

An Arbitrage Free Method For Smile Extrapolation Quarcome

This paper gives an arbitrage-free prediction for future prices of an arbitrary co-terminal set of options with a given maturity, based on the observed time series of these option prices. The statistical analysis of such a multi-dimensional time series of option prices corresponding to n strikes (with n large, e.g. $n \approx 40$) and the same maturity, is a difficult task due to the fact that option prices at any moment in time satisfy non-linear and non-explicit no-arbitrage restrictions. Hence any n -dimensional time series model also has to satisfy these implicit restrictions at each time step, a condition that is impossible to meet since the model innovations can take arbitrary values. We solve this problem for any $n \approx N$ in the context of Foreign Exchange (FX) by first encoding the option prices at each time step in terms of the parameters of the corresponding risk-neutral martingale model. The option price predictions are obtained from the predicted risk-neutral measure by effectively integrating against the corresponding option payoffs. The non-linear transformation between option prices and the risk-neutral parameters applied here is not arbitrary; it is the standard mapping used by market makers in the FX option markets (the SABR parameterisation) and is given explicitly in closed form. Our method is not restricted to the FX asset class nor does it depend on the type of parameterisation used. Statistical analysis of FX market data illustrates that our arbitrage-free predictions outperform the naive random walk forecasts, suggesting a potential for building management strategies for portfolios of derivative products, akin to the ones widely used in the underlying equity and futures markets.

Master the practical aspects of the CFA Program Curriculum with expert instruction for the 2018 exam The same official curricula that CFA Program candidates receive with program registration is now publicly available for purchase. CFA Program Curriculum 2018 Level II, Volumes 1-6 provides the complete Level II Curriculum for the 2018 exam, with practical instruction on the Candidate Body of Knowledge (CBOK) and how it is applied, including expert guidance on incorporating concepts into practice. Level II focuses on complex analysis with an emphasis on asset valuation, and is designed to help you use investment concepts appropriately in situations analysts commonly face. Coverage includes ethical and professional standards, quantitative analysis, economic, financial reporting and analysis, corporate finance, equities, fixed income, derivatives, alternative investments, and portfolio management organized into individual study sessions with clearly defined Learning Outcome Statements. Charts, graphs, figures, diagrams, and financial statements illustrate complex concepts to facilitate retention, and practice questions with answers allow you to gauge your understanding while reinforcing important concepts. While Level I introduced you to basic foundational investment skills and techniques and a strong grasp of valuation methods, this set dives deep into practical application, explaining complex topics to help you understand and retain critical concepts and processes. Incorporate analysis skills into case evaluations Master complex calculations and quantitative techniques Understand the international standards used for valuation and analysis Gauge your skills and understanding against each Learning Outcome Statement CFA Institute promotes the highest standards of ethics, education, and professional excellence among investment professionals. The CFA Program Curriculum guides you through the breadth of knowledge required to uphold these standards. The three levels of the program build on each other. Level I provides foundational knowledge and teaches the use of investment tools; Level II focuses on application of concepts and analysis, particularly in the valuation of assets; and Level III builds toward synthesis across topics with an emphasis on portfolio management.

In this paper we develop a new method for implied volatility surface construction for FX options. The methodology is based on the local variance gamma model developed by Carr (2008). Our approach is to solve a simplified "one-step" version of the Dupire equation analytically under the assumption of a continuous five parameter diffusion function. The unique solution to this equation can be interpreted as a continuous representation of option prices, defined for strikes in an arbitrarily large range. The derived price functions are C^2 -positive, arbitrage-free by construction, and they do not depend on the strike discretization. By using a least-square approach, we calibrate price functions to Reuters quoted FX volatility smiles. Our results suggest that the model allows for very rapid calibration; using a Levenberg-Marquardt algorithm we measure the average calibration time to less than 1 ms for one expiry on a standard personal computer. We also extend our model to allow for interpolation between maturities and present sufficient conditions for absence of calendar spread arbitrage. In order to generate the whole implied volatility surface, we suggest a simple, fast and yet market-consistent technique allowing for arbitrage-free interpolation of calibrated price functions in the maturity dimension. The methods are tested against EUR/USD and EUR/GBP options, where we show that the model is capable to reduce volatility surfaces which fit market quotes with an error of few volatility basis points. We then apply the methodology to pricing variance swaps.

