ECONOMICS 450-1 - FALL 2019
INDUSTRIAL ORGANIZATION AND PRICES I
SYLLABUS

1. Overview

This course sequence provides a graduate-level introduction to Industrial Organization (IO). It is designed to provide a broad introduction to topics and industries that current researchers are studying as well as to expose students to a wide variety of techniques. It will start the process of preparing Ph.D. students to conduct thesis research in the area.

This first quarter focuses on the estimation of production functions and demand functions, presenting both methods and applications. The quarter ends with a section on entry.

2. Contact Information

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3. **Office Hours** - by appointment

4. Text and Readings

There is no textbook for this course. Instead, students will be asked to read papers prior to each class.. We will not discuss all of the papers on the reading list, but we expect you to read all of the papers we discuss in class.

While we will not be following it, Victor Aguirregabiria has written a great book on Empirical Industrial Organization. This is a very useful reference. It is available at:
http://aguirregabiria.net/wpapers/book_dynamic_io.pdf

5. Lectures

MW 1:30-3:20 KGH 1410

6. Course Schedule

Date	Topic	Assigned Papers
09/25/19	Production I	Syverson 2011, Olley and Pakes 1996
09/30/19	Production II	Levinsohn and Petrin 2003, Ackerberg, Caves and Frazer 2015, Gandhi, Navarro and Rivers 2017
10/02/19	Production III	Syverson 2004, De Loecker 2011
10/07/19	Production IV	De Loecker, Goldberg, Khandewal and Pavcnik 2016, De Loecker and Eeckout 2018

10/09/19	Demand I	Deaton and Muellbauer 1980, Chaudhuri, Goldberg and Jia Barwick 2006
10/14/19	Demand II	Berry, Levinsohn and Pakes 1995
10/16/19	Demand III	Nevo 2001, Dube, Fox and Su 2012, Berry, Levinsohn and Pakes 2004
10/21/19	Welfare	Hausman 1996 (and comment chain), Petrin 2002
10/23/19	Demand Extensions I	Berry and Pakes 2007 (read up to Section 4.3), Nosko 2014 (read Appendix 2)
10/28/19	Demand Extensions II	Gentzkow 2007, Goeree 2008
10/30/19	Demand Extensions III	Fox, Kim and Yang 2016, Nevo, Turner and Williams 2016
11/04/19	Demand Extensions IV	Discrete-Continuous Demand (TBD), MLE Extensions to BLP
11/06/19	Pass-Through	Weyl and Fabinger 2013, Miravete, Seim and Thurk 2018
11/11/19	Identification	Berry and Haile 2014
11/13/19	Computation I	Judd, (1998), Chapters 1-5
11/18/19	Computation II	Judd, (1998), Chapters 7-9, Ackerberg 2009
11/20/19	Entry I	Bresnahan and Reiss 1991, Mankiw and Whinston 1986, Berry and Waldfogel 1999
11/25/19	Entry II	Berry 1992
11/27/19	No Class	
12/02/19	Entry III	Tamer 2003, Sweeting 2009
12/04/19	Entry IV	Mazzeo 2003, Seim 2006, Jia 2008

7. Grading

In each part of the course a number of problem sets will be handed out. The final grade f will be based 50 percent on problem sets and 50 percent on the final exam.

8. Course Web Page

The course web page will be on the Canvas web site. This course outline, reading lists, homework sets, answers to homework sets and lecture notes will all be posted on the web site.

9. Readings

The following abbreviations are used for journal titles:

AER	American Economic Review
AEJ: Micro	American Economic Journal: Microeconomics
BJE	Bell Journal of Economics
EMA	Econometrica
IER	International Economic Review
IJIO	International Journal of Industrial Organization
JE	Journal of Econometrics
JEH	Journal of Economic History

JEL	Journal of Economic Literature
JEMS	Journal of Economics & Management Strategy
JEP	Journal of Economic Perspectives
JET	Journal of Economic Theory
JIE	Journal of Industrial Economics
JLE	Journal of Law and Economics
JPE	Journal of Political Economy
QJE	Quarterly Journal of Economics
QME	Quantitative Marketing and Economics
ReStat	Review of Economics and Statistics
ReStud	Review of Economic Studies
RJE	Rand Journal of Economics

I. Production, Technology and Industry Structure (Illanes)

* D. Ackerberg, K. Caves and G. Frazer, "Structural Estimation of Production Functions," EMA, November 2015, 2411-51.

