



Advanced Interest Rate Modelling Workshop

London: 23rd – 25th March 2011

This workshop provides THREE booking options

Register to ANY ONE day TWO days or all THREE days of the workshop

Register to ANY TWO days of the workshop and receive £200 discount

Register to ALL THREE workshop days and receive £300 discount

Early Bird Discount: 10% Before 31st December 2010

Topics:

Day 1: Interest Rate Modelling: From Solid Foundations To Advanced Models

- Building Yield Curves
- Basis and Multiple Projection Curves
- Vanilla models for single and multi-rate derivatives
- Old and new copulas and fitting smiles of CMS spreads
- Short rate models -- what works and what does not
- Quasi-Gaussian Models with Local and Stochastic Volatility
- Industrial-strength Libor market models
- Advanced calibration techniques
- Interest rate exotics in Monte Carlo
- Advanced regression techniques
- Lessons from crisis: Introducing deterministic and stochastic bases in interest rate models
- Multiple discounting curves

Presenter:

Vladimir Piterbarg: Global Head of Quantitative Analytics Group, Barclays Capital

Day 2: Interest Rate Modelling for the New Era

- Managing Smile Risks
- Levy based models for managing volatility surfaces
- Market technicals
- Leverage, cost of funds, and the credit crisis
- Managing exotic risks
- Choosing a model and the five main interest rate risks
- Practical pricing of exotics
- Calibration strategies and the selection of calibration instruments
- Adjusters and risk migration
- Mis-hedging, mis-pricing, and the need for risk migrators
- Pricing/hedging callable range notes & accrual swaps
- Using internal adjusters to correct prices and hedges

Presenter:

Pat Hagan: Head of Quantitative Analytics, Chief Investment Office, JP Morgan

Topics:

Day 3: Interest Rate Modelling

- **Parsimonious HJM Models for Multiple Yield-Curve Dynamics**
- **Volatility constraints for yield curve dynamics**
- **Implying swaption volatility surfaces for different Libor tenors**
- **Using Changes of Measure to Estimate Arbitrage-Free Models of the Rates Curve**
- **A multi-factor affine model of the interest rate curve. The model leads to a specification of the curve that is similar to the Nelson-Siegel formula**
- **An efficient way to estimate the multi-factor affine model, using Kalman filtering and maximum quasi-likelihood**
- **Repricing Spread Option Smiles with Methods from Foreign Exchange**
- **Constructing a model consistent with a spread smile is related to the problem of a model for driving assets and cross in FX**
- **Constructing a joint probability density repricing the triangle of smiles analytically**
- **Completing Correlation Matrices**
- **Review of the multi-asset stochastic volatility case, where cross-asset-vol correlations need to be completed**
- **Review of the multi-currency rates setup, where correlation matrices between term structures need to be completed**

Presenters:

Peter Austing: Quantitative Analytics, Barclays Capital

Roger Lord: Co-Head of Financial Engineering, Cardano

Andrea Pallavicini: Financial Engineering, Head of Financial Models, Mediobanca

Julien Turc: Head of Cross-Asset Quantitative Research, Société Générale

Day 1: Interest Rate Modelling: From Solid Foundations To Advanced Models by Vladimir Piterbarg

All delegates will receive a complimentary copy of the 2010 publication: Interest Rate Modeling (Volume I. Foundations and Vanilla Models) by Leif B.G. Andersen and Vladimir V. Piterbarg

Building Yield Curves

- Cubic Splines
- Non-parametric methods
- Tension splines
- Basis and Multiple Projection Curves

Vanilla Models for Single and Multi-Rate Derivatives

- Basics of CMS models
- Copula calculus
- Old and new copulas and fitting smiles of CMS spreads

Short Rate Models – What Works and What Does Not

- Quasi-Gaussian Models with Local and Stochastic Volatility
- Quadratic Gaussian Models
- Multi-factor short rate models

Industrial-Strength Libor Market Models

- Classical developments
- Advanced calibration techniques
- Interpolation of rates

Interest Rate Exotics in Monte Carlo

- Lower and upper bounds
- Advanced regression techniques
- Greeks

Lessons from Crisis: Introducing Deterministic and Stochastic Bases in Interest Rate Models

- Multiple discounting curves
- Multiple projection curves
- Stochastic basis in interest rate models
- Impact on derivatives valuation

All delegates will receive a complimentary copy of the 2010 publication: Interest Rate Modeling (Volume I. Foundations and Vanilla Models) by Leif B.G. Andersen and Vladimir V. Piterbarg.