Statistics for Finance develops students' professional skills in statistics with applications in finance. Developed from the authors' courses at the Technical University of Denmark and Lund University, the text bridges the gap between classical, rigorous treatments of financial mathematics that rarely connect concepts to data and books on econometrics and time series analysis that do not cover specific problems related to option valuation. The book discusses applications of financial derivatives pertaining to risk assessment and elimination. The authors cover various statistical and mathematical techniques, including linear and nonlinear time series analysis, stochastic calculus models, stochastic differential equations, Itô's formula, the Black-Scholes model, the generalized method-of-moments, and the Kalman filter. They explain how these tools are used to price financial derivatives, identify interest rate models, value bonds, estimate parameters, and much more. This textbook will help students understand and manage empirical research in financial engineering. It includes examples of how the statistical tools can be used to improve value-at-risk calculations and other issues. In addition, end-of-chapter exercises develop students' financial reasoning skills.

Yield Curve Modeling and Forecasting
Algorithmic Trading Insights and Techniques
Local Variance Gamma Revisited
Modeling Fixed-Income Securities and Interest Rate Options
Arbitrage-Free Discretization of Lognormal Forward Libor and Swap Rate Models

This text seeks to teach the basics of fixed-income securities in a way that requires a minimum of prerequisites. Its approach - the Heath Jarrow Morton model - under which all other models are presented as special cases, aims to enhance understanding while avoiding repetition. The essential guide to fixed income portfolio management, from the experts at CFA Fixed Income Analysis is a new edition of Frank Fabozzi's Fixed Income Analysis, Second Edition that provides authoritative and up-to-date coverage of how investment professionals analyze and manage fixed income portfolios. With detailed information from CFA Institute, this guide contains comprehensive, example-driven presentations of all essential topics in the field to provide value for self-study, general reference, and classroom use. Readers are first introduced to the fundamental concepts of fixed income before continuing on to analysis of risk, asset-backed securities, term structure analysis, and a general framework for valuation that assumes no prior relevant background. The final section of the book consists of three readings that build the knowledge and skills needed to effectively manage fixed income portfolios, giving readers a real-world understanding of how the concepts discussed are practically applied in client-based scenarios. Part of the CFA Institute Investment Series, this book provides a thorough exploration of fixed income analysis, clearly presented by experts in the field. Readers gain critical knowledge of underlying concepts, and the skills they need to translate theory into practice. Understand fixed income securities, markets, and valuation Master risk analysis and general valuation of fixed income securities Learn how fixed income securities are backed by pools of assets Explore the relationships between bond yields of different maturities Investment analysts, portfolio managers, individual and institutional investors and their advisors, and anyone with an interest in fixed income markets will appreciate this access to the best in professional quality information. For a deeper understanding of fixed income portfolio management practices, Fixed Income Analysis is a complete, essential resource.

A comprehensive and self-contained treatment of the theory and practice of option pricing. The role of martingale methods in financial modeling is exposed. The emphasis is on using arbitrage-free models already accepted by the market as well as on building the new ones. Standard calls and puts together with numerous examples of exotic options such as barriers and quantos, for example on stocks, indices, currencies and interest rates are analysed. The importance of choosing a convenient numeraire in price calculations is explained. Mathematical and financial language is used so as to bring mathematicians closer to practical problems of finance and presenting to the industry useful maths tools.