J. Asker, A. Collard-Wexler and J. De Loecker, "Dynamic Inputs and Resource (Mis)Allocation," JPE, October 2014, 1013-1063.

L. Benkard, "Learning and Forgetting: The Dynamics of Aircraft Production," AER, September 2000, 1034-54.

R. Blundell and S. Bond, "GMM Estimation with Persistent Panel Data: An Application to Production Functions," Econometric Reviews, 2000, 321-340.

A. Collard-Wexler and J. De Loecker, "Reallocation and Technology: Evidence from the US Steel Industry," AER, January 2015, 131-171.

* J. De Loecker, "Product Differentiation, Multi-Product Firms and Estimating the Impact of Trade Liberalization on Productivity," EMA, September 2011, 1407-51.

* J. De Loecker, P. Goldberg, A. Khandelwal and N. Pavcnik, "Prices, Markups and Trade Reform," EMA, March 2016, 445-510.

* J. De Loecker and J. Eeckout, "The Rise of Market Power and the Macroeconomic Implications", NBER Working Paper 23687, August 2017

J. De Loecker and F. Warzynski, "Markups and Firm Level Export Status," AER, October 2012, 2437-71.

U. Doraszelski and J. Jaumandreu, "R&D and Productivity: Estimating Endogenous Productivity," ReStud, October 2013, 1338-83.

* A. Gandhi, S. Navarro and D. Rivers, “On the Identification of Gross Output Production Functions”, forthcoming, JPE 2018

A. Gandhi, S. Navarro and D. Rivers, “How Heterogeneous is Productivity? A Comparison of Gross Output and Value Added”, mimeo, University of Wisconsin-Madison, 2017

Z. Griliches and J. Mairesse, “Production Functions: The Search for Identification,” mimeo, NBER, 1995.

C. Hsieh and P. Klenow, “Misallocation and Manufacturing TFP in China and India,” QJE, November 2009, 1403-1448

* J. Levinsohn and A. Petrin, “Estimating Production Functions Using Intermediate Inputs to Control for Unobservables,” ReStud, April 2003, 317-41.

S. Levitt, J. List and C. Syverson, “Toward an Understanding of Learning by Doing: Evidence from an Automobile Assembly Plant,” JPE, August 2013, 643-81.

* S. Olley and A. Pakes, “The Dynamics of Productivity in the Telecommunications Industry,” EMA, November 1996, 1263-97.

J. Panzar, “Technological Determinants of Firm and Industry Structure,” *HIO1*, Chapter 1.

* C. Syverson, “Market Structure and Productivity: A Concrete Example,” JPE, December 2004, 1181-222.

* C. Syverson, “What Determines Productivity?,” JEL, February 2011, 326-365.

F. Wolak, “An Econometric Analysis of the Asymmetric Information, Regulator-Utility Interaction,” Annales d’Economie et de Statistique, 1994, 13-69.

II. Demand Estimation

S. Anderson, A. de Palma and J. Thisse, *Discrete Choice Theory of Product Differentiation*, MIT Press, 1992.

* S. Berry, “Estimating Discrete-Choice Models of Product Differentiation,” RJE, Summer 1994, 242-62.

* S. Berry, J. Levinsohn and A. Pakes, “Automobile Prices in Market Equilibrium,” EMA, July 1995, 841-90.

* S. Berry, J. Levinsohn and A. Pakes, “Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market,” JPE, February 2004, 68-105.

T. Bresnahan, “Competition and Collusion in the American Automobile Market: The 1955 Price War,” JIE, June 1982, 457-482.

* S. Chaudhuri, P. Goldberg and P. Jia Barwick, “Estimating the Effects of Global Patent Protection in Pharmaceuticals: A Study of Quinolones in India,” AER, May 2006, 1477-1514.

* A. Deaton and J. Muellbauer, “An Almost Ideal Demand System,” AER, March 1980, 312-326.

* J.P. Dube, J. Fox and C. Su, “Improving the Numerical Performance of Static and Dynamic Aggregate Discrete Choice Random Coefficients Demand Estimation,” EMA, September 2012, 2231-2267.

