Pricing Bermudan Swaptions In The Libor Market Model

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Modern Pricing of Interest-Rate Derivatives
Monte Carlo Methods and Models in Finance and Insurance
The Oxford Guide to Financial Modeling
Irregular Grid Methods for Pricing High-dimensional American Options
Efficient Control Variates and Strategies for Bermudan Swaptions in a Libor Market Model
Quantitative Analysis in Financial Markets
Modern Pricing of Interest-Rate Derivatives
Manufacturing and Managing Customer-Driven Derivatives
An Introduction to Quantitative Finance
Pricing of Bermudan Swaptions Under OIS Discounting
Bermudan Swaptions and the Libor Market Model
Network and Parallel Computing
Monte Carlo Methods for Pricing and Hedging
Modeling Derivatives in C++
Market-Conform Valuation of Options
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Pricing Models for Bermudan-style Interest Rate Derivatives
Novel Methods in Computational Finance
Robust Libor Modelling and Pricing of Derivative Products
Interest Rate Modeling
Bermudan swaptions Choice of One Factor Interest Rate Term Structure Models for Pricing and Hedging
Bermudan Swaptions
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Market Risk Analysis, Pricing, Hedging and Trading Financial Instruments
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Modern Pricing of Interest-Rate Derivatives

Monte Carlo Methods and Models in Finance and Insurance

The Oxford Guide to Financial Modeling

An authoritative handbook on risk management techniques and simulations as applied to financial engineering topics, theories, and statistical methodologies. The Handbook of Financial Risk Management: Simulations and Case Studies illustrates the practical implementation of simulation techniques in the banking and financial industries through the use of real-world applications. Striking a balance between theory and practice, the Handbook of Financial Risk Management: Simulations and Case Studies demonstrates how simulation algorithms can be used to solve practical problems and showcases how accuracy and efficiency in implementing various simulation methods are indispensable tools in risk management. The book provides the reader with an intuitive understanding of financial risk management and deepens insight into those financial products that cannot be priced traditionally. The Handbook of Financial Risk Management also features: Examples in each chapter derived from consulting projects, current research, and course instruction Topics such as volatility, fixed-income derivatives, LIBOR Market Models, and risk measures Over twenty-four recognized simulation models Commentary, data sets, and computer subroutines available on a chapter-by-chapter basis As a complete reference for practitioners, the book is useful in the fields of finance, business, applied statistics, econometrics, and engineering. The Handbook of Financial Risk Management is also an excellent text or supplement for graduate and MBA-level students in courses on financial risk management and simulation.

Irregular Grid Methods for Pricing High-dimensional American Options

In recent years, interest-rate modeling has developed rapidly in terms of both practice and theory. The academic and practitioners' communities, however, have not always communicated as productively as would have been desirable. As a result, their research programs have often developed with little constructive interference. In this book, Riccardo Rebonato draws on his academic and professional experience, straddling both sides of the divide to bring together and build on what theory and trading have to offer. Rebonato begins by presenting the conceptual foundations for the application of the LIBOR market model to the pricing of interest-rate derivatives. Next he treats in great detail the calibration of this model to market prices, asking how possible and advisable it is to enforce a simultaneous fitting to several market observables. He does so with an eye not only to mathematical feasibility but also to financial justification, while devoting special scrutiny to the implications of market incompleteness. Much of the book concerns an original extension of the LIBOR market model, devised to account for implied volatility smiles. This is done by introducing a stochastic-volatility, displaced-diffusion version of the model. The emphasis again is on the financial justification and on the computational feasibility of the proposed solution to the smile problem. This book is must reading for quantitative researchers in financial houses, sophisticated practitioners in the derivatives area, and students of finance.
Efficient Control Variates and Strategies for Bermudan Swaptions in a Libor Market Model

