

## **ANALYSIS OF THE TERM STRUCTURE OF INTEREST RATES**

### TOPICS OF THE COURSE:

This course studies both the theory and the econometrics of the general equilibrium theory of the term structure. Some well-known term structure models and the econometric techniques advanced for their estimation are presented. A computer session is also included.

#### **General equilibrium framework**

Setup of the economy

- State variables and production processes
- Wealth and contingent claims
- Portfolio allocation problem
- Riskless interest rate and expected returns

Contingent claim valuation

- Contingent claims in real terms
- Contingent claims in nominal terms

#### **Term structure models**

The base model

Single-factor models

- Gaussian processes: Vasicek model
- Square-root process: Cox-Ingersoll-Ross model
- Translated square-root-process: Pearson-Sun model

Multifactor models

- Interest rate volatility: Longstaff-Schwartz model
- Unknown factors: Langetieg model
- Set of yields: Duffie-Kan model
- Stochastic long-term mean: BDFS model

#### **Estimations methods**

Nonlinear least squares

- Cross-sectional nonlinear least squares
- Multivariate nonlinear least squares

Generalised method of moments

Maximum likelihood

Kalman filter

Computer session

### READING LIST:

- Chen, R.R., "Understanding and managing interest rate risks", World Scientific: London. (Chapter 2 and 5), 1996;
- Duffie, D., "Dynamic asset pricing theory", 2nd edition, Princeton University Press: Princeton. (Chapter 7), 1996;
- Wilmott, P., "Derivatives", Wiley & Sons: Chichester. (Chapters 33-34, 37-39), 1998;
- Lecture notes will be distributed.