



Interest Rate Modelling for the New Era

London: 15th & 16th April 2010

This workshop provides TWO booking options

Register to ANY ONE day of the workshop

Register to BOTH days of the workshop and receive £200 discount

Topics:

Day 1: Interest Rate Modelling for the New Era

- Curve stripping, bucket deltas, and managing IR risks
- Smiles, local volatility models, and equivalent volatilities
- Using the SABR model to manage volatility smiles, hedging stability
- Ref rates & basis spreads
- Leverage, cost of funds, and the credit crisis
- Three elements to modern pricing: model, calibration, and evaluation
- Choosing a model and the five main interest rate risks
- HJM models – strengths, weaknesses, usage
- Calibration strategies and the selection of calibration instruments
- Connection between calibration instruments and vega risks
- Predicted vs. actual vol matrices for different calibrations
- Mis-hedging, mis-pricing, and the need for risk migrators

Presenter:

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

Day 2: Interest Rate Modelling: Back to Basics

- Interest rate theory: past, present, and future
- Calibration of the interest rate term structure
- Term-structure density approach
- Revisiting CMS Spread Options (Cap, Floor, Digital, Range Accrual)
- Fast computation of CMS Range accrual
- Real time calibration of SABR model
- Post-Credit Crunch Multiple-Curve Framework
- Foreign-Currency Analogy, No Arbitrage and Quanto Adjustment
- No Arbitrage and Counterparty Risk

Presenters:

Eric Benhamou: CEO, Pricing Partners

Marco Bianchetti: Risk Management – Market Risk – Pricing & Financial Modelling, Intesa SanPaolo Bank

Dr Dorje C Brody: Reader in Mathematical Finance, Imperial College London

Professor Lane P Hughston: Professor of Mathematical Finance, Imperial College London

Jochen Theis: Director, Markit

Day 1: Interest Rate Modelling for the New Era: 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**

Day 2: Interest Rate Modelling: Back to Basics

09:00 – 11:00 / Theory of Interest Rate Modelling: From Basics to
/ New Interest Rate Models:
/ Dr Dorje C Brody & Professor Lane P Hughston,
/ Imperial College London

1. Interest rate theory: past, present, and future

- Overview of interest rate theory
- Dynamic models for the short rate
- The Heath-Jarrow-Morton framework
- Pricing kernel methodology
- Dynamical models for risky assets
- The dynamics of discount bonds
- The volatility structure approach: pros and cons
- Pricing formulae for discount-bonds
- Asymptotic conditions on long-dated discount bonds

2. Calibration of the interest rate term structure

- Conditional variance representation for the pricing kernel
- Parametrisation and calibration of interest rate dynamics
- The role of the Wiener chaos expansion in interest-rate term-structure calibration
- Bond option pricing in Wiener-chaos models

3. Term-structure density approach

- Dynamics of the term-structure density
- Construction of admissible term-structure models
- New Levy-based interest-rate models
- Brownian, Gamma, and Variance-Gamma models
- Bond-option pricing in rational Levy models

11:00 – 11:15 Break

11:15 – 12:45 / Revisiting CMS Spread Options (Cap, Floor, Digital,
/ Range Accrual):
/ Eric Benhamou, Pricing Partners

- Product description
- CMS Replication
- Presentation of the various approaches: Normal, Bi Lognormal, Bi-SABR with copula, Bi Heston with copula, and Hagan adjuster method
- Comparisons and price differences
- Fast computation of CMS Range accrual
- Real time calibration of SABR model
- Impact of the copula assumption
- Impact of multi curve construction

12:45 – 13:45 Lunch

**13:45 – 15:15 / Bases between Rates and Implications on Curve
/ Construction and Pricing:
/ Jochen Theis, Markit**

Bullets to follow

15:15 – 15:30 Break

**15:30 – 17:00 / Multiple Curves, One Price: New Approaches
/ for Pricing & Hedging Interest Rate Derivatives
/ Decoupling Forwarding and Discounting Yield
/ Curves:
/ Marco Bianchetti, Intesa SanPaolo Bank**

Market Context and Practices:

- **Pre-Credit Crunch Single-Curve Framework**
- **Post-Credit Crunch Multiple-Curve Framework**
- **No Arbitrage and Forward Basis**

Foreign-Currency Analogy, No Arbitrage and Quanto Adjustment:

- **Single Currency Spot and Forward Exchange Rates**
- **Quanto Adjustment**
- **Pricing & Hedging FRAs, Swaps, Caps/Floors/Swaptions**

No Arbitrage and Counterparty Risk

Other Approaches:

- **Multi-Curve Market Model Approach**
- **Axiomatic Approach**
- **Counterparty Risk Approach**

Workshop Fee:

Any One day: £1099 + UK VAT

Both days: £1998 + UK VAT
(Including £200 Discount)

30% discount Academic delegates

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To register please fax the completed booking form to:

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