This book discusses the state-of-the-art and open problems in computational finance. It presents a collection of research outcomes and reviews of the work from the STRIKE project, an FP7 Marie Curie Initial Training Network (ITN) project in which academic partners trained early-stage researchers in close cooperation with a broader range of associated partners, including from the private sector. The aim of the project was to arrive at a deeper understanding of complex (mostly nonlinear) financial models and to develop effective and robust numerical schemes for solving linear and nonlinear problems arising from the mathematical theory of pricing financial derivatives and related financial products. This was accomplished by means of financial modelling, mathematical analysis and numerical simulations, optimal control techniques and validation of models. In recent years the computational complexity of mathematical models employed in financial mathematics has witnessed tremendous growth. Advanced numerical techniques are now essential to the majority of present-day applications in the financial industry. Special attention is devoted to a uniform methodology for both testing the latest achievements and simultaneously educating young PhD students. Most of the mathematical codes are linked into a novel computational finance toolbox, which is provided in MATLAB and PYTHON with an open access license. The book offers a valuable guide for researchers in computational finance and related areas, e.g. energy markets, with an interest in industrial mathematics.

Quantitative Analysis in Financial Markets

The focus of this volume is on the development of new approaches for the market-conform valuation of newly issued derivatives. The first chapter presents a flexible approach to construct the binomial process of the underlying asset price by using a simultaneously backward and forward induction algorithm. This framework can be used to price and hedge a wide range of plain-vanilla and exotic options. In the second chapter this new approach is compared to existing models using a sample of plain-vanilla options, American call options and European Barrier options from two competing markets. In the third chapter new methods to value American-style options via Monte Carlo simulations in accordance with given market prices are discussed. After a short introduction to Monte Carlo methods, two new approaches are proposed. These new frameworks are illustrated via pricing examples for standard American put options.

Modern Pricing of Interest-Rate Derivatives

Manufacturing and Managing Customer-Driven Derivatives

Manufacturing and Managing Customer-Driven Derivatives

"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"--

An Introduction to Quantitative Finance

"The three volumes of Interest rate modeling are aimed primarily at practitioners working in the area of interest rate derivatives, but much of the material is quite general and, we believe, will also hold significant appeal to researchers working in other asset classes. Students and academics interested in financial engineering and applied work will find the material particularly useful for its description of real-life model usage and for its expansive discussion of model calibration, approximation theory, and numerical methods."--Preface.

Pricing of Bermudan Swaptions Under OIS Discounting

Bermudan Swaptions and the Libor Market Model

The first swap was executed over thirty years ago. Since then, the interest rate swaps and other derivative markets have grown and diversified in phenomenal directions. Derivatives are used today by a myriad of institutional investors for the purposes of risk management, expressing a view on the market, and pursuing market opportunities that are otherwise unavailable using more traditional financial instruments. In this volume, Howard Corb explores the concepts behind interest rate swaps and the many derivatives that evolved from them. Corb’s book uniquely marries academic rigor and real-world trading experience in a compelling, readable style. While it is filled with sophisticated formulas and analysis, the volume is geared toward a wide range of readers searching for an in-depth understanding of these markets. It serves as both a textbook for students and a must-have reference book for practitioners. Corb helps readers develop an intuitive feel for these products and their use in the market,
providing a detailed introduction to more complicated trades and structures. Through examples of financial structuring, readers will come away with an understanding of how derivatives products are created and how they can be deconstructed and analyzed effectively.

**Network and Parallel Computing**

This book contains lectures delivered at the celebrated Seminar in Mathematical Finance at the Courant Institute. The lecturers and presenters of papers are prominent researchers and practitioners in the field of quantitative financial modeling. Most are faculty members at leading universities or Wall Street practitioners. The lectures deal with the emerging science of pricing and hedging derivative securities and, more generally, managing financial risk. Specific articles concern topics such as option theory, dynamic hedging, interest-rate modeling, portfolio theory, price forecasting using statistical methods, etc. Contents: Estimation and Data-Driven Models; Transition Densities for Interest Rate and Other Nonlinear Diffusions (Y Aït-Sahalia); Hidden Markov Experts (A Weigend & S-M Shi); When is Time Continuous? (A Lo et al.); Asset Prices are Browninan Motion: Only in Business Time (H Geman et al.); Hedging Under Stochastic Volatility (K Ronnie Sircar); Model Calibration and Volatility Smile; Determining Volatility Surfaces and Option Values from an Implied Volatility Smile (P Carr & D Madan); Reconstructing the Unknown Local Volatility Function (T Coleman et al.); Building a Consistent Pricing Model from Observed Option Prices (J-P Laurent & D Leisen); Weighted Monte Carlo: A New Technique for Calibrating Asset-Pricing Models (M Avellaneda et al.); Pricing and Risk Management: One- and Multi-Factor Valuation of Mortgages: Computational Problems and Shortcuts (A Levin); Simulating Bermudan Interest-Rate Derivatives (P Carr & G Yang); How to Use Self-Similarities to Discover Similarities of Path-Dependent Options (A Lipton); Monte Carlo Within a Day (J Cárdenas et al.); Decomposition and Search Techniques in Disjunctive Programs for Portfolio Selection (K Wyatt); Readings: Students and researchers in economics, finance and applied mathematics. Keywords:

