barcelona|gse
graduate school of economics

6 ECTS

12E016

Econometric Methods II

Overview and Objectives

This course deals with the econometric issues related to the use of microdata (individual, household or firm data) in empirical analysis. We will discuss the most important microeconometric methods and their applicability in contexts typically encountered by empirical researchers. The course combines both theoretical and empirical aspects. The theoretical part of the course will be complemented with practical exercises to be solved by the students using real data sets and Stata.

Course Outline

1. Randomized Experiments (Stephan Litschig, 6 hours)
    a. Identification and estimation of causal effects with experimental data
    b. Conditional mean independence and conditional randomization
    c. Heterogeneity in treatment effects
    d. Imperfect compliance
    e. Spill-overs/externalities/general equilibrium effects
    f. Applications

2. Natural Experiments and the Problems with Weak Instruments (Stephan Litschig, 4 hours)
    a. Natural experiments vs. instrumental variable approaches
    b. Problems with weak instruments
    c. Applications

3. Regression Discontinuity Designs (Stephan Litschig, 4 hours)
    a. Identification in RD designs
    b. Estimation in RD designs
    c. Applications

4. Selection on Observables (Regression Control and Matching) (Stephan Litschig, 4 hours)
    a. Identification in observational studies
    b. Estimation in observational studies
    c. Applications

5. Panel Data Models (Albrecht Glitz, 10 hours)
    a. Basic linear models
    b. Fixed effects vs. random effects
    c. Dynamic models
    d. GMM methods in panel data
    e. Extensions to nonlinear models
    f. Applications

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6. Discrete Choice Models (Albrecht Glitz, 4 hours)
    a. Binary choice models
    b. Multinomial choice models
    c. Nested models
    d. Ordered response models
    e. Applications

7. Tobit and Selection Models (Albrecht Glitz, 4 hours)
    a. Censoring and Truncation
    b. Tobit model
    c. Sample selection models
    d. Heckman two-step estimator
    e. Applications

8. Duration Models (Albrecht Glitz, 2 hours)
    a. Basic theory
    b. Parametric models with observed heterogeneity
    c. Models with unobserved heterogeneity
    d. Applications

9. Quantile Regression (Albrecht Glitz, 2 hours)
    a. Basic theory
    b. Applications

Required Activities

There will be three Problem Sets to hand out.

Evaluation

There will be a final exam, 70%, problem sets, 30%.

Materials

Randomized Experiments

DiNardo J. and D. S. Lee, 2010, "Program Evaluation and Research Design," *Handbook of Labor Economics*, Vol. 4A.

Duflo, E. R. Glennerster and M. Kremer, 2007, "Using Randomization in Development Economics Research: A Toolkit," *CEPR Discussion Paper* No. 6059.

Miguel E. and M. Kremer (2004), "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities," *Econometrica* 72(1).

Imbens, G. and J. D. Angrist (1994), "Identification and Estimation of Local Average Treatment Effects," *Econometrica* 62 (2), 467-475.

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Natural Experiments and Weak Instruments

John Snow (1855), On the Mode of Communication of Cholera, Churchill, London. Reprinted by Hafner, New York (1965).

Stock, J. H., J. Wright and M. Yogo, 2002, "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments," *Journal of Business and Economic Statistics*, 20, 518 – 529.
Stock, J. H. and M. Yogo, 2005, "Testing for Weak Instruments in Linear IV Regression," Ch. 5 in D. W. K. Andrews (ed.), *Identification and Inference for Econometric Models*, New York, Cambridge University Press, 109-120.

Regression Discontinuity Designs

Imbens, G. and T. Lemieux, 2007, "Regression Discontinuity Designs: A Guide to Practice," Journal of Econometrics, 2007, 142(2): 615-635.

David S. Lee and T. Lemieux, 2009, "Regression Discontinuity Designs in Economics," Journal of Economic Literature, 48(2): 281-355.

