ECONOMETRICS II
IKT3902-Gr.1
(Thursday 10.00-12.50)
(2024-25 Spring Semester)

Syllabus

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Classnotes: https://github.com/htastan/Econometrics-II
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Office Hours: Thursdays 14.00-16.00
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SCOPE and PURPOSE

This course is the second part of the Econometrics sequence. The purpose of this course is to teach fundamental methods in econometrics at the introductory level. In the first part, Econometrics I, offered in the Fall semester, we covered the classical linear regression model within the context of cross-sectional data and examined various extensions. Problems and issues arising in the regression analysis using time series data, such as dependence, trends, seasonality, non-stationarity, unit roots, etc., were left to the second part of the econometrics sequence. Econometrics II will particularly focus on the regression analysis with time series data and panel data. Topics in Econometrics II include the classical linear regression model (CNLRM) using matrix algebra, the properties and the nature of time series data, stationarity and dependency, unit roots and cointegration and panel data models.
Econometrics software: We will use R in class and in lab sessions. R is an open-source software for statistical computing and graphics which is widely used by statisticians, researchers, data scientists and econometricians as well as industry professionals. The latest version of R can be downloaded from:
https://www.r-project.org/
And R-studio may be used as an integrated development environment for R:
https://www.rstudio.com/products/RStudio/

PREREQUISITES
- You should have successfully completed Econometrics I and Statistics I & II. This course builds upon the foundational concepts introduced in Econometrics I.

TEXTBOOK
- J.M. Wooldridge (**W**), *Introductory Econometrics: A Modern Approach*, 7th ed., 2020, Cengage Learning. R applications based on the Wooldridge's text:
  - F. Heiss (**H**), *Using R for Introductory Econometrics*, 2016, CreateSpace.
    Online version and other materials available at: http://www.urfie.net/

ADDITIONAL MATERIALS
- Class notes
- J. H. Stock and M.W. Watson (**SW**), *Introduction to Econometrics*, 3rd ed., 2015, Pearson.

EVALUATION

Midterms: 60% (there will be two Midterms 30% each), Final: 40%

CLASS SCHEDULE
(2025 Sring)

Week	Date	Topics (W: Wooldridge, H: Heiss, SW: Stock and Watson)	Preparation
1	Feb 20	Review of Econometrics I; Review of Matrix Algebra; Linear Regression Model in Matrix Form	**W**: Appendix D and E
2	Feb 27	Linear Regression Model in Matrix Form (cont'd), Classical assumptions using matrix form, Properties of OLS estimators	**W**: Appendix D and E
3	March 6	Introduction to time series data, the nature of time series, basic concepts in time series analysis, Trends and seasonality, Forecasting	**W**: ch. 10, **H**: ch.10 **SW**: ch.14
4	March 13	Regression analysis using time series data, Finite sample properties of OLS estimator	**W**: ch. 10 **H**: ch.10
5	March 20	Regression analysis using time series data, cont.'d	**W**: ch. 10-11 **H**: ch.10
6	March 27	Further issues in regression analysis, stationarity and weak dependence, Moving Average (MA) process, AR process	**W**: ch. 11 **H**: ch.11
7	April 3	Further issues in regression analysis (cont.'d), asymptotic properties of OLS estimators, Highly persistent time series	**W**: ch. 11 **H**: ch.11
8	April 10	**Midterm 1** (date and time to be announced later)	
9	April 17	Serial correlation in time series regressions, autocorrelation tests	**W**: ch. 12 **H**: ch.12
10	April 24	Serially correlated errors, GLS estimation, Heteroscedasticity in time series models, ARCH and GARCH models	**W**: ch. 12
11	May 1	No class (holiday)	
12	May 8	Detecting nonstationarity, Unit root tests, Dickey-Fuller (DF) and Augment Dickey-Fuller (ADF) tests	**W**: ch. 18 **H**: ch.18 **SW**: ch.14
13	May 15	**Midterm 2** (date and time to be announced later)	
14	May 22	Regression analysis using nonstationary variables I, Cointegration, Vector Autoregression (VAR) model	**W**: ch. 18 **H**: ch.18 **SW**: ch.16
15	May 29	Regression analysis using nonstationary variables II, Error correction model (ECM), Topics in Forecasting	**W**: ch. 18 **H**: ch.18 **SW**: ch.16