**Monte Carlo Methods for Pricing and Hedging**

Written by leading market risk academic, Professor Carol Alexander, Pricing, Hedging and Trading Financial Instruments forms part three of the Market Risk Analysis four volume set. This book is an in-depth, practical and accessible guide to the models that are used for pricing and the strategies that are used for hedging financial instruments, and to the markets in which they trade. It provides a comprehensive, rigorous and accessible introduction to bonds, swaps, futures and forwards and options, including variance swaps, volatility indices and their futures and options, to stochastic volatility models and to modelling the implied and local volatility surfaces. All together, the Market Risk Analysis four volume set illustrates virtually every concept or formula with a practical, numerical example or a longer, empirical case study. Across all four volumes there are approximately 300 numerical and empirical examples, 400 graphs and figures and 30 case studies many of which are contained in interactive Excel spreadsheets available from the accompanying CD-ROM. Empirical examples and case studies specific to this volume include: Duration-Convexity approximation to bond portfolios, and portfolio immunization; Pricing floaters and vanilla, basis and variance swaps; Coupon stripping and yield curve fitting; Proxy hedging, and hedging international securities and energy futures portfolios; Pricing models for European exotics, including barriers, Asians, look-backs, choosers, capped, contingent, power, quanto, compo, exchange, ‘best-of’ and spread options; Libor model calibration; Dynamic models for implied volatility based on principal component analysis; Calibration of stochastic volatility models (Matlab code); Simulations from stochastic volatility and jump models; Duration, PV01 and volatility invariant cash flow mappings; Delta-gamma-theta-vega mappings for options portfolios; Volatility beta mapping to volatility indices.

**Modeling Derivatives in C++**

The LIBOR Market Model (LMM) is the first model of interest rates dynamics consistent with the market practice of pricing interest rate derivatives and therefore it is widely used by financial institution for valuation of interest rate derivatives. This book provides a full practitioner’s approach to the LIBOR Market Model. It adopts the specific language of a quantitative analyst to the largest possible level and is one of first books on the subject written entirely by quants. The book is divided into three parts – theory, calibration and simulation. New and important issues are covered, such as various drift approximations, various parametric and nonparametric calibrations, and the uncertain volatility approach to smile modelling; a version of the HJM model based on market observables and the duality between BGM and HJM models. Co-authored by Dariusz Gatarek, the ?G? in the BGM model who is internationally known for his work on LIBOR market models, this book offers an essential perspective on the global benchmark for short-term interest rates.  

**Market-Conform Valuation of Options**

This book is the definitive and most comprehensive guide to modeling derivatives in C++ today. Providing readers with not only the theory and math behind the models, as well as the fundamental concepts of financial engineering, but also actual robust object-oriented C++ code, this is a practical introduction to the most important derivative models.
models used in practice today, including equity (standard and exotics including barrier, lookback, and Asian) and fixed income (bonds, caps, swaptions, swaps, credit) derivatives. The book provides complete C++ implementations of the most important derivatives and interest rate pricing models used on Wall Street including Hull-White, BDT, CIR, HJM, and LIBOR Market Model. London illustrates the practical and efficient implementations of these models in real-world situations and discusses the mathematical underpinnings and derivation of the models in a detailed yet accessible manner illustrated by many examples with numerical data as well as real market data. A companion CD contains quantitative libraries, tools, applications, and resources that will be of value to those doing quantitative programming and analysis in C++. Filled with practical advice and helpful tools, Modeling Derivatives in C++ will help readers succeed in understanding and implementing C++ when modeling all types of derivatives.

