Syllabus: Time Series Analysis

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1 Topics to be covered

1. Stochastic processes (some basic concepts)
2. Stationary stochastic processes
3. Autocovariance and autocorrelation functions
4. Ergodicity of a stationary stochastic process
5. Estimation of moment functions of a stationary processes
6. ARIMA models
7. Estimation of ARIMA models
8. Building ARIMA models
9. Forecasting from ARIMA models
10. Some elements of multivariate time series models

2 Aim and objectives of the course

The aim of the course is to present important concepts of time series analysis (Stationarity of stochastic processes, ARMA models, forecasting etc.). The course is a mixture of theory and practical applications of time series methods. The theoretical part focuses upon properties of stationary time series and their analysis in the time domain. We use the econometric package GRETL for empirical applications.

At the end of the course, the student should be able

• Compute and interpret a correlogram
• Derive the properties of an ARIMA model
• Select an appropriate ARIMA model for a given time series fit the model using an appropriate package
• Compute forecasts

3 References

The textbooks for the course are: