

## **Econometrics III**

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### **Course information**

This course should be a sequel to the basic Econometrics. It assumes familiarity with the general linear model and knowledge how to deal with basic model and data deficiencies, simultaneous systems, and simple time-series processes. Econometrics III is the third course in a sequence designed to introduce tools necessary to understand and implement empirical studies in (micro)economics. The main emphasis of the course is twofold: (i) to extend regression models in the context of cross-section and panel data analysis, (ii) to focus on situations where linear regression models are not appropriate and to study alternative methods. The objective of the course is to expose the student to variety of basic applied microeconomic challenges with the ultimate goal of gaining a stronger appreciation of strengths and weaknesses of the econometric methodology. Examples from applied work will be used to illustrate the discussed methods.

**Prerequisites:** Statistics, Microeconomics, Econometrics I and II or equivalents.

### **Course outline (tentative):**

1. Review of basic linear regression model and introduction to maximum likelihood estimation and hypothesis testing ([G])
2. Generalised linear regression model ([G] 14, [A] 6)
  - GLS
  - SUR
  - Panel data analysis
3. Cases where residuals and regressors are correlated ([H] 6-7, [A] 7-8)
  - Misspecification
  - Errors in variables ([G] 9)
  - Unobserved fixed effect in panel data analysis ([H] 3)
  - Simultaneity
  - Lagged dependent variables and serial correlation
4. Cases where linear regression models are not appropriate (nonlinear models)
  - Maximum likelihood estimation ([A] 3-4)
  - Qualitative response models ([M] 2-3, [A] 9, [H] 7, [G] 21)
  - Tobit model ([A] 10, [H] 6, [G] 22)
  - Self selection models ([M] 9)

- Duration analysis ([L], [G] 22)
  - Structural estimation
5. Various advanced topics
- LAD estimation
  - Bootstrap

**Requirements and grading** Final grade: 25% problem sets, 25% midterm, 50% final. There might be a term paper.

### **Seminar sessions**

There will be two types of seminar sessions. The first one will be related to the theoretical issues covered and the second one should connect the covered theory and applications. These two types of seminar sessions will be held in approximately an equal share.

Evaluation of applied problem sets:

1. Completeness. These problems are open-ended, they do not have a unique solution, they are research in their nature.
2. Clarity. Think about the way of presentation of the results.
3. Being in time. Problems are due 17:00 on the due date.

### **Basic Textbooks:**

[G], William Greene, *Econometrics Analysis*, NY, Macmillan Publishing Company, 1993.

[H], Cheng Hsiao, *Analysis of Panel Data*, Cambridge University Press, 1986

[M], G.S. Maddala, *Limited-dependent and Qualitative Variables in Econometrics*, Cambridge University Press, 1983

### **Additional Resources:**

[A], Takeshi Amemiya, *Advanced Econometrics*, Harvard University Press, 1985

[MS], Matyas and Severstre, *The Econometrics of Panel Data*, Kluwer Academic Publishers, 1992.

[TSP] *TSP User's Guide and Reference*, <http://www.cerge.cuni.cz/tsp/tsp.htm>.

[K] Kmenta, *Elements of Econometrics*, Macmillan, NY, 1990.

[GI] Gary Chamberlain (1984) "Panel Data", in *Handbook of Econometrics* vol. II, edited by Z. Griliches and M.D. Intriligator, pp. 1247-1318. Amsterdam, North-Holland

[L], Tony Lancaster, *The Econometric Analysis of Transition Data*, Cambridge University Press, 1990

Additional references will be provided for the various topics.