

Empirical Industrial Organization II

Syllabus

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Course Overview

This is a second course in empirical industrial organization. The material is essential for students planning to do research in empirical IO, and it will also be useful to any students interested in understanding, evaluating, and designing structural estimation strategies.

This semester, we will cover industry dynamics and productivity, dynamic discrete choice models, entry models, moment inequalities, and collusion. We will read a mix of both methodological and applied papers, and some topics will involve a little theory.

Time and Location

The course meets on Thursdays, 9:30-12:30 in MD 104.

Course requirements

Grades will be based on two problem sets and in-class participation.

Both problems sets will be due towards the end of the semester (date TBA).
Do not leave them to the last minute.

It can be very hard to understand structural estimation papers well without some learning by doing, so problem sets are very important.

Problem sets may be done in pairs.

Reading List

Broader references

There is no standard comprehensive reference for graduate-level empirical IO. The following references are useful although incomplete:

Akerberg, Daniel A. et al. (2007). “Econometric Tools for Analyzing Market Outcomes”. *Handbook of Econometrics* 6, pp. 4171–4276.

Aguirregabiria, Victor (2012). *Empirical Industrial Organization: Models, Methods and Applications*. URL: http://www.academia.edu/2816069/Empirical_Industrial_Organization_Models_Methods_and_Applications.

Industry dynamics and productivity: facts and theory

Bartelsman, Eric J. and Mark Doms (2000). “Understanding Productivity: Lessons from Longitudinal Microdata”. English. *Journal of Economic Literature* 38.3, pp. 569–594. ISSN: 00220515. URL: <http://www.jstor.org/stable/2565420>.

Dunne, Timothy, Mark J. Roberts, and Larry Samuelson (1989). “The Growth and Failure of U. S. Manufacturing Plants”. *The Quarterly Journal of Economics* 104.4, pp. 671–698. DOI: 10.2307/2937862. eprint: <http://qje.oxfordjournals.org/content/104/4/671.full.pdf+html>. URL: <http://qje.oxfordjournals.org/content/104/4/671.abstract>.

Hopenhayn, Hugo A. (1992). “Entry, Exit, and firm Dynamics in Long Run Equilibrium”. English. *Econometrica* 60.5, pp. 1127–1150. ISSN: 00129682. URL: <http://www.jstor.org/stable/2951541>.

Jovanovic, Boyan (1982). “Selection and the Evolution of Industry”. English. *Econometrica* 50.3, pp. 649–670. ISSN: 00129682. URL: <http://www.jstor.org/stable/1912606>.

Melitz, Marc J. (2003). “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity”. *Econometrica* 71.6, pp. 1695–1725. ISSN: 1468-0262. DOI: 10.1111/1468-0262.00467. URL: <http://dx.doi.org/10.1111/1468-0262.00467>.

Industry dynamics and productivity: methods

- Ackerberg, Daniel A., C. Lanier Benkard, et al. (2007). “Econometric Tools for Analyzing Market Outcomes”. *Handbook of Econometrics* 6, pp. 4171–4276.
- Ackerberg, Daniel A., Kevin Caves, and Garth Frazer (2006). “Structural Identification of Production Functions”. Working paper.
- Blundell, Richard and Stephen Bond (2000). “GMM estimation with persistent panel data: an application to production functions”. *Econometric reviews* 19.3, pp. 321–340.
- Gandhi, Amit, Salvador Navarro, and David Rivers (2013). “On the Identification of Production Functions: How Heterogeneous is Productivity?” Working Paper.
- Griliches, Zvi and Jacques Mairesse (1998). “Production Functions: The Search for Identification”. In: *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*. Vol. 31. Cambridge University Press, p. 169.
- Levinsohn, James and Amil Petrin (2003). “Estimating Production Functions Using Inputs to Control for Unobservables”. *Review of Economic Studies* 70.2, pp. 317–341.
- Marschak, Jacob and Jr. Andrews William H. (1944). “Random Simultaneous Equations and the Theory of Production”. English. *Econometrica* 12.3/4, pp. 143–205. ISSN: 00129682. URL: <http://www.jstor.org/stable/1905432>.
- Olley, G. Steven and Ariel Pakes (1996). “The Dynamics of Productivity in the Telecommunications Industry”. *Econometrica* 64.6, pp. 1263–1297.

Industry dynamics and productivity: applications

- Collard-Wexler, Allan and Jan De Loecker (2015). *Reallocation and Technology: Evidence from the US Steel Industry*. Tech. rep. 1, pp. 131–71. DOI: 10.1257/aer.20130090. URL: <http://www.aeaweb.org/articles.php?doi=10.1257/aer.20130090>.
- De Loecker, Jan (2011). “Product differentiation, multiproduct firms, and estimating the impact of trade liberalization on productivity”. *Econometrica* 79.5, pp. 1407–1451.
- Doraszelski, Ulrich and Jordi Jaumandreu (2013). “R&D and productivity: Estimating endogenous productivity”. *The Review of Economic Studies* 80.4, pp. 1338–1383.

