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KEY=THE - GAEL LOGAN

VOLATILITY AND CORRELATION

THE PERFECT HEDGER AND THE FOX

John Wiley & Sons In Volatility and Correlation 2nd edition: The Perfect Hedger and the Fox, Rebonato looks at derivatives pricing from the angle of volatility and correlation. With both practical and theoretical applications, this is a thorough update of the highly successful Volatility & Correlation – with over 80% new or fully reworked material and is a must have both for practitioners and for students. The new and updated material includes a critical examination of the 'perfect-replication' approach to derivatives pricing, with special attention given to exotic options; a thorough analysis of the role of quadratic variation in derivatives pricing and hedging; a discussion of the informational efficiency of markets in commonly-used calibration and hedging practices. Treatment of new models including Variance Gamma, displaced diffusion, stochastic volatility for interest-rate smiles and equity/FX options. The book is split into four parts. Part I deals with a Black world without smiles, sets out the author's 'philosophical' approach and covers deterministic volatility. Part II looks at smiles in equity and FX worlds. It begins with a review of relevant empirical information about smiles, and provides coverage of local-stochastic-volatility, general-stochastic-volatility, jump-diffusion and Variance-Gamma processes. Part II concludes with an important chapter that discusses if and to what extent one can dispense with an explicit specification of a model, and can directly prescribe the dynamics of the smile surface. Part III focusses on interest rates when the volatility is deterministic. Part IV extends this setting in order to account for smiles in a financially motivated and computationally tractable manner. In this final part the author deals with CEV processes, with diffusive stochastic volatility and with Markov-chain processes. Praise for the First Edition: "In this book, Dr Rebonato brings his penetrating eye to bear on option pricing and hedging.... The book is a must-read for those who already know the basics of options and are looking for an edge in applying the more sophisticated approaches that have recently been developed." —Professor Ian Cooper, London Business School "Volatility and correlation are at the very core of all option pricing and hedging. In this book, Riccardo Rebonato presents the subject in his characteristically elegant and simple fashion...A rare combination of intellectual insight and practical common sense." —Anthony Neuberger, London Business School

THE VOLATILITY SMILE

John Wiley & Sons The Volatility Smile The Black-Scholes-Merton option model was the greatest innovation of 20th century finance, and remains the most widely applied theory in all of finance. Despite this success, the model is fundamentally at odds with the observed behavior of option markets: a graph of implied volatilities against strike will typically display a curve or skew, which practitioners refer to as the smile, and which the model cannot explain. Option valuation is not a solved problem, and the past forty years have witnessed an abundance of new models that try to reconcile theory with markets. The Volatility Smile presents a unified treatment of the Black-Scholes-Merton model and the more advanced models that have replaced it. It is also a book about the principles of financial valuation and how to apply them. Celebrated author and quant Emanuel Derman and Michael B. Miller explain not just the mathematics but the ideas behind the models. By examining the foundations, the implementation, and the pros and cons of various models, and by carefully exploring their derivations and their assumptions, readers will learn not only how to handle the volatility smile but how to evaluate and build their own financial models. Topics covered include: The principles of valuation Static and dynamic replication The Black-Scholes-Merton model Hedging strategies Transaction costs The behavior of the volatility smile Implied distributions Local volatility models Stochastic volatility models Jump-diffusion models The first half of the book, Chapters 1 through 13, can serve as a standalone textbook for a course on option valuation and the Black-Scholes-Merton model, presenting the principles of financial modeling, several derivations of the model, and a detailed discussion of how it is used in practice. The second half focuses on the behavior of the volatility smile, and, in conjunction with the first half, can be used for as the basis for a more advanced course.

PRICING DERIVATIVES UNDER LÉVY MODELS

MODERN FINITE-DIFFERENCE AND PSEUDO-DIFFERENTIAL OPERATORS APPROACH

Birkhäuser This monograph presents a novel numerical approach to solving partial integro-differential equations arising in asset pricing models with jumps, which greatly exceeds the efficiency of existing approaches. The method, based on pseudo-differential operators and several original contributions to the theory of finite-difference schemes, is new as applied to the Lévy processes in finance, and is herein presented for the first time in a single volume. The results within, developed in a series of research papers, are collected and arranged together with the necessary background material from Lévy processes, the modern theory of finite-difference schemes, the theory of M-matrices and EM-matrices, etc., thus forming a self-contained work that gives the reader a smooth introduction to the subject. For readers with no knowledge of finance, a short explanation of the main financial terms and notions used in the book is given in the glossary. The latter part of the book demonstrates the efficacy of the method by solving some typical problems encountered in computational finance, including structural default models with jumps, and local stochastic volatility models with stochastic interest rates and jumps. The author also adds extra complexity to the traditional statements of these problems by taking into account jumps in each stochastic component while all jumps are fully correlated, and shows how this setting can be efficiently addressed within the framework of the new method. Written for non-mathematicians, this book will appeal to financial engineers and analysts, econophysicists, and researchers in applied numerical analysis. It can also be used as an advance course on modern finite-difference methods or computational finance.

