

Robust Libor Modelling and Pricing of Derivative Products

NEW!

John Schoenmakers

Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany

Chapman & Hall/CRC Financial Mathematics series
Series Editors: Michael Dempster and Dilip Madan

New approaches remove obstacles from Libor modelling and derivative pricing

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.

Catalog no. C441X, March 2005, 224 pp.
ISBN: 1-58488-441-X, \$89.95 / £49.99

FEATURES

- Provides a quick introduction to general interest rate modelling and derivatives pricing
- Introduces an effective stable calibration procedure that overcomes intrinsic stability problems associated with direct least-squares calibration methods
- Examines exotics pricing based on real-life calibrated models and considers the impact of different calibrations on a variety of exotic derivative structures
- Introduces a generic method for pricing of Bermudan callable structures based on a new iterative procedure for solving optimal stopping problems
- Includes many supporting examples and empirical tests

CONTENTS

ARBITRAGE-FREE MODELLING OF EFFECTIVE INTEREST RATES

Elements of Arbitrage Theory and Derivative Pricing
Modelling of Effective Forward Rates
Pricing of Caps and Swaptions in Libor and Swap Market Models

PARAMETRISATION OF THE LIBOR MARKET MODEL

General Volatility Structures
(Quasi) Time-Shift Homogeneous Models
Parametrisation of Correlation Structures
Some Possible Applications of Parametric Structures

IMPLIED CALIBRATION OF A LIBOR MARKET MODEL TO CAPS AND SWAPTIONS

Orientation and General Aspects
Assessment of the Calibration Problem
LSq Calibration and Stability Issues in Practice
Regularisation via a Collateral Market Criterion
Calibration of a Time-Shift Homogeneous LMM

PRICING OF EXOTIC EUROPEAN STYLE PRODUCTS

Exotic European Style Products
Factor Dependence of Exotic Products
Case Studies

See reverse side for continuation of contents and ordering information

ORDER ONLINE AT WWW.CRCPRESS.COM

 **Chapman & Hall/CRC**
Taylor & Francis Group

Robust Libor Modelling and Pricing of Derivative Products

Contents continued...

PRICING OF BERMUDAN STYLE LIBOR DERIVATIVES

Orientation
The Bermudan Pricing Problem
Backward Construction of the Exercise Boundary
Iterative Construction of the Optimal Stopping Time
Duality; From Tight Lower Bounds to Tight Upper Bounds
Monte Carlo Simulation of Upper Bounds

Numerical Evaluation of Bermudan Swaptions by Different Methods
Efficient Monte Carlo Construction of Upper Bounds
Multiple Callable Structures

PRICING LONG DATED PRODUCTS VIA LIBOR APPROXIMATIONS

Introduction
Different Lognormal Approximations
Direct Simulation of Lognormal Approximations

Efficiency Gain with Respect to SDE Simulation; an Optimal Simulation Program

Practical Simulation Examples
Summarisation and Final Remarks

APPENDIX

Glossary of Stochastic Calculus
Minimum Search Procedures
Additional Proofs

REFERENCES

INDEX

ORDER ONLINE AT www.crcpress.com

Please use this ORDER FORM, CALL or ORDER ONLINE at WWW.CRCPRESS.COM

Please indicate quantities next to the title(s) ordered below:

ROBUST LIBOR MODELLING AND PRICING OF DERIVATIVE PRODUCTS

.....Catalog no. C441X, ISBN: 1-58488-441-X at \$89.95 / £49.99 each.

Other titles of interest:

QUANTITATIVE MODELING OF DERIVATIVE SECURITIES: FROM THEORY TO PRACTICE

.....Catalog no. C0383, ISBN: 1-58488-031-7 at \$89.95 / £49.99 each.

AN INTRODUCTION TO CREDIT RISK MODELING

.....Catalog no. C326X, ISBN: 1-58488-326-X at \$74.95 / £42.99 each.

FINANCIAL MODELLING WITH JUMP PROCESSES

.....Catalog no. C4134, ISBN: 1-58488-413-4 at \$79.95 / £45.99 each.

Ordering Information: Orders must be prepaid or accompanied by a purchase order. Checks should be made payable to CRC Press. Please add the appropriate shipping and handling charge for each book ordered. All prices are subject to change without notice. **U.S./Canada:** All orders must be paid in U.S. dollars. TAX: As required by law, please add applicable state and local taxes on all merchandise delivered to CA, CT, FL, KY, MO, NY, and PA. For Canadian orders, please add GST. We will add tax on all credit card orders. **European Orders:** All orders must be paid in U.K. £. VAT will be added at the rate applicable. **Textbooks:** Special prices for course adopted textbooks may be available for certain titles. To review a book for class adoption, contact our Academic Sales Department or submit your textbook evaluation request online at www.crcpress.com/eval.htm **Satisfaction Guaranteed:** If the book supplied does not meet your expectations, it may be returned to us in a saleable condition within 30 days of receipt for a full refund.

SHIPPING AND HANDLING

Region	Delivery Time	First Title	Additional Title	For priority mail services, please contact your nearest CRC PRESS office.
USA/Canada	3-5 Days	\$5.99	\$1.99	
South America	7-14 Days	\$9.99	\$3.99	
Europe	3-5 Days	£2.99	£0.99	
Rest of World	7-21 Days	£4.99	£2.99	

Name
please print clearly

Company/Institution

Address

City State/Province Zip/Postal Code

Country

Visa MasterCard American Express Check Enclosed \$
Exp. Date: _____
Month Year

Signature and Telephone Number required on all orders

Signature PO#

Telephone

If you would like to receive information from us by e-mail, please provide your e-mail address below.

E-Mail Address

ORDERING LOCATIONS

In the Americas: CRC PRESS

6000 Broken Sound Parkway, NW, Suite 300
Boca Raton, FL 33487, USA
Tel: 1-800-272-7737
Fax: 1-800-374-3401
From Outside the Continental U.S.
Tel: 1-561-994-0555
Fax: 1-561-361-6018
e-mail: orders@crcpress.com

Rest of the World: CRC PRESS / ITPS

Cheriton House, North Way
Andover, Hants, SP10 5BE, UK
Tel (UK): +44 (0) 1264 34 2926
Tel (Int'l): +44 (0) 1264 34 3070
Fax: +44 (0) 1264 34 3005
e-mail:
(UK): uk.tandf@thomsonpublishingservices.co.uk
(Int'l): international.tandf@thomsonpublishingservices.co.uk

Corporate Offices

CRC PRESS

6000 Broken Sound Parkway, NW, Suite 300
Boca Raton, FL 33487, USA
Tel: 1-800-272-7737
Fax: 1-800-374-3401
From Outside the Continental U.S.
Tel: 1-561-994-0555
Fax: 1-561-361-6018
e-mail: orders@crcpress.com

CRC PRESS UK

23-25 Blades Court, Deodar Road
London SW15 2NU, UK
Tel: 44 (0) 20 8875 4370
Fax: 44 (0) 20 8871 3443
e-mail: enquiries@crcpress.com

www.crcpress.com

2.18.05bh