

Environmental Economics and Applied Microeconometrics

June 8-17th, 2015

Lappeenranta University of Technology

Instructor: Dr. Mahmut Yaşar, University of Texas Artlington

“Research is not good simply because it is mathematical or statistical, or because it makes use of ingenious machines. Research is good if it is significant, if it is fruitful, if it is consistent with established principles, or if it helps to overthrow erroneous principles.”

Henry Schultz

Course Description

This course provides a working knowledge of tools that are used to conduct empirical research in various fields, especially in the fields of business and environmental economics. The course covers the traditional and recent cross section, panel data, and limited dependent variables methods. Topics may include analysis of natural experiments/ differences-in-differences, advanced panel data methods, instrumental variable estimation, simultaneous equation models, sample selection corrections, and limited dependent variable models. There is a dual focus on conceptual framework and the application of techniques to data sets in various fields. Participants learn how to use statistical packages such as STATA to apply the methods to data to examine causal relationships. They build an understanding of appropriate methods for different research design. Participants will read and replicate published papers that apply the techniques learned in class. The replication and the examples will provide hands-on experience of each of methods covered in the course.

Course Objectives/Learning Outcomes

The objective of the course is to have an understanding of the advanced econometric techniques needed for empirical research. By the end of the course, participants should gain an understanding of the problems that inherently arise from different data and how to address them. They should obtain the necessary knowledge and skills to be able to critically assess the work in the literature, and to improve and/or apply the techniques to their own research or data analysis. They should have an understanding of empirical methods and research designs that are most commonly used in business and environmental economics fields.

Schedule and location

June 8th- 17th, 10 am – 2 pm. Lunch break 12-13.

LUT Green Campus room 7339 (8-13.6), 4304-05 (15.-17.6). Note the different room for the final three days of the course.

Registration info

All PhD students and faculty members are welcome to participate. Basic understanding of statistical methods recommended. Register by email to pirkko.kangasmaki@lut.fi no later than 29th May 2015.

Course Outline

The lectures will mostly be based on published articles. Participants will read and replicate published papers that apply the techniques learned in class. The replication and the examples will provide hands-on experience of each of methods covered in the course. I will also heavily rely on the following books.

Textbooks

Wooldridge, J. M., *Introductory Econometrics: A Modern Approach*, South-Western College Publishing, 3rd or 4th or 5th edition. (W1)

Wooldridge, J.M. *Econometric Analysis of Cross Section and Panel Data*. MIT, 2002 or 2010. (W2)

Course Schedule/Outline

(Note that this is a tentative schedule subject to modification during the course of the semester. If any changes are made they will be announced in advance.)

Topics
Review of Some Basic Material (Basics of Regression Analysis, Use of Dummy Variables, and Bootstrap)
Difference-in-Difference Estimation / Natural Experiments <ul style="list-style-type: none">a. Wooldridge Ch. 13b. Card, D., Krueger, A.B. (1994). "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." <i>American Economic Review</i>, 84, 772–93.c. Kiel, K.A. and K.T. McClain (1995). "House Prices During Siting Decision Stages: The Case of an Incinerator from Rumor Through Operation." <i>Journal of Environmental Economics and Management</i>, 28, 241-255.
Advanced Panel Data Methods (Fixed Effects Estimation, Random Effects Models, and Dynamic Panel Data Models) <ul style="list-style-type: none">a. Wooldridge Ch. 14b. Neumayer, E. (2004). "National Carbon Dioxide Emissions: Geography Matters." <i>Area</i>, 36 (1), 33-40.c. Cole, M.A., and E Neumayer (2005). "Examining the Impact of Demographic Factors On Air Pollution." <i>Population and Environment</i>, 26 (1), 5-21.d. Acemoglu, D. and S. Johnson (2007). "Disease and Development: The Effect of Life Expectancy on Economic Growth." <i>Journal of Political Economy</i>, 115, 925-985.e. Griliches Z. and J. Mairesse (1998). "Production Functions: The Search for Identification." NBER WP5067.f. Hausman, J.A. and W.E. Taylor (1981). "Panel Data and Unobservable Individual Effects." <i>Econometrica</i>, 49(6), 1377-1398.g. Mundlak, Y. (1978). "On the Pooling of Time Series and Cross Section Data." <i>Econometrica</i>, 46(1), 69-85.