FOREIGN EXCHANGE OPTION PRICING

A PRACTITIONERS GUIDE

John Wiley & Sons This book covers foreign exchange options from the point of view of the finance practitioner. It contains everything a quant or trader working in a bank or hedge fund would need to know about the mathematics of foreign exchange—not just the theoretical mathematics covered in other books but also comprehensive coverage of implementation, pricing and calibration. With content developed with input from traders and with examples using real-world data, this book introduces many of the more commonly requested products from FX options trading desks, together with the models that capture the risk characteristics necessary to price these products accurately. Crucially, this book describes the numerical methods required for calibration of these models – an area often neglected in the literature, which is nevertheless of paramount importance in practice. Thorough treatment is given in one unified text to the following features: Correct market conventions for FX volatility surface construction Adjustment for settlement and delayed delivery of options Pricing of vanillas and barrier options under the volatility smile Barrier bending for limiting barrier discontinuity risk near expiry Industry strength partial differential equations in one and several spatial variables using finite differences on nonuniform grids Fourier transform methods for pricing European options using characteristic functions Stochastic and local volatility models, and a mixed stochastic/local volatility model Three-factor long-dated FX model Numerical calibration techniques for all the models in this work The augmented state variable approach for pricing strongly path-dependent options using either partial differential equations or Monte Carlo simulation Connecting mathematically rigorous theory with practice, this is the essential guide to foreign exchange options in the context of the real financial marketplace. Table of Contents Mathematical Preliminaries Deltas and Market Conventions Volatility Surface Construction Local Volatility and Implied Volatility Stochastic Volatility Numerical Methods for Pricing and Calibration First Generation Exotics – Binary and Barrier Options Second Generation Exotics Multicurrency Options Long-dated FX Options

FX OPTIONS AND STRUCTURED PRODUCTS

John Wiley & Sons An academic, yet practical approach to the latest FX market developments FX Options and Structured Products provides new insights into the FX Options market post-crisis, straddling the realms of both academics and practitioners. Products are explained in a simple case study format, with clear examples of all FX options, common structures, and tailor-made solutions. This new second edition contains updated real-world deals complete with explanatory background information, plus new information on yield curve construction, spreading, litigation, and new products and trade ideas. Interviews have been extended to provide additional in-depth information, and new coverage on the latest trading technology guides readers toward cutting edge tools and services. Foreign Exchange Options and Structured Products are typically traded over the counter, and market participants need to fully understand the products to work with them effectively. FX Options and Structured Products is a complete reference, helping practitioners understand the products, how they're used, and how they're priced, and the risk management, hedging, regulatory, and accounting issues involved. Understand spreads in the interest rate market, and how they affect valuation of FX options Learn why yield curve construction is a crucial ingredient for pricing, and examine the vanna-volga approach Explore recent advances in software for trading and platform structuring Review the various products including accumulators, kikos, auto-callables, and more This authoritative reference also provides expert guidance toward practical application, helping readers structure their own solutions with new ideas and understanding. Knowing how and why particular products are applied in different situations helps practitioners build alternative solutions to client problems. For complete mastery of the FX market, FX Options and Structured Products is a valuable resource and a thorough guide.

SIMULATION TECHNIQUES IN FINANCIAL RISK MANAGEMENT

Wiley-Interscience This unique resource provides simulation techniques for financial risk managers ensuring you become well versed in many recent innovations, including Gibbs sampling, the use of heavy-tailed distributions in VaR calculations, construction of volatility smile, and state space modeling. The authors illustrate key concepts with examples and case studies you can reproduce using either S-PLUS® or Visual Basic® and provide exercises so you can apply new concepts and test your knowledge. Simulation Techniques in Financial Risk Management is invaluable both as a resource for risk managers in the financial and actuarial industries and as a coursebook for upper-level undergraduate and graduate courses in simulation and risk management.

MODERN COMPUTATIONAL FINANCE

SCRIPTING FOR DERIVATIVES AND XVA

John Wiley & Sons An incisive and essential guide to building a complete system for derivative scripting In Volume 2 of Modern Computational Finance Scripting for Derivatives and xVA, quantitative finance experts and practitioners Drs. Antoine Savine and Jesper Andreasen deliver an indispensable and insightful roadmap to the interrogation, aggregation, and manipulation of cash-flows in a variety of ways. The book demonstrates how to facilitate portfolio-wide risk assessment and regulatory calculations (like xVA). Complete with a professional scripting library written in modern C++, this stand-alone volume walks readers through the construction of a comprehensive risk and valuation tool. This essential book also offers: Effective strategies for improving scripting libraries, from basic examples—like support for dates and vectors—to advanced improvements, including American Monte Carlo techniques Exploration of the concepts of fuzzy logic and risk sensitivities, including support for smoothing and condition domains Discussion of the application of scripting to xVA, complete with a full treatment of branching Perfect for quantitative analysts, risk professionals, system developers, derivatives traders, and financial analysts, Modern Computational Finance Scripting for Derivatives and xVA: Volume 2 is also a must-read resource for students and teachers in master's and PhD finance programs.

VOLATILITY

PRACTICAL OPTIONS THEORY

John Wiley & Sons Gain a deep, intuitive and technical understanding of practical options theory The main challenges in successful options trading are conceptual, not mathematical. Volatility: Practical Options Theory provides financial professionals, academics, students and others with an intuitive as well as technical understanding of both the basic and advanced ideas in options theory to a level that facilitates practical options trading. The approach taken in this book will prove particularly valuable to options traders and other practitioners tasked with making pricing and risk management decisions in an environment where time constraints mean that simplicity and intuition are of greater value than mathematical formalism. The most important areas of options theory, namely implied volatility, delta hedging, time value and the so-called options greeks are explored based on intuitive economic arguments alone before turning to formal models such as the seminal Black-Scholes-Merton model. The reader will understand how the model free approach and mathematical models are related to each other, their underlying theoretical assumptions and their implications to level that facilitates practical implementation. There are several excellent mathematical descriptions of options theory, but few focus on a translational approach to convert the theory into practice. This book emphasizes the translational aspect, while first building an intuitive, technical understanding that allows market makers, portfolio managers, investment managers, risk managers, and other traders to work more effectively within—and beyond—the bounds of everyday practice. Gain a deeper understanding of the assumptions underlying options theory Translate theoretical ideas into practice Develop a more accurate intuition for better time-constrained decision making This book allows its readers to gain more than a superficial understanding of the mechanisms at work in options markets. Volatility gives its readers the edge by providing a true bedrock foundation upon which practical knowledge becomes stronger.