**Dependence of Bermudan Swaptions on Volatility Structure-computational Comparisons in the Lognormal Forward LIBOR Market Model**

**Analytical Finance: Volume II**

**Stochastic Interest Rate Modeling With Fixed Income Derivative Pricing (Third Edition)**

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.

**Pricing Bermudan Swaptions in the LIBOR Market Model**

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

**Interest Rate Modeling**

The 2nd edition of this successful book has several new features. The calibration discussion of the basic LIBOR market model has been enriched considerably, with an analysis of the impact of the swaptions interpolation technique and of the exogenous instantaneous correlation on the calibration outputs. A discussion of historical estimation of the instantaneous correlation matrix and of rank reduction has been added, and a LIBOR-model consistent swaption-volatility interpolation technique has been introduced. The old sections devoted to the smile issue in the LIBOR market model have been enlarged into a new chapter. New sections on local-volatility dynamics, and on stochastic volatility models have been added, with a thorough treatment of the recently developed uncertain-volatility approach. Examples of calibrations to real market data are now considered. The fast-growing interest for hybrid products has led to a new chapter. A special focus here is devoted to the pricing of inflation-linked derivatives. The three final new chapters of this second edition are devoted to credit. Since Credit Derivatives are increasingly fundamental, and since in the reduced-form modeling framework much of the technique involved is analogous to interest-rate modeling, Credit Derivatives -- mostly Credit Default Swaps (CDS), CDS Options and Constant Maturity CDS - are discussed, building on the basic short rate-models and market models introduced earlier for the default-free market. Counterparty risk in interest rate payoff valuation is also considered, motivated by the recent Basel II framework developments.

**Market Practice in Financial Modelling**
Written to bridge the gap between foundational quantitative finance and market practice, this book goes beyond the basics covered in most textbooks by presenting content concerning actual industry norms, thus resulting in a clearer picture of the field for the readers. These include, for instance, the practitioner’s perspective of how local versus stochastic volatility affects forward smile, or the implications of mean reversion on forward volatility. Key considerations for modelling in rates, equities and foreign exchange are presented from the perspective of common themes across various assets, as well as their individual characteristics. The discussion on models emphasizes the key aspects that are relevant to the pricing of different types of financial derivatives, so that the reader can observe how an appropriate choice of models is essential in reflecting the risk profile and hedging considerations for different products. With the knowledge gleaned from this book, readers will attain a more comprehensive understanding of market practice in derivatives modelling. Foreword Foreword (246 KB)

**Interest Rate Derivatives**

The essential premise of this book is that theory and practice are equally important in describing financial modeling. In it the authors try to strike a balance in their discussions between theories that provide foundations for financial models and the institutional details that provide the context for applications of the models. The book presents the financial models of stock and bond options, exotic options, investment grade and high-yield bonds, convertible bonds, mortgage-backed securities, liabilities of financial institutions—the business model and the corporate model. It also describes the applications of the models to corporate finance. Furthermore, it relates the models to financial statements, risk management for an enterprise, and asset/liability management with illiquid instruments. The financial models are progressively presented from option pricing in the securities markets to firm valuation in corporate finance, following a format to emphasize the three aspects of a model: the set of assumptions, the model specification, and the model applications. Generally, financial modeling books segment the world of finance as “investments,” “financial institutions,” “corporate finance,” and “securities analysis,” and in so doing they rarely emphasize the relationships between the subjects. This unique book successfully ties the thought processes and applications of the financial models together and describes them as one process that provides business solutions. Created as a companion website to the book readers can visit www.thomasho.com to gain deeper understanding of the book’s financial models. Interested readers can build and test the models described in the book using Excel, and they can submit their models to the site. Readers can also use the site’s forum to discuss the models and can browse server based models to gain insights into the applications of the models. For those using the book in meetings or class settings the site provides Power Point descriptions of the chapters. Students can use available question banks on the chapters for studying.

**Handbook of Financial Risk Management**

This book constitutes the refereed post-proceedings of the 9th IFIP International Conference on Network and Parallel Computing, NPC 2012, held in Gwangju, Korea, in September 2012. The 38 papers presented were carefully reviewed and selected from 136 submissions. The papers are organized in the following topical sections: algorithms, scheduling, analysis, and data mining; network architecture and protocol design; network security; parallel, distributed, and virtualization techniques; performance modeling, prediction, and tuning; resource management; ubiquitous communications and networks; and web, communication, and cloud computing. In addition, a total of 37 papers selected from five satellite workshops (ATIMCN, ATSME, Cloud&Grid, DATICS, and UMAS 2012) are included.

**The Concepts and Practice of Mathematical Finance**

The term Financial Derivative is a very broad term which has come to mean any financial transaction whose value depends on the underlying value of the asset concerned. Sophisticated statistical modelling of derivatives enables practitioners in the banking industry to reduce financial risk and ultimately increase profits made from these transactions. The book originally published in March 2000 to widespread acclaim. This revised edition has been updated with minor corrections and new references, and now includes a chapter of exercises and solutions, enabling use as a course text. Comprehensive introduction to the theory and practice of financial derivatives. Discusses and elaborates on the theory of interest rate derivatives, an area of increasing interest. Divided into two self-contained parts: the first concentrating on the theory of stochastic calculus, and the second describes in detail the pricing of a number of different derivatives in practice. Written by well-respected academics with experience in the banking industry. A valuable text for practitioners in research departments of all banking and finance sectors. Academic researchers and graduate students working in mathematical finance.

**Interest Rate Models - Theory and Practice**

The quantitative nature of complex financial transactions makes them a fascinating subject area for mathematicians of all types. This book gives an insight into financial engineering while building on introductory probability courses by detailing one of the most fascinating applications of the subject.

**Martingale Methods in Financial Modelling**
Interest Rate Swaps and Other Derivatives

Pricing of Bermudan Swaptions Using Calibrated LIBOR Market Models

Professional text/reference on mathematical finance.

Pricing Models for Bermudan-style Interest Rate Derivatives

Novel Methods in Computational Finance

One of Riskbook.com's Best of 2005 - Top Ten Finance Books The Libor market model remains one of the most popular and advanced tools for modelling interest rates and interest rate derivatives, but finding a useful procedure for calibrating the model has been a perennial problem. Also the respective pricing of exotic derivative products such as Bermudan callable structures is considered highly non-trivial. In recent studies, author John Schoenmakers and his colleagues developed a fast and robust implied method for calibrating the Libor model and a new generic procedure for the pricing of callable derivative instruments in this model. Within a compact, self-contained review of the requisite mathematical theory on interest rate modelling, Robust Libor Modelling and Pricing of Derivative Products introduces the author's new approaches and their impact on Libor modelling and derivative pricing. Discussions include economically sensible parametrisations of the Libor market model, stability issues connected to direct least-squares calibration methods, European and Bermudan style exotics pricing, and lognormal approximations suitable for the Libor market model. A look at the available literature on Libor modelling shows that the issues surrounding instability of calibration and its consequences have not been well documented, and an effective general approach for treating Bermudan callable Libor products has been missing. This book fills these gaps and with clear illustrations, examples, and explanations, offers new methods that surmount some of the Libor model's thornier obstacles.

Robust Libor Modelling and Pricing of Derivative Products

An up-to-date look at the evolution of interest rate swaps and derivatives Interest Rate Swaps and Derivatives bridges the gap between the theory of these instruments and their actual use in day-to-day life. This comprehensive guide covers the main "rates" products, including swaps, options (cap/floors, swaptions), CMS products, and Bermudan callables. It also covers the main valuation techniques for the exotics/structured-notes area, which remains one of the most challenging parts of the market. Provides a balance of relevant theory and real-world trading instruments for rate swaps and swap derivatives. Uses simple settings and illustrations to reveal key results. Written by an experienced trader who has worked with swaps, options, and exotics. With this book, author Amir Sadr shares his valuable insights with practitioners in the field of interest rate derivatives-from traders and marketers to those in operations.

