PhD course Time Series Analysis Summer 2020: Syllabus

This course provides a very basic introduction to modern time series tools for estimating models in, e.g. macroeconomics, finance and marketing. The focus is on the implementation of the models presented in the course. Every lecture is accompanied with an practical session using the computer for estimation or simulation. Programming knowledge is desirable but definitely not necessary to follow the course's contents.

Contents

1. Stationary Time Series Analysis
   - ARMA(p,q) models
   - Forecasting
   - State-Space Form
   - Kalman Filter
2. Structural Analysis
   - VAR(p) models
   - Granger Causality
   - Identification
   - Impulse Response Functions (IRFs)
3. Unit Roots and Structural Breaks
   - Unit Roots
   - Structural Breaks
   - Trend/Cycle Decomposition
4. Nonlinearity
   - ARCH and GARCH
   - Markov Switching
   - Threshold Models
   - Time-Varying Parameters
   - Gibbs sampling (Bayesian Econometrics)

Schedule

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Course materials

Each chapter is accompanied by lecture slides as well as by solution hints for the problem sets.

Literature

Enders, W.: *Applied Econometric Time Series.* Wiley.

Greenberg, E.: *Introduction to Bayesian Econometrics.* Cambridge University Press.

Hamilton, J.D.: *Time Series Analysis.* Princeton University Press.

Kilian, L. and H. Lütkepohl: *Structural Vector Autoregressive Analysis.* Cambridge University Press.

Lütkepohl, H.: *New Introduction to Multiple Time Series Analysis.* Springer: Berlin, 2nd edn.