FRONTIERS IN QUANTITATIVE FINANCE

VOLATILITY AND CREDIT RISK MODELING

John Wiley & Sons The Petit D'euner de la Finance–which author Rama Cont has been co-organizing in Paris since 1998–is a well-known quantitative finance seminar that has progressively become a platform for the exchange of ideas between the academic and practitioner communities in quantitative finance. Frontiers in Quantitative Finance is a selection of recent presentations in the Petit D'euner de la Finance. In this book, leading quants and academic researchers cover the most important emerging issues in quantitative finance and focus on portfolio credit risk and volatility modeling.

PRINCIPLES OF FINANCIAL ENGINEERING

Academic Press Principles of Financial Engineering, Third Edition, is a highly acclaimed text on the fast-paced and complex subject of financial engineering. This updated edition describes the "engineering" elements of financial engineering instead of the mathematics underlying it. It shows how to use financial tools to accomplish a goal rather than describing the tools themselves. It lays emphasis on the engineering aspects of derivatives (how to create them) rather than their pricing (how they act) in relation to other instruments, the financial markets, and financial market practices. This volume explains ways to create financial tools and how the tools work together to achieve specific goals. Applications are illustrated using real-world examples. It presents three new chapters on financial engineering in topics ranging from commodity markets to financial engineering applications in hedge fund strategies, correlation swaps, structural models of default, capital structure arbitrage, contingent convertibles, and how to incorporate counterparty risk into derivatives pricing. Poised midway between intuition, actual events, and financial mathematics, this book can be used to solve problems in risk management, taxation, regulation, and above all, pricing. A solutions manual enhances the text by presenting additional cases and solutions to exercises. This latest edition of Principles of Financial Engineering is ideal for financial engineers, quantitative analysts in banks and investment houses, and other financial industry professionals. It is also highly recommended to graduate students in financial engineering and financial mathematics programs. The Third Edition presents three new chapters on financial engineering in commodity markets, financial engineering applications in hedge fund strategies, correlation swaps, structural models of default, capital structure arbitrage, contingent convertibles and how to incorporate counterparty risk into derivatives pricing, among other topics. Additions, clarifications, and illustrations throughout the volume show these instruments at work instead of explaining how they should act The solutions manual enhances the text by presenting additional cases and solutions to exercises

UNDERSTANDING AND MANAGING MODEL RISK

A PRACTICAL GUIDE FOR QUANTS, TRADERS AND VALIDATORS

John Wiley & Sons A guide to the validation and risk management of quantitative models used for pricing and hedging Whereas the majority of quantitative finance books focus on mathematics and risk management books focus on regulatory aspects, this book addresses the elements missed by this literature--the risks of the models themselves. This book starts from regulatory issues, but translates them into practical suggestions to reduce the likelihood of model losses, basing model risk and validation on market experience and on a wide range of real-world examples, with a high level of detail and precise operative indications.

HANDBOOK OF HEAVY-TAILED DISTRIBUTIONS IN ASSET MANAGEMENT AND RISK MANAGEMENT

World Scientific The study of heavy-tailed distributions allows researchers to represent phenomena that occasionally exhibit very large deviations from the mean. The dynamics underlying these phenomena is an interesting theoretical subject, but the study of their statistical properties is in itself a very useful endeavor from the point of view of managing assets and controlling risk. In this book, the authors are primarily concerned with the statistical properties of heavy-tailed distributions and with the processes that exhibit jumps. A detailed overview with a Matlab implementation of heavy-tailed models applied in asset management and risk managements is presented. The book is not intended as a theoretical treatise on probability or statistics, but as a tool to understand the main concepts regarding heavy-tailed random variables and processes as applied to real-world applications in finance. Accordingly, the authors review approaches and methodologies whose realization will be useful for developing new methods for forecasting of financial variables where extreme events are not treated as anomalies, but as intrinsic parts of the economic process.

HANDBOOK OF MARKET RISK

John Wiley & Sons A ONE-STOP GUIDE FOR THE THEORIES, APPLICATIONS, AND STATISTICAL METHODOLOGIES OF MARKET RISK Understanding and investigating the impacts of market risk on the financial landscape is crucial in preventing crises. Written by a hedge fund specialist, the Handbook of Market Risk is the comprehensive guide to the subject of market risk. Featuring a format that is accessible and convenient, the handbook employs numerous examples to underscore the application of the material in a real-world setting. The book starts by introducing the various methods to measure market risk while continuing to emphasize stress testing, liquidity, and interest rate implications. Covering topics intrinsic to understanding and applying market risk, the handbook features: An introduction to financial markets The historical perspective from market events and diverse mathematics to the value-at-risk Return and volatility estimates Diversification, portfolio risk, and efficient frontier The Capital Asset Pricing Model and the Arbitrage Pricing Theory The use of a fundamental multi-factors model Financial derivatives instruments Fixed income and interest rate risk Liquidity risk Alternative investments Stress testing and back testing Banks and Basel II/III The Handbook of Market Risk is a must-have resource for financial engineers, quantitative analysts, regulators, risk managers in investments banks, and large-scale consultancy groups advising banks on internal systems. The handbook is also an excellent text for academics teaching postgraduate courses on financial methodology.