- Foster, Lucia, John Haltiwanger, and Chad Syverson (2008). “Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?” *American Economic Review* 98.1, pp. 394–425.
- Nerlove, Marc (1963). “Returns to Scale in Electricity Supply”. In: *Measurement in Economics-Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld*. Stanford University Press.
- Pavcnik, Nina (2002). “Trade liberalization, exit, and productivity improvements: Evidence from Chilean plants”. *The Review of Economic Studies* 69.1, pp. 245–276.
- Syverson, Chad (2004). “Market Structure and Productivity: A Concrete Example”. *Journal of Political Economy* 112.6, pp. 1181–1222.

Auction estimation

- Guerre, Emmanuel, Isabelle Perrigne, and Quang Vuong (2000). “Optimal Non-parametric Estimation of First-Price Auctions”. *Econometrica* 68.3, pp. 525–574.
- Laffont, Jean-Jacques, Herve Ossard, and Quang Vuong (1995). “Econometrics of first-price auctions”. *Econometrica: Journal of the Econometric Society*, pp. 953–980.

Market power: collusion and cartels

- Asker, John (2010). “A Study of the Internal Organization of a Bidding Cartel”. English. *The American Economic Review* 100.3, pp. 724–762. ISSN: 00028282. URL: <http://www.jstor.org/stable/27871229>.
- Clark, Robert and Jean-François Houde (2013). “Collusion with asymmetric retailers: Evidence from a gasoline price-fixing case”. *American Economic Journal: Microeconomics* 5.3, pp. 97–123.
- Ellison, Glenn (1994). “Theories of cartel stability and the joint executive committee”. *The Rand journal of economics*, pp. 37–57.
- Fershtman, Chaim and Ariel Pakes (1999). “A dynamic oligopoly with collusion and price wars”.
- Genesove, David and Wallace P Mullin (2001). “Rules, Communication, and Collusion: Narrative Evidence from the Sugar Institute Case”. *American Economic Review* 91.3, pp. 379–398.
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- Rotemberg, Julio J and Garth Saloner (1986). “A supergame-theoretic model of price wars during booms”. *The American Economic Review* 76.3, pp. 390–407.
- Stigler, George J (1964). “A theory of oligopoly”. *The Journal of Political Economy*, pp. 44–61.

Market power: identification

- Albæk, Svend, Peter Møllgaard, and Per B. Overgaard (1997). “Government-Assisted Oligopoly Coordination? A Concrete Case”. English. *The Journal of Industrial Economics* 45.4, pp. 429–443. ISSN: 00221821. URL: <http://www.jstor.org/stable/2950610>.
- Bresnahan, Timothy F (1982). “The oligopoly solution concept is identified”. *Economics Letters* 10.1, pp. 87–92.
- (1987). “Competition and collusion in the American automobile industry: The 1955 price war”. *The Journal of Industrial Economics*, pp. 457–482.
- (1989). “Empirical studies of industries with market power”. *Handbook of industrial organization* 2, pp. 1011–1057.
- De Loecker, Jan and Frederic Warzynski (2012). “Markups and Firm-Level Export Status”. *American Economic Review* 102.6, pp. 2437–71. DOI: 10.1257/aer.102.6.2437. URL: <http://www.aeaweb.org/articles.php?doi=10.1257/aer.102.6.2437>.
- Genesove, David and Wallace P. Mullin (1998). “Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914”. *The RAND Journal of Economics* 29.2, pp. 355–377. ISSN: 07416261. URL: <http://www.jstor.org/stable/2555893>.
- Porter, Robert H. and J. Douglas Zona (1999). “Ohio School Milk Markets: An Analysis of Bidding”. English. *The RAND Journal of Economics* 30.2, pp. 263–288. ISSN: 07416261. URL: <http://www.jstor.org/stable/2556080>.

Mergers

- Benkard, C Lanier, Aaron Bodoh-Creed, and John Lazarev (2010). “Simulating the dynamic effects of horizontal mergers: Us airlines”. *Manuscript, Yale University*.

- Farrell, Joseph and Carl Shapiro (2010). “Antitrust evaluation of horizontal mergers: An economic alternative to market definition”. *The BE Journal of Theoretical Economics* 10.1.
- Jaffe, Sonia and E. Glen Weyl (2013). “The First-Order Approach to Merger Analysis”. *American Economic Journal: Microeconomics* 5.4, pp. 188–218. DOI: 10.1257/mic.5.4.188. URL: <http://www.aeaweb.org/articles.php?doi=10.1257/mic.5.4.188>.
- Miller, Nathan H. et al. (2013). “On the First Order Approximation of Counterfactual Price Effects in Oligopoly Models”. *Working Paper*. URL: <http://www.nathanhmilller.org/MRRS-2013.08.21.pdf>.