Fixed Income Analysis Workbook helps busy professionals better understand and apply the concepts and methodologies essential to fixed income portfolio management. A companion to the Fixed Income Analysis text, this helpful workbook offers learning objectives, chapter summaries, and practice problems that reinforce the practitioner-oriented material to give readers the confidence they need before applying these concepts to real cases. Readers will test their understanding of the metrics, methods, and mechanics associated with fixed income portfolios, and make use of the tools and techniques described in the text. Work topic-specific practice problems to facilitate intuitive understanding Review each topic quickly using clear chapter summaries Understand each chapter's objective to avoid missing key information Practice important methods and techniques before applying them in the real world For a more solid understanding of fixed income portfolio management, Fixed Income Analysis Workbook is a complete, practical resource.

Martingale Methods in Financial Modelling
Pricing Derivative Securities
Convertible Arbitrage

Topics in Numerical Methods for Finance
The Dynamic Nelson-Siegel Approach

The concept of local volatility as well as the local volatility model are one of the classical topics of mathematical finance. Although the existing literature is wide, there still exist various problems that have not drawn sufficient attention so far, for example: a) construction of analytical solutions of the Dupire equation for an arbitrary shape of the local volatility function; b) construction of parametric or non-parametric regression of the local volatility surface suitable for fast calibration; c) no-arbitrage interpolation and extrapolation of the local and implied volatility surfaces; d) extension of the local volatility concept beyond the Black-Scholes model, etc. Also, recent progresses in deep learning and artificial neural networks as applied to financial engineering have made it reasonable to look again at various classical problems of mathematical finance including that of building a no-arbitrage local/implied volatility surface and calibrating it to the option market data. This book was written with the purpose of presenting new results previously developed in a series of papers and explaining them consistently, starting from the general concept of Dupire, Derman and Kani and then concentrating on various extensions proposed by the author and his co-authors. This volume collects all the results in one place, and provides some typical examples of the problems that can be efficiently solved using the proposed methods. This also results in a faster calibration of the local and implied volatility surfaces as compared to standard approaches. The methods and solutions presented in this volume are new and recently published, and are accompanied by various additional comments and considerations. Since from the mathematical point of view, the level of details is closer to the applied rather than to the abstract or pure theoretical mathematics, the book could also be recommended to graduate students with majors in computational or quantitative finance, financial engineering or even applied mathematics. In particular, the author used to teach some topics of this book as a part of his special course on computational finance at the Tandon School of Engineering, New York University.

This book provides an advanced guide to correlation modelling for credit portfolios, providing both theoretical underpinnings and practical implementation guidance. The book picks up where pre-crisis credit books left off, offering guidance for quants on the latest tools and techniques for credit portfolio modelling in the presence of CVA (Credit Value Adjustments). Written at an advanced level, it assumes that readers are familiar with the fundamentals of credit modelling covered, for example, in the market leading books by Schonbucher (2003) and O'Kane (2008). Coverage will include the latest default correlation approaches; correlation modelling in the 'Marshall-Olkin' contagion framework, in the context of CVA; numerical implementation; and pricing, calibration and risk challenges. The explosive growth of credit derivatives markets in the early-to-mid 000's was bought to a close by the 2007 financial crisis, where these instruments were held largely to blame for the economic downturn. However, in the wake of increased regulation across all financial instruments and the challenge of buying and selling bonds in large amounts, credit derivatives have once again been found to be the answer and the market has grown significantly. Written by a practitioner for practitioners, this book will also interest researchers in mathematical finance who want to understand how things happen and work 'on the floor'. Building the reader's knowledge from the ground up, and with numerous real life examples used throughout, this book will prove a popular reference for anyone with a mathematical mind interested in credit markets.