QUANTITATIVE FINANCE WITH PYTHON

A PRACTICAL GUIDE TO INVESTMENT MANAGEMENT, TRADING, AND FINANCIAL ENGINEERING

CRC Press Quantitative Finance with Python: A Practical Guide to Investment Management, Trading and Financial Engineering bridges the gap between the theory of mathematical finance and the practical applications of these concepts for derivative pricing and portfolio management. The book provides students with a very hands-on, rigorous introduction to foundational topics in quant finance, such as options pricing, portfolio optimization and machine learning. Simultaneously, the reader benefits from a strong emphasis on the practical applications of these concepts for institutional investors. Features Useful as both a teaching resource and as a practical tool for professional investors. Ideal textbook for first year graduate students in quantitative finance programs, such as those in master's programs in Mathematical Finance, Quant Finance or Financial Engineering. Includes a perspective on the future of quant finance techniques, and in particular covers some introductory concepts of Machine Learning. Free-to-access repository with Python codes available at www.routledge.com/ 9781032014432.

FINANCIAL MODELING

A BACKWARD STOCHASTIC DIFFERENTIAL EQUATIONS PERSPECTIVE

Springer Science & Business Media Backward stochastic differential equations (BSDEs) provide a general mathematical framework for solving pricing and risk management questions of financial derivatives. They are of growing importance for nonlinear pricing problems such as CVA computations that have been developed since the crisis. Although BSDEs are well known to academics, they are less familiar to practitioners in the financial industry. In order to fill this gap, this book revisits financial modeling and computational finance from a BSDE perspective, presenting a unified view of the pricing and hedging theory across all asset classes. It also contains a review of quantitative finance tools, including Fourier techniques, Monte Carlo methods, finite differences and model calibration schemes. With a view to use in graduate courses in computational finance and financial modeling, corrected problem sets and Matlab sheets have been provided. Stéphane Crépey's book starts with a few chapters on classical stochastic processes material, and then... fasten your seatbelt... the author starts traveling backwards in time through backward stochastic differential equations (BSDEs). This does not mean that one has to read the book backwards, like a manga! Rather, the possibility to move backwards in time, even if from a variety of final scenarios following a probability law, opens a multitude of possibilities for all those pricing problems whose solution is not a straightforward expectation. For example, this allows for framing problems like pricing with credit and funding costs in a rigorous mathematical setup. This is, as far as I know, the first book written for several levels of audiences, with applications to financial modeling and using BSDEs as one of the main tools, and as the song says: "it's never as good as the first time". Damiano Brigo, Chair of Mathematical Finance, Imperial College London While the classical theory of arbitrage free pricing has matured, and is now well understood and used by the finance industry, the theory of BSDEs continues to enjoy a rapid growth and remains a domain restricted to academic researchers and a handful of practitioners. Crépey's book presents this novel approach to a wider community of researchers involved in mathematical modeling in finance. It is clearly an essential reference for anyone interested in the latest developments in financial mathematics. Marek Musiela, Deputy Director of the Oxford-Man Institute of Quantitative Finance

PRINCIPLES OF FINANCIAL ENGINEERING

Academic Press Principles of Financial Engineering, Second Edition, is a highly acclaimed text on the fast-paced and complex subject of financial engineering. This updated edition describes the "engineering" elements of financial engineering instead of the mathematics underlying it. It shows you how to use financial tools to accomplish a goal rather than describing the tools themselves. It lays emphasis on the engineering aspects of derivatives (how to create them) rather than their pricing (how they act) in relation to other instruments, the financial markets, and financial market practices. This volume explains ways to create financial tools and how the tools work together to achieve specific goals. Applications are illustrated using real-world examples. It presents three new chapters on financial engineering in topics ranging from commodity markets to financial engineering applications in hedge fund strategies, correlation swaps, structural models of default, capital structure arbitrage, contingent convertibles, and how to incorporate counterparty risk into derivatives pricing. Poised midway between intuition, actual events, and financial mathematics, this book can be used to solve problems in risk management, taxation, regulation, and above all, pricing. This latest edition of Principles of Financial Engineering is ideal for financial engineers, quantitative analysts in banks and investment houses, and other financial industry professionals. It is also highly recommended to graduate students in financial engineering and financial mathematics programs. * The Second Edition presents 5 new chapters on structured product engineering, credit markets and instruments, and principle protection techniques, among other topics * Additions, clarifications, and illustrations throughout the volume show these instruments at work instead of explaining how they should act * The Solutions Manual enhances the text by presenting additional cases and solutions to exercises

PRICING AND HEDGING FINANCIAL DERIVATIVES

A GUIDE FOR PRACTITIONERS

John Wiley & Sons The only guide focusing entirely on practical approaches to pricing and hedging derivatives One valuable lesson of the financial crisis was that derivatives and risk practitioners don't really understand the products they're dealing with. Written by a practitioner for practitioners, this book delivers the kind of knowledge and skills traders and finance professionals need to fully understand derivatives and price and hedge them effectively. Most derivatives books are written by academics and are long on theory and short on the day-to-day realities of derivatives trading. Of the few practical guides available, very few of those cover pricing and hedging—two critical topics for traders. What matters to practitioners is what happens on the trading floor—information only seasoned practitioners such as authors Marroni and Perdomo can impart. Lays out proven derivatives pricing and hedging strategies and techniques for equities, FX, fixed income and commodities, as well as multi-assets and cross-assets Provides expert guidance on the development of structured products, supplemented with a range of practical examples Packed with real-life examples covering everything from option payout with delta hedging, to Monte Carlo procedures to common structured products payoffs The Companion Website features all of the examples from the book in Excel complete with source code

