Econometric Methods I - Part I, WS 2022/23

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Lectures: Fridays 10:00-14:00, Room 3.3.002C at DIW Berlin starting on 21 October 2022
TA sessions: Mondays 10:00-12:00, Room 3.3.002C at DIW Berlin starting on 24 October 2022

1. The Classical Linear Regression Model
   a) Ordinary Least Squares (OLS) Estimation
   b) Maximum Likelihood (ML) Estimation
   c) Hypothesis Testing
   d) Generalized Least Squares (GLS) Estimation

   References: Hayashi (2000, Ch. 1), Judge et al. (1988, Ch. 5,6,8), Greene (2019, Ch. 2,3,4,5,9,14)

2. Asymptotic Theory
   a) Stochastic Convergence Concepts
   b) Laws of Large Numbers (LLN) and Central Limit Theorems (CLT)
   c) Asymptotic Properties of OLS
   d) Asymptotic Properties of ML
   e) Asymptotic Properties of GLS

   References: Hayashi (2000, Ch. 2), Judge et al. (1985, Ch. 5), Hamilton (1994, Ch. 7), Greene (2019, Ch. 4,5,9,14)

3. Single Equation Generalized Method of Moments (GMM)
   a) Instrumental Variables (IV) Estimation
   b) Method of Moments (MM) Estimation
   c) GMM Estimation
   d) Asymptotic Properties of GMM
   e) Related Tests

   References: Hayashi (2000, Ch. 3), Hamilton (1994, Ch. 14), Judge et al. (1988, Ch. 13), Greene (2019, Ch. 8, 13)

4. Multiple Equation Generalized Method of Moments (GMM)

a) Simultaneous Equations

b) GMM Estimation

c) Uses of Multiple Equation GMM

References: Hayashi (2000, Ch. 4), Hamilton (1994, Ch. 14), Judge et al. (1988, Ch. 11,14,15), Greene (2019, Ch. 10, 13)

5. Panel Data

   a) Random Effects

   b) Fixed Effects

   References: Judge et al. (1988, Ch. 11), Greene (2019, Ch. 11), Hayashi (2000, Ch. 5),

6. Bayesian Estimation and State-Space Models

   a) Bayesian Estimation of the Classical Linear Regression Model

   b) Time-Varying-Parameter, Unobserved Components, Dynamic Factor and Common Stochastic Trend Models

   c) The Kalman Filter

   References: Kim & Nelson (1999, Ch. 3, 7), Hamilton (1994, Ch. 13), Judge et al. (1985, Appendix C), Greene (2019, Ch. 16)

References

Greene, W. H. (2019). *Econometric Analysis* (8 ed.). Pearson.

Hamilton, J. D. (1994). *Time Series Analysis*. Princeton university press.

Hayashi, F. (2000). *Econometrics*. Princeton University Press.

Judge, G. G., Hill, R. C., Griffiths, W., Lütkepohl, H., & Lee, T.-C. (1985). *The Theory and Practice of Econometrics*.

Judge, G. G., Hill, R. C., Griffiths, W., Lütkepohl, H., & Lee, T.-C. (1988). *Introduction to the Theory and Practice of Econometrics*. New York New York John Wiley and Sons.

Kim, C.-J. & Nelson, C. R. (1999). *State-space models with regime switching: classical and Gibbs-sampling approaches with applications*. The MIT press.

Course Requirements

The grading is based on the assignments (20%) and an exam (80%) at the end of the each part. Each part of the course is given a 50% weight of the total grade.