

881-14: DEMAND ESTIMATION

The course provides a graduate-level introduction to some of the core IO empirical methods, mainly the techniques used to estimate demand. The course will cover the core empirical methods papers and also some recent applications of these methodologies. The goal is to give students enough background in the relevant literature and empirical methods so that they can begin to undertake their own research in the area.

Lectures: Thursday 1:25-3:55, Social Sciences 105

Web Page: <http://econ.duke.edu/~jr139/>

Sakai: I will use Sakai to distribute class materials.

Text: There is no required text for the course but I would recommend Tirole's *The Theory of Industrial Organization* to brush up on the theoretical models we discuss.

Grading: Evaluation will be based on five problem sets, two in-class presentations and your research project (described below). The problem sets are due at the *beginning of class* on the following days:

- Problem Set 1 due 1/21/16
- Problem Set 2 due 1/28/16
- Problem Set 3 due 2/4/16
- Problem Set 4 due 2/11/16
- Problem Set 5 due 2/18/16

The in-class presentations will be assigned on the first day of class.

Research Project: The goal of this course is to foster and promote your own independent research. To that end, on the last day of class you will each turn in a short paper describing an original research idea.

You find yourself in one of two scenarios today. Either you currently have a well-developed research project, which may or may not be an IO paper, or you don't. Since this course is not only for people who want to do IO, you are welcome to present a project that has nothing to do with IO. It should be microeconomics focused, however. If you do want to do IO, then you should present a research project which is IO focused, *even if you have a more coherent, non-IO project*. The minimum standards for the presentation and paper are:

1. A Point.
2. A clear understanding and articulation of why your project is interesting and important. This should include a well-focused description of where your paper would fit in the literature.
3. If the project is empirical in nature, a description of what data would be used to analyze your question, as well as where you'd get it and how. Make sure to say why these data are ideal. You don't necessarily have to obtain the data by week 7, just know how you'd do it.
4. Some semblance of a model and what variation in the data would identify parameters of interest.

This is hard. I will have very high standards for this. You should all feel free to discuss your topic with me at your earliest convenience.

Course Outline: Below is the course outline and reading list for each topic. It is up to you to determine the amount of reading that maximizes your personal objective function.

Week 1: 1/14/16

Introduction, why we estimate demand with examples of price discrimination and bundling, single product demand estimation

Suggested Reading:

- T. Bresnahan, "The Oligopoly Solution is Identified," *Economics Letters*, 1982, 10, 87-92.
- C. Wolfram, "Measuring Duopoly Power in the British Electricity Spot Market," *AER*, September 1999, 805-26.
- K. Corts, "Conduct Parameters and the Measurement of Market Power," *JE*, November 1998, 227-50.
- R. Porter, "A Study of Cartel Stability: The Joint Executive Committee, 1880-1886," *BJE*, Autumn 1983, 301-14.

Weeks 2 and 3: 1/21/16 and 1/28/16

Product space approach to estimating demand, begin characteristics space approach

Students Week 2: G. Ellison, "Theories of Cartel Stability and the Joint Executive Committee," *RJE*, Spring 1994, 37-57.

Students Week 3: (a) S. Chaudhuri, P. Goldberg and P. Jia, "Estimating the Effect of Global Patent Protection in Pharmaceuticals: A Case Study of Quinolones in India," *AER*, December 2006, 1477-1514.

(b) B. Bronnenberg, J.P. Dube and M. Gentzkow, "The Evolution of Brand Preferences: Evidence from Consumer Migration," *AER*, 102(6), 2006, 2472-2508.

Suggested Reading:

- J. Hausman, G. Leonard and J. D. Zona, "Competitive Analysis with Differentiated Products," *Annales D'Economie Et Statistique*, 1994, 159-180.
- T. Bresnahan, "Empirical Studies of Industries with Market Power," *HIO2*, Chapter 17.
- O. Ashenfelter and D. Sullivan, "Nonparametric Tests of Market Structure: An Application to the Cigarette Industry," *JIE*, June 1987, 483-98.
- J. Baker and T. Bresnahan, "Estimating the Residual Demand Curve Facing a Single Firm," *IJIO*, September 1988, 283-300.
- S. Borenstein, J. Bushnell and F. Wolak, "Measuring Market Inefficiencies in California's Restructured Wholesale Electricity Market," *AER*, December 2002, 1396-405.
- D. Genesove and W. Mullin, "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914," *RJE*, Summer 1998, 355-77.
- C. Holt, "Industrial Organization: A Survey of Laboratory Research," in J. Kagel and A. Roth, eds., *Handbook of Experimental Economics*, Princeton, 1995, 349-443.

