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Optimization Methods for Gas and Power Markets Enrico Edoli 2016-04-30 As power and gas markets are becoming more and more mature and globally competitive, the importance of reaching maximum potential economic efficiency is fundamental in all the sectors of the value chain, from investments selection to asset optimization, trading and sales. Optimization techniques can be used in many different fields of the energy industry, in order to reduce production and financial costs, increase sales revenues and mitigate all kinds of risks potentially affecting the economic margin. For this reason the industry has now focused its attention on the general concept of optimization and to the different techniques (mainly mathematical techniques) to reach it. Optimization Methods for Gas and Power Markets presents both theoretical elements and practical examples for solving energy optimization issues in gas and power markets. Starting with the theoretical framework and the basic business and economics of power and gas optimization, it quickly moves on to review the mathematical optimization problems inherent to the industry, and their solutions – all supported with examples from the energy sector. Coverage ranges from very long-term (and capital intensive) optimization problems such as investment valuation/diversification to asset (gas and power) optimization/hedging problems, and pure trading decisions. This book first presents the readers with various examples of optimization problems arising in power and gas markets, then deals with general optimization problems and describes the mathematical tools useful for their solution. The remainder of the book is dedicated to presenting a number of key business cases which apply the proposed techniques to concrete market problems. Topics include static asset optimization, real option evaluation, dynamic optimization of structured products like swing, virtual storage or virtual power plant contracts and optimal trading in intra-day power markets. As the book progresses, so too does the level of mathematical complexity, providing readers with an appreciation of the growing sophistication of even common problems in current market practice. Optimization Methods for Gas and Power Markets provides a valuable quantitative guide to the technicalities of optimization methodologies in gas and power markets; it is essential reading for practitioners in the energy industry and financial sector who work in trading, quantitative analysis and energy risk modeling.
Valuation In A World Of Cva, Dva, And Fva : A Tutorial On Debt Securities And Interest Rate Derivatives Smith Donald J 2017-07-20 CVA, DVA, and FVA, which are the acronyms for credit, debit, and funding valuation adjustments, have become widely used by major banks since the financial crisis. This book aims to bridge the gap between the highly complex and mathematical models used by these banks to adjust the value of debt securities and interest rate derivatives, and the end users of the valuations, for example, accountants, auditors, and analysts. The book, which is essentially a tutorial, demonstrates the types of models that are used using binomial trees that are featured in the CFA® fixed income curriculum and allows readers to replicate the examples using a spreadsheet.
Counterparty Risk and Funding Stéphane Crépey 2014-06-23 Solve the DVA/FVA Overlap Issue and Effectively Manage Portfolio Credit Risk Counterparty Risk and Funding: A Tale of Two Puzzles explains how to study risk embedded in financial transactions between the bank and its counterparty. The authors provide an analytical basis for the quantitative methodology of dynamic valuation, mitigation, and hedging of bilateral counterparty risk on over-the-counter (OTC) derivative contracts under funding constraints. They explore credit, debt, funding, liquidity, and rating valuation adjustment (CVA, DVA, FVA, LVA, and RVA) as well as replacement cost (RC), wrong-way risk, multiple funding curves, and collateral. The first part of the book assesses today’s financial landscape, including the current multi-curve reality of financial markets. In mathematical but model-free terms, the second part describes all the basic elements of the pricing and hedging framework. Taking a more practical slant, the third part introduces a reduced-form modeling approach in which the risk of default of the two parties only shows up through their default intensities. The fourth part addresses counterparty risk on credit derivatives through dynamic copula models. In the fifth part, the authors present a credit migrations model that allows you to account for rating-dependent credit support annex (CSA) clauses. They also touch on nonlinear FVA computations in credit portfolio models. The final part covers classical tools from stochastic analysis and gives a brief introduction to the theory of Markov copulas. The credit crisis and ongoing European sovereign debt crisis have shown the importance of the proper assessment and management of counterparty risk. This book focuses on the interaction and possible overlap between DVA and FVA terms. It also explores the particularly challenging issue of counterparty risk in portfolio credit modeling. Primarily for researchers and graduate students in financial mathematics, the book is also suitable for financial quants, managers in banks, CVA desks, and members of supervisory bodies.
Counterparty Risk and Funding Stéphane Crépey 2014-06-23 Solve the DVA/FVA Overlap Issue and Effectively Manage Portfolio Credit Risk Counterparty Risk and Funding: A Tale of Two Puzzles explains how to study risk embedded in financial transactions between the bank and its counterparty. The authors provide an analytical basis for the quantitative methodology of dynamic valuation, mitigation, and hedging of bilateral counterparty risk on over-the-counter (OTC) derivative contracts under funding constraints. They explore credit, debt, funding, liquidity, and rating valuation

