

Graduate IO - Spring 2006 Syllabus
EMPIRICAL METHODS IN INDUSTRIAL ORGANIZATION

ECO 2901H,S - Industrial Organization & Public Organization II

Instructor:

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Lectures: Tuesday 3-5pm, room KP113

Office hours: by appointment, send me an email

Requirements:

Students have to make three problem sets, give a presentation, and submit a research proposal; each counts for one fifth of the final grade.

There will be empirical problem sets on three of the four topics that the course covers. For this, you will need to be familiar or become familiar with a statistical package like Gauss, Matlab, or TSP to perform the empirical component.

In the first topic of the course, estimating market power, each student has to select an industry and briefly (approximately 30') present a paper that estimates market power in that industry. All students are expected to have read these papers and to participate in the discussion afterwards.

The final fifth of the grade is based on a research proposal in empirical i.o., not limited to topics covered in the class. It can be brief, as short as 5 pages, as long as it makes clear what the goal of the paper is and how it will be accomplished. The proposal will be evaluated on clarity, originality and feasibility.

Deadlines:

- Problem sets (3x20%): One week after the topic is over – you can work together, but everyone needs to turn in his/her own assignment
- Presentations (20%): Weeks 3 and 4 of the course – you should let me know the paper you want to present by email by January 17 (first come - first served)
- Proposal (20%): April 25, 2006 – 2 weeks after classes are over

Course Outline

1. Introduction: Measuring market power (4 weeks)

Introduction:

- Bresnahan, Timothy (1989): “Empirical Studies of Industries with Market Power”, *The Handbook of Industrial Organization, Vol. 2, Chapter 17*.
- Bresnahan, Timothy (1982): “The Oligopoly Solution Concept is Identified”, *Economics Letters*, 10, 87–92.
- Corts, Kenneth S. (1999): “Conduct parameters and the measurement of market power,” *Journal of Econometrics*, 88, 227–250.

Presentations:

Each student presents a paper on the estimation of market power in one industry. It is crucial to illustrate and critically discuss how (the author claims that) market power is identified. Some possible papers are listed below, but others are certainly allowed.

- Railroads: Porter, R. (1983): “A Study of Cartel Stability: The Joint Executive Committee 1880-1886”, *Bell Journal of Economics*, 14(2), 301–14.
- Automobiles: Bresnahan, T. (1987): “Competition and Collusion in the American Automobile Oligopoly: The 1955 Price War”, *Journal of Industrial Economics*, 35(4), 457–482.
- Electricity: Borenstein, S., J. Bushnell, and F. Wolak (2003): “Measuring Market Inefficiencies in California’s Restructured Wholesale Electricity Market,” *American Economic Review*, 92(5), 1376–1405.
- Airlines: Borenstein, S. (1989): “Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry”, *RAND*, 20(3), pp. 344–65.
- Gasoline: Borenstein, S. and A. Shepard, (1996): “Dynamic Pricing in Retail Gasoline Markets” *RAND*, 27, 429-51.
- Sugar: Genesove, D. and W. P. Mullin (1998): “Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914”, *RAND Journal of Economics*, 29(2), pp. 355–77.
- Oil: Smith, J. L. (2005): “Inscrutable OPEC? Behavioral Tests of the Cartel Hypothesis”, *Energy Journal*, 26(1), pp. 51–82
- Computers: Bresnahan, T. F., S. Stern, and M. Trajtenberg (1997): “Market Segmentation and the Sources of Rents from Innovation: Personal Computers in the Late 1980s,” *RAND*, 28(0), 17–44.
- Supermarkets: Smith H. (2004): “Supermarket Choice and Supermarket Competition in Market Equilibrium” *Review of Economic Studies*, 71(1), pp. 235–63.

- Small retail: Bresnahan, T. and P. Reiss, (1991): “Entry and Competition in Concentrated Markets”, *Journal of Political Economy* 99(5), pp. 977–1009.
- Health care: Sorensen A. T. (2003): “Insurer-hospital bargaining: negotiated discounts in post-deregulation Connecticut,” *Journal of Industrial Economics* 51(4), pp. 469–90. (and other papers in the same issue)
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2. Production functions and productivity (3 weeks)

Semi-parametric identification:

Structural approach to production function estimation without distributional assumptions on the unobservables and a long panel.

- Olley, S. and A. Pakes (1996): “The Dynamics of Productivity in the Telecommunications Equipment Industry”, *Econometrica*, 1263-1297.
- Levinsohn, J. and A. Petrin (2003), “Estimating Production Functions Using Inputs to Control for Unobservables”, *Review of Economic Studies*, 70 (2), 317–342
- Akerberg, D. A., K. Caves, and G. Frazer) (2005): “Structural Identification of Production Functions”, *Working paper*, University of Arizona

Price heterogeneity:

Effects on production function estimates when prices are not homogenous across firms. Applications look at the returns to scale, productivity, and mark-up estimates.

