

14E026

6 ECTS

Advanced Econometric Methods III

Overview and Objectives

This is an advanced course in time series econometrics. The first part discusses stationary and non-stationary time series models from both the time-domain and the frequency domain perspective. The second part focuses on specific topics that are relevant in time series analysis.

Course Outline

Part I: Core methods (20 hours)

- Introduction to time series
- Hilbert spaces and the Projection Theorem
- Stationary ARMA processes
- Non-stationary time series
- Frequency domain

Part II: Advanced topics (20 hours)

- Multivariate time series:*
 - Vector autoregressions
 - Dynamic factor models
 - State space methods and the Kalman filter
- Bayesian econometrics:*
 - Theory and comparison to frequentist perspective
 - Gibbs sampling
 - Metropolis-Hastings algorithm

Required Activities

There will be two weekly take home problem sets: one consisting of theoretical problems and one consisting of applied exercises. For the applied exercises some basic coding skills are required (either Matlab, Gauss, R, Oxmetrics or a comparable language is fine). All exercises need to be handed in individually.

Evaluation

Grades will be based on the exercises (25%) and the final exam (75%).

Materials

Brockwell, P. J. & Davis, R. A. (1991), Time Series: Theory and Methods (main reference for part I)
Hamilton, J. D. (1994), Time Series Analysis, Princeton University Press. (covers nearly all topics)

Koop, G. (2003), Bayesian Econometrics, Wiley-Interscience (reference for Bayesian part)
Shumway, R. H. & Stoffer, D. S. (2011), Time Series Analysis and Its Applications with R Examples, Springer

A list of additional articles will be appended.