

**ECONOMICS 600, FALL 2007
YALE UNIVERSITY**

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Overview and Objectives. I will teach the first half of both terms in the two-semester second-year sequence in Industrial Organization. In the fall, the second half will be taught by Ali Hortaçsu, who is visiting from the University of Chicago.

The course will be oriented primarily toward empirical work, although we will cover theoretical background for each topic at varying degrees of depth, and the empirical work studied will almost always have a close tie to an economic model.

My goals in the course are to help you (1) understand some key papers in the IO literature (2) master key methodological developments in the field, (3) think critically about research questions and methods in the field, and (4) begin to develop your own ideas for research.

The basic structure of the course will be presentation and discussion of papers, which you will read in advance. I will typically present key components of the papers, raising questions for you as we go in order to generate discussion. I expect you to arrive prepared and to participate actively. Thoughtful questions and ideas from you will improve the course for everyone.

Course Requirements. Students are expected to (1) read the papers assigned for each class meeting; (2) participate in the discussion of papers during class; (3) turn in regular homework assignments (4) take an in-class final exam covering topics from both halves of the semester.

Homework assignments will likely include problem sets, programming of estimation routines for models discussed in class, and/or “referee reports” on papers from the reading list and/or papers presented in the Thursday IO Seminar.

Grades will be based on the quality of the required work for the course, including class participation.

READING LIST

I will give you a schedule of topics and papers for the course. Below is a much more extensive “reading list,” divided somewhat arbitrarily. The list is meant to provide a starting point for reading on a number of topics. It does not attempt to be comprehensive, to cover all important topics in IO, or even to select the “best” papers in each area!

Basic IO Theory

Tirole, J. (1988). *The Theory of Industrial Organization*, MIT Press. This text is outdated and not too far ahead of what I teach undergrads. But it is an excellent starting point for much of the basic theory of IO. We will only discuss things from this book occasionally, but you should make sure you know what is inside – certainly any of this is fair game for oral exams.

Handbook Chapters in Empirical IO

There are several very recent handbook chapters on IO. Together these provide excellent resources on methods used in recent applied work in IO, as well as an overview of applications in some areas.

Akerberg, D., L. Benkard, S. Berry, and A. Pakes (2007). “Econometric Tools for Analyzing Market Outcomes.” Demand estimation, production function estimation, dynamics, and entry. Forthcoming in the Handbook of Econometrics.

Athey, S. and P. Haile (2007), “Nonparametric Approaches to Auctions,” Auctions, focusing on methods. Forthcoming in the Handbook of Econometrics.

Hendricks, K. and R. Porter (2007), “An Empirical Perspective on Auctions.” Auctions, focusing on applications. Forthcoming in the Handbook of IO.

Reiss, P. and S. Berry (2007), “Entry.” Forthcoming in the Handbook of IO.

Reiss, P. and F. Wolak (2007), “Structural Econometric Modeling: Rationales and Examples from I.O.” Forthcoming in the Handbook of Econometrics.

Early Structural I.O.: Measuring Market Power, Inferring Costs

Bresnahan, T. (1987), “Competition and Collusion in the American Auto Industry: The 1955 Price War,” *Journal of Industrial Economics*, 35, 457–482.

Bresnahan, T. (1981). “Departures from Marginal Cost Pricing in the American Automobile Industry,” *Journal of Econometrics*, 17, 201–227.

Bresnahan, T. (1989). “Empirical Studies of Industries with Market Power,” in R. Schmalensee and R. Willig (eds) *Handbook of Industrial Organization*, ch. 17.

Corts, K. (1999). “Conduct Parameters and the Measurement of Market Power” *Journal of Econometrics*, 88, 227-250.

Rosse, J. (1970). “Estimating Cost Function Parameters without Using Cost Data: Illustrated Methodology,” *Econometrica*, 38, 256–75.

Supply and Demand in Differentiated Products Markets

Anderson, S., A. DePalma, and F. Thisse (1992). *Discrete Choice Theory of Product Differentiation*, Cambridge: MIT Press.

Bajari, P. and L. Benkard (2005). “Demand Estimation with Heterogeneous Consumers and Unobserved Product Characteristics: A Hedonic Approach,” *Journal of Political Economy* 113(6), 1239-1276.

Bartik, M. (1987). “The Estimation of Demand Parameters in Hedonic Pricing Models,” *Journal of Political Economy*, 95, 81–88.

Berry, S. (1994). “Estimating Discrete Choice Models of Product Differentiation,” *Rand Journal of Economics*, 242–262.

Berry, S., J. Levinsohn, and A. Pakes (1995), “Automobile Prices in Market Equilibrium,” *Econometrica*, 63, 841–890.