THE THOROUGHLY REVISED AND UPDATED FOURTH EDITION OF THE COMPANION WORKBOOK TO FIXED INCOME ANALYSIS Now in its fourth edition, the Fixed Income Analysis Workbook offers a range of practical information and exercises that will enhance your understanding of the tools, strategies, and techniques associated with fixed-income portfolio management. Written by a team of knowledgeable contributors, this hands-on resource helps busy professionals and those new to the discipline apply the concepts and methodologies that are essential for mastery. The Workbook is an accessible guide for understanding the metrics, methods, and mechanics as applied in the competitive world of fixed-income analysis. It also provides a stress-free way to practice the tools and techniques described in the companion text. The Fixed Income Analysis Workbook includes information and exercises to help you: Work real-world problems associated with fixed-income risk and return Review the fundamentals of asset-backed securities Comprehend the principles of credit analysis Understand the arbitrage-free valuation framework Practice important methods and techniques before applying them in actual situations The fourth edition provides updated coverage of fixed income portfolio management including detailed applications of liability-driven and index-based strategies, exposure to the major types of yield curve strategies, and practical approaches to implementing active credit strategies. For anyone who wants a more solid understanding of fixed-income portfolio management, the Fixed Income Analysis Workbook is a comprehensive and practical resource.

We present a neural network (NN) approach to fit and predict implied volatility surfaces (IVS). Atypically to standard NN applications, financial industry practitioners use such models equally to replicate market prices and to value other financial instruments. In other words, low training losses are as important as generalization capabilities. Importantly, IVS models need to generate realistic arbitrage-free option prices, meaning that no portfolio can lead to risk-free profits. We propose an approach guaranteeing the absence of arbitrage opportunities by penalizing the loss using soft constraints. Furthermore, our method can be combined with standard IVS models in quantitative finance, thus providing a NN-based correction when such models fail at replicating observed market prices. This lets practitioners use our approach as a plug-in on top of classical methods. Empirical results show that this approach is particularly useful when only sparse or erroneous data are available. We also quantify the uncertainty of the model predictions in regions with few or no observations. We further explore how deeper NNs improve over shallower ones, as well as other properties of the network architecture. We benchmark our method against standard IVS models. By evaluating our method on both training sets, and testing sets, namely, we highlight both their capacity to reproduce observed prices and predict new ones.

Contemporary Quantitative Finance

PDE and Martingale Methods in Option Pricing

Efficient Methods for Valuing Interest Rate Derivatives

Arbitrage-Free Prediction of the Implied Volatility Smile

This book provides an overview of the models that can be used for valuing and managing interest rate derivatives. Split into two parts, the first discusses and compares the traditional models, such as spot- and forward-rate models, while the second concentrates on the more recently developed Market models. Unlike most of his competitors, the author's focus is on his experience in industry to explore a host of practical issues.

BIG DATA, ARTIFICIAL INTELLIGENCE AND DATA ANALYSIS SET Coordinated by Jacques Janssen Data analysis is a scientific field that continues to grow enormously, most notably over the last few decades, following rapid growth within the tech industry, as well as the wide applicability of computational techniques alongside new advances in analytic tools. Modeling relationships, make predictions, and to understand, interpret and visualize the extracted information more strategically. This book includes the most recent advances on this topic, meeting increasing demand from wide circles of the scientific community. Applied Modeling Techniques and Data Analysis 2 is a collective work by a number of leading scientists, analysts, working on the front end of data analysis and modeling applications. The chapters cover a cross section of current concerns and research interests in the above scientific areas. The collected material is divided into appropriate sections to provide the reader with both theoretical and applied information on data analysis methods, models and techniques, along with a coverage of central but corporate risk management and to a wide range of investment strategies. Thousands of financial executives, managers, and sophisticated investors want to understand it, but most books on arbitrage are far too abstract and technical to serve their needs. Billingsley addresses this untapped market with the first accessible and realistic arbitrage-free approach. His intuitive and algebra based approach is easy to understand and begin using its methods. The author starts with a lucid introduction to the fundamentals of arbitrage, including the Laws of One Price and One Expected Return. Using realistic examples, he shows how to identify assets and portfolios ripe for arbitrage: interest rate differences; and more. You'll learn how to establish relative prices between underlying stock, puts, calls, and 'riskless' securities like Treasury bills -- and how these techniques support derivatives pricing and hedging. Billingsley then illuminates options pricing, the heart of modern risk management and financial engineering. He concludes with winning Modigliani-Miller theory, and its use in analyzing capital structure.