Day schedule:	09:00 – 17:00
Break:	10:30 – 10:45
Lunch:	12:30 – 13:30
Break:	15:15 – 15:30

Day 2: Interest Rate Modelling for the New Era by Pat Hagan

09:00 – 10:30 / Managing Smile Risks

- **Basics: discount factors, FRAs, swaps, and other delta products**
- **Curve stripping, bucket deltas, and managing IR risks**
- **Martingales & the fundamental theorem**
- **Vanilla options (caps, floors, and swaptions) & martinga**
- **Vol matrices, bucket vegas, and managing vol risks**
- **Smiles, local volatility models, and equivalent volatilities**
- **Mishedging, and the development of the stochastic vol model**
- **Using the SABR model to manage volatility smiles, hedging stability**
- **Levy based models for managing volatility surfaces**

10:30 – 10:45 Break

10:45 – 12:30 / Intermission: Market Technicals

- **Money vs. scrip**
- **Holiday calendars, business day rules, and schedule generation**
- **Day count fractions**
- **Ref rates & basis spreads**
- **Leverage, cost of funds, and the credit crisis**

Managing Exotic Risks

- **Three elements to modern pricing: model, calibration, and evaluation**
- **Choosing a model and the five main interest rate risks**
- **HJM models – strengths, weaknesses, usage**
- **BGM/LMM models – strengths, weaknesses, usage**
- **Short rate models – strengths, weaknesses, usage**
- **Markovian models – strengths, weaknesses, usage**
- **Summary**

12:30 – 13:30 Lunch

13:30 – 15:15 / Practical Pricing of Exotics

- **LGM model**
- **Callable swaps (Bermudans)**
- **Calibration strategies and the selection of calibration instruments**
- **Connection between calibration instruments and vega risks**
- **Explicit calibrations for Bermudan**
- **Predicted vs. actual vol matrices for different calibrations**
- **Dependence of Bermudan price on choice of calibration instruments**
- **Dependence of hedges on calibration choices**
- **Conclusions**

15:15 – 15:30 Break

- **Mis-hedging, mis-pricing, and the need for risk migrators**
- **Price sharpening via adjusters**
- **Example: Correcting a Bermudan calibrated to ATM swaptions**
- **Example: Correcting a Bermudan calibrated to caplets**

Pricing/Hedging Callable Range Notes & Accrual Swaps

- **Definition of the deal**
- **Mismatched payoffs & convexity corrections**
- **Using replication to price non-callable range notes**
- **LGM model and potential calibration strategies**
- **Potential mishedging of swaption or caplet risks**
- **Using internal adjusters to correct prices and hedges**

Day 3: Interest Rate Modelling

09:00 – 10:45 / Parsimonious HJM Models for Multiple Yield- / Curve Dynamics: / Andrea Pallavicini, Mediobanca

- Stylized facts on money market rates
- Volatility constraints for yield curve dynamics
- Multiple-curve HJM framework
- Calibration examples
- Implied swaption volatility surfaces for different Libor tenors
- Conclusion and further developments

10:45 – 11:00 Break

11:00 – 12:30 / Using Changes of Measure to Estimate Arbitrage- / Free Models of the Rates Curve: / Julien Turc, Société Générale

- We present a multi-factor affine model of the interest rate curve. The model leads to a specification of the curve that is similar to the Nelson-Siegel formula.
- The model involves three latent factors (level, slope and curvature), and considers risk premia between the historical and risk-neutral measures.
- We present an efficient way to estimate the model, using Kalman filtering and maximum quasi-likelihood.

This framework can be used to spot: relative value opportunities within the nominal curve, within the real curve, or between both curves. The model also leads to useful estimates of risk premia, and strips expected inflation out of market prices of inflation linked products. We also consider credit risk, and present credit-adjusted estimates for nominal risk premia.

12:30 – 13:30 Lunch

13:30 – 15:00 / Repricing Spread Option Smiles with Methods / from Foreign Exchange: / Peter Austing, Barclays Capital

- Constructing a model consistent with a spread smile is related to the problem of a model for driving assets and cross in FX
- Introduction to the FX problem
- Best-of contracts have some special properties
- They allow us to construct a joint probability density repricing the triangle of smiles analytically
- Then we can value more general european contracts
- Method can be extended to spreads (eg CMS spreads)

15:00 – 15:15 Break

15:15 – 16:45 / Completing Correlation Matrices: / Roger Lord, Cardano

- **Review of the multi-asset stochastic volatility case, where cross-asset-vol correlations need to be completed**
- **Review of the multi-currency rates setup, where correlation matrices between term structures need to be completed**
- **Consideration of case where we need to have control over the level of correlations between spreads**
- **Numerical examples**

Workshop Fee:

- Any One day: £1099 + UK VAT
- Any Two days: £1998 + UK VAT
(Including £200 Discount)
- All Three days: £2997 + UK VAT
(Including £300 Discount)
- Early Bird Discount: 10% Before 31st December 2010
- 70% Academic Discount (FULL-TIME students only.)

Delegate details:

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Position:	
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To register please fax the completed booking form to:

Fax: +44 (0) 1273 201360

Flight details:

All delegates flying into London on the morning of the event are reminded that they should arrive 30 minutes before the workshop starts for registration. The hotels West End location is approximately 1 hour from all 3 main London airports, Heathrow, Gatwick and City. Returning flights should equally allow for the events finishing time.

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Prior to the two week deadline, cancellations are subject to a fee of 25% of the overall course cost.

Discount Structure:

The discount is available on any day permutation, and can be combined across delegates within the same company (only at the time of booking and not retrospectively).

Registration:

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