Berry, S., J. Levinsohn, and A. Pakes (2004). “Differentiated Products Demand Systems from a

- Combination of Micro and Macro Data: The New Car Market,” *Journal of Political Economy*, 112, 68–105.
- Berry, S. and A. Pakes (2001), “The Pure Characteristics Demand Model,” forthcoming in the IER.
- Bresnahan, T. (1981). “Departures from Marginal Cost Pricing in the American Automobile Industry,” *Journal of Econometrics*, 17, 201–227.
- Bresnahan, T. (1987), “Competition and Collusion in the American Auto Industry: The 1955 Price War,” *Journal of Industrial Economics*, 35, 457–482.
- Davis, P. (2000). “Empirical Models of Demand for Differentiated Products,” *European Economic Review*, 44, 993–1005.
- Einav, L. (2007). “Seasonality in the U.S. Motion Picture Industry,” *Rand Journal of Economics* forthcoming.
- Epple, D. (1987). “Hedonic Prices and Implicit Markets: Estimating Demand and Supply Functions for Differentiated Products,” *Journal of Political Economy*, 95, 59–80.
- Goldberg, P. (1995). “Product Differentiation and Oligopoly in International Markets,” *Econometrica*, 63, 891–951.
- Goolsbee, A. and A. Petrin (2004). “The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV,” *Econometrica*, 72, 251–382.
- Hausman, J. and D. Wise (1978). “Conditional Probit Model for Qualitative Choice: Discrete Decisions Recognizing Interdependence and Heterogeneous Preferences,” *Econometrica*, 46, 403–426.
- Hausman, J., G. Leonard, and D. Zona (1994). “Competitive Analysis with Differentiated Products,” *Annales d’Economie et de Statistique*, 34, 159–80.
- Hendel, I. (1999). “Estimating Multiple Discrete-Choice Models: An Application to Computerization Returns,” *Review of Economic Studies*, April 1999, 423–446.
- Horowitz, J. (1998). *Semiparametric Methods in Econometrics*, chapters 2 and 3, New York: Springer.
- Matzkin, R. (1992) Nonparametric and Distribution-Free Estimation of the Binary Choice and the Threshold Crossing Models, *Econometrica*. 60, No. 2, p. 239.
- McFadden, D. and K. Train (2000). “Mixed MNL for Discrete Response,” *Journal of Applied Econometrics*, 15, 447–470.
- Nevo, A. (2001). “Measuring Market Power in the Ready-to-Eat Breakfast Cereal Industry,” *Econometrica*, 69, 307–342.
- Nevo, A. (2000). “A Practitioner’s Guide to Random Coefficients Logit Models of Demand,” *Journal of Economics and Management Strategy*, 9, 513–548.
- Rosen, (1974). “Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition,” *Journal of Political Economy*, 82, 34–55.
- Shaked, A. and J. Sutton (1982). “Relaxing Price Competition through Product Differentiation,” *Review of Economic Studies*, 49, 3–13.

Costs, Technology, Productivity

- Akerberg, D., Caves, K., and Frazer, G. Structural Identification of Production Functions working paper, UCLA.
- Benkard, L. (2000). “Learning and Forgetting: the Dynamics of Aircraft Production,” *American Economic Review*, 90, 1034–1054.
- Berndt, E. (1991). *The Practice of Econometrics: Classic and Contemporary*, Addison-Wesley, ch. 3 and 9.
- Dick, A. (1994). “Accounting for Semiconductor Industry Dynamics,” *International Journal of Industrial Organization*, 12, 35–52.
- Panzar, J. (1989). “Technological Determinants of Firm and Industry Structure,” in R. Schmalensee and R. Willig (eds) *Handbook of Industrial Organization*, ch. 1.
- Evans, D. and J. Heckman (1984). “A Test for Subadditivity of the Cost Function with and Application to the Bell System,” *American Economic Review*, 9, 615–623. (Comment and errata, *AER*, 1986, 9, 854–858.)
- Jarmin, R. (1994). “Learning by Doing and Competition in the Early Rayon Industry,” *Rand Journal of Economics*, 25, 441–454.
- Jovanovic, B. “Selection and Evolution of Industry,” *Econometrica* 50(3), 25–43.
- Levinsohn, J. and A. Petrin (2001).
- Lieberman, M. (1984). “The Learning Curve and Pricing in the Chemical Processing Industries,” *Rand Journal of Economics*, 15, 213–228.
- Olley, G. and A. Pakes (1996). “The Dynamics of Productivity in the Telecommunications Equipment Industry,” *Econometrica*, 64, 1263–1297.
- Syverson, C. (2004). “Market Structure and Productivity: A Concrete Example,” *Journal of Political Economy* 1181–1222.