Arbitrage-Free Prediction of the Implied Volatility Smile

Essays in Honour of Eckhard Platen

Understanding Arbitrage

Mathematical Modeling And Methods Of Option Pricing

An Introduction to the Mathematics of Financial Derivatives

Financial, Demographic, Stochastic and Statistical Models and Methods

This highly readable and accessible text, introduces the mathematics underlying the pricing of derivatives. The increase of interest in dynamic pricing models stems from their applicability to practical situations: with the freeing of exchange, interest rates, and capital controls, the market for derivative products has matured and pricing models have become more accurate. Professor Neftci's book answers the need for a resource targeting professionals, Ph.D. students, and advanced MBA students who are specifically interested in these financial products. The Second Edition is designed to make the book the main text in first year masters and Ph.D. programs for certain courses, and will continue to be an important manual for market professionals.

Evaluate your understanding of fixed-income portfolio management with exercises for today's investment practitioner Fixed Income Analysis, 5th Edition offers the key component of effective learning-practice. Designed for both students and professionals, this companion workbook aligns with the latest Fixed Income Analysis text chapter-by-chapter. To improve your comprehension of core concepts, this book includes brief chapter summaries before diving into challenging practice questions and their solutions, while also laying out learning objectives so you can understand the "why" of each exercise. Fixed Income Analysis Workbook, 5th Edition will help you: Synthesize essential material from the main Fixed Income Analysis text using real-world applications. Understand the key fundamentals of fixed income securities and portfolio management. Work toward specific chapter objectives to internalize important information. CFA Institute is the world's premier association for investment professionals, and the governing body for the CFA® Program, CFP® Program, CFA Institute ESG Investing Certificate, and Investment Foundations® Program. Those seeking a deeper understanding of fixed income portfolio management tactics will value the level of expertise CFA Institute brings to the discussion as well as the extra practice delivered in the fifth edition Fixed Income Analysis Workbook based on real scenarios investors face every day.

Master's Thesis from the year 2015 in the subject Mathematics - Applied Mathematics, grade: 1,5, University of Hannover, Language: English, abstract: This work discusses trading strategies with focus on the application in the government bond market. An arbitrage-free yield curve prediction model and a parametric estimation method are presented to form the basis of finding trading strategies. The arbitrage-free model is based on the Heath-Jarrow-Morton model. The parametric approach is the Dynamic Nelson-Siegel method. For the US Treasury yield curve the performance of both methods is tested and compared to each other. Moreover, portfolio optimization with respect to the conditional value at risk is illustrated. A smoothing technique and the Nesterov procedure are exhibited as efficient implementations of the linked portfolio selection problem. At last, it is shown in an example for US Treasuries how the estimated yield curve can be incorporated into portfolio optimization to derive trading strategies. In der vorliegende Arbeit wird gezeigt, wie Strategien für das Handeln von staatlichen Obligationen entwickelt werden können. Die Basis hierzu bilden ein arbitrage-freier Ansatz und ein parametrischer Ansatz, um die Zinskurve zu prognostizieren. Beide Ansätze werden parametrisch durch Nelson-Siegel Methoden beschrieben. Die praktische Nutzen bei Verfahren wird für US Staatsanleihen untersucht und ein Beispiel für die Optimierung der Rendite gegeben. In weiteren wird die Portfolio-Optimierung bezüglich des Conditional Value at Risks vorgestellt und zwei Verfahren zu dessen effizienten Implementierung erklärt. Schlussendlich wird an einem Beispiel für US Staatsanleihen gezeigt, wie die Methoden zur Zinsvorhersage in das Portfoliooptimierungsproblem mit einbezogen werden können, um Handelsstrategien zu entwickeln.