- J. Panzar and J. Rosse, "Testing for 'Monopoly' Equilibrium," JIE, June 1987, 443-56.
- M. Salinger, "The Concentration-Margin Relationship Reconsidered," Brookings Papers on Economic Activity Micro, 1990, 287-335.
- R. Schmalensee, "Inter-industry Studies of Structure and Performance," in HIO2, Chapter 16.
- V. Aguirregabiria, "The Dynamics of Markups and Inventories in Retail Firms," ReStud, April 1999, 275-308.
- S. Borenstein and A. Shepard, "Dynamic Pricing in Retail Gasoline Markets," RJE, Autumn 1996, 429-51.
- Evans, W. and I. Kessides, "Living by the 'Golden Rule': Multimarket Contact in the U.S. Airline Industry," QJE, May 1994, 341-66.
- *T. Bresnahan, "Competition and Collusion in the American Automobile Market: The 1955 Price War," JIE, June 1982, 457-482.
- *S. Berry, 1994, "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.
- *P. Goldberg, "Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry," EMA, July 1995, 891-951.
- *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.
- S. Anderson, A. dePalma and J. Thisse. Discrete Choice Theory of Product Differentiation, 1992, MIT Press.
- J. Baker and T. Bresnahan, "Estimating the Residual Demand Curve Facing a Single Firm," IJIO, 1988, 283-300.
- 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.
- F. Gasmı, J. Laffont and Q. Vuong, "Econometric Analysis of Collusive Behavior in a Soft-Drink Market," JEMS, Summer 1992, 277-311.
- 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, 1984, Chapter 24.

Week 4: 2/4/16*Applications to health care*

Students Week 4: (a) M. Grennan, "Price Discrimination and Bargaining: Empirical Evidence from Medical Devices," *AER*, 2013, 103(1), 145-177.

(b) B. Handel, "Adverse Selection and Inertia in Health Insurance Markets: When Nudging Hurts," *AER*, 2013, 103(7), 2643-2682.

Suggested Reading:

*C. Dalton, G. Gowrisankaran, B. Town, "Myopia and Complex Dynamic Incentives: Evidence from Medicare Part D", NBER Working Paper 21104.

Weeks 5 and 6: 2/11/16 and 2/18/16*Auctions, an introduction to empirical work*

Students Week 5: L. Einav, M. Jenkins and J. Levin, "Contract Pricing in Consumer Credit Markets," *Econometrica*, 80(4), 1387-1432.

Students Week 6: (a) J. Asker (2010). "A Study of the Internal Organization of a Bidding Cartel," *American Economic Review*, 100: 724-762.

(b) T. Youle, "How Much Did Manipulation Distort the Labor," Working Paper, Dartmouth Univ.

Suggested Reading:

Overview

Milgrom, P. and R. Weber (1982). "A Theory of Auctions and Competitive Bidding," *Econometrica*, 50 (5), September, 1089-1122.

McAfee, P. and J. McMillan (1987). "Auctions and Bidding," *Journal of Economic Literature*, June, 699-738.

Milgrom, P. (1989). "Auctions and Bidding: A Primer," *Journal of Economic Perspectives*, Summer, 3-22.

Klemperer, P. (2003). "Why Every Economist Should Learn Some Auction Theory," in *Advances in Economics and Econometrics: Invited Lectures to 8th World Congress of the Econometric Society*, M. Dewatripont, L. Hansen and S. Turnovsky (eds.), Cambridge University Press. (See: <http://www.nuff.ox.ac.uk/users/klemperer/WhyEveryEconomist.pdf>)

Vickrey, W. (1961). "Counterspeculation, Auctions and Competitive Sealed Tenders," *Journal of Finance*, 16: 8-37.

SPA:

- Donald, S. and H. Paarsch (1996). "Identification, Estimation, and Testing in Parametric Empirical Models of Auctions within the Independent Private Values Paradigm," *Econometric Theory*, 12, 517-67.
- Athey, S. and P. Haile (2002). "Identification of Standard Auction Models," *Econometrica*, 70: 2107-40.
- Bajari, P. and A. Hortacsu (2003). "The Winner's Curse, Reserve Prices, and Endogenous Entry: Empirical Insights from eBay Auctions," *RAND Journal of Economics*, 34: 329-55.
- Hong, H. and M. Shum (2003). "Econometric Models of Ascending Auctions," *Journal of Econometrics*, 112: 327-58.
- *Haile, P. and E. Tamer (2003). "Inference in an Incomplete Model of English Auctions," *Journal of Political Economy*, 111: 1-51.
- Paarsch, H. (1997). "Deriving an Estimate of the Optimal Reserve Price: An Application to British Columbia Timber Sales," *Journal of Econometrics*, 78: 333-57.
- Roberts, J. (2012). "Unobserved Heterogeneity and Reserve Prices in Auctions," mimeo, Duke University.
- Athey, S., J. Levin and E. Seira (2004). "Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions," mimeo, Stanford University.
- Song, U. (2004). "Nonparametric Estimation of an eBay Auction Model with an Unknown Number of Bidders," mimeo, University of British Columbia.
- Riley, J. and W. Samuelson (1981). "Optimal Auctions," *American Economic Review*, 71: 381-92.
- Wilson, R. (1998). "Sequential Equilibria of Asymmetric Ascending Auctions," *Economic Theory*, 12: 433-40.
- Klemperer, P. (1998). "Auctions with Almost Common Values: The 'Wallet Game' and its Applications," *European Economic Review*, 42: 757-69.
- Bikhchandani, S., P. Haile and J. Riley (2002). "Symmetric Separating Equilibria in English Auctions," *Games and Economic Behavior*, 38: 19-27.
- Bikhchandani, S. and J. Riley (1991). "Equilibria in Open Common Value Auctions," *Journal of Economic Theory*, 53: 101-30.
- Avery, C. (1998). "Strategic Jump Bidding in English Auctions," *Review of Economic Studies*, 65: 185-210.

FPA:

- Milgrom, P. (1981). "Rational Expectations, Information Acquisition, and Competitive Bidding," *Econometrica*, 49: 921-43.
- Laffont, J.J., H. Ossard and Q. Vuong (1995). "Econometrics of First-Price Auctions," *Econometrica*, 63: 953-80.
- Laffont, J.J. and Q. Vuong (1996). "Structural Analysis of Auction Data," *American Economic Review Papers and Proceedings*, 86: 414-20.

- Hendricks, K., J. Pinkse and R. Porter (2003). "Empirical Implications of Equilibrium Bidding in First Price, Symmetric, Common Value Auctions," *Review of Economic Studies*, 70: 115-45.
- Van den Berg, G. and B. van der Klaauw (2000). "Structural Analysis of Dutch Flower Auctions," mimeo, Free University Amsterdam.
- Donald, S. and H. Paarsch (1993). "Piecewise Pseudo-Maximum Likelihood Estimation in Empirical Models of Auctions," *International Economic Review*, 34: 121-48.
- Paarsch, H. (1992). "Deciding between the Common and Private Value Paradigms in Empirical Models of Auctions," *Journal of Econometrics*, 51: 191-215.
- Bajari, P. (1997). "The First Price Auction with Asymmetric Bidders: Theory and Applications," unpublished Ph.D. thesis, University of Minnesota.
- Bajari, P., S. Houghton and S. Tadelis (2006). "Bidding for Incomplete Contracts: An Empirical Analysis," mimeo, University of Michigan.
- Elyakime, B., J.J. Laffont, P. Loisel and Q. Vuong (1994). "First-Price, Sealed-Bid Auctions with Secret Reservation Prices," *Annales de l'Institut Henri Poincaré*, 34: 115-41.
- *Guerre, E., I. Perrigne and Q. Vuong (2000). "Optimal Nonparametric Estimation of First-Price Auctions," *Econometrica*, 68: 525-74.
- Bajari, P. and L. Ye (2003). "Deciding Between Competition and Collusion," *Review of Economics and Statistics*, 85: 971-89.
- Krasnokutskaya, E. (2004). "Identification and Estimation in Highway Procurement Auctions Under Unobserved Auction Heterogeneity," mimeo, University of Pennsylvania.
- Athey, S., J. Levin and E. Seira (2004). "Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions," mimeo, Stanford University.
- Yao, S. and C. Mela (2007). "Online Auction Demand," *Marketing Science*, 27: 861-885.
- Lebrun, B. (1996). "Existence of an Equilibrium in First Price Auctions," *Economic Theory*, 7: 421-43.
- Lebrun, B. (1999). "First Price Auctions in the Asymmetric N Bidder Case," *International Economic Review*, 40: 125-42.
- Li, T. (2005). "Econometrics of First-Price Auctions with Entry and Binding Reservation Prices," *Journal of Econometrics*, 126: 173-200.
- Maskin, E. and J. Riley (2000). "Asymmetric Auctions," *Review of Economic Studies*, 67: 413-38.
- Maskin, E. and J. Riley (2000). "Equilibrium in Sealed High Bid Auctions," *Review of Economic Studies*, 67: 439-54.

Week 7: 2/25/16*Recent Job Market Papers in IO*

Tentative List – we'll firm up, add more if needed, and assign papers around week 5:

- a. Mark Shepard, Harvard Kennedy School
- b. Alexander MacKay, JM Candidate at Chicago
- c. Chris Neilsen, Princeton
- d. Adam Kapor, Columbia (currently doing post-doc at Princeton)
- e. Brad Larsen, Stanford
- f. Tobias Salz, JM Candidate at NYU
- g. Nicholas Buchholz, JM Candidate at Texas
- h. Paul Scott, Toulouse

The following abbreviations are (sometimes) used for journal titles:

AER	American Economic Review
BJE	Bell Journal of Economics
EMA	Econometrica
EJ	Economic Journal
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
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
RAND	Rand Journal of Economics
ReStat	Review of Economics and Statistics
ReStud	Review of Economic Studies