Entry, Exit, Industry Dynamics

- Berry, S. (1992). “Estimation of a Model of Entry in the Airline Industry,” *Econometrica*, 60, 889–917.
- Berry, S. and J. Waldfogel (1999). “Free Entry and Social Inefficiency in Radio Broadcasting,” *RAND Journal of Economics*, 30, 397–420.
- Berry, S. and J. Waldfogel (2001). “Do Mergers Increase Product Variety? Evidence from Radio Broadcasting,” *Quarterly Journal of Economics*, 1009–1025.
- Berry, S. and E. Tamer (2006). “Identification in Models of Oligopoly Entry,” *Advances in Economics and Econometrics Ninth World Congress*.
- Bresnahan, T. and P. Reiss (1991). “Entry and Competition in Concentrated Markets,” *Journal of Political Economy*, 10, 977–1009.
- Bresnahan, T. and P. Reiss (1990). “Entry in Monopoly Markets,” *Review of Economic Studies*, 57, 531–553.
- Bresnahan, T. and P. Reiss (1991). “Empirical Models of Discrete Games,” *Journal of Economet-*

rics, 48, 57–81.

- Bresnahan, T. and P. Reiss (1994). “Measuring the Importance of Sunk Costs,” *Annales d’Economie et de Statistique*, 34, 181–217.
- Ciliberto, F. and E. Tamer (2003). “Market Structure and Multiple Equilibria in Airline Markets,” working paper.
- Dunne, T., M. Roberts, and L. Samuelson (1988). “Patterns of Firm Entry and Exit in U.S. Manufacturing Industries,” *Rand Journal of Economics*, 19, 495–515.
- Dunne, T., M. Roberts, and L. Samuelson (1989). “The Growth and Failure of U.S. Manufacturing Plants,” *Quarterly Journal of Economics*, 104, 671–698.
- Einav, L. (2003). “Not All Rivals Look Alike: Estimating an Equilibrium Model of The Release Date Timing Game,” working paper.
- Jia, P. (2005). “What Happens when Wal-Mart Comes to Town?”, working paper, MIT.
- Lieberman, M. (1990). “Exit from Declining Industries: ‘Shakeout’ or ‘Stakeout’?”, *Rand Journal of Economics*, 21, 538–554.
- Mazzeo, M. (2002). “Product Choice and Oligopoly Market Structure,” *Rand Journal of Economics*, 221–242.
- Seim, K. (2003). “An Empirical Model of Firm Entry with Endogenous Product-Type Choices,” forthcoming in *Rand Journal of Economics*.
- Sutton, J. (1991). *Sunk Costs and Market Structure*. MIT Press.
- Sweeting, A. (2002). “Coordination Equilibria in Radio Broadcasting Markets,” working paper.
- Tamer, E. (2003). “Incomplete Simultaneous Discrete Response Model with Multiple Equilibria,” *Review of Economic Studies*, 70, 147–167.

Network Effects

- Akerberg, D. and G. Gowrisankaran (2002). “Quantifying Equilibrium Network Externalities in the ACH Banking Industry.” forthcoming in *Rand Journal of Economics*.
- Farrell, J. and P. Klemperer (2004). “Coordination and Lock-in: Copetition with Switching Costs and Network Effects,” working paper.
- Rysman, M. (2004). “Competition Between Networks: A Study of the Market for Yellow Pages,” *Review of Economic Studies*.
- Saloner, G. and A. Shepard (1995). “Adoption of Technologies with Network Effects: An Empirical Examination of the Adoption of Automated Teller Machines,” *Rand Journal of Economics*, 26, 479–501.

Empirical Studies of Contracts

- Abbring, J., P.A. Chiappori, J. Heckman, and J. Pinquet (2001), “Adverse Selection and Moral Hazard in Insurance: Can Dynamic Data Help to Distinguish?” working paper, Chicago.
- Botticini, M. and D. Akerberg (2002). “Endogenous Matching and the Empirical Determinants of Contract Form,” *Journal of Political Economy* Vol. 110, No. 3, June 2002.