From the perspective of partial differential equations (PDE), this book introduces the Black-Scholes-Merton's option pricing theory. A unified approach is used to model various types of option pricing as PDE problems, to derive pricing formulas as their solutions, and to design efficient algorithms from the numerical calculation of PDEs.

A Practitioner's Guide

Credit Correlation

Theory and Practice

Relative Pricing of Options with Stochastic Volatility

Fixed Income Analysis Workbook

Minimize risk and maximize profits with convertible arbitrage Convertible arbitrage involves purchasing a portfolio of convertible securities—generally convertible bonds—and hedging a portion of the equity risk by selling short the underlying common stock. This increasingly popular strategy, which is especially appealing to hedge fund investors, allows individuals to increase their returns while decreasing their risks. Convertible Arbitrage offers a thorough explanation of this substantially extended new edition Bjork has added separate and complete chapters on the martingale approach to optimal investment problems, optimal stopping theory with applications to American options, and positive interest rates and their connection to potential theory and stochastic discount factors. More advanced areas of study are clearly marked to help students and teachers use the book as suits their need.

Understanding the dynamic evolution of the yield curve is critical to many financial tasks, including pricing financial assets and their derivatives, managing financial risk, allocating portfolios, structuring fiscal debt, conducting monetary policy, and valuing capital goods. Unfortunately, most yield curve models tend to be theoretically rigorous but empirically disappointing, or empirically successful but theoretically lacking. In this book, Francis Diebold and Glenn Rudebusch propose two extensions of the classic yield curve model of Nelson and Siegel that are both theoretically rigorous and empirically successful. The first extension is the dynamic Nelson-Siegel model (DNS), while the second takes this dynamic version and makes it arbitrage-free (AFNS). Diebold and Rudebusch show how these two models are just slightly different implementations of a single unified approach to dynamic yield curve modeling and forecasting. They emphasize both descriptive and efficient-markets aspects, they pay special attention to the links between the yield curve and macroeconomic fundamentals, and they show why DNS and AFNS are likely to remain of lasting appeal even as alternative arbitrage-free models are developed. Based on the Econometric and Tinbergen Institutes Lectures, Yield Curve Modeling and Forecasting contains essential tools with enhanced utility for academics, central banks, governments, and industry.

This book offers an introduction to the mathematical, probabilistic and numerical methods used in the modern theory of option pricing. The text is designed for readers with a basic mathematical background. The first part contains a presentation of the arbitrage theory in discrete time. In the second part, the pricing of European and parabolic options is presented. The third part contains a presentation of analytical methods in Markovian setting by means of Feynman-Kac theorem. The Girsanov theory have been presented in the martingale theory topics. General tools from PDE and martingale theories are also used in the analysis of volatility modeling. The book also contains an Introduction to Lévy processes and Malliavin calculus. The last part is devoted to the description of the numerical methods used in option pricing: Monte Carlo, binomial trees, finite differences and Fourier transform.

This book presents techniques for valuing derivative securities at a level suitable for practitioners, students in doctoral programs in economics and finance, and those in masters-level programs in financial mathematics and computational finance. It provides the necessary mathematical tools from analysis, probability theory, the theory of stochastic processes, and stochastic calculus, making extensive use of examples. It also covers pricing theory, with emphasis on martingale methods. The chapters are organized around the assumptions made about the dynamics of underlying price processes. Readers begin with simple, discrete-time models that require little mathematical sophistication, proceed to the basic Black-Scholes theory, and then advance to continuous-time models with multiple risk sources. The second edition takes account of the major developments in the field since 2000. New topics include the use of simulation to price American-style options, as well as the use of Monte Carlo simulation to price American-style options. The new model is a generalization of the Black-Scholes model and Markov-driven changes in regime. The new chapter on interest-rate derivatives includes extensive coverage of the LIBOR market model and an introduction to the modeling of credit risk. As a supplement to the text, the book contains an accompanying CD-ROM with user-friendly FORTRAN, C++, and VBA program components.