- h. Vella, F. and M. Verbeek (1998). "Whose Wages do Unions Raise? A Dynamic Model of Unionism and Wage Rate Determination for Young Men." *Journal of Applied Econometrics*, 13: 163–183.
- a. Dietz, S., E. Neumayer, and I. de Soysa (2007). "Corruption, the Resource Curse and Genuine Saving." *Environment and Development Economics*, 12 (1), 2007, 33-53.
- b. Anderson, T.W. and C. Hsiao (1981). "Estimation of Dynamic Models with Error Components." *Journal of American Statistical Association*, 76, 598-606.
- c. Anderson, T.W. and C. Hsiao (1982). "Formulation and Estimation of Dynamic Models Using Panel Data." *Journal of Econometrics*, 18, 47-82.
- d. Arellano, M. and S. Bond (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, 58, 277-297.
- e. Baltagi, B. H. and D. Levin (1992). "Cigarette Taxation: Raising Revenues and Reducing Consumption." *Structural Change and Economic Dynamics*, 3, 321-335.
- f. Blundell, R. and S. R. Bond (1998). "GMM Estimation with Persistent Panel Data: An Application to Production Functions." Mimeo, Institute for Fiscal Studies, London.
- g. Blundell, R., S. R. Bond, and F. Windmeijer (2000). "Estimation in Dynamic Panel Data Models: Improving on the Performance of the Standard GMM Estimators." The Institute of Fiscal Studies, London.
- h. Bond, S.R. (2002). "Dynamic Panel Data Models: A Guide to Microdata Methods and Practice." *Portuguese Economic Journal* 1, 141-162.
- i. Wagner, U.J. and C.D. Timmins (2009). "Agglomeration Effects in Foreign Direct Investment and the Pollution Haven Hypothesis." *Environmental and Resource Economics*, 43, 231-256 (D)
- j. Yang, X. and Y. Yao (2012). "Environmental Compliance and Firm Performance: Evidence from China." *Oxford Bulletin of Economics and Statistics*, 74(3), 397-424. (S)
- k. Keller, W. and A. Levinson (2002). "Pollution Abatement Costs and Foreign Direct Investment." *Review of Economics and Statistics*, 84, 691-703 (S / D)
- l. Asiedu, E. and D. Lien (2011). "Democracy, Foreign Direct Investment and Natural Resources." *Journal of International Economics*, 84, 99-111 (D)
- m. Baryshnikova, N.V. (2010). "Pollution Abatement and Environmental Equity: A Dynamic Study," *Journal of Urban Economics*, 68, 183-190 (D)

Instrumental Variables Estimation

- a. Wooldridge Ch. 15
- b. Frankel, J. A. and A. K. Rose (2005) "Is Trade Good or Bad for the Environment? Sorting Out the Causality." *The Review of Economics and Statistics*, 87(1), 85-91.
- c. Card, D. (1995). Using Geographic Variation in College Proximity to Estimate the Return to Schooling. In *Aspects of Labour Market Behavior: Essays in Honour of John Vanderkamp*, ed. L. N. Christophides, E. K. Grant, and R. Swidinsky, 201–222. Toronto: University of Toronto Press.

Simultaneous Equations Models / Structural Equation Modeling

- a. Wooldridge Ch. 16

- b. Romer, D. (1993). "Openness and Inflation: Theory and Evidence." *Quarterly Journal of Economics* 108, 869-903.

Limited Dependent Variable Models and Sample Selection Corrections (Logit, Probit, Tobit, Poisson, Negative Binomial, Heckman Sample Selection Corrections)

- a. Wooldridge Ch. 17
- b. Dechezleprêtre, A., R. Perkins, and E. Neumayer. "Environmental Regulation and the Cross-Border Diffusion of New Technology: Evidence from Automobile Patents." *Research Policy*, Forthcoming. (NB)
- c. Fredriksson, G., E. Neumayer, R. Damiana, and Scott Gates (2005). "Environmentalism, Democracy, and Pollution Control." *Journal of Environmental Economics and Management*, 49 (2), 343-365. (Tobit)
- d. Mroz, T.A. (1987). "The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions." *Econometrica* 55, 765-799.
- e. Flues, F., A. Michaelowa, and K. Michaelowa (2010), "What Determines UN Approval of Greenhouse Gas Emission Reduction Projects in Developing Countries?" *Public Choice*, 145, 1-24 (Probit)
- f. Altomonte, C. and E. Pennings (2008). "Learning from Foreign Investment by Rival Firms: Theory and Evidence." *International Journal of Industrial Organization*, 26, 1203-1217 (Count Data)
- g. Georgopoulos, G.J. (2008). "Cross-Border Mergers and Acquisitions: Does the Exchange Rate Matter? Some Evidence for Canada." *Canadian Journal of Economics*, 41, 450-474 (Count Data)
- h. Condliffe, S. and O.A. Morgan (2009). "The Effects of Air Quality Regulations on the Location Decisions of Pollution-Intensive Manufacturing Plants." *Journal of Regulatory Economics*, 36, 83-93 (Count Data)

Production Function Estimates and Total Factor Productivity Measurement: Simultaneity, Heterogeneity, Entry and Exit, Selection

- a. Evans, D. S. (1987). "The Relationship between Firm Growth, Size, and Age: Estimates for 100 Manufacturing Industries." *Journal of Industrial Economics*, 197-211.
- b. Griliches Z., J. Mairesse (1998). "Production Functions: The Search for Identification." NBER WP5067.
- c. Hall, B. H. (1987). "The Relationship between Firm Size and Firm Growth in the U.S. Manufacturing Sector." *Journal of Industrial Economics*, 212-236.
- d. Levinsohn, J. and A. Petrin (2003). "Estimating Production Functions Using Inputs to Control for Unobservables." *Review of Economic Studies*, 70(2), 317-41.
- e. Olley, G.S. and A. Pakes (1996). "The Dynamics of Productivity in the Telecommunications Equipment Industry." *Econometrica*, 64(6), 1263-97.
- f. Sutton, J. (1997). "Gibrat's Legacy." *Journal of Economic Literature*, 35, 40-59.

If Time Permits:

Propensity Score Matching Methods

Quantile Regressions