P. Goldberg, “Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry,” EMA, July 1995, 891-951.

J. Hausman, G. Leonard and J. Zona, “Competitive Analysis with Differentiated Products,” Annales D'Economie et de Statistique, April/June 1994, 159-80.

I. Hendel, “Estimating Multiple Discrete Choice Models: An Application to Computerization Returns,” ReStud, April 1999, 423-46.

D. McFadden, “Econometric Analysis of Qualitative Response Models,” Handbook of Econometrics, Volume 2, Chapter 24.

A. Nevo, “A Practitioner’s Guide to Estimation of Random Coefficients Logit Models of Demand,” JEMS, Winter 2000, 513-48.

* A. Nevo, “Measuring Market Power in the Ready-to-Eat Cereal Industry,” EMA, March 2001, 307-42.

A. Nevo, “Empirical Models of Consumer Behavior,” Annual Review of Economics, 2011, 51-75.

III. Welfare Measures Computed from Estimated Demand Systems

D. Ackerberg and M. Rysman, “Unobservable Product Differentiation in Discrete Choice Models: Estimating Price Elasticities and Welfare Effects,” RJE, Winter 2005, 771-88.

T. Bresnahan, S. Stern and M. Trajtenberg, “Market Segmentation and the Sources of Rents from Innovation,” RJE, 1997, S17-S44.

A. Goolsbee and A. Petrin, “The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV,” EMA, 2004, 351-381.

* J. Hausman, “Valuation of New Goods Under Perfect and Imperfect Competition,” in T. Bresnahan and R. Gordon, eds. *The Economics of New Goods*, NBER, 1996. Including comment by Bresnahan (in the same volume) and reply to comment (and reply to reply).

J. Hausman, “Cellular Telephone, New Products and the CPI,” Journal of Business and Economic Statistics, 1999, 188-94.

A. Nevo, “New Products, Quality Changes and Welfare Measures Computed from Estimated Demand Systems,” ReStat, 2003, 266-75.

* A. Petrin, “Quantifying the Benefits of New Products: The Case of the Minivan,” JPE, August 2002, 705-29.

M. Trajtenberg, “The Welfare Analysis of Product Innovations, with an Application to Computed Tomography Scanners,” JPE, April 1989, 444-79.

IV. Additional Topics in Demand Estimation

S. Berry and P. Jia Barwick, “Tracing the Woes: An Empirical Analysis of the Airline Industry,” AEJ: Micro, August 2010, 1-43.

* S. Berry and A. Pakes, “The Pure Characteristics Demand Model,” IER, November 2007, 1193-225.

J. Fox, K.I. Kim, S. Ryan and P. Bajari, “A simple estimator for the distribution of random coefficients”, Quantitative Economics, 2011

* J. Fox, K.I. Kim and C. Yang, “A simple nonparametric approach to estimating the distribution of
random coefficients in structural models”, JE, 2016

* M. Gentzkow, “Valuing New Goods in a Model with Complementarity: Online Newspapers,” AER, June 2007, 713-44.

* M. Goeree, “Limited Information and Advertising in the US Personal Computer Industry,” EMA, September 2008, 1017-74.

G. Illanes and M. Padi, “Competition, Asymmetric Information, and the Annuity Puzzle: Evidence from a Government-run Exchange in Chile”, mimeo, Northwestern University

* A. Nevo, J. Turner and J. Williams, “Usage-Based Pricing and Demand for Residential Broadband”, EMA, March 2016, 411-443

* C. Nosko, “Competition and quality choice in the CPU market,” Working Paper, University of

Chicago, Graduate School of Business, 2014.

T. Pires, “Costly search and consideration sets in storable goods markets,” QME, September 2016, 157-193.

V. Pass-Through

D. Besanko, J.P. Dube, S. Gupta, “Own-brand and cross-brand retial pass-through”, Marketing Science, 2005.

C. Conlon and N. Rao, “Discrete Prices and the Incidence and Efficiency of Excise Taxes”, mimeo, New York University, 2016

N. Fabra and M. Reguant, “Pass-Through of Emissions Costs in Electricity Markets”, AER 2014

P. Goldberg and R. Hellerstein, “A Structural Approach to Identifying the Sources of Local Currency Price Stability”, ReStud 2013

* E. J. Miravete, K. Seim and J. Thurk, “Market Power and the Laffer Curve”, EMA 2018

E. Nakamura and D. Zerom, “Accounting for Incomplete Pass-Through”, ReStud 2010

* E. G. Weyl and M. Fabinger, “Pass-Through as an Economic Tool: Principles of Incidence under Imperfect Competitition”, JPE 2013

VI. Identification

* S. Berry and P. Haile, “Identification in Differentiated Products Markets Using Market Level Data,” EMA, September 2014, 1749-97.