adjustment (CVA, DVA, FVA, LVA, and RVA) as well as replacement cost (RC), wrong-way risk, multiple funding curves, and collateral. The first part of the book assesses today's financial landscape, including the current multi-curve reality of financial markets. In mathematical but model-free terms, the second part describes all the basic elements of the pricing and hedging framework. Taking a more practical slant, the third part introduces a reduced-form modeling approach in which the risk of default of the two parties only shows up through their default intensities. The fourth part addresses counterparty risk on credit derivatives through dynamic copula models. In the fifth part, the authors present a credit migrations model that allows you to account for rating-dependent credit support annex (CSA) clauses. They also touch on nonlinear FVA computations in credit portfolio models. The final part covers classical tools from stochastic analysis and gives a brief introduction to the theory of Markov copulas. The credit crisis and ongoing European sovereign debt crisis have shown the importance of the proper assessment and management of counterparty risk. This book focuses on the interaction and possible overlap between DVA and FVA terms. It also explores the particularly challenging issue of counterparty risk in portfolio credit modeling. Primarily for researchers and graduate students in financial mathematics, the book is also suitable for financial quants, managers in banks, CVA desks, and members of supervisory bodies.

Enterprise Risk Analytics for Capital Markets Raghurami Reddy Etukuru 2014-10-09 While quantitative models can help predict the trends in Capital Markets, forecasts don't always hold up and can quickly cause things to spiral out of control and can lead to global risk. In order to reduce systemic risk, the G20 committed to a fundamental reform of the financial system, to correct the fault lines, and to rebuild the financial system as a safer, more resilient source of finance that better serves the real economy. This requires Financial Institutions to develop sound Risk Management practices. In straightforward language, you'll learn about key components of risk management, including risk knowledge, risk quantification, risk data management, risk data aggregation, risk architectures, risk analytics and reporting, risk regulation. You'll also get definitions explaining how different financial products work, mathematical formulas with explanations, and insights on different asset classes, different approaches to hedging, and much more. This book Enterprise Risk Analytics for Capital Markets will help whether you are just beginning a career in risk management or advancing your career with in risk management.

An Introduction to Banking Moorad Choudhry 2018-05-29 A practical primer to the modern banking operation Introduction to Banking, Second Edition is a comprehensive and jargon-free guide to the banking operation. Written at the foundational level, this book provides a broad overview of banking to give you an all-around understanding that allows you to put your specialty work into context within the larger picture of your organization. With a specific focus on risk components, this second edition covers all key elements with new chapters on reputational risk, credit risk, stress testing and customer service, including an updated chapter on sustainability. Practical material includes important topics such as the yield curve, trading and hedging, asset liability management, loan origination, product marketing, reputational risk and regulatory capital. This book gives you the context you need to understand how modern banks are run, and the key points operation at all levels. Learn the critical elements of a well-structured banking operation Examine the risk components inherent in banking Understand operational topics including sustainability and stress testing Explore service-end areas including product marketing and customer service Banks continue to be the heart of the modern economy, despite the global financial crisis —they have however become more complex. Multiple layers and a myriad of functions contribute to the running of today's banks, and it's critical for new and aspiring bankers to understand the full breadth of the operation and where their work fits in. Introduction to Banking, Second Edition provides an accessible yet complete primer, with emphasis on the areas that have become central to sustainable banking operation.

The Moorad Choudhry Anthology, + Website Moorad Choudhry 2018-07-18 The definitive and timeless guide to the principles of banking and finance, addressing and meeting the challenges of competition, strategy, regulation and the digital age. Moorad Choudhry Anthology compiles the best of renowned author Professor Moorad Choudhry's incisive writings on financial markets and bank risk management, together with new material that reflects the legislative changes in the post-crisis world of finance and the impact of digitization and global competition. Covering the developments and principles of banking from the 1950s to today, this unique book outlines the author's recommended best practices in all aspects of bank strategy, governance and risk management, including asset-liability management, liquidity risk management, capital planning, Treasury risk, and corporate framework, and describes a "vision of the future" with respect to a sustainable bank business model. You will gain the insight of a global authority on topics essential to retail, corporate, and investment/wholesale banking, including strategy, risk appetite, funding policies, regulatory requirements, valuation, and much more. The companion website is a goldmine for senior practitioners that provides templates that can applied in virtually any bank, including policy documents, pricing models, committee terms of reference, teaching aids and learning tools including PowerPoint slides and spreadsheet models. These facilitate a deeper understanding of the subject and the requirements of the senior executive, making this book an ideal companion for practitioners, graduate students and professional students alike. The intense demand for knowledge and expertise in asset-liability management, liquidity, and capital management has been driven by the regulatory challenges of Basel III, the European Union's CRDIV, the Volcker Rule, Dodd-Frank Act, and a myriad of other new regulations. This book meets that need by providing you with a complete background and modern insight on every aspect of bank risk management. Re-engage with timeless principles of finance that apply in every market and which are the drivers of principles of risk management Learn strategic asset liability management practices that suit today's economic environment Adopt new best practices for liquidity models and choosing the appropriate liquidity risk management framework Examine optimum capital and funding model recommendations for corporate, retail, and investment/wholesale banks Dig deeper into derivatives risk management, balance sheet capital management, funding policy, and more Apply best-practice corporate governance frameworks that ensure a perpetual and viable robust balance sheet Adopt strategy formulation principles that reflect the long-term imperative of the banking business In the 21st century more than ever banks need to "re-learn" traditional risk management principles and apply them every day. Every bank in the world needs to be up to speed on these issues, and Anthology from Professor Moorad Choudhry is the answer to this new global policy response.