FINANCIAL RISK MANAGEMENT

MODELS, HISTORY, AND INSTITUTIONS

John Wiley & Sons Financial risk has become a focus of financial and nonfinancial firms, individuals, and policy makers. But the study of risk remains a relatively new discipline in finance and continues to be refined. The financial market crisis that began in 2007 has highlighted the challenges of managing financial risk. Now, in Financial Risk Management, author Allan Malz addresses the essential issues surrounding this discipline, sharing his extensive career experiences as a risk researcher, risk manager, and central banker. The book includes standard risk measurement models as well as alternative models that address options, structured credit risks, and the real-world complexities or risk modeling, and provides the institutional and historical background on financial innovation, liquidity, leverage, and financial crises that is crucial to practitioners and students of finance for understanding the world today. Financial Risk Management is equally suitable for firm risk managers, economists, and policy makers seeking grounding in the subject. This timely guide skillfully surveys the landscape of financial risk and the financial developments of recent decades that culminated in the crisis. The book provides a comprehensive overview of the different types of financial risk we face, as well as the techniques used to measure and manage them. Topics covered include: Market risk, from Value-at-Risk (VaR) to risk models for options Credit risk, from portfolio credit risk to structured credit products Model risk and validation Risk capital and stress testing Liquidity risk, leverage, systemic risk, and the forms they take Financial crises, historical and current, their causes and characteristics Financial regulation and its evolution in the wake of the global crisis And much more Combining the more model-oriented approach of risk management-as it has evolved over the past two decades-with an economist's approach to the same issues, Financial Risk Management is the essential guide to the subject for today's complex world.

RECENT PROGRESS AND MODERN CHALLENGES IN APPLIED MATHEMATICS, MODELING AND COMPUTATIONAL SCIENCE

Springer This volume is an excellent resource for professionals in various areas of applications of mathematics, modeling, and computational science. It focuses on recent progress and modern challenges in these areas. The volume provides a balance between fundamental theoretical and applied developments, emphasizing the interdisciplinary nature of modern trends and detailing state-of-the-art achievements in Applied Mathematics, Modeling, and Computational Science. The chapters have been authored by international experts in their respective fields, making this book ideal for researchers in academia, practitioners, and graduate students. It can also serve as a reference in the diverse selected areas of applied mathematics, modelling, and computational sciences, and is ideal for interdisciplinary collaborations.

FX OPTIONS AND SMILE RISK

The FX options market represents one of the most liquid and strongly competitive markets in the world, and features many technical subtleties that can seriously harm the uninformed and unaware trader. This book is a unique guide to running an FX options book from the market maker perspective. Striking a balance between mathematical rigour and market practice and written by experienced practitioner Antonio Castagna, the book shows readers how to correctly build an entire volatility surface from the market prices of the main structures. Starting with the basic conventions related to the main FX deals and the basic traded structures of FX options, the book gradually introduces the main tools to cope with the FX volatility risk. It then goes on to review the main concepts of option pricing theory and their application within a Black-Scholes economy and a stochastic volatility environment. The book also introduces models that can be implemented to price and manage FX options before examining the effects of volatility on the profits and losses arising from the hedging activity. Coverage includes:ul type="disc"lihow the Black-Scholes model is used in professional trading activitylithe most suitable stochastic

volatility modelslisources of profit and loss from the Delta and volatility hedging activitylifundamental concepts of smile hedginglimajor market approaches and variations of the Vanna-Volga methodlivolatility-related Greeks in the Black-Scholes modellipricing of plain vanilla options, digital options, barrier options and the less well known exotic optionslitools for monitoring the main risks of an FX options' book/ul The book is accompanied by a CD Rom featuring models in VBA, demonstrating many of the approaches described in the book.

CREDIT DERIVATIVES PRICING MODELS

MODELS, PRICING AND IMPLEMENTATION

John Wiley & Sons The credit derivatives market is booming and, for the first time, expanding into the banking sector which previously has had very little exposure to quantitative modeling. This phenomenon has forced a large number of professionals to confront this issue for the first time. Credit Derivatives Pricing Models provides an extremely comprehensive overview of the most current areas in credit risk modeling as applied to the pricing of credit derivatives. As one of the first books to uniquely focus on pricing, this title is also an excellent complement to other books on the application of credit derivatives. Based on proven techniques that have been tested time and again, this comprehensive resource provides readers with the knowledge and guidance to effectively use credit derivatives pricing models. Filled with relevant examples that are applied to real-world pricing problems, Credit Derivatives Pricing Models paves a clear path for a better understanding of this complex issue. Dr. Philipp J. Schönbucher is a professor at the Swiss Federal Institute of Technology (ETH), Zurich, and has degrees in mathematics from Oxford University and a PhD in economics from Bonn University. He has taught various training courses organized by ICM and CIFT, and lectured at risk conferences for practitioners on credit derivatives pricing, credit risk modeling, and implementation.

