

Seminar on Time Series Econometrics

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Time Schedule

Seminar kick-off meeting:

- **First** week of the (upcoming) semester (exact time and date will be announced later; in agreement with participants)

Meeting to assign seminar topics to participants:

- **Second** week of the semester (exact time and date will be announced later; in agreement with participants)

Seminar presentations:

- Block seminar **at the end** of the semester (exact time and date in agreement with participants)

What is time series econometrics?

Econometrics (engl. Wikipedia): „Econometrics is the application of statistical methods to economic data in order to give empirical content to economic relationships. More precisely, it is the quantitative analysis of actual economic phenomena based on the concurrent development of theory and observation, related by appropriate methods of inference.“

Time series (engl. Wikipedia): „In mathematics, a time series is a series of data points indexed (or listed or graphed) in time order. Most commonly, a time series is a sequence taken at successive equally spaced points in time. Thus it is a sequence of discrete-time data.“

Time series analysis (engl. Wikipedia): „Time series analysis comprises methods for analyzing time series data in order to extract meaningful statistics and other characteristics of the data. Time series forecasting is the use of a model to predict future values based on previously observed values.“

⇒ **Time series econometrics**: Time series analysis for modeling, forecasting, interpretation and testing of (economic theory based) hypothesis on economic time series data.

Possible topics

Vector AutoRegressive (VAR) models

- estimation, testing, impulse-response analysis, Granger causality, forecasting, model diagnostics

Unit root and cointegration analysis

- (co)integrated processes, estimation, testing, Vector Error Correction Model (VECM), Granger causality

Structural Vector AutoRegressive (SVAR) models:

- structural inference in macro econometrics, identification schemes (e.g. short-run, long-Run, sign restrictions, proxy variables, ...), Forecast Error Variance Decomposition (FEVD), mixed frequency data

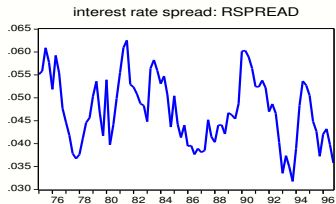
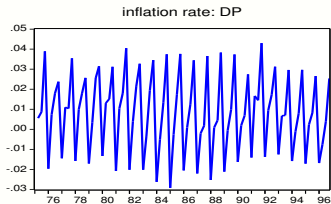
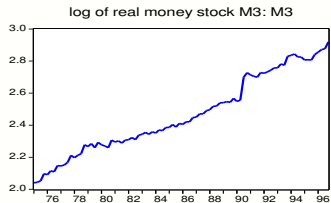
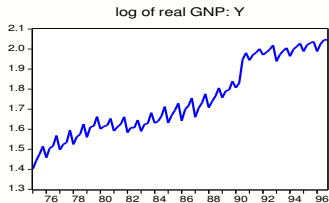
conditional heteroscedasticity

- (multivariate) ARCH- and GARCH models, valid statistical methods under heteroscedasticity

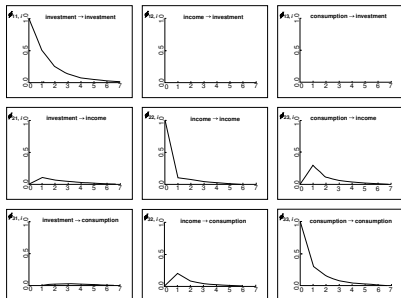
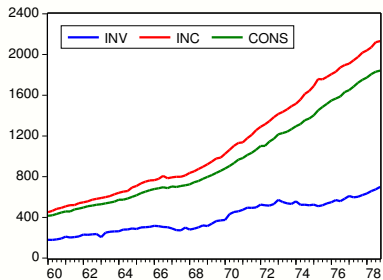
Other topics

- state space models, Kalman filters, VARMA models, Bayesian VARs, DSGE models, ...

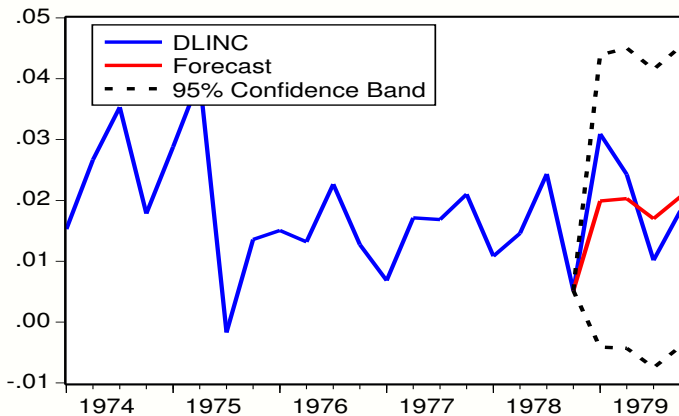
Example: typical time series



Example: Impulse Response Analysis



Example: Forecasting



Literature

- Kilian & Lütkepohl (2017). Structural Vector Autoregressive Analysis
- Lütkepohl (2005). New Introduction to Multiple Time Series Analysis
- Lütkepohl & Krätzig (2010). Applied Times Series Econometrics
- Enders (2014). Applied Econometric Times Series
- Hamilton (1994). Time Series Analysis

Requirements to pass the seminar

Bachelor:

- presentation (30 minutes)
- seminar paper (10 pages)
- active participation in discussions, feedback

Master:

- presentation (45 minutes)
- seminar paper (10 pages)
- active participation in discussions, feedback

Anmeldung

Binding enrollment for the seminar via email to:

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till

September 30, 2021