



## TRAINING COURSE

### FLORENCE SCHOOL OF BANKING AND FINANCE

# **ADVANCES IN THE COMPUTATIONAL METHODS FOR MODELS WITH OCCASIONALLY BINDING CONSTRAINTS**

#### Course Instructors:

**Fabio Canova** | Florence School of Banking and Finance and Norwegian Business School

**Wouter J. den Haan** | London School of Economics

**Junior Maih** | Norges Bank and Norwegian Business School

Cappella

Villa Schifanoia, Via Boccaccio 121 - Florence

**7 JUNE 2017**

## ■ INTRODUCTION

This course will present the most recent methods to study models with financial constraints which bind in some state of nature (e.g. recessions) or when variables reach a threshold ( e.g. a capital ratio trigger).

## ■ READING MATERIAL

- Kulish, M. and Pagan, A. (2014). *Estimation and solution of models with rational expectations and structural changes*, Dynare working paper 34, forthcoming Journal of Applied Econometrics.
- Guerrieri, L. and Iacoviello, M. (2015). *Occbin: a toolkit for solving dynamic models with occasional binding constraints easily*, Journal of Monetary Economics, 70, 22-38.
- Maih, J (2015) *Efficient Perturbation Methods for Solving Regime-Switching DSGE Models*, Norges bank, working paper.
- Liu, Z., D. Waggoner and T. Zha, (2011). *Sources of marcoeconomic fluctuations: a regime-switching DSGE approach*. Quantitative Economics 2, 251-301.

- Maliar, L. and Maliar, S. (2014). *Numerical Methods for Large Scale Dynamic Economic Models* in: Schmedders, K. and K. Judd (Eds.), *Handbook of Computational Economics*, Volume 3, Chapter 7, 325-477, Amsterdam: Elsevier Science.

## ■ PROGRAMME

### 7 JUNE

- 09.00 - 09.15 Welcome by **Fabio Canova** | Head of Training Florence School of Banking and Finance
- 09.15 - 11.00 **Session 1. Piece-wise Linear Models and Applications by Fabio Canova**
- Piecewise linear methods
  - The construction of the likelihood function and the use of the likelihood function in Bayesian estimation
- 11.00 - 11.30 *Coffee break*
- 11.30 - 13.30 **Session 2. Markov switching Models and Applications by Junior Maih**
- Regime switching approach to solve the model
  - Estimation of Markov switching
- The solution and the estimation of the parameters of such models will be performed using the package RISE toolbox.
- 13.30 - 14.30 *Lunch break (Sala Villetta)*
- 14.30 - 16.30 **Lecture 3. Projection Techniques, Policy Function Iterations and Applications by Wouter J. den Haan**
- Projection techniques for models with occasionally binding constraints
  - Numerical integration. Splines. Fixed point and time iteration (policy function iteration)
- 16.30 - 17.30 **Open Q&A session by participants to lectures on the topics discussed in the course**
- 17.30 - 18.30 *Cocktail at the course venue (Sala Bandiere)*