Interest Rate Modeling

In recent years, interest-rate modeling has developed rapidly in terms of both practice and theory. The academic and practitioners' communities, however, have not always communicated as productively as would have been desirable. As a result, their research programs have often developed with little constructive interference. In this book, Riccardo Rebonato draws on his academic and professional experience, straddling both sides of the divide to bring together and build on what theory and trading have to offer. Rebonato begins by presenting the conceptual foundations for the application of the LIBOR market model to the pricing of interest-rate derivatives. Next he treats in great detail the calibration of this model to market prices, asking how possible and advisable it is to enforce a simultaneous fitting to several market observables. He does so with an eye not only to mathematical feasibility but also to financial justification, while devoting special scrutiny to the implications of market incompleteness. Much of the book concerns an original extension of the LIBOR market model, devised to account for implied volatility smiles. This is done by introducing a stochastic-volatility, displaced-diffusion version of the model. The emphasis again is on the financial justification and on the computational feasibility of the proposed solution to the smile problem. This book is must reading for quantitative researchers in financial houses, sophisticated practitioners in the derivatives area, and students of finance.

Bermudan swaptions

This book introduces the mathematics of stochastic interest rate modeling and the pricing of related derivatives, based on a step-by-step presentation of concepts with a focus on explicit calculations. The types of interest rates considered range from short rates to forward rates such as LIBOR and swap rates, which are presented in the HJM and BGM frameworks. The pricing and hedging of interest rate and fixed income derivatives such as bond options, caps, and swaptions, are treated using forward measure techniques. An introduction to default bond pricing and
an outlook on model calibration are also included as additional topics. This third edition represents a significant update on the second edition published by World Scientific in 2012. Most chapters have been reorganized and largely rewritten with additional details and supplementary solved exercises. New graphs and simulations based on market data have been included, together with the corresponding R codes. This new edition also contains 75 exercises and 4 problems with detailed solutions, making it suitable for advanced undergraduate and graduate level students.

**Choice of One Factor Interest Rate Term Structure Models for Pricing and Hedging Bermudan Swaptions**

Offering a unique balance between applications and calculations, Monte Carlo Methods and Models in Finance and Insurance incorporates the application background of finance and insurance with the theory and applications of Monte Carlo methods. It presents recent methods and algorithms, including the multilevel Monte Carlo method, the statistical Romberg method, and the Heath–Platen estimator, as well as recent financial and actuarial models, such as the Cheyette and dynamic mortality models. The authors separately discuss Monte Carlo techniques, stochastic process basics, and the theoretical background and intuition behind financial and actuarial mathematics, before bringing the topics together to apply the Monte Carlo methods to areas of finance and insurance. This allows for the easy identification of standard Monte Carlo tools and for a detailed focus on the main principles of financial and insurance mathematics. The book describes high-level Monte Carlo methods for standard simulation and the simulation of stochastic processes with continuous and discontinuous paths. It also covers a wide selection of popular models in finance and insurance, from Black–Scholes to stochastic volatility to interest rate to dynamic mortality. Through its many numerical and graphical illustrations and simple, insightful examples, this book provides a deep understanding of the scope of Monte Carlo methods and their use in various financial situations. The intuitive presentation encourages readers to implement and further develop the simulation methods.

**The LIBOR Market Model in Practice**

Manufacturing and Managing Customer-Driven Derivatives Manufacturing and Managing Customer-Driven Derivatives sheds light on customer-driven derivative products and their manufacturing process, which can prove a complicated topic for even experienced financial practitioners. This authoritative text offers up-to-date knowledge and practices across a broad range of topics that address the entire manufacturing, pricing and risk management process, including practical knowledge and industrial best practices. This resource blends quantitative and business perspectives to provide an in-depth understanding of the derivative risk management skills that are necessary to adopt in the competitive financial industry. Manufacturing and managing customer-driven derivative products have become more complex due to macro factors such as the multi-curve environments triggered by the recent financial crises, stricter regulatory requirements of consistent modelling and managing frameworks, and the need for risk/reward optimisation. Explore the fundamental components of the derivatives business, including equity derivatives, interest rates derivatives, real estate derivatives, and real life derivatives, etc. Examine the life cycle of manufacturing derivative products and practical pricing models Deep dive into a wide range of customer-driven structured derivative products, their investment or hedging payoff features and associated risk exposures Examine the implications of changing regulatory standards, which can increase costs in the banking sector Discover practical yet sophisticated product analysis, quantitative modeling, infrastructure integration, risk analysis, and hedging analysis Gain insight on how banks should handle complex derivatives products Manufacturing and Managing Customer-Driven Derivatives is an essential guide for quants, structurers, derivatives traders, risk managers, business executives, insurance industry professionals, hedge fund managers, academic lecturers, and financial math students who are interested in looking at the bigger picture of the manufacturing, pricing and risk management process of customer-driven derivative transactions.

