

Principles of Estimation and Inference in Econometrics
European University Institute, November-December 2005

This course is ‘Compulsory Block 2’ of the Statistics/Econometrics sequence. It meets for five weeks, with an examination in the seventh week. Assessment depends entirely on the examination result. There will be problem sets for each week of the course; these will usually be distributed at the first lecture of the week. If you hand them in by noon of the following Monday, the TA (Alexander Muravyev) will undertake to grade them, in the sense that he will correct them and provide personalized comments. Alexander will also conduct a ‘problem session’ each week, concerning the previous week’s lectures and problem set. This session will typically take place on Tuesdays, so before the next week’s first lecture which is scheduled for Wednesday.

The lectures will not follow any textbook closely, but will generally follow the subject matter and level of Greene, *Econometric Analysis*, Fifth Edition, with heavy supplementation from Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, MIT Press.

It is impossible to learn econometrics without ‘doing econometrics’, which in turn is impossible without computer software and data. If you end up doing anything empirical in economics, you will need to do some econometric estimation, and this inevitably requires either programming in some language or using a computer ‘package’, and usually both. This in turn requires an important amount of personal investment, which will affect your subsequent research, your views on software, and particularly how you think about programming (personally, I can write Fortran in any language—if you understand this joke, you have the point.) Consequently, most econometrician’s views on programming are strongly held, arbitrary, and largely determined by accidents of personal history.

Personally, I like R (google ‘CRAN’ and go to the first entry) for a ‘package’ and Ox for a programming language. Stata, Matlab, and Gauss are other reasonable choices. I will provide some scripts in R to run the problem sets, but you will be able to do these in any language you choose. I will discuss software further in the first lecture.

Schedule of Topics and Readings

- (1) Week 1. OLS estimation of the linear model. Practical tricks, interpretation of estimates, remedies for failures of ‘ideal conditions’. Greene: Chapters 1-4; Chapter 7, pp 116-120.
- (2) Week 2. Instrumental variables; identification; endogeneity; systems of equations (elementary treatment). Greene: Chapter 5.
- (3) Week 3. Theory of maximum likelihood and M-estimation; QMLE. Greene: Chapter 17.
- (4) Week 4. Quantile regression. There is a very brief treatment in Greene: pp. 448-450. Also the following by Roger Koenker: ‘Short course on quantile regression’, ‘Quantile regression manual’, and Chapter 1-2, ‘Quantile Regression’, Econometric Society Monograph 38, 2005, Cambridge University Press; also Koenker and Hallock, ‘Quantile regression,’ *Journal of Economic Perspectives*, **15**, 2001, pp 143-156.
- (5) Week 5. Generalized method of moments (GMM). Greene: Chapter 18.

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