- Chiappori, P.-A. and B. Salanie (1997). "Empirical Contract Theory: The Case of Insurance Data," *European Economic Review*, 41, 943-50.
- Chiappori, P.-A. and B. Salanie (2000). "Testing Contract Theory: A Survey of Some Recent Work," working paper, Chicago.
- Chiappori, P.-A. and B. Salanie (2000). "Testing for Asymmetric Information in Insurance Markets," *Journal of Political Economy*, 108, 56-78.
- Cardon J. and I. Hendel (2001) "Asymmetric Information in Health Markets: Evidence from the National Medical Expenditure Survey," *Rand Journal of Economics*, 32:408-427.
- Chiappori, P.-A. and B. Salanie (2000). "Testing for Asymmetric Information in Insurance Markets," *Journal of Political Economy*, 108, 56-78.
- Fang, H., M. Keane and D. Silverman (2006). "Sources of Advantageous Selection: Evidence from the Medigap Insurance Market," NBER working paper 12289.
- Finkelstein, A. and J. Poterba (2004). "Adverse Selection in Insurance Markets: Policyholder Evidence from the U.K. Annuity Market," *Journal of Political Economy*, 112, 183-208.
- Finkelstein, A. and J. Poterba (2006), "Testing for Adverse Selection with 'Unused Observables'," NBER working paper 12112.
- Hendel I. and A. Lizzeri (2003). "The Role of Commitment in Dynamic Contracts: Evidence from Life Insurance," *Quarterly Journal of Economics*, 118: 299-327.
- Israel, M. (2005). "Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobiles Insurance Firms," *Rand Journal of Economics*, 36: 165-192.

IO of Health Care

- Capps, C., D. Dranove and M. Satterthwaite (2003). "Competition and Market Power in Option Demand Markets," *Rand Journal of Economics*, 34(4), pp. 737-763.
- Crawford, G. and M. Shum (2005). "Uncertainty and Learning in Pharmaceutical Demand," *Econometrica*, 73: 1137-1174.
- Dranove, D., D. Kessler, M. McClellan and M. Satterthwaite (2003). Is More Information Better? The Effects of Health Care Quality Report Cards , *Journal of Political Economy* 111.
- Duggan, M. and F. Morton. (2006). "The Distortionary Effects of Government Procurement: Evidence for Medicaid Prescription Drug Purchasing," *Quarterly Journal of Economics*, February, 1-30.
- Gaynor, M. and W. Vogt (2003). "Competition Among Hospitals," *Rand Journal of Economics*, 34, 764-785.
- Ho, K. (2005). "Insurer-Provider Networks in the Medical Care Market" NBER Working Paper 11822.

Durable Goods

- Bulow, J. (1986). "Durable Good Monopolist," *Journal of Political Economy*, 90, 314-352.

Gowrisankaran, G. and M. Rysman (2006). “Dynamics of Consumer Demand for New Durable Goods,” working paper, Boston University.

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Zhao, E. (2006). “Why are Prices Falling Fast? An Empirical Study of the US Digital Camera Market,” working paper, Yale University.

Price Discrimination

Armstrong, M. (1996). “Multiproduct Nonlinear Pricing,” *Econometrica*, 51–76.

Armstrong, M. (1999). “Price Discrimination by a Multiproduct Firm,” *Review of Economic Studies*, 151–168.

Chevalier, J., A. Kashyap and P. Rossi (2003). “Why don't prices rise during periods of peak demand? Evidence from scanner data,” *American Economic Review*.

Crawford, G. and M. Shum (2004), “Empirical Modeling of Endogenous Quality Choice: The Case of Cable Television,” working paper, Arizona.

Leslie, P. (2004). “Price Discrimination in Broadway Theater,” *Rand Journal of Economics*, 35(3), 520–41.

Maskin, E. and J. Riley (1984). “Monopoly with Incomplete Information,” *Rand Journal of Economics*, 171–196.

McAfee, R.P., J. McMillan and M. Whinston (1989). “Multiproduct Monopoly, Commodity Bundling, and Correlation of Values,” *Quarterly Journal of Economics*, 371–383.

McManus, B. (2002). “Nonlinear Pricing in an Oligopoly Market: The Case of Specialty Coffee,” working paper, Washington University St. Louis.

Miravete, E. and L. Roeller (2004). “Competitive Nonlinear Pricing in Duopoly Equilibrium: The Early US Cellular Telephone Industry,” working paper.

Mussa, M. and S. Rosen (1978). “Monopoly and Product Quality,” *Journal of Economic Theory*, 18, 301–317.

Rochet, J. and L. Stole (2002). “Nonlinear Pricing with Random Participation,” *Review of Economic Studies*, 69, 277–311.

Shepard, A. (1991). “Price Discrimination and Retail Configuration,” *Journal of Political Economy* 99, 30–51.

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New Products

Petrin, A. (2001). “Quantifying the Benefits of New Products: The Case of the Minivan,” *Journal of Political Economy*.