Interest Rate Derivatives Explained J. Kienitz 2014-12-05 Aimed at practitioners who need to understand the current fixed income markets and learn the techniques necessary to master the fundamentals, this book provides a thorough but concise description of fixed income markets, looking at the business, products and structures and advanced modeling of interest rate instruments.

XVA Desks - A New Era for Risk Management I. Ruiz 2015-04-27 Written by a practitioner with years working in CVA, FVA and DVA this is a thorough, practical guide to a topic at the very core of the derivatives industry. It takes readers through all aspects of counterparty credit risk management and the business cycle of CVA, DVA and FVA, focusing on risk management, pricing considerations and implementation.

The xVA Challenge Jon Gregory 2015-10-26 A detailed, expert-driven guide to today's major financial point of interest The xVA Challenge: Counterparty Credit Risk, Funding, Collateral, and Capital is a practical guide from one of the leading and most influential credit practitioners, Jon Gregory. Focusing on practical methods, this informative guide includes discussion around the latest regulatory

requirements, market practice, and academic thinking. Beginning with a look at the emergence of counterparty risk during the recent global financial crisis, the discussion delves into the quantification of firm-wide credit exposure and risk mitigation methods, such as netting and collateral. It also discusses thoroughly the xVA terms, notably CVA, DVA, FVA, ColVA, and KVA and their interactions and overlaps. The discussion of other aspects such as wrong-way risks, hedging, stress testing, and xVA management within a financial institution are covered. The extensive coverage and detailed treatment of what has become an urgent topic makes this book an invaluable reference for any practitioner, policy maker, or student. Counterparty credit risk and related aspects such as funding, collateral, and capital have become key issues in recent years, now generally characterized by the term 'xVA'. This book provides practical, in-depth guidance toward all aspects of xVA management. Market practice around counterparty credit risk and credit and debit value adjustment (CVA and DVA) The latest regulatory developments including Basel III capital requirements, central clearing, and mandatory collateral requirements The impact of accounting requirements such as IFRS 13 Recent thinking on the applications of funding, collateral, and capital adjustments (FVA, ColVA and KVA) The sudden realization of extensive counterparty risks has severely compromised the health of global financial markets. It's now a major point of action for all financial institutions, which have realized the growing importance of consistent treatment of collateral, funding, and capital alongside counterparty risk. The xVA Challenge: Counterparty Credit Risk, Funding, Collateral, and Capital provides expert perspective and real-world guidance for today's institutions.

Financial Derivatives Modeling Christian Ekstrand 2011-08-26 This book gives a comprehensive introduction to the modeling of financial derivatives, covering all major asset classes (equities, commodities, interest rates and foreign exchange) and stretching from Black and Scholes' lognormal modeling to current-day research on skew and smile models. The intended reader has a solid mathematical background and is a graduate/final-year undergraduate student specializing in Mathematical Finance, or works at a financial institution such as an investment bank or a hedge fund.

Modeling and Valuation of Energy Structures Daniel Mahoney 2016-01-26 Commodity markets present several challenges for quantitative modeling. These include high volatilities, small sample data sets, and physical, operational complexity. In addition, the set of traded products in commodity markets is more limited than in financial or equity markets, making value extraction through trading more difficult. These facts make it very easy for modeling efforts to run into serious problems, as many models are very sensitive to noise and hence can easily fail in practice. Modeling and Valuation of Energy Structures is a comprehensive guide to quantitative and statistical approaches that have been successfully employed in support of trading operations, reflecting the author's 17 years of experience as a front-office 'quant'. The major theme of the book is that simpler is usually better, a message that is drawn out through the reality of incomplete markets, small samples, and informational constraints. The necessary mathematical tools for understanding these issues are thoroughly developed, with many techniques (analytical, econometric, and numerical) collected in a single volume for the first time. A particular emphasis is placed on the central role that the underlying market resolution plays in valuation. Examples are provided to illustrate that robust, approximate valuations are to be preferred to overly ambitious attempts at detailed qualitative modeling.

