

Ulrich Müller
Economics Department
Princeton University

Bavarian Graduate Program in Economics Time Series

Overview of topics:

- (1) Stationary Time Series, ARMA Models, Wold Representation
- (2) LLN and CLT for Dependent Observations
- (3) Spectral Analysis
- (4) HAC Variance Estimation
- (5) Structural VARs
- (6) Kalman Filter
- (7) Structural Breaks, Functional Central Limit Theorem
- (8) Unit Root Econometrics, Cointegration

Background:

Students are expected to be familiar with advanced econometrics as taught in the Bavarian Graduate Program. Specifically, you should have a working knowledge of standard probabilistic concepts (random variables, moments, multivariate normal distribution), some asymptotics for iid observations (LLN, CLT) and estimation techniques (OLS, IV, GMM). Some of the exercises of the course ask you to implement inference procedures yourself; for this purpose, some coding experience in matlab, R, Ox or some other matrix oriented software is helpful.

Lectures:

- 9.00 - 10.30: First lecture
- 10.30 - 10.45: Break
- 10.45 - 12.15: Second lecture
- 12.15 - 14.00: Lunch
- 14.00 - 14.30: Catch-up lecture
- 14.30 - 17.00: Problem set and reading
- 17.00 - 18.00: Discussion of problems

Text Book:

There is no official text book for the course. I will post detailed and largely self-contained lecture notes.

Here is a list of useful books

- Hamilton "Time Series Analysis" (standard graduate book, some nonstationary time series topics are covered)
- Brockwell and Davis "Time Series: Theory and Methods" (very good and mathematically rigorous stationary time series textbook and reference)

- Davidson "Stochastic Limit Theory" (advanced time series book, many proofs, self-contained)
- White "Asymptotic Theory for Econometricians" (good reference, very few proofs)