- Klette, T. J. and Z. Griliches (1996), “The Inconsistency of Common Scale Estimators When Output Prices Are Unobserved and Endogenous.” *Journal of Applied Econometrics*. 11 (4), 343-361.
- Melitz, M. (2000), “Estimating Firm-Level Productivity in Differentiated Product Industries”, *mimeo*, Harvard University
- DeSouza, S. A. “Estimating Markups From Plant-Level Data”, *mimeo*, CAEN
- Katayama, H., S. Lu, and J. R. Tybout (2005), “Firm-level Productivity Studies: Illusions and a Solution”, *mimeo*, Penn State University

3. Dynamic Behavior: Single agents (3 weeks)

Background: Intro to dynamic programming, definitions, and crucial theorems

- Pakes' dynamics notes: lectures 1-4a
<http://www.courses.fas.harvard.edu/~ec2610/lectures/>

Nested fixed point algorithm:

- Rust, J., (1987): "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher", *Econometrica*, 55(5), 999-1033.

Recent advances: The first paper introduces a computationally lighter approach derived from the conditional choice probabilities. The second paper shows how the Rust (1997) and Hotz and Miller (1993) methods are extreme cases of a different nested algorithm.

- Hotz, J., R. Miller, (1993): Conditional Choice Probabilities and the Estimation of Dynamic Models, *Review of Economic Studies*, 60, 497-529.
- Aguirregabiria, V. and P. Mira (2002): "Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models," *Econometrica* 70(4), July, 1519-43.

Reference papers: single agent

- Pakes, A., (1986): "Patents as Options: Some Estimates of the Value of Holding European Patent Stocks", *Econometrica*, 54(4), 755-84.
- Pakes, A. and P. McGuire (1994): "Computing Markov-Perfect Nash Equilibrium: Empirical Implications of a Dynamic Model," *RAND Journal of Economics* 555-89.
- Aguirregabiria, V., (1999): "The Dynamics of Markups and Inventories in Retail Firms", *Review of Economic Studies*, 66(2), 275-308.
- Timmens, C. D., (2003): "Measuring the Dynamic Efficiency Costs of Regulators' Preferences: Municipal Water Utilities in the Arid West," *Econometrica* 70(2), March, 603-29.

Reference papers: multi agent

- Jovanovic, B., (1982): "Selection and the Evolution of Industry", *Econometrica*, 649-670.
- Hopenhayn, H., (1992): "Entry, Exit, and Firm Dynamics in Long Run Equilibrium," *Econometrica*, Vol. 60, No. 5, pp. 1127-50.
- Ericson, R., A. Pakes, (1995): "Markov Perfect Industry Dynamics: A Framework for Empirical Work", *Review of Economic Studies*, 53-82.

Reference papers: dynamic games

- Aguilgibirria, V. and P. Mira (2005): “Sequential Estimation of Dynamic Games,” forthcoming *Econometrica*
- Bajari, P, L. Benkard, and J. Levin (2004): “Estimating Dynamic Models of Imperfect Competition,” *mimeo*, Stanford University
- Pakes, A., M. Ostrovski, S. Berry (2004): “Simple Estimators for the Parameters of Dynamic Games (with Entry/Exit Examples),” *mimeo*, Harvard University
- Pesendorfer, M. and P. Schmidt-Dengler (2003): “Identification and Estimation of Dynamic Games,” NBER Working paper No. 9726

4. **Within the firm.** (3 weeks)

Transaction Costs, Property Rights and Vertical Integration

Classics

- Monteverde, K. and D. J. Teece (1982): “Supplier Switching Costs and Vertical Integration in the Automobile Industry,” *Bell Journal of Economics* 13(1), pp. 206–13
- Joskow, P. L. (1985): “Vertical Integration and Long-term Contracts: The Case of Coal-burning Electric Generating Plants,” *Journal of Law, Economics, and Organization* 1(1), pp. 33–80
- Joskow, P. L. (1987): “Contract Duration and Relationship-Specific Investments: Empirical Evidence on Coal Markets,” *American Economic Review* 77(1), pp. 168–85.

Newer papers

- Woodruff, C. (2002): “Non-Contractible Investments and Vertical Integration in the Mexican Footwear Industry,” *International Journal of Industrial Organization*, 20(8), pp. 1197–1224
- Whinston, M. D. (2003): “On the Transaction Cost Determinants of Vertical Integration”, *Journal of Law Economics & Organization*, 19(1), pp. 1–23
- Baker, G. and T. Hubbard (2004): “Contractibility and Asset Ownership: On-Board Computers and Governance in U.S. Trucking,” *Quarterly Journal of Economics* 119(4), pp. 1443–79.
- Acemoglu, D., P. Aghion, R. Griffith, F. Zilibotti (2005): “Vertical Integration and Technology: Theory and Evidence”, CEPR Working Paper, August.

Contracting and Learning

Classics

- Shepard, A. (1993): “Contractual Form, Retail Price, and Asset Characteristics in Gasoline Retailing,” *RAND Journal of Economics*, 24(1), pp. 58–77.

Newer papers

- Mortimer, J. (2004), “Vertical Contracts in the Video Rental Industry” *mimeo* Harvard University.
- Israel, M. (2005), “Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance”, *American Economic Review*, December
- Levin J. and S. Tadelis (2005): “Contracting for Government Services: Theory and Evidence from U.S. Cities,” *mimeo*, Haas School of Business