

Economics 696Q – Empirical Methods in Industrial Organization

University of Arizona, Spring 2008
Thursday, 12:45-3:15pm, McClelland 401KK

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Office hours: by appointment, or just stop by
Class web page: <http://www.u.arizona.edu/~mxiao/teach/e696q/index.htm>

COURSE SUMMARY

This course focuses on research methods in empirical industrial organization. Every 1-2 weeks, we will review 4-5 recent empirical papers centered on a particular topic. We will discuss in detail the research question, related theories, data, sources of identification, estimation techniques and policy implications. There is no textbook.

Necessary Background: With a focus on teaching empirical research skills, we assume you are familiar with the theory behind the economic models we will be studying. You should obtain a copy of the text by Tirole, *The Theory of Industrial Organization*, and use that to update your knowledge on models we cover.

COURSE ASSESSMENT

- Class assessment is a combination of

- In-class presentation 20%

The in-class presentation is 30 minutes, and should be done during the class session where we discuss the topic that you are presenting. Please sign up for the in-class presentation by e-mailing the teaching assistant your preferred date and paper. Any paper marked with a # is open to student presentation.

- Two (computational) problem sets 30%

Details of the computational problem sets will be provided in class.

- One referee report 20%

We will provide a list of papers on which you may base your report.

- Final exam: 30%

We will give you an oral exam based on a paper we provide you two weeks in advance.

COURSE REQUIREMENTS

We will discuss papers with * in the reading list in detail in class. You are expected to read these papers before coming to class and participate in classroom discussion. The following questions can serve as guidelines in your reading:

1. What is the question the author(s) claim to answer (or be motivated by)?
2. What are the main findings of the paper? What questions remain open?
3. What is the theoretical/empirical methodology used in the paper? What is the source of identification?
4. Where does (do) the author(s) get the data? What are the pros and cons of the data in this research?

A more detailed list of questions is provided at the end of the syllabus.

LECTURE OUTLINE (subject to change)

Note: You must read papers with *. Papers with # are open to student presentation. Other papers are useful to read depending on your interests.

Topic 1: Introduction (Gowrisankaran, Xiao), one class

* Schmalensee, R. (1989), "Interindustry Studies of Structure and Performance," *Handbook of Industrial Organization*, edited by R. Schmalensee and R. Willig.

Tirole (1988), Introduction, *The Theory of Industrial Organization*, MIT.

Topic 2: Production Function Estimation (Xiao), two classes

* Griliches Z. and Mairesse J. (1995), "Production Functions – The Search for Identification", *NBER Working Paper #5067*.

* Christensen L. and W. Greene (1976), "Economies of Scale in U.S. Electric Power Generation," *Journal of Political Economy*, 84(4), 655-76.

* Olley, S. and Pakes, A. (1996), "The Dynamics of Productivity in the Telecommunications Equipment Industry" *Econometrica*, 64 (6) 1263-97.

* Levinsohn, J. and Petrin, A. (2003), "Estimation of Production Functions using Inputs to Control for Unobservables", *Review of Economic Studies*, 70(2), 317-342.

Mundlak, Y. (1963), "Estimation of Production and Behavioral Functions from a Combination of Cross-Section and Time-Series Data," in Christ and others, *Measurement in Economics: Studies in Mathematical Economics and Econometrics*, Stanford University Press, 1963.

Panzar, J. "Technological Determinants of Firm and Industry Structure," *Handbook of Industry Organization*, Vol. 1, Chapter 1.

Berry, S., S. Kortum and A. Pakes (1996), "Environmental Change and Hedonic Cost Functions for Automobiles," *Proceedings of the National Academy of Sciences*, 12731-38.

Benkard, L. (2000), "Learning and Forgetting: the Dynamics of Aircraft Production," *AER*.

Akerberg, D. and Caves, K. (2003), "Structural Identification of Production Functions," mimeo, UCLA.

N. Pavcnik, (2002) "Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants," *Restud*, January, 245-76.

Foster, L., J. Haltiwanger, and C. Syverson (2008), "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?" *American Economic Review*.

Van Biesebroeck, J. (2003), "Productivity Dynamics with Technology Choice: An Application to Automobile Assembly," *Review of Economic Studies*, 70(1), pp. 167-198.

Topic 3: Market Power in Homogeneous Goods Markets (Xiao), two classes

* Bresnahan, T. (1982) "The Oligopolistic Solution Concept is Identified", *Economics Letters* 10, 87-92.