QUANTITATIVE FINANCIAL RISK MANAGEMENT

John Wiley & Sons A mathematical guide to measuring and managing financial risk. Our modern economy depends on financial markets. Yet financial markets continue to grow in size and complexity. As a result, the management of financial risk has never been more important. Quantitative Financial Risk Management introduces students and risk professionals to financial risk management with an emphasis on financial models and mathematical techniques. Each chapter provides numerous sample problems and end of chapter questions. The book provides clear examples of how these models are used in practice and encourages readers to think about the limits and appropriate use of financial models. Topics include: • Value at risk • Stress testing • Credit risk • Liquidity risk • Factor analysis • Expected shortfall • Copulas • Extreme value theory • Risk model backtesting • Bayesian analysis • . . . and much more

OPTIONS ON FOREIGN EXCHANGE

John Wiley & Sons Your A to Z Guide to the World's Largest Option Market "A clearly written manual that flows smoothly. Whether you have 20 years of experience in the FX options markets or none, you will learn something interesting from reading this book. Highly recommended for both traders and non-traders." * Adam Kreysar, Global Head FX Options Warburg Dillon Read "DeRosa presents technical material with a minimum of technical fuss. Filtered through his scholarship and practical trading experience, up-to-date topics such as exotic options, forward volatilities, and the volatility smile become accessible. The book will be extremely useful to asset managers and risk managers." * Allan M. Malz, Partner The RiskMetrics Group "This new edition of Options on Foreign Exchange provides an exhaustive review of the literature on currency options, in addition to covering the practical aspects of the business. It is greatly pedagogical and well written-as can be expected from David DeRosa." * Nassim Taleb, President Empirica Capital LLC

FX OPTIONS AND SMILE RISK

John Wiley & Sons The FX options market represents one of the most liquid and strongly competitive markets in the world, and features many technical subtleties that can seriously harm the uninformed and unaware trader. This book is a unique guide to running an FX options book from the market maker perspective. Striking a balance between mathematical rigour and market practice and written by experienced practitioner Antonio Castagna, the book shows readers how to correctly build an entire volatility surface from the market prices of the main structures. Starting with the basic conventions related to the main FX deals and the basic traded structures of FX options, the book gradually introduces the main tools to cope with the FX volatility risk. It then goes on to review the main concepts of option pricing theory and their application within a Black-Scholes economy and a stochastic volatility environment. The book also introduces models that can be implemented to price and manage FX options before examining the effects of volatility on the profits and losses arising from the hedging activity. Coverage includes: how the Black-Scholes model is used in professional trading activity the most suitable stochastic volatility models sources of profit and loss from the Delta and volatility hedging activity fundamental concepts of smile hedging major market approaches and variations of the Vanna-Volga method volatility-related Greeks in the Black-Scholes model pricing of plain vanilla options, digital options, barrier options and the less well known exotic options tools for monitoring the main risks of an FX options' book The book is accompanied by a CD Rom featuring models in VBA, demonstrating many of the approaches described in the book.

QUANTITATIVE FINANCIAL RISK MANAGEMENT

Wiley A mathematical guide to measuring and managing financial risk. Our modern economy depends on financial markets. Yet financial markets continue to grow in size and complexity. As a result, the management of financial risk has never been more important. Quantitative Financial Risk Management introduces students and risk professionals to financial risk management with an emphasis on financial models and mathematical techniques. Each chapter provides numerous sample problems and end of chapter questions. The book provides clear examples of how these models are used in practice and encourages readers to think about the limits and appropriate use of financial models. Topics include: • Value at risk • Stress testing • Credit risk • Liquidity risk • Factor analysis • Expected shortfall • Copulas • Extreme value theory • Risk model backtesting • Bayesian analysis • . . . and much more

QUANTITATIVE ANALYSIS IN FINANCIAL MARKETS

COLLECTED PAPERS OF THE NEW YORK UNIVERSITY MATHEMATICAL FINANCE SEMINAR

World Scientific This volume contains lectures delivered at the Seminar in Mathematical Finance at the Courant Institute, New York University. Subjects covered include: the emerging science of pricing and hedging derivative securities, managing financial risk, and price forecasting using statistics.

FORECASTING EXPECTED RETURNS IN THE FINANCIAL MARKETS

Elsevier Forecasting returns is as important as forecasting volatility in multiple areas of finance. This topic, essential to practitioners, is also studied by academics. In this new book, Dr Stephen Satchell brings together a collection of leading thinkers and practitioners from around the world who address this complex problem using the latest quantitative techniques. *Forecasting expected returns is an essential aspect of finance and highly technical *The first collection of papers to present new and developing techniques *International authors present both academic and practitioner perspectives

QUANTITATIVE RISK MANAGEMENT

CONCEPTS, TECHNIQUES AND TOOLS - REVISED EDITION

Princeton University Press This book provides the most comprehensive treatment of the theoretical concepts and modelling techniques of quantitative risk management. Whether you are a financial risk analyst, actuary, regulator or student of quantitative finance, Quantitative Risk Management gives you the practical tools you need to solve real-world problems. Describing the latest advances in the field, Quantitative Risk Management covers the methods for market, credit and operational risk modelling. It places standard industry approaches on a more formal footing and explores key concepts such as loss distributions, risk measures and risk aggregation and allocation principles. The book's methodology draws on diverse quantitative disciplines, from mathematical finance and statistics to econometrics and actuarial mathematics. A primary theme throughout is the need to satisfactorily address extreme outcomes and the dependence of key risk drivers. Proven in the classroom, the book also covers advanced topics like credit derivatives. Fully revised and expanded to reflect developments in the field since the financial crisis Features shorter chapters to facilitate teaching and learning Provides enhanced coverage of Solvency II and insurance risk management and extended treatment of credit risk, including counterparty credit risk and CDO pricing Includes a new chapter on market risk and new material on risk measures and risk aggregation

SEMIPARAMETRIC MODELING OF IMPLIED VOLATILITY

Springer Science & Business Media This book offers recent advances in the theory of implied volatility and refined semiparametric estimation strategies and dimension reduction methods for functional surfaces. The first part is devoted to smile-consistent pricing approaches. The second part covers estimation techniques that are natural candidates to meet the challenges in implied volatility surfaces. Empirical investigations, simulations, and pictures illustrate the concepts.

