Econometrics: Level I
Syllabus

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September 3, 2012

Most of you is probably interested in empirical research in economic- and finance-oriented institutions. The course on Econometrics (Level I) is designed to introduce the basic tools to analyze linear relationships among economic and financial variables and to draw conclusions thereof. Theoretical classes will be supported and complemented by empirical exercises. We will try to address empirical and policy relevant questions, such as the response of inflation to an accommodative monetary policy, or the consequences of credit tightening on the economic activity. As a consequence, the course will require the use of computers and programs; in the first part we will mainly work with Excel and in the second part of the course we will use Octave, a licence-free version of Matlab. It is scheduled an introductory class on how to program in Octave. The course is divided in two parts. In the first part, we study the linear multivariate regression model. In the second part, we look closely to the study of variables that evolve over time.

Prerequisites are the knowledge of elementary calculus, matrix algebra and basic concepts of statistics and probability (a fresh-up class of probability and statistics is provided at the beginning of the course). Students are supposed to hand in a number of take-home problem sets.

Grading. There are two partial exams and eight problems sets. Problem sets contribute to half of the final grade and partial exams contribute the other half. Each partial exam counts 25% of the final grade. Problem sets can be done in groups of two/three people max.

The course organization more in details is as follows:

- Part 1: Linear Multivariate Regression Model
    1. Statistics and Probability Review, (PS1)
    2. Bivariate Regression Model, intro (PS2)
    3. Bivariate Regression Model, properties (PS3)
    4. Multivariate Regression Model, (PS4)
    5. Multivariate Regression Model, Pitfalls and Practice
    6. Partial Exam (1 h) and Introduction to Octave
- Part 2: Applied Times Series
    1. Basic Concepts in Applied Times Series, AR, MA and ARMA processes (PS1)

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2. Forecasting and Linear Projections (PS2)
3. VAR and Structural VAR (part 1) (PS3)
4. VAR and Structural VAR (part 2) (PS4)
5. Maximum Likelihood and Arch models
6. Partial Exam (1 h)

References

You can mostly rely on the slides. However, below a list of suggested text books and reading.

First Part:
Greene W.H., *Econometric analysis*, 5ed., Prentice Hall, 2003 (*)
Hayashi F., *Econometrics*, Princeton University Press, 2000
Maddala G.S., *Introduction to econometrics*, 2ed., Macmillan, 1992
Wooldridge J.M., *Introductory econometrics*, South-Western College Pub., 2003
Stock J.H. and Watson, M. W., *Introduction to Econometrics*, 3rd Ed., Addison-Wesley Series in Economics, 2011
Second Part:
Hamilton J.D., *Time series analysis*, Princeton University Press, 1994 (*)
Canova F. *Methods for applied macroeconomic research*, Princeton University Press, 2007)
Sims, Macroeconomics and Reality (1980), *Econometrica* (VARs)