Advertising

Ackerberg, D. (2001). Empirically Distinguishing Informative and Prestige Effects of Advertising, *RAND Journal of Economics*, Vol. 32, No. 2, Summer 2001. pp 100–118

Bagwell, K. “The Economic Analysis of Advertising,” working paper.

Becker, G. and K. Murphy (1993). “A Simple Theory of Advertising as a Good or Bad,” *Quarterly Journal of Economics* 941–964.

Goeree, M. (2005) ”Advertising in the US Personal Computer Industry”, working paper, Claremont-McKenna.

Milgrom, P. and J. Roberts (1986). “Price and Advertising as Signals of Quality,” *Journal of Political Economy*, 94, 796–821.

Milyo, J. and J. Waldfogel (1999). “The Effect of Price Advertising on Prices: Evidence in the Wake of 44 Liquormart,” *American Economic Review*, 89, 1081–1096.

Mergers

DOJ Horizontal Merger Guidelines, www.usdoj.gov/atr/

Berry, S. and J. Waldfogel (2001). “Do Mergers Increase Product Variety? Evidence from Radio Broadcasting,” *Quarterly Journal of Economics*, 1009–1025.

Capps, C., D. Dranove and M. Satterthwaite (2003). “Competition and Market Power in Option Demand Markets,” *Rand Journal of Economics*, 34(4), pp. 737-763.

Gowrisankaran, G. (1999). “A Dynamic Model of Endogenous Horizontal Mergers,” *Rand Journal of Economics* 30, 56-83.

Nevo, A. (2000). “Mergers with Differentiated Products: The Case of the Ready-to-Eat Breakfast Cereal Industry,” *Rand Journal of Economics*, 31, 395–421..

Search

Varian, H. (1980) “A Theory of Sales,” *American Economic Review*, 70, 651–658.

Hong, H. and M. Shum (2006). “Using Price Distributions to Estimate Search Costs,” *Rand Journal of Economics*, Vol. 37, no. 2.

Hortacsu, A. and C. Syverson (2004). “Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds” *Quarterly Journal of Economics*, May.

Sorensen, A. (2000) “Equilibrium Price Dispersion in Retail Markets for Prescription Drugs,” *Journal of Political Economy*, 108,833–850.

Stahl D. (1989) “Oligopolistic Pricing with Sequential Consumer Search,” *American Economic Review*, 79, 700-712.

Vertical Relations

Bernheim, D. and M. Whinston (1998). “Exclusive Dealing,” *Journal of Political Economy*, 64–103.

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

Rey, P and J. Tirole (2003). “A Primer on Foreclosure,” forthcoming in *Handbook of IO*.

- Hellerstein, R. and S. Villas-Boas (2006). “Identification of Supply Models of Manufacturer and Retailer Oligopoly Pricing,” *Economics Letters*, 90, 132-140
- Villas-Boas, S. (2007). “Vertical Relationships Between Manufacturers and Retailers: Inference With Limited Data,” *Review of Economic Studies*, 2007, Vol. 74, 2, pp. 625-652.
- Whinston, M. (1990). “Tying, Foreclosure and Exclusion,” *American Economic Review*, 98, 837–859.

Dynamic Models

- Aguirregabiria, V. (1999). “The Dynamics of Markups and Inventories in Retail Firms,” *Review of Economic Studies*, 275–308.
- Aguirregabiria, V. and P. Mira (2002). “Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models,” *Econometrica*, 70, 1519-1543.
- Aguirregabiria, V. and P. Mira (2007). “Sequential Estimation of Dynamic Discrete Games,” *Econometrica* 75(1), 1-53.
- Benkard, L. (2004). “A Dynamic Analysis of the Market for Wide-Bodied Commercial Aircraft” *Review of Economic Studies*.
- Bajari, P., L. Benkard, and J. Levin (2007). “Estimating Dynamic Models of Imperfect Competition,” *Econometrica*.
- Berry, S., M. Ostrovsky, and A. Pakes (2007) “Simple Estimators for the Parameters of Discrete Dynamic Games (with Entry Exit Examples),” working paper.
- Hendel, I. and A. Nevo (2007), “Measuring the Effects of Sales and Consumer Inventories,” working paper.
- Hotz, J. and R. Miller (1993). “Conditional Choice Probabilities and the Estimation of Dynamic Models,” *Review of Economic Studies*, 60, 497–529.
- Jofre-Bonet, M. and M. Pesendorfer (2003). “Bidding Behavior in a Repeated Procurement Auction,” *Econometrica*.
- Melnikov, O. (2000). “Demand for Differentiated Durable Products: The Case of the US Computer Printer Market,” working paper.
- Pakes, A. