UNIVERSITÄT LEIPZIG: IEW
M.Sc. Economics

Prof. Dr. Bernd Süssmuth
suessmuth@wifa.uni-leipzig.de

Winter 2022/23

Time Series Analysis for Macroeconomics and Finance

Lecture: Tue, 5.15-6.45 p.m., classroom: SR 12
Lab class: Tue, 3.15-4.45 p.m., PC Pool 3 (start: Oct 18)

Aims and scope

The course conveys up-to-date techniques and methods for quantitative research in macroeconomics and finance. The lecture is accompanied by a computer tutorial and exercises (Tue: PC Pool #3, 3.15 to 4.45 p.m.). Applied problems are solved in the computer lab using Stata. Supplementary programming is done with a matrix-based language/software like Python, Matlab or Gauss.

I Preliminaries

II ARIMA and Error Correction (EC) models

II.1 Basic time series analysis framework

- Unit root (UR) & stationarity tests and autocorrelations: AC/PAC functions and ARIMA
- Correlogram/Periodogram and spectral density
- Filter applications
- Causality in the time series context
- From distributed lags (DL) to ARDL to EC models

II.2 Extensions: NARDL, testing for "bubble" dynamics, ARCH/GARCH models

III Vector AR and Vector EC (VAR and VEC) models

III.1 Structural/Reduced form (SF/RF-) VARs and mapping to RF-VAR

III.2 Forecasts and Impulse Response (IR) functions

III.3 Orthogonalization

III.4 VECM and Johansen procedure

IV Selected problems and models

IV.1 New approaches in the frequency domain

IV.2 Forecasting and time-varying measures

Grading and Material

The final course grade will be computed from (i) a 90 minutes final exam, consisting of 50% methodological questions and 50% questions relating to applied problems and (ii) a written term paper and oral presentation. A reader, problem sets, and data will be made available online.

Literature

Becketti, S. (2013): *Introduction to Time Series Using Stata*, College Station: Stata Press

Hamilton, J. D. (1994): *Time Series Analysis*, Princeton: Princeton University Press

Kilian, L. and H. Lütkepohl (2017): *Structural Vector Autoregressive Analysis*, Cambridge: CUP

Lütkepohl, H. and M. Krätzig (2004): *Applied Time Series Econometrics*, Cambridge: CUP

Lütkepohl, H. (2005): *New Introduction to Multiple Time Series Analysis*, Heidelberg, New York: Springer