* Bresnahan, T. (1989) "Empirical Studies of Industries with Market Power", *Handbook of Industrial Organization*, Vol. II, Chapter 17.

* Sullivan, D. (1985) "Testing Hypotheses about Firm Behavior in the Cigarette Industry", *Journal of Political Economy*, 93, 586-598.

* Porter, R. (1983) "A Study of Cartel Stability: The Joint Executive Committee, 1880-1886", *Bell Journal of Economics*, 14, 301-314.

Corts, K. (1998), "Conduct Parameters and the Measure of Market Power", *Journal of Econometrics*, 88(2), 227-50.

Gollop, F and Roberts, M (1979) "Firm Interdependence in Oligopolistic Markets", *Journal of Econometrics* 10, 313-331.

Wolfram, C. (1999) "Measuring Duopoly Power in the British Electricity Spot Market" *American Economic Review*, 89, 805-826.

Genesove, D. and Mullin, W. (1998) "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914", *RAND* 29 (2), 355-77.

S. Borenstein and A. Shepard, (1996) "Dynamic Pricing in Retail Gasoline Markets," *Rand Journal of Economics*, 429-51

Ellison, G. (1994) "Theories of Cartel Stability and the Joint Executive Committee" *RAND* 25 (1) 37-57.

Evans, W. and I. Kessides (1994) "Living by the 'Golden Rule': Multimarket Contact in the U.S. Airline Industry," *the Quarterly Journal of Economics*.

Justine Hastings (2004), "Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California," *American Economic Review*

Topic 4: Estimating Static Differentiated Products Demand (Gowrisankaran, Xiao), three classes

* Berry S. (1994), "Estimating Discrete Choice Models of Product Differentiation," *RAND Journal of Economics*, 25, 242-262.

* Bresnahan, T. (1987), "Competition and Collusion in the American Auto Industry: The 1955 Price War," *Journal of Industrial Economics*, 35, 457-82.

* Berry S., J. Levinsohn and A. Pakes (1995), "Automobile Prices in Market Equilibrium," *Econometrica*, 60(4), 889-917.

* Berry S., J. Levinsohn and A. Pakes (2004), "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market," *JPE*.

Berry S., J. Levinsohn and A. Pakes (1999), "Voluntary Export Restraints on Automobiles: Evaluating a Strategic Trade Policy," *American Economic Review*, 89(3), 400-430.

Nevo A. (2000), "A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand," *Journal of Management and Economic Strategy*, 9(4), 513-48.

Goldberg, P. K. (1995) "Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry," *Econometrica*, 63(4), 891-951.

Aviv Nevo (2001) "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica*, 69(2), 307-342, 2001.

Amil Petrin (2002), "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy*, Vol. 110(4), 705-29.

Peter Davis (2006), "Spatial Competition in Retail Markets: Movie Theaters," *Rand Journal of Economics*.

I. Hendel, (1999), "Estimating Multiple Discrete Choice Models: An Application to Computerization Returns," *Restud*, 66(2), 423-446.

Topic 5: Models of Entry and Exit (Xiao), two classes

* Caves, R. (1998), "Industrial Organization and New Findings on the Turnover and Mobility of Firms," *Journal of Economic Literature*, 1947-82.

* Dunne, T., M. Roberts, & L. Samuelson, (1988) "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries," *Rand Journal of Economics*, 19(4), 495-515.

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

- * Berry, S. (1992) "Estimation of a Model of Entry in the Airline Industry," *Econometrica* 60:889-917.
- * Seim, K. (2006) "An Empirical Model of Firm Entry with Endogenous Product-Type Choices," *RAND Journal of Economics*, forthcoming.
- Lucas R. (1978), "On the Size Distribution of Business Firms," *Bell Journal of Economics*, 508-523.
- Simon, H. and Bonini C. (1958), "The Size Distribution of Business Firms," *AER*, 607-17.
- Sutton, J. (1997) "Gibrat's Legacy," *Journal of Economic Literature*, 40-59.
- Bresnahan T. and Reiss, P. (1990), "Entry in Monopoly Markets," *The Review of Economic Studies*, 57(4), 531-551.
- Reiss, P. C. (1996), "Empirical Models of Discrete Strategic Choices," *American Economic Review*, 86(2), 421-426.
- Sutton, J. (1991) *Sunk Costs and Market Structure* MIT Press, Chapters 1-6, and 8.
- Xiao, M. & Orazem, P. (2006) "Do Entry Conditions Vary over Time? Entry and Competition in the Broadband Market 1999-2003," mimeo, University of Rochester.
- Jia, Panle (2006). "What Happens When Wal-Mart Comes to Town: An Empirical Analysis of the Discount Retail Industry." Mimeo, MIT.
- Mazzeo, M. (2002). "Product Choice and Oligopoly Structure," *RAND* 33.
- Toivane, O. & M. Waterson (2004). "Market Structure and Entry: Where's the Beef," forthcoming, *Rand Journal of Economics*.
- Berry, S. and Waldfogel, J. (1999) "Free Entry and Social Inefficiency in Radio Broadcasting," *RAND* 30 (3) 397-420.
- Berry, S. and Waldfogel, J. (2008) "Horizontal and Vertical Product Variety in Radio Broadcasting," working paper, Yale.
- # Einav, Liran (2003). "Not All Rivals Look Alike: Estimating an Equilibrium Model of the Release Date Timing Game," Mimeo, Stanford University.
- # Xiao, M. & Orazem, P. (2007) "Entry Threat and Entry Deterrence: Evidence from the Broadband Market".