INSIDE VOLATILITY ARBITRAGE

THE SECRETS OF SKEWNESS

John Wiley & Sons Today?s traders want to know when volatility is a sign that the sky is falling (and they should stay out of the market), and when it is a sign of a possible trading opportunity. Inside Volatility Arbitrage can help them do this. Author and financial expert Alireza Javaheri uses the classic approach to evaluating volatility -- time series and financial econometrics -- in a way that he believes

is superior to methods presently used by market participants. He also suggests that there may be "skewness" trading opportunities that can be used to trade the markets more profitably. Filled with in-depth insight and expert advice, Inside Volatility Arbitrage will help traders discover when "skewness" may present valuable trading opportunities as well as why it can be so profitable.

APPLIED QUANTITATIVE FINANCE

THEORY AND COMPUTATIONAL TOOLS

Springer Science & Business Media This book presents solutions for many practical problems in quantitative finance. The e-book design of the text connects theory and computational tools in an innovative way. All "quantlets" for calculation of examples in the text are executable on an XploRe Quantlet Server (XQS) and can be modified by the reader via the internet. The electronic edition can be downloaded from the web.

THE VOLATILITY SURFACE

A PRACTITIONER'S GUIDE

John Wiley & Sons Praise for The Volatility Surface "I'm thrilled by the appearance of Jim Gatheral's new book The Volatility Surface. The literature on stochastic volatility is vast, but difficult to penetrate and use. Gatheral's book, by contrast, is accessible and practical. It successfully charts a middle ground between specific examples and general models--achieving remarkable clarity without giving up sophistication, depth, or breadth." --Robert V. Kohn, Professor of Mathematics and Chair, Mathematical Finance Committee, Courant Institute of Mathematical Sciences, New York University "Concise yet comprehensive, equally attentive to both theory and phenomena, this book provides an unsurpassed account of the peculiarities of the implied volatility surface, its consequences for pricing and hedging, and the theories that struggle to explain it." --Emanuel Derman, author of My Life as a Quant "Jim Gatheral is the wiliest practitioner in the business. This very fine book is an outgrowth of the lecture notes prepared for one of the most popular classes at NYU's esteemed Courant Institute. The topics covered are at the forefront of research in mathematical finance and the author's treatment of them is simply the best available in this form." --Peter Carr, PhD, head of Quantitative Financial Research, Bloomberg LP Director of the Masters Program in Mathematical Finance, New York University "Jim Gatheral is an acknowledged master of advanced modeling for derivatives. In The Volatility Surface he reveals the secrets of dealing with the most important but most elusive of financial quantities, volatility." --Paul Wilmott, author and mathematician "As a teacher in the field of mathematical finance, I welcome Jim Gatheral's book as a significant development. Written by a Wall Street practitioner with extensive market and teaching experience, The Volatility Surface gives students access to a level of knowledge on derivatives which was not previously available. I strongly recommend it." --Marco Avellaneda, Director, Division of Mathematical Finance Courant Institute, New York University "Jim Gatheral could not have written a better book." --Bruno Dupire, winner of the 2006 Wilmott Cutting Edge Research Award Quantitative Research, Bloomberg LP

TOOLS FOR COMPUTATIONAL FINANCE

Springer Science & Business Media The disciplines of financial engineering and numerical computation differ greatly, however computational methods are used in a number of ways across the field of finance. It is the aim of this book to explain how such methods work in financial engineering; specifically the use of numerical methods as tools for computational finance. By concentrating on the field of option pricing, a core task of financial engineering and risk analysis, this book explores a wide range of computational tools in a coherent and focused manner and will be of use to the entire field of computational finance. Starting with an introductory chapter that presents the financial and stochastic background, the remainder of the book goes on to detail computational methods using both stochastic and deterministic approaches. Now in its fifth edition, Tools for Computational Finance has been significantly revised and contains: A new chapter on incomplete markets which links to new appendices on Viscosity solutions and the Dupire equation; Several new parts throughout the book such as that on the calculation of sensitivities (Sect. 3.7) and the introduction of penalty methods and their application to a two-factor model (Sect. 6.7) Additional material in the field of analytical methods including Kim's integral representation and its computation Guidelines for comparing algorithms and judging their efficiency An extended chapter on finite elements that now includes a discussion of two-asset options Additional exercises, figures and references Written from the perspective of an applied mathematician, methods are introduced as tools within the book for immediate and straightforward application. A 'learning by calculating' approach is adopted throughout this book enabling readers to explore several areas of the financial world. Interdisciplinary in nature, this book will appeal to advanced undergraduate students in mathematics, engineering and other scientific disciplines as well as professionals in financial engineering.

TERM-STRUCTURE MODELS

A GRADUATE COURSE

Springer Science & Business Media Changing interest rates constitute one of the major risk sources for banks, insurance companies, and other financial institutions. Modeling the term-structure movements of interest rates is a challenging task. This volume gives an introduction to the mathematics of term-structure models in continuous time. It includes practical aspects for fixed-income markets such as day-count conventions, duration of coupon-paying bonds and yield curve construction; arbitrage theory; short-rate models; the Heath-Jarrow-Morton methodology; consistent term-structure parametrizations; affine diffusion processes and option pricing with Fourier transform; LIBOR market models; and credit risk. The focus is on a mathematically straightforward but rigorous development of the theory. Students, researchers and practitioners will find this volume very useful. Each chapter ends with a set of exercises, that provides source for homework and exam questions. Readers are expected to be familiar with elementary Itô calculus, basic probability theory, and real and complex analysis.

DECISION TECHNOLOGIES FOR COMPUTATIONAL FINANCE

PROCEEDINGS OF THE FIFTH INTERNATIONAL CONFERENCE COMPUTATIONAL FINANCE

Springer Science & Business Media This volume contains selected papers that were presented at the International Conference COMPUTATIONAL FINANCE 1997 held at London Business School on December 15-17 1997. Formerly known as Neural Networks in the Capital Markets (NNCM), this series of meetings has emerged as a truly multi-disciplinary international conference and provided an international focus for innovative research on the application of a multiplicity of advanced decision technologies to many areas of financial engineering. It has drawn upon theoretical advances in financial economics and robust methodological developments in the statistical, econometric and computer sciences. To reflect its multi-disciplinary nature, the NNCM conference has adopted the new title COMPUTATIONAL FINANCE. The papers in this volume are organised in six parts. Market Dynamics and Risk, Trading and Arbitrage strategies, Volatility and Options, Term-Structure and Factor models, Corporate Distress Models and Advances on Methodology. This years' acceptance rate (38%) reflects both the increasing interest in the conference and the Programme Committee's efforts to improve the quality of the meeting year-on-year. I would like to thank the members of the programme committee for their efforts in refereeing the papers. I also would like to thank the members of the computational finance group at London Business School and particularly Neil Burgess, Peter Bolland, Yves Bentz, and Nevil Towers for organising the meeting.

STATISTICAL MODELS AND METHODS FOR FINANCIAL MARKETS

Springer Science & Business Media The idea of writing this bookarosein 2000when the ?rst author wasassigned to teach the required course STATS 240 (Statistical Methods in Finance) in the new M. S. program in ?nancial mathematics at Stanford, which is an interdisciplinary program that aims to provide a master's-level education in applied mathematics, statistics, computing, ?nance, and economics. Students in the programhad di?erent backgroundsin statistics. Some had only taken a basic course in statistical inference, while others had taken a broad spectrum of M. S. - and Ph. D. -level statistics courses. On the other hand, all of them had already taken required core courses in investment theory and derivative pricing, and STATS 240 was supposed to link the theory and pricing formulas to real-world data and pricing or investment strategies. Besides students in theprogram,thecoursealso attractedmanystudentsfromother departments in the university, further increasing the heterogeneity of students, as many of them had a strong background in mathematical and statistical modeling from the mathematical, physical, and engineering sciences but no previous experience in ?nance. To address the diversity in background but common strong interest in the subject and in a potential career as a "quant" in the ?nancialindustry,thecoursematerialwascarefullychosennotonlytopresent basic statistical methods of importance to quantitative ?nance but also to summarize domain knowledge in ?nance and show how it can be combined with statistical modeling in ?nancial analysis and decision making. The course material evolved over the years, especially after the second author helped as the head TA during the years 2004 and 2005.

THE BEST OF WILMOTT 2

John Wiley & Sons The Team at Wilmott is very proud to present this compilation of Wilmott magazine articles and presentations from our second year. We have selected some of the very best in cutting-edge research, and the most illuminating of our regular columns. The technical papers include state-of-the-art pricing tools and models. You'll notice there's a bias towards volatility modelling in the book. Of course, it's one of my favourite topics, but volatility is also the big unknown as far as pricing and hedging is concerned. We present research in this area from some of the best newcomers in this field. You'll see ideas that make a mockery of 'received wisdom,' ideas that are truly paradigm shattering - for we aren't content with a mere 'shift.' We know you'll enjoy it! The Best of Wilmott will return again next year...

HANDBOOK OF COMPUTATIONAL AND NUMERICAL METHODS IN FINANCE

Springer Science & Business Media The subject of numerical methods in finance has recently emerged as a new discipline at the intersection of probability theory, finance, and numerical analysis. The

methods employed bridge the gap between financial theory and computational practice, and provide solutions for complex problems that are difficult to solve by traditional analytical methods. Although numerical methods in finance have been studied intensively in recent years, many theoretical and practical financial aspects have yet to be explored. This volume presents current research and survey articles focusing on various numerical methods in finance. The book is designed for the academic community and will also serve professional investors.

AI AND FINANCIAL TECHNOLOGY

Frontiers Media SA

STATISTICAL ANALYSIS OF FINANCIAL DATA IN S-PLUS

Springer Science & Business Media This is the first book at the graduate textbook level to discuss analyzing financial data with S-PLUS. Its originality lies in the introduction of tools for the estimation and simulation of heavy tail distributions and copulas, the computation of measures of risk, and the principal component analysis of yield curves. The book is aimed at undergraduate students in financial engineering; master students in finance and MBA's, and to practitioners with financial data analysis concerns.