Investment Risk Management H. Kent Baker 2015 All investments carry with them some degree of risk. In the financial world, individuals, professional money managers, financial institutions and many others encounter and must deal with risk. The main purpose of 'Investment Risk Management' is to provide an overview of developments in risk management and a synthesis of research involving the latest developments in the field.

Principles of Financial Engineering Robert Kosowski 2014-11-26 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

Counterparty Credit Risk, Collateral and Funding Damiano Brigo 2013-03-05 The book’s content is focused on rigorous and advanced quantitative methods for the pricing and hedging of counterparty credit and funding risk. The new general theory that is required for this methodology is developed from scratch, leading to a consistent and comprehensive framework for counterparty credit and funding risk, inclusive of collateral, netting rules, possible debit valuation adjustments, re-hypothecation and closeout rules. The book however also looks at quite practical problems, linking particular models to particular ‘concrete’ financial situations across asset classes, including interest rates, FX, commodities, equity, credit itself, and the emerging asset class of longevity. The authors also aim to help quantitative analysts, traders, and anyone else needing to frame and price counterparty credit and funding risk, to develop a ‘feel’ for applying sophisticated mathematics and stochastic calculus to solve practical problems. The main models are illustrated from theoretical formulation to final implementation with calibration to market data, always keeping in mind the concrete questions being dealt with. The authors stress that each model is suited to different situations and products, pointing out that there does not exist a single model which is uniformly better than all the others, although the problems originated by counterparty credit and funding risk point in the direction of global valuation. Finally, proposals for restructuring counterparty credit risk, ranging from contingent credit default swaps to margin lending, are considered.

The XVA of Financial Derivatives: CVA, DVA and FVA Explained Dongsheng Lu 2015-11-10 This latest addition to the Financial Engineering Explained series focuses on the new standards for derivatives valuation, namely, pricing and risk management taking into account counterparty risk, and the XVA's Credit, Funding and Debt value adjustments.

Modern Derivatives Pricing and Credit Exposure Analysis Roland Stamm 2015-06-01 This book provides a comprehensive guide for modern derivatives pricing and credit analysis. Written to provide

sound theoretical detail but practical implication, it provides readers with everything they need to know to price modern financial derivatives and analyze the credit exposure of a financial instrument in today's markets.

Introduction to Derivatives and Risk Management Don M. Chance 2015-01-01 Coupling real business examples with minimal technical mathematics, market-leading INTRODUCTION TO DERIVATIVES AND RISK MANAGEMENT, 10e blends institutional material, theory, and practical applications to give students a solid understanding of how derivatives are used to manage the risks of financial decisions. The book delivers detailed coverage of options, futures, forwards, swaps, and risk management as well as a balanced introduction to pricing, trading, and strategy. New Taking Risk in Life features illustrate the application of risk management in real-world financial decisions. In addition, the financial information throughout the Tenth Edition reflects the most recent changes in the derivatives market--one of the most volatile sectors in the financial world. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Interest Rate Modelling in the Multi-Curve Framework M. Henrard 2014-05-29 Following the financial crisis dramatic market changes, a new standard in interest rate modelling emerged, called the multi-curve framework. The author provides a detailed analysis of the framework, through its foundations, evolution and implementation. The book also covers recent extensions to collateral and stochastic spreads modelling.

Quantitative Finance A. Reghai 2014-11-25 The series of recent financial crises have thrown open the world of quantitative finance and financial modeling. This book brings together proven and new methodologies from finance, physics and engineering, along with years of industry and academic experience to provide a cookbook of models for dealing with the challenges of today's markets.

Financial Risk Management Jimmy Skoglund 2015-10-12 Presenting an in-depth look at banking risk on a global scale, including comprehensive examination of the U.S. Comprehensive Capital Analysis and Review, and the European Banking Authority stress tests, this guide offers the most up-to-date information and expert insight into real risk management, based on the authors' experience in developing and implementing risk analytics in banks around the globe. --

XVA Andrew Green 2015-12-14 Thorough, accessible coverage of the key issues in XVA XVA – Credit, Funding and Capital Valuation Adjustments provides specialists and non-specialists alike with an up-to-date and comprehensive treatment of Credit, Debit, Funding, Capital and Margin Valuation Adjustment (CVA, DVA, FVA, KVA and MVA), including modelling frameworks as well as broader IT engineering challenges. Written by an industry expert, this book navigates you through the complexities of XVA, discussing in detail the very latest developments in valuation adjustments including the impact of regulatory capital and margin requirements arising from CCPs and bilateral initial margin. The book presents a unified approach to modelling valuation adjustments including credit risk, funding and regulatory effects. The practical implementation of XVA models using Monte Carlo techniques is also central to the book. You'll also find thorough coverage of how XVA sensitivities can be accurately measured, the technological challenges presented by XVA, the use of grid computing on CPU and GPU platforms, the management of data, and how the regulatory framework introduced under Basel III presents massive implications for the finance industry. Explores how XVA models have developed in the aftermath of the credit crisis The only text to focus on the XVA adjustments rather than the broader topic of counterparty risk. Covers regulatory change since the credit crisis including Basel III and the impact regulation has had on the pricing of derivatives. Covers the very latest valuation adjustments, KVA and MVA. The author is a regular speaker and trainer at industry events, including WBS training, Marcus Evans, ICBI, Infoline and RISK If you're a quantitative analyst, trader, banking manager, risk manager, finance and audit professional, academic or student looking to expand your knowledge of XVA, this book has you covered.

Zero Lower Bound Term Structure Modeling L. Krippner 2015-01-05 Nominal yields on government debt in several countries have fallen very near their zero lower bound (ZLB), causing a liquidity trap and limiting the capacity to stimulate economic growth. This book provides a comprehensive reference to ZLB structure modeling in an applied setting.

Interest Rate Derivatives Explained J. Kienitz 2014-12-05 Aimed at practitioners who need to understand the current fixed income markets and learn the techniques necessary to master the fundamentals, this book provides a thorough but concise description of fixed income markets, looking at the business, products and structures and advanced modeling of interest rate instruments.

Practical Methods of Financial Engineering and Risk Management Rupak Chatterjee 2014-09-26 Risk control, capital allocation, and realistic derivative pricing and hedging are critical concerns for major financial institutions and individual traders alike. Events from the collapse of Lehman Brothers to the Greek sovereign debt crisis demonstrate the urgent and abiding need for statistical tools adequate to measure and anticipate the amplitude of potential swings in the financial markets—from ordinary stock price and interest rate moves, to defaults, to those increasingly frequent "rare events" fashionably called black swan events. Yet many on Wall Street continue to rely on standard models based on artificially simplified assumptions that can lead to systematic (and sometimes catastrophic) underestimation of real risks. In Practical Methods of Financial Engineering and Risk Management, Dr. Rupak Chatterjee— former director of the multi-asset quantitative research group at Citi—introduces finance professionals and advanced students to the latest concepts, tools, valuation techniques, and analytic measures being deployed by the more discerning and responsive Wall Street practitioners, on all operational scales from day trading to institutional strategy, to model and analyze more faithfully the real behavior and risk exposure of financial markets in the cold light of the post-2008 realities. Until one masters this modern skill set, one cannot allocate risk capital properly, price and hedge derivative securities realistically, or risk-manage positions from the multiple perspectives of market risk, credit risk, counterparty risk, and systemic risk. The book assumes a working knowledge of calculus, statistics, and Excel, but it teaches techniques from statistical analysis, probability, and stochastic processes sufficient to enable the reader to calibrate probability distributions and create the simulations that are used on Wall Street to valuate various financial instruments correctly, model the risk dimensions of trading strategies, and perform the numerically intensive analysis of risk measures required by various regulatory agencies.

Understanding and Managing Model Risk Massimo Morini 2011-10-20 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.

International Convergence of Capital Measurement and Capital Standards 2004

FX Barrier Options Zareer Dadachanji 2016-04-29 Barrier options are a class of highly path-dependent exotic options which present particular challenges to practitioners in all areas of the financial industry. They are traded heavily as stand-alone contracts in the Foreign Exchange (FX) options market, their trading volume being second only to that of vanilla options. The FX options industry has

correspondingly shown great innovation in this class of products and in the models that are used to value and risk-manage them. FX structured products commonly include barrier features, and in order to analyse the effects that these features have on the overall structured product, it is essential first to understand how individual barrier options work and behave. FX Barrier Options takes a quantitative approach to barrier options in FX environments. Its primary perspectives are those of quantitative analysts, both in the front office and in control functions. It presents and explains concepts in a highly intuitive manner throughout, to allow quantitatively minded traders, structurers, marketers, salespeople and software engineers to acquire a more rigorous analytical understanding of these products. The book derives, demonstrates and analyses a wide range of models, modelling techniques and numerical algorithms that can be used for constructing valuation models and risk-management methods. Discussions focus on the practical realities of the market and demonstrate the behaviour of models based on real and recent market data across a range of currency pairs. It furthermore offers a clear description of the history and evolution of the different types of barrier options, and elucidates a great deal of industry nomenclature and jargon.
Quantitative Analysis, Derivatives Modeling, and Trading Strategies Yi Tang 2007-01-23 This book addresses selected practical applications and recent developments in the areas of quantitative financial modeling in derivatives instruments, some of which are from the authors' own research and practice. It is written from the viewpoint of financial engineers or practitioners, and, as such, it puts more emphasis on the practical applications of financial mathematics in the real market than the mathematics itself with precise (and tedious) technical conditions. It attempts to combine economic insights with mathematics and modeling so as to help the reader to develop intuitions. Among the modeling and the numerical techniques presented are the practical applications of the martingale theories, such as martingale model factory and martingale resampling and interpolation. In addition, the book addresses the counterparty credit risk modeling, pricing, and arbitraging strategies from the perspective of a front office functionality and a revenue center (rather than merely a risk management functionality), which are relatively recent developments and are of increasing importance. It also discusses various trading structuring strategies and touches upon some popular credit/IR/FX hybrid products, such as PRDC, TARN, Snowballs, Snowbears, CCDS, and credit extinguishers. While the primary scope of this book is the fixed-income market (with further focus on the interest rate market), many of the methodologies presented also apply to other financial markets, such as the credit, equity, foreign exchange, and commodity markets. Contents:Theory and Applications of Derivatives Modeling:Introduction to Counterparty Credit RiskMartingale Arbitrage Pricing in Real MarketThe Black–Scholes Framework and ExtensionsMartingale Resampling and InterpolationIntroduction to Interest Rate Term Structure ModelingThe Health–Jarrow–Morton FrameworkThe Interest Rate Market ModelCredit Risk Modeling and PricingInterest Rate Market Fundamentals and Proprietary Trading Strategies:Simple Interest Rate ProductsYield Curve ModelingTwo-Factor Risk ModelThe Holy Grail — Two-Factor Interest Rate ArbitrageYield Decomposition ModelInflation Linked Instruments ModelingInterest Rate Proprietary Trading Strategies Readership: Advanced readers who work or are interested in the fixed-income market. Keywords:CVA;Credit Valuation Adjustment;Counterparty Credit;BGM Model;HJM Model;RS Model;Martingale;Derivatives Modeling;Martingale Resampling;Orthogonal Exponential Spline;Stat Arb;Nonexploding Bushy Tree;NBT;PRDC;TARN;Snowball;Snowbear;CCDS;Credit ExtinguisherReviews: “This state of the art text emphasizes various contemporary topics in fixed income derivatives from a practitioner's perspective. The combination of martingale technology with the author's expert practical knowledge contributes hugely to the book's success. For those who desire timely reporting straight from the trenches, this book is a must.” Peter Carr, PhD Director of the Masters in Math Finance Program Courant Institute, NYU “It is quite obvious that the authors have significant practical experience in sophisticated quantitative analysis and derivatives modeling. This real world focus has resulted in a text that not only provides clear presentations on modeling, pricing and hedging derivatives products, but also provides more advanced material that is usually found only in research publications. This book has innovative ideas, state of the art applications, and contains a wealth of valuable information that will interest academics, applied quantitative derivatives modelers, and traders.” Peter Ritchken Kenneth Walter Haber Professor Department of Banking and Finance, Weatherhead School of Management, Case Western Reserve University “Written by two experienced production Quants, this book contains a wealth of practical methods and useful insights that have been tried and tested. In addressing new tasks, most Quants worry about best practice. Along with specialist published papers, etc, this book is a must to help calibrate judgment. Presently one of the dozen select math-finance books that really should be on one's shelf!” Alan Brace University of Technology Sydney School of Finance and Economics Key Features:Covers various advanced interest rate models, such as the HJM framework, Markovian HJM models (multi-factor RS model in particular), and BGM models, as well as counterparty credit pricing models. It also touches upon some credit models, such as the Copula model, the factor model, and risky market model for credit spreadAddresses various practical applications of modeling, such as martingale arbitrage modeling under real market situations (such as using the correct risk-free interest rate, revised put-call parity, defaultable derivatives, and hedging in the presence of the volatility skew and smile, as well as brief discussions on secondary model calibration for handling the un-hedgeable variables, models for pricing and models for hedging)Presents practical numerical algorithms for the model implementation, such as martingale interpolation and resampling for enforcing discrete martingale relationships in situ in numerical procedures, modeling of the volatility skew, and a nonexploding bushy tree (NBT) technique for efficiently solving non-Markovian models, such as the multi-factor BGM market model, under the backward induction frameworkIntroduces the basics of the interest rate market, including various yield curve modeling, such as the well known Orthogonal Exponential Spline (OES) model, as well as proprietary trading strategies, stat arb in particular
Discounting, LIBOR, CVA and Funding C. Kenyon 2012-08-06 Providing the most up-to-date tools and techniques for pricing interest rate and credit products for the new financial world, this book discusses pricing and hedging, funding and regulation, and interpretation, as an essential resource for quantitatively minded practitioners and researchers in finance.
Equity Derivatives and Hybrids Oliver Brockhaus 2016-04-29 Since the development of the Black-Scholes model, research on equity derivatives has evolved rapidly to the point where it is now difficult to cut through the myriad of literature to find relevant material. Written by a quant with many years of experience in the field this book provides an up-to-date account of equity and equity-hybrid (equity-rates, equity-credit, equity-foreign exchange) derivatives modeling from a practitioner's perspective. The content reflects the requirements of practitioners in financial institutions: Quants will find a survey of state-of-the-art models and guidance on how to efficiently implement them with regards to market data representation, calibration, and sensitivity computation. Traders and structurers will learn about structured products, selection of the most appropriate models, as well as efficient hedging methods while risk managers will better understand market, credit, and model risk and find valuable information on advanced correlation concepts. Equity Derivatives and Hybrids provides exhaustive coverage of both market standard and new approaches, including: -Empirical properties of stock returns including autocorrelation and jumps -Dividend discount models -Non-Markovian and discrete-time volatility processes -Correlation skew modeling via copula as well as local and stochastic correlation factors -Hybrid modeling covering local and stochastic processes for interest rate, hazard rate, and volatility as well as closed form solutions -Credit, debt, and funding valuation adjustment (CVA, DVA, FVA) -Monte Carlo techniques for sensitivities including algorithmic differentiation, path recycling, as well as multilevel. Written in a highly accessible manner with