Dynamics: single-agent models

- Chan, Tat Y., Barton H. Hamilton, and Nicholas W. Papageorge (2015). “Health, Risky Behavior and the Value of Medical Innovation for Infectious Disease”. Working Paper.
- Kalouptsi, Myrto (2014a). “Detection and Impact of Industrial Subsidies: The Case of World Shipbuilding”. Working paper.
- (2014b). “Time to build and fluctuations in bulk shipping”. *The American Economic Review* 104.2, pp. 564–608.
- Pakes, Ariel (1986). “Patents as options: Some estimates of the value of holding European patent stocks”.
- Rust, John (1987). “Optimal Replacement of GMC Bus Engines: an Empirical Model of Harold Zurcher”. *Econometrica* 55.5, pp. 999–1033.

Dynamic estimation: methods and identification

- Aguirregabiria, Victor and Pedro Mira (2002). “Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models”. *Econometrica* 70.4, pp. 1519–1543. ISSN: 1468-0262. DOI: 10.1111/1468-0262.00340. URL: <http://dx.doi.org/10.1111/1468-0262.00340>.
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- Arcidiacono, Peter and Robert A. Miller (2011). “Conditional Choice Probability Estimation of Dynamic Discrete Choice Models With Unobserved Heterogeneity”. *Econometrica* 79.6, pp. 1823–1867. ISSN: 1468-0262. DOI: 10.3982/ECTA7743. URL: <http://dx.doi.org/10.3982/ECTA7743>.
- Hotz, V Joseph and Robert A Miller (1993). “Conditional Choice Probabilities and the Estimation of Dynamic Models”. *Review of Economic Studies* 60.3, pp. 497–529. URL: <http://ideas.repec.org/a/bla/restud/v60y1993i3p497-529.html>.
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- Kalouptsi, Myrto, Paul Scott, and Eduardo Souza-Rodrigues (2016). “Identification of Counterfactuals and Payoffs in Dynamic Discrete Choice Models”. Working Paper.
- Magnac, Thierry and David Thesmar (2002). “Identifying Dynamic Discrete Decision Processes”. *Econometrica* 70.2, pp. 801–816. ISSN: 1468-0262. DOI: 10.1111/1468-0262.00306. URL: <http://dx.doi.org/10.1111/1468-0262.00306>.
- Pesendorfer, Martin and Philipp Schmidt-Dengler (2008). “Asymptotic Least Squares Estimators for Dynamic Games”. *The Review of Economic Studies* 75.3, pp. 901–928. DOI: 10.1111/j.1467-937X.2008.00496.x. eprint: <http://restud.oxfordjournals.org/content/75/3/901.full.pdf+html>. URL: <http://restud.oxfordjournals.org/content/75/3/901.abstract>.
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Dynamic estimation: Euler equations

- Altug, Sumru and Robert A. Miller (1998). “The Effect of Work Experience on Female Wages and Labour Supply”. *The Review of Economic Studies* 65.1, pp. 45–85. DOI: 10.1111/1467-937X.00035. eprint: <http://restud.oxfordjournals.org/content/65/1/45.full.pdf+html>. URL: <http://restud.oxfordjournals.org/content/65/1/45.abstract>.

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Dynamic estimation: games

- Bajari, Patrick, C. Lanier Benkard, and Jonathan Levin (2007). “Estimating Dynamic Models of Imperfect Competition”. *Econometrica* 75.5, pp. 1331–1370. ISSN: 1468-0262. DOI: 10.1111/j.1468-0262.2007.00796.x. URL: <http://dx.doi.org/10.1111/j.1468-0262.2007.00796.x>.
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Entry and exit models

- Bajari, Patrick, Han Hong, and Stephen P Ryan (2010). “Identification and estimation of a discrete game of complete information”. *Econometrica* 78.5, pp. 1529–1568.
- Berry, Steven and Peter Reiss (2007). “Empirical models of entry and market structure”. *Handbook of industrial organization* 3, pp. 1845–1886.
- Bresnahan, Timothy F and Peter C Reiss (1990). “Entry in monopoly market”. *The Review of Economic Studies* 57.4, pp. 531–553.
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- Seim, Katja (2006). “An empirical model of firm entry with endogenous product-type choices”. *The RAND Journal of Economics* 37.3, pp. 619–640.
- Sweeting, Andrew (2009). “The strategic timing incentives of commercial radio stations: An empirical analysis using multiple equilibria”. *The RAND Journal of Economics* 40.4, pp. 710–742.
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Environmental

- Allcott, Hunt and Michael Greenstone (2012). “Is There an Energy Efficiency Gap?” *Journal of Economic Perspectives* 26.1, pp. 3–28.
- Allcott, Hunt and Nathan Wozny (2014). “Gasoline prices, fuel economy, and the energy paradox”. *Review of Economics and Statistics* 96.5, pp. 779–795.
- Covert, Thomas, Michael Greenstone, and Christopher R. Knittel (2016). “Will We Ever Stop Using Fossil Fuels?” *Journal of Economic Perspectives* 30.1, pp. 117–38. DOI: 10.1257/jep.30.1.117. URL: <http://www.aeaweb.org/articles.php?doi=10.1257/jep.30.1.117>.
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Moment inequalities: applications

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- Haile, Philip A and Elie Tamer (2003). “Inference with an incomplete model of English auctions”. *Journal of Political Economy* 111.1, pp. 1–51.
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