While statistical arbitrage has faced some tough times?as markets experienced dramatic changes in dynamics beginning in 2000?new developments in algorithmic trading have allowed it to rise from the ashes of that fire. Based on the results of author Andrew Pole's own research and experience running a statistical arbitrage hedge fund for eight years?in partnership with a group whose own history stretches back to the dawn of what was first called pairs trading?this unique guide provides detailed insights into the nuances of a proven investment strategy. Filled with in-depth insights and expert advice, Statistical Arbitrage contains comprehensive analysis that will appeal to both investors looking for an overview of this discipline, as well as quants looking for critical insights into modeling, risk management, and implementation of the strategy.

Variance Gamma in Constructing Implied Volatility Surfaces

Applied Modeling Techniques and Data Analysis 2

Inside Volatility Arbitrage

Statistics for Finance

An Intuitive Approach to Financial Analysis

The third edition of this popular introduction to the classical underpinnings of the mathematics behind finance continues to combine sound mathematical principles with economic applications. Concentrating on the probabilistic theory of continuous arbitrage pricing of financial derivatives, including stochastic optimal control theory and Merton's fund separation theory, the book is designed for graduate students and as a necessary mathematical background and solid economic focus. It includes a special example for every new technique presented, contains numerous exercises, and suggests further reading in each chapter. In this substantially extended new edition Bjork has added separate and complete chapters on the martingale approach to optimal investment problems, optimal stopping theory with applications to American options, and positive interest rates and their connection to potential theory and stochastic discount factors. More advanced areas of study are clearly marked to help students and teachers use the book as suits their need.

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Understanding the dynamic evolution of the yield curve is critical to many financial tasks, including pricing financial assets and their derivatives, managing financial risk, allocating portfolios, structuring fiscal debt, conducting monetary policy, and valuing capital goods. Unfortunately, most yield curve models tend to be theoretically rigorous but empirically disappointing, or empirically successful but theoretically lacking. In this book, Francis Diebold and Glenn Rudebusch propose two extensions of the classic yield curve model of Nelson and Siegel that are both theoretically rigorous and empirically successful. The first extension is the dynamic Nelson-Siegel model (DNS), while the second takes this dynamic version and makes it arbitrage-free (AFNS). Diebold and Rudebusch show how these two models are just slightly different implementations of a single unified approach to dynamic yield curve modeling and forecasting. They emphasize both descriptive and efficient-markets aspects, they pay special attention to the links between the yield curve and macroeconomic fundamentals, and they show why DNS and AFNS are likely to remain of lasting appeal even as alternative arbitrage-free models are developed. Based on the Econometric and Tinbergen Institutes Lectures, Yield Curve Modeling and Forecasting contains essential tools with enhanced utility for academics, central banks, governments, and industry.

This book offers an introduction to the mathematical, probabilistic and numerical methods used in the modern theory of option pricing. The text is designed for readers with a basic mathematical background. The first part contains a presentation of the arbitrage theory in discrete time. In the second part, the pricing of European and parabolic options is presented. The third part contains a presentation of analytical methods in Markovian setting by means of Feynman-Kac theorem. The Girsanov theory have been presented in the martingale theory topics. General tools from PDE and martingale theories are also used in the analysis of volatility modeling. The book also contains an Introduction to Lévy processes and Malliavin calculus. The last part is devoted to the description of the numerical methods used in option pricing: Monte Carlo, binomial trees, finite differences and Fourier transform.

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Quantitative Research, Bloomberg LP
Trading Strategies in Bond Markets
Arbitrage Theory in Continuous Time