

ECO 418H

EMPIRICAL APPLICATIONS OF ECONOMIC THEORY

University of Toronto. Department of Economics. Spring 2012

Prof. Carlos J. Serrano
Department of Economics
Office: 150 St. George St., Room 308

Prof. Junichi Suzuki
Department of Economics
Office: 150 St. George St., Room 306

Office hours: Tue 4.10am-5:00pm or by appointment [Serrano]
Mon 2.00am-3:00pm [Suzuki]
Lecture: Wed 2.10pm-4.00pm. Room TC 22
Tutorial: Wed 4.10pm-5pm. Room TC 22

COURSE DESCRIPTION

This course covers methods and applications in economic theory. This year we will focus on econometric methods and their application that are at the core of the new empirical industrial organization. Such topics are the estimation of demand functions, estimation of production functions, estimation of single agent decision problems, and estimation of games. We will also go over potential applications of these methods into other fields of economics such as the economics of innovation, economics of education, urban economics, and labor economics, as well as topics drawn from our own research work.

The course will emphasize the interactions between economic theory and empirical methods rather than focusing just on the statistical analysis. I have organized the course in six parts (see main references below). The papers which appear with an asterisk (i.e., *) in the reference are mandatory and you should read them. I expect you to participate in the class discussion of some of these papers.

LECTURES

There will be two hours of lectures every week. Wed 2.10pm-4.00pm. We will be meeting at TC 22

COMPUTATION

To complete the problem sets you must be familiar or learn a statistical package like Stata or SAS. However, if you plan to apply for graduate school and are interested in empirical work, then you should seriously consider learning a computational language such as Matlab, Gauss, or Fortran.

There will be a teaching assistant to help students with both statistical packages. We will organize two or three tutorials during the semester for statistical packages.

TEXTBOOK

There will be no text book; the course will be based on published and working papers.

EVALUATION

The final exam grade will be based on three problem sets, one midterm, and a final exam. Problem sets 40%, term test 30%, and final exam 30%. The final exam will not be cumulative. If you miss the midterm test due to medical reasons, there will be a make-up test. Students are reminded that ALL students who miss a test for medical reasons MUST contact me and submit a doctor's note immediately. You must provide this note to us.

Students are strongly encouraged to collaborate on problem sets. However, students should write the final answer to the problem sets on your own and submit them individually. Students must acknowledge the help of classmates and others by citing their names in the problem sets. Problem sets submitted within one day after the deadline will receive 50% of the points. Problem sets submitted one day or more after the deadline will receive zero points.

CONTENTS OF THE COURSE

1. Introduction (0-1 week)
2. Estimation of demand and supply functions / differentiated products. Instrumental variables and the role of simulation (2-3 weeks)
3. Estimation of production functions. Simultaneity and endogenous firm exit (2 weeks)
4. Estimating the Effects of the Market for Innovation on Patent Litigation (1 week)
5. Static game of complete information (3-4 weeks)
6. Static game of incomplete information (2-3 weeks)

References

1. Introduction

- * [ABBA] D. Akerberg, L. Benkard, S. Berry and A. Pakes, "Econometric Tools for analyzing Market Outcomes," forthcoming in *Handbook of Econometrics*, Volume 6. Available at <http://www.stanford.edu/~lanierb/research/tools81-6-8.pdf> . Introduction section.
- * Griliches (1990), "Patent Statistics as Indicators: Survey", *Journal of Economic Literature*, vol. 28, No. 4, pp. 1661-1707.
- * [RW] Reiss, Peter, and Wolak, Frank (2006): "Structural Econometric Modeling: Rationales and Examples from Industrial Organization," *Handbook of Econometrics*, volume 6, forthcoming. Available at <http://www.stanford.edu/~preiss/makeit.pdf> . Sections 1 to 4.

2. Demand and Supply Estimation / Differentiated Products

2.1. Introduction: Empirical questions and econometric issues

- * [ABBA] Section 1
- * [RW]. Sections 5 to 7.
- Angrist, Josh, Graddy, Kathryn, and Imbens, Guido (2000): "The Interpretation of Instrumental Variables Estimators in Simultaneous Equations Models with an Application to the Demand for Fish," *Review of Economic Studies*, 67, 3, 499-527.
- Hausman, Jerry, G. Leonard, and J. Zona (1994): "Competitive Analysis with Differentiated Products," *Annales D'Economie et de Statistique*, 34, 159-180.

2.2. Models in characteristics space with heterogeneous agents

- * Anderson, S., A. de Palma, and J.-F. Thisse (1992): "Discrete choice theory of product differentiation", Cambridge, MA. MIT Press. Chapter 7.
- * Berry, S., (1994), "Estimating Discrete Choice Models of Product Differentiation", *RAND*, vol. 25, no. 2, pp. 242-262.

2.3. Simulation-based estimation

- Hajivassiliou, V. and P. Ruud (1994): "Classical Estimation Methods for LDV Models Using Simulation," in R. Engle and D. McFadden (eds.), *Handbook of Econometrics*, vol. 4. North-Holland.
- McFadden, D. and K. Train (2000): "Mixed MNL models for discrete response," *Journal of Applied Econometrics*, 15, 447-470.
- Nevo, Aviv (2000): "A Practitioners Guide to Estimation of Random Coefficients Logit Models of Demand," *Journal of Economics & Management Strategy*, 9(4), 513-548.
- Train, K. (2003): "Discrete Choice Methods with Simulation," Cambridge University Press.

2.4. Applications to static models with aggregate data

- * Berry, S., J. Levinsohn, and A. Pakes (1995): "Automobile Prices in Market Equilibrium," *Econometrica*, 63(4), 841-890.

- Bresnahan, T. (1987): "Competition and Collusion in the American Auto Industry: The 1955 Price War," *Journal of Industrial Economics*, 35, 457-482.
- Bresnahan, T., S. Stern and M. Trajtenberg (1997): "Market Segmentation and the Sources of Rents from Innovation: Personal Computers in the Late 1980s." *The Rand Journal of Economics*, 28, S17-S44.
- * Nevo, A. (2001): "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica*, 69(2).
- Petrin, A. and K. Train (2005). Control function corrections for omitted attributes in differentiated product models. wp, University of Chicago.

2.5. Applications to static models with consumer level data

- Allenby, G. and P. Rossi (1998): "Marketing models of consumer heterogeneity," *Journal of Econometrics*, 89(1).
- Berry, S., J. Levinsohn, and A. Pakes, (2003): "Differentiated Product Demand Systems From a Combination of Micro and Macro Data: The New Car Market", Harvard University working paper.

2.6. New goods

- Bresnahan, Timothy F. and Robert J. Gordon, eds., 1997, *The Economics of New Goods*, Chicago, Il: University of Chicago Press.
- Hausman, J. A. (1994). Valuation of new goods under perfect and imperfect competition. NBER wp 4970.
- Petrin, Amil. 2002. Quantifying the Benefits of New Products: The Case of Minivans, *Journal of Political Economy*, 110(4), 705-727.
- * Trajtenberg, Manuel (1989): "The Welfare Analysis of Product Innovations, with an Application to Computed Tomography Scanners," *Journal of Political Economy*, 97, 2, 444-79.

3. Production Function Estimation

3.1 Introduction

- * [ABBA]. Section 2.
- * Griliches, Zvi, and Jacques Mairesse (1995): "Production Functions: The Search for Identification," NBER Working Paper No. 5067. <http://www.nber.org/papers/W5067>
- Marschak, Jacob, and William Andrews (1944) "Random Simultaneous Equations and the Theory of Production," *Econometrica*, 12, 3/4, 143-205. See Also Marschak and Andrews, 1945, Errata, 13,1, 91.

3.2. Using lagged inputs as instruments

- * Blundell, R. and S. Bond (1999): "GMM estimation with persistent panel data: An application to production functions," The Institute for Fiscal Studies. Working Paper Series No. W99/4. <http://www.ifs.org.uk/wps/wp9904.pdf>

3.3. Control function approach

- Akerberg, D., K. Caves and G. Frazer (2003): "Structural Identification of

Production Functions,” manuscript.

- Levinsohn, J. and A. Petrin (2003): "Estimating production functions using inputs to control for unobservables," *Review of Economic Studies*, pp. 317-342.

<http://www.nber.org/papers/w7819.pdf>

- * Olley, S., and A. Pakes (1996), "The dynamics of productivity in the telecommunications equipment industry", *Econometrica*, 64, 1263-97.

4. The markets for patents, and patent litigation ideas and technology

- * Galasso, A., Schankerman, M., and Serrano, C.J. (2011), "Trading and Enforcing Patent Rights." Working paper, University of Toronto.

5. Static games of complete information

5.1 Introduction

- * [BR] Berry, S. and Reiss, P. (2006). "Empirical Models of Entry and Market Structure," in *Handbook of Industrial Organization*, Volume III, 1845-1886. Elsevier.

5.2 Homogenous Players

- * [BR] Section 1-2

- Bresnahan, T.F. and Reiss, P. (1990). "Entry in Monopoly Markets", *Review of Economic Studies*, 57: 531-553.

- Bresnahan, T.F. and Reiss, P. (1991b). "Entry and Competition in Concentrated Markets", *Journal of Political Economy*, 99(5): 977-1009.

5.3 Application: Free Entry and Efficiency

- * Berry, S.T. and Waldfoegel, J. (1999). "Free Entry and Social Inefficiency in Radio Broadcasting", *RAND Journal of Economics*, 30(3): 397-420.

- Mankiw, N. G. and Whinston, M. D. (1986). "Free Entry and Social Inefficiency", ", *RAND Journal of Economics*, 17(1): 48-58.

5.4 Heterogenous Players

- * [BR] Section 3.1-3.3

- Bajari, P., Hong, H. and Ryan, S. (2010). "Identification and Estimation of a Discrete Game of Complete Information", *Econometrica*, 78 (5), 1529-1568.

- Bresnahan, T.F. and Reiss, P. (1991a). "Empirical Models of Discrete Game", *Journal of Econometrics*, 48: 57-81.

- Berry, S. (1992). "Estimation of a Model of Entry in the Airline Industry", *Econometrica*, 60 (4), 889-917.

- Ciliberto, F., and Tamer, E. (2009). "Market Structure and Multiple Equilibria in the Airline Industry", *Econometrica*, 77(6): 1791-1828.

- Mazzeo, M. (2002) "Product Choice and Oligopoly Market Structure". *Rand Journal of Economics* 33 (2), 1-22.

- Tamer (2003) "Incomplete Simultaneous Discrete Response Model with Multiple Equilibria". *Review of Economic Studies* 70: 147-165.

6. Static games of incomplete information

- * [BR] Section 3.4

- * Bajari, P., Hong, H., Krainer, J. and Nekipelov, D. (2010). “Estimating Static Models of Strategic Interaction”, *Journal of Business and Economic Statistics*, 28 (4), 469-482.

- Datta, Sumon. (2011). “Does Reducing Spatial Differentiation Increase Product Differentiation? Effects of Zoning on Retail Entry and Format Variety”, Purdue University Working paper.

- Ellickson, P. and Misra, S. (2008). “Supermarket Pricing Strategies”, *Marketing Science*, 27(5): 811-828.

- Seim, K. (2010) “An Empirical Model of Firm Entry with Endogenous Product-Type Choices”. *Rand Journal of Economics* 37 (3), 619-640.

- Sweeting, A. (2009) “Coordination Games, Multiple Equilibria and the Timing of Radio Commercials”. *Rand Journal of Economics* 40 (4).