

FIXED INCOME

TOPICS OF THE COURSE:

The purpose of the course is to present the latest achievements in the term structure modeling for pricing and hedging interest rate derivatives.

Lecture 1

- Basic elements of financial mathematics.
- Building Blocks: TBills, FRA, Eurofutures, Swap.
- Yield Curve Stripping.

Lecture 2

- Caps and Swaptions.
- The Black Model.
- The implied volatility curve.

Lecture 3

- Problems in building an interest rate model.
- The Heath Jarrow Morton Model.
- The discrete time model
- The continuous time model
- Model calibration

Lectures 4

- Gaussian Heath-Jarrow-Morton Models.
- The Ho and Lee model
- The extended Vasicek model.
- The two-factor Hull and White model.

Lecture 5

- Why a multifactor model? A PCA Analysis
- Multivariate HJM models.

Lezione 6

- Pricing of interest rate derivatives
- Change of numeraire and the forward measure

Applications

- Bond option pricing in Gaussian models
- The Brace Gatarek Musiela model
- The Jamshidian model.

Laboratory Class: Implementation

- Excel and Visual Basic for Application
- Bootstrapping the yield curve
- Bootstrapping the volatility curve
- Pricing of structured bonds:
- Fixed coupon bonds
- Floating rate notes

- Constant Maturity Swaps

READING LIST:

- Brigo Mercurio, "Interest Rate Models - Theory and Practice" , Springer Finance, June 2001.
- Nick Webber, Jessica James, "Interest Rate Modelling" John Wiley and Sons Ltd Paperback - 5 April, 2000
- Richard Flavell, Swaps & Other Derivatives , John Wiley and Sons Ltd, 2002
- Riccardo Rebonato: "Interest Rate Option Models" , 2nd ed. J Wiley and Sons, New York.
- Les Clelow and Chris Strickland: "Implementing Derivative Model" , Wiley series in financial engineering, 1998;
- John Hull, "Options, futures, and other derivatives" , last edition, London, Prentice Hall, 2002