Lee, D., 2007, "Randomized Experiments from Non-random Selection in U.S. House Elections," Journal of Econometrics, 142(2): 675-697.

Jens Ludwig and Douglas L. Miller (2007), "Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design," The Quarterly Journal of Economics, 122(1): 159-208.

Selection on Observables

Dehejia, R. and S. Wahba, (2002), "Propensity Score Matching Methods for Non-experimental Causal Studies," *Review of Economics and Statistics* 84(1), 151-161.

J. D. Angrist and J.-S. Pischke, 2009, *Mostly Harmless Econometrics, An Empiricist´s Companion*, Princeton University Press.

Panel Data Models

Arellano, M. (2003), *Panel Data Econometrics*, Oxford University Press.

Baltagi, B. H. (2005), *Econometric Analysis of Panel Data*, 3rd Edition, John Wiley.

Cameron, A. C. and P. K. Trivedi (2005), *Microeconometrics: Methods and Applications*, Cambridge University Press, New York, Chapters 21-23.
Hsiao, C. (2003), *Analysis of Panel Data*, Cambridge University Press.

Wooldridge, J. M. (2002), *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge MA.

Models with Qualitative Variables & Tobit and Selection Models

Cameron, A. C. and P. K. Trivedi (2005), *Microeconometrics: Methods and Applications*, Cambridge University Press, New York, Chapters 14-16.

Greene, W. (2005), *Econometric Analysis*, 5th edition, Prentice-Hall International, Chapter 23.

Maddala, G. S. (1989), *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, New York.

Wooldridge, J. M. (2002), *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge MA, Chapters 15-17.

Duration Models

Greene, W. (2005), *Econometric Analysis*, 5th edition, Prentice-Hall International, Chapter 22.5 (Brief discussion within a standard econometrics textbook)

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Heckman, J. and B. Singer (1984), "A Method for Minimizing the Impact of Distributional Assumptions in Econometrics Models for Duration Data," *Econometrica*, 52 (2), 271-318.

Jenkins, S. P. (2005*a*), *Survival Analysis*, unpublished manuscript, Institute for Social and Economic Research, University of Essex. Downloadable from http://www.iser.essex.ac.uk/teaching/degree/stephenj/ec968/pdfs/ec968lnotesv6.pdf

Kiefer, N. (1985), "Econometric Analysis of Duration Data," *Journal of Econometrics* 28, 1-169. (Extensive survey for econometricians)

Kiefer, N. (1988), "Economic Duration Data and Hazard Functions," *Journal of Economic Literature* 26, 646-679. (Readable general survey)

Lancaster, T. (1990), *The Econometric Analysis of Transition Data*, Cambridge University Press. (The modern classic)

Wooldridge, J. M. (2002), *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge MA, Chapter 20. (Single chapter introduction in a leading graduate microeconometrics textbook)

Quantile Regression

Buchinsky, M. (1994), "Changes in the US Wage Structure 1963-1987: Applications of Quantile Regression," *Econometrica* 62 (2), 405-458.

Greene, W. (2005), *Econometric Analysis*, 5th edition, Prentice-Hall International, Chapter 16.3. (short section).

Hall, P. (1994), "Methodology and Theory for the Bootstrap," Handbook of Econometrics, Vol. IV, Chapter 39, 2342-2383.

Imbens, G. and J. M. Wooldridge (2007), "Quantile Methods," in *What's New in Econometrics?,* Notes from the NBER Summer Institute 2007 (http://www.nber.org/minicourse3.html).

Koenker, R. W. and G. Basset (1978), "Regression Quantiles," *Econometrica* 46 (1), 33-50.

Powell, J. L. (1991), "Estimation of Monotonic Regression Models under Quantile Restrictions," in Barnett, Powell and Tauchen (eds.), *Nonparametric and Semiparametric Methods in Econometrics and Statistics*, Cambridge University Press.