**Market Risk Analysis, Pricing, Hedging and Trading Financial Instruments**

This book presents a major innovation in the interest rate space. It explains a financially motivated extension of the LIBOR Market model which accurately reproduces the prices for plain vanilla hedging instruments (swaptions and caplets) of all strikes and maturities produced by the SABR model. The authors show how to accurately recover the whole of the SABR smile surface using their extension of the LIBOR market model. This is not just a new model, this is a new way of option pricing that takes into account the need to calibrate as accurately as possible to the plain vanilla reference hedging instruments and the need to obtain prices and hedges in reasonable time whilst reproducing a realistic future evolution of the smile surface. It removes the hard choice between accuracy and time because the framework that the authors provide reproduces today’s market prices of plain vanilla options almost exactly and simultaneously gives a reasonable future evolution for the smile surface. The authors take the SABR model as the starting point for their extension of the LMM because it is a good model for European options. The problem, however with SABR is that it treats each European option in isolation and the processes for the various underlyings (forward and swap rates) do not talk to each other so it isn’t obvious how to relate these processes into the dynamics of the whole yield curve. With this new model, the authors bring the dynamics of the various forward rates and stochastic volatilities under a single umbrella. To ensure the absence of arbitrage they derive drift adjustments to be applied to both the forward rates and their volatilities. When this is completed, complex derivatives that depend on the joint realisation of all relevant forward rates can now be priced.
THEORETICAL SET-UP The Libor Market model
The SABR Model
The LMM-SABR Model
IMPLEMENTATION AND CALIBRATION
Calibrating the LMM-SABR model to Market Caplet prices
Calibrating the LMM/SABR model to Market Swaption Prices
Calibrating the Correlation Structure
EMPirical EVIDENCE
The Empirical problem
Estimating the volatility of the forward rates
Estimating the correlation structure
Estimating the volatility of the volatility
HEDGING
Hedging the Volatility Structure
Hedging the Correlation Structure
Hedging in conditions of market stress

Financial Derivatives in Theory and Practice

The class of interest rate models introduced by O. Cheyette in 1994 is a subclass of the general HJM framework with a time dependent volatility parameterization. This book addresses the above mentioned class of interest rate models and concentrates on the calibration, valuation and sensitivity analysis in multifactor models. It derives analytical pricing formulas for bonds and caplets and applies several numerical valuation techniques in the class of Cheyette model, i.e. Monte Carlo simulation, characteristic functions and PDE valuation based on sparse grids. Finally it focuses on the sensitivity analysis of Cheyette models and derives Model- and Market Greeks. To the best of our knowledge, this sensitivity analysis of interest rate derivatives in the class of Cheyette models is unique in the literature. Up to now the valuation of interest rate derivatives using PDEs has been restricted to 3 dimensions only, since the computational effort was too great. The author picks up the sparse grid technique, adjusts it slightly and can solve high-dimensional PDEs (four dimensions plus time) accurately in reasonable time. Many topics investigated in this book are new areas of research and make a significant contribution to the scientific community of financial engineers. They also represent a valuable development for practitioners.

Interest Rate Swaps and Their Derivatives

Containing many results that are new, or which exist only in recent research articles, Interest Rate Modeling: Theory and Practice, 2nd Edition portrays the theory of interest rate modeling as a three-dimensional object of finance, mathematics, and computation. It introduces all models with financial-economical justifications, develops options along the martingale approach, and handles option evaluations with precise numerical methods. Features: Presents a complete cycle of model construction and applications, showing readers how to build and use models. Provides a systematic treatment of intriguing industrial issues, such as volatility and correlation adjustments. Contains exercise sets and a number of examples, with many based on real market data includes comments on cutting-edge research, such as volatility-smile, positive interest-rate models, and convexity adjustment. New to the 2nd edition: volatility smile modeling; a new paradigm for inflation derivatives modeling; an extended market model for credit derivatives; a dual-curved model for the post-crisis interest-rate derivatives markets; and an elegant framework for the xVA.