S. Berry and P. Haile, “Nonparametric Identification of Multinomial Choice Demand Models with Heterogeneous Consumers,” mimeo, Cowles Foundation

S. Berry, A. Gandhi and P. Haile, “Connected Substitutes and Invertibility of Demand,” EMA, May 2013, 2087-2111.

A. Gandhi and J.F. Houde, “Measuring Substitution Patterns in Differentiated Products Industries”, mimeo, Wisconsin and Wharton, 2015

R. Matzkin, “Nonparametric Identification,” Handbook of Econometrics, Volume 6b, Chapter 73.

VII. Computation

* D.A. Ackerberg, “A New Use of Importance Sampling to Reduce Computational Burden in Simulation Estimation”. Quantitative Marketing and Economics, 7:343-376, 2009

D. Goldberg, "What Every Computer Scientist Should Know About Floating-Point Arithmetic". ACM Computing Surverys, 1991

K.L. Judd, "Computational Economics and Economic Theory: Substitutes or Complements?" Journal of Economic Dynamics and Control, 21 (6), 907–942

* K.L. Judd, (1998), *Numerical Methods in Economics*. The MIT Press, Cambridge, MA.

J. Nocedal and S.J. Wright (2006), *Numerical Optimization*, Springer-Verlag, New York, NY. Chapters 2, 8, and 15.

VIII. Market Structure (Bhattacharya)

VIII.1. Entry Models

P. Bajari, H. Hong and S. Ryan, "Identification and Estimation of Discrete Games of Complete Information," EMA, September 2010, 1529-68.

* S. Berry, "Estimation of a Model of Entry in the Airline Industry," EMA, July 1992, 889–918.

S. Berry and P. Reiss, "Empirical Models of Entry and Market Structure," *HIO3*, Chapter 29.

S. Berry and E. Tamer, "Identification in Models of Oligopoly Entry," in R. Blundell, W. Newey and T. Persson, eds., *Advances in Economics and Econometrics: Theory and Applications*, Vol. 2, Cambridge, 2007, Chapter 2.

T. Bresnahan and P. Reiss, "Entry in Monopoly Markets," ReStud, October 1990, 531-53

* T. Bresnahan and P. Reiss, "Entry and Competition in Concentrated Markets," JPE, October 1991, 977–1009.

F. Cilberto and E. Tamer, "Market Structure and Multiple Equilibria in Airline Markets," EMA, November 2009, 1791-828.

P. Ellickson, S. Houghton and C. Timmins, "Estimating Network Economies in Retail Chains: A Revealed Preference Approach," RJE, Summer 2013, 169-93.

P. Grieco, "Discrete Games with Flexible Information Structures: An Application to Local Grocery Markets," RJE, Summer 2014, 303-40.

* P. Jia, "What Happens When Wal-Mart Comes to Town: An Empirical Analysis of the Discount Retail Industry," EMA, November 2008, 1263-316.

* A. Sweeting, "The Strategic Timing Incentives of Commercial Radio Stations: An Empirical Analysis Using Multiple Equilibria," RJE, Winter 2009, 710-42.

Y. Takahashi, “Estimating a War of Attrition: The Case of the US Movie Theater Industry,” AER, July 2015, 2204-41.

* E. Tamer, “Incomplete Simultaneous Discrete Response Model with Multiple Equilibria,” ReStud, January 2003, 147-65.

VIII.2. Entry and Product Quality

S. Berry, A. Eizenberg and J. Waldfogel, “Optimal Product Variety in Radio Markets,” RJE, Fall 2016, 463-97.

S. Berry and J. Waldfogel, “Free Entry and Social Inefficiency in Radio Broadcasting,” RJE, Autumn 1999, 397-420.

S. Berry and J. Waldfogel, “Product Quality and Market Size,” JIE, March 2010, 1-31.

A. Eizenberg, “Upstream Innovation and Product Variety in the U.S. Home PC Market,” REStud, July 2014, 1003-45.

P. Ellickson, “Does Sutton Apply to Supermarkets?” RJE, Spring 2007, 43-59.

Y. Fan, “Ownership Consolidation and Product Characteristics: A Study of the US Daily Newspaper Market,” AER, August 2013, 1598-1628.