Topic 6: Single Agent Dynamic Models (Gowrisankaran), three classes

- *Rust, J. (1987): "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher," *Econometrica*, 55(5), 999-1033.
- *Gowrisankaran, G., and M. Rysman, (2006) "Dynamics of Consumer Demand for New Durable Goods," mimeo.

*Hotz, J. and R. Miller (1993) "Conditional Choice Probabilities and the Estimation of Dynamic Models," *Review of Economic Studies*, 60(3), 497-529.

Akerberg, D. (2003), "Advertising, Learning and Consumer Choice in Experience Good Markets: A Structural Empirical Examination," *International Economic Review*.

Pakes, A. (1986): "Patents as Options: Some Estimates of the Value of Holding European Patent Stocks," *Econometrica*, 54(4), 755-843.

Topic 7: Dynamic Oligopoly Models (Gowrisankaran), two classes

* Pakes, A. and P. McGuire, (1994). "Computing Markov Perfect Nash Equilibrium: Numerical Implications of a Dynamic Differentiated Product Model," *RAND Journal of Economics* 25, 555-589.

* Benkard, Lanier (2004). "A Dynamic Analysis of the Market for Wide-bodied Commercial Aircraft." *Review of Economic Studies* 71: 581-611.

* Bajari, P. L. Benkard, and J. Levin (2007). "Estimating Dynamic Models of Imperfect Competition." Forthcoming, *Econometrica*.

Pakes A., S. Berry, M. Ostrovsky (2004). "Simple Estimators for the Parameters of Discrete Dynamic Games (with Entry/Exit Examples)," mimeo, Harvard University.

Aguirregabiria, V. and P. Mira (2007). "Sequential Estimation of Dynamic Discrete Games." Forthcoming, *Econometrica*.

Dunne, T., S. Klimek, M. Roberts, and Y. Xu (2006), Entry and Exit in Geographic Markets, Mimeo, The Pennsylvania State University.

Gowrisankaran, G. and R. Town, (1997). "Dynamic Equilibrium in the Hospital Industry," *Journal of Economics and Managerial Strategy* 6, 45-74.

Ryan, Stephen (2006). "The Costs of Environmental Regulation in a Concentrated Industry." Mimeo, MIT.

Collard-Wexler, A. (2005), Demand Fluctuations and Plant Turnover in Ready-Mix Concrete, mimeo, NYU.

A Detailed List of Questions to Keep in Mind

Please keep the following questions in your mind while reading each paper. Ideally you should prepare an answer to each question before the class meets for that paper.

- What is the research question?
- Why is it interesting to study the research question?
- What theory is closely related to the empirical study? What is the testable implication from the theory?
- What industry does the author choose to address the research question? Why the industry is appropriate for the study? Do answers found in this industry applicable to other industries? If so, what are these industries and what modification are you expecting to make in order to apply the results from this study to these industries?
- How does the author get the data?
- What is the dependent variable? What is the unit of observation? What are the key explanatory variables? What is the key empirical relationship between the dependent variable and the key explanatory variables?
- What is the identification strategy? What are the other possible identification strategies and why does the author choose this one?
- What is the key empirical finding? (e.g. what is the key coefficient?)
- What economic explanation does the author offer for the empirical finding? What is the most likely alternative explanation? How does the author distinguish between these two explanations?
- Does the key empirical finding suggest any policy implications?
- What economics do we learn from this paper? Try to state it in one sentence and in your own language.