depth knowledge in Quant Maths but definitely NOT for beginners/intermediate level readers.The jumps in and between chapters is too much to handle at times so either you are a 100% Quant Math person - in that case perhaps you will be able to connect the dots or you are at my stage - you will fail to connect the dots miserably.4 of 7 people found the following review helpful. Well DoneBy Stephen Tam Kwok KeungDaniel J.Duffy introduces Finite Difference methods for solving partial differential equations that arise in numerical pricing of derivatives. There are seven sections in the book. They are:Part I The Continuous Theory of Partial Differential Equations - A short introduction to partial differential equations and their applications to financial engineering.Part II Finite Difference Methods: the Fundamentals - There are three chapters that introduce Finite Difference methods to approximate initial value and initial boundary value problems. Another two chapters apply the methods to Black-Scholes equation. He did a nice job to approximate the solutions to problems with small volatility or large drift,...Part III Applying FDM to One-Factor Instrument PricingPart IV FDM for Multidimensional problemsPart V Applying FDM to Multi-Factor Instrument Pricing andPart VI Free and Moving Boundary Value ProblemsThere are altogether 18 chapters (about 180 pages) that thoroughly introduce the application of FDM techniques to a wide range of options (pricing) modelling. The exposition is clear and concise.The last partPart VII Design and implementation In C++ - The last four chapters design for readers having programming literacy.To fully appreciate the materials of the book, readers should have at least one year training in partial differential equations and knowledge in financial derivatives at about the same level as John Hull's book - Options, Futures and Other Derivatives, 5e.If the book contains a few applications to real world data, it will be perfect to primers in this field.

The world of quantitative finance (QF) is one of the fastest growing areas of research and its practical applications to derivatives pricing problem. Since the discovery of the famous Black-Scholes equation in the 1970's we have seen a surge in the number of models for a wide range of products such as plain and exotic options, interest rate derivatives, real options and many others. Gone are the days when it was possible to price these derivatives analytically. For most problems we must resort to some kind of approximate method. In this book we employ partial differential equations (PDE) to describe a range of one-factor and multi-factor derivatives products such as plain European and American options, multi-asset options, Asian options, interest rate options and real options. PDE techniques allow us to create a framework for modeling complex and interesting derivatives products. Having defined the PDE problem we then approximate it using the Finite Difference Method (FDM). This method has been used for many application areas such as fluid dynamics, heat transfer, semiconductor simulation and astrophysics, to name just a few. In this book we apply the same techniques to pricing real-life derivative products. We use both traditional (or well-known) methods as well as a number of advanced schemes that are making their way into the QF literature: Crank-Nicolson, exponentially fitted and higher-order schemes for one-factor and multi-factor options Early exercise features and approximation using front-fixing, penalty and variational methods Modelling stochastic volatility models using Splitting methods Critique of ADI and Crank-Nicolson schemes; when they work and when they don't work Modelling jumps using Partial Integro Differential Equations (PIDE) Free and moving boundary value problems in QF Included with the book is a CD containing information on how to set up FDM algorithms, how to map these algorithms to C++ as well as several working programs for one-factor and two-factor models. We also provide source code so that you can customize the applications to suit your own needs.

From the Back CoverThe world of quantitative finance (QF) is one of the fastest growing areas of research and its practical applications to derivatives pricing problem. Since the discovery of the famous Black-Scholes equation in the 1970rsquo;s we have seen a surge in the number of models for a wide range of products such as plain and exotic options, interest rate derivatives, real options and many others. Gone are the days when it was possible to price these derivatives analytically. For most problems we must resort to some kind of approximate method. In this book we employ partial differential equations (PDE) to describe a range of one-factor and multi-factor derivatives products

such as plain European and American options, multi-asset options, Asian options, interest rate options and real options. PDE techniques allow us to create a framework for modeling complex and interesting derivatives products. Having defined the PDE problem we then approximate it using the Finite Difference Method (FDM). This method has been used for many application areas such as fluid dynamics, heat transfer, semiconductor simulation and astrophysics, to name just a few. In this book we apply the same techniques to pricing real-life derivative products. We use both traditional (or well-known) methods as well as a number of advanced schemes that are making their way into the QF literature: Crank-Nicolson, exponentially fitted and higher-order schemes for one-factor and multi-factor options Early exercise features and approximation using front-fixing, penalty and variational methods Modelling stochastic volatility models using Splitting methods Critique of ADI and Crank-Nicolson schemes; when they work and when they donrsquo;t work Modelling jumps using Partial Integro Differential Equations (PIDE) Free and moving boundary value problems in QF Included with the book is a CD containing information on how to set up FDM algorithms, how to map these algorithms to C++ as well as several working programs for one-factor and two-factor models. We also provide source code so that you can customize the applications to suit your own needs.About the AuthorDaniel Duffy is a numerical analyst who has been working in the IT business since 1979. He has been involved in the analysis, design and implementation of systems using object-oriented, component and (more recently) intelligent agent technologies to large industrial and financial applications. As early as 1993 he was involved in C++ projects for risk management and options applications with a large Dutch bank. His main interest is in finding robust and scalable numerical schemes that approximate the partial differential equations that model financial derivatives products. He has an M.Sc. in the Finite Element Method first-order hyperbolic systems and a Ph.D. in robust finite difference methods for convection-diffusion partial differential equations. Both degrees are from Trinity College, Dublin, Ireland. Daniel Duffy is founder of Datasim Education and Datasim Component Technology, two companies involved in training, consultancy and software development.