M. Gentzkow, J. Shapiro and M. Sinkinson, “Competition and Ideological Diversity: Historical Evidence from US Newspapers,” AER, October 2014, 3073-114.

D. Matsa, “Competition and Product Quality in the Supermarket Industry,” QJE, August 2011, 1539-91.

* M. Mazzeo, “Product Choice and Oligopoly Market Structure,” RJE, Summer 2002, 221-42.

* K. Seim, “An Empirical Model of Firm Entry with Endogenous Product-Type Choices,” RJE, Autumn 2006, 619-40.

J. Sutton, “Market Structure: Theory and Evidence,” *HIO3*, Chapter 36.

A. Sweeting, “The Effects of Mergers on Product Positioning: Evidence from the Music Radio Industry,” RJE, Summer 2010, 372-97.

R. Watson, “Product Variety and Competition in the Retail Market for Eyeglasses,” JIE, June 2009, 217-51.

T. Wollman, “Trucks without Bailouts: Equilibrium Product Characteristics for Commercial Vehicles,” mimeo, Booth, 2017.

VIII.3. Entry Deterrence

J. Chevalier, “Capital Structure and Product Market Competition: Empirical Evidence from the Supermarket Industry,” AER, June 1995, 415-35.

* G. Ellison and S. Ellison, “Strategic Entry Deterrence and the Behavior of Pharmaceutical Incumbents Prior to Patent Expiration,” AEJ: Micro, February 2011, 1-36.

* A. Goolsbee and C. Syverson, “How do Incumbents Respond to the Threat of Entry? Evidence from the Major Airlines,” QJE, November 2008, 1611-33.

V. Kadiyali, “Entry, Its Deterrence, and Its Accommodation: A Study of the U.S. Photographic Film Industry,” RJE, Autumn 1996, 452-78.

C. Snider, “Predatory Incentives and Predation Policy: The American Airlines Case,” mimeo, UCLA, 2009.

C. Snider and J. Williams, “Barriers to Entry in the Airline Industry: A Multi-Dimensional Regression Discontinuity Analysis of AIR-21,” REStat, December 2015, 1002-22.

VIII.4. Entry, Growth, and Turnover

J. Abbring and J. Campbell, “Last-in First-out Oligopoly Dynamics,” EMA, September 2010, 1491-527.

T. Bresnahan and D. Raff, “Inter-industry Heterogeneity and the Great Depression: The American Motor Vehicles Industry, 1929-1935,” JEH, June 1991, 317-31.

A. Collard-Wexler, “Mergers and Sunk Costs: An Application to the Ready-Mix Concrete Industry,” AEJ: Micro, November 2014, 407-47.

A. Collard-Wexler, “Productivity Dispersion and Plant Selection in the Ready-Mix Concrete Industry,” mimeo, Duke, 2011.

A. Collard-Wexler and J. De Loecker, “Reallocation and Technology: Evidence from the U.S. Steel Industry,” AER, January 2015, 131-71.

T. Dunne, M. Roberts, and L. Samuelson, “Patterns of Firm Entry and Exit in U.S. Manufacturing,” RJE, Winter 1988, 495-515.

T. Dunne, M. Roberts, and L. Samuelson, “The Growth and Failure of U.S. Manufacturing Plants,” QJE, November 1989, 671-98.

H. Hopenhayn, “Entry, Exit and Firm Dynamics in Long Run Equilibrium,” EMA, September 1992, 1127-50.

B. Jovanovic, “Selection and the Evolution of Industry,” EMA, May 1982, 649–70.

L. Foster, J. Haltiwanger, and C. Syverson, “The Slow Growth of New Plants: Learning about Demand?” Economica, January 2016, 91-129.

A. Pakes and R. Ericson, “Empirical Applications of Alternative Models of Firm Dynamics,” JET, March 1998, 1-45.

J. Sutton, “Gibrat’s Legacy,” JEL, March 1997, 40-59.