examples, applications, research, and ideas throughout, this book provides a valuable resource for quantitative-minded practitioners and researchers.

XVA Desks - A New Era for Risk Management I. Ruiz 2014-01-14 Written by a practitioner with years working in CVA, FVA and DVA this is a thorough, practical guide to a topic at the very core of the derivatives industry. It takes readers through all aspects of counterparty credit risk management and the business cycle of CVA, DVA and FVA, focusing on risk management, pricing considerations and implementation.

SABR and SABR LIBOR Market Models in Practice Christian Crispoldi 2016-04-29 Interest rate traders have been using the SABR model to price vanilla products for more than a decade. However this model suffers however from a severe limitation: its inability to value exotic products. A term structure model à la LIBOR Market Model (LMM) is often employed to value these more complex derivatives, however the LMM is unable to capture the volatility smile. A joint SABR LIBOR Market Model is the natural evolution towards a consistent pricing of vanilla and exotic products. Knowledge of these models is essential to all aspiring interest rate quants, traders and risk managers, as well an understanding of their failings and alternatives. SABR and SABR Libor Market Models in Practice is an accessible guide to modern interest rate modelling. Rather than covering an array of models which are seldom used in practice, it focuses on the SABR model, the market standard for vanilla products, the LIBOR Market Model, the most commonly used model for exotic products and the extended SABR LIBOR Market Model. The book takes a hands-on approach, demonstrating simply how to implement and work with these models in a market setting. It bridges the gap between the understanding of the models from a conceptual and mathematical perspective and the actual implementation by supplementing the interest rate theory with modelling specific, practical code examples written in Python.

The Validation of Risk Models S. Scandizzo 2016-07-01 This book is a one-stop-shop reference for risk management practitioners involved in the validation of risk models. It is a comprehensive manual about the tools, techniques and processes to be followed, focused on all the models that are relevant in the capital requirements and supervisory review of large international banks.

Interest Rate Derivatives Explained: Volume 2 Jörg Kienitz 2017-11-08 This book on Interest Rate Derivatives has three parts. The first part is on financial products and extends the range of products considered in Interest Rate Derivatives Explained I. In particular we consider callable products such as Bermudan swaptions or exotic derivatives. The second part is on volatility modelling. The Heston and the SABR model are reviewed and analyzed in detail. Both models are widely applied in practice. Such models are necessary to account for the volatility skew/smile and form the fundament for pricing and risk management of complex interest rate structures such as Constant Maturity Swap options. Term structure models are introduced in the third part. We consider three main classes namely short rate models, instantaneous forward rate models and market models. For each class we review one representative which is heavily used in practice. We have chosen the Hull-White, the Cheyette and the Libor Market model. For all the models we consider the extensions by a stochastic basis and stochastic volatility component. Finally, we round up the exposition by giving an overview of the numerical methods that are relevant for successfully implementing the models considered in the book.

Analytical Finance: Volume II Jan R. M. Röman 2017-11-30 Analytical Finance is a comprehensive introduction to the financial engineering of equity and interest rate instruments for financial markets. Developed from notes from the author’s many years in quantitative risk management and modeling roles, and then for the Financial Engineering course at Mälardalen University, it provides exhaustive coverage of vanilla and exotic mathematical finance applications for trading and risk management, combining rigorous theory with real market application. Coverage includes: • Date arithmetic’s, quote types of interest rate instruments • The interbank market and reference rates, including negative rates• Valuation and modeling of IR instruments; bonds, FRN, FRA, forwards, futures, swaps, CDS, caps/floors and others • Bootstrapping and how to create interest rate curves from prices of traded instruments• Risk measures of IR instruments• Option Adjusted Spread and embedded options• The term structure equation, martingale measures and stochastic processes of interest rates; Vasicek, Ho-Lee, Hull-While, CIR• Numerical models; Black-Derman-Toy and forward induction using Arrow-Debreu prices and Newton–Raphson in 2 dimension• The Heath-Jarrow-Morton framework• Forward measures and general option pricing models• Black log-normal and, normal model for derivatives, market models and managing exotics instruments• Pricing before and after the financial crisis, collateral discounting, multiple curve framework, cheapest-to-deliver curves, CVA, DVA and FVA

Innovations in Derivatives Markets Kathrin Glau 2016-12-02 This book presents 20 peer-reviewed chapters on current aspects of derivatives markets and derivative pricing. The contributions, written by leading researchers in the field as well as experienced authors from the financial industry, present the state of the art in: • Modeling counterparty credit risk: credit valuation adjustment, debit valuation adjustment, funding valuation adjustment, and wrong way risk. • Pricing and hedging in fixed-income markets and multi-curve interest-rate modeling. • Recent developments concerning contingent convertible bonds, the measuring of basis spreads, and the modeling of implied correlations. The recent financial crisis has cast tremendous doubts on the classical view on derivative pricing. Now, counterparty credit risk and liquidity issues are integral aspects of a prudent valuation procedure and the reference interest rates are represented by a multitude of curves according to their different periods and maturities. A panel discussion included in the book (featuring Damiano Brigo, Christian Fries, John Hull, and Daniel Sommer) on the foundations of modeling and pricing in the presence of counterparty credit risk provides intriguing insights on the debate.

Commercial Banking Risk Management Weidong Tian 2016-12-08 This edited collection comprehensively addresses the widespread regulatory challenges uncovered and changes introduced in financial markets following the 2007-2008 crisis, suggesting strategies by which financial institutions can comply with stringent new regulations and adapt to the pressures of close supervision while responsibly managing risk. It covers all important commercial banking risk management topics, including market risk, counterparty credit risk, liquidity risk, operational risk, fair lending risk, model risk, stress test, and CCAR from practical aspects. It also covers major components of enterprise risk management, a modern capital requirement framework, and the data technology used to help manage risk. Each chapter is written by an authority who is actively engaged with large commercial banks, consulting firms, auditing firms, regulatory agencies, and universities. This collection will be a trusted resource for anyone working in or studying the commercial banking industry.

Kreditderivate und Kreditrisikomodelle Marcus R.W. Martin 2014-02-14 Ein einführendes Lehrbuch, dessen Adressaten Studierende und Praktiker sind. Die Autoren versuchen dabei, einen Mittelweg zu gehen zwischen Theorie und praktischer Anwendung von Kreditderivaten und Kreditrisikomodellen. Thematisch werden die für das tägliche Bankgeschäft relevanten Aspekte angesprochen. Studierende werden fundiert an ein hochaktuelles Anwendungsgebiet der Mathematik herangeführt. Für Praktiker bietet das Werk eine systematische Darstellung der methodischen Grundlagen ihrer täglichen Arbeit, z. B. in Bezug auf die Implementierung von Risikomesssystemen.

Manufacturing and Managing Customer-Driven Derivatives Dong Qu 2016-03-21 "This book deals with some of the key derivatives products including equity derivatives, mainly used for creating

investment products for retail and private investors, interest rates derivatives, used for creating investment and treasury products, real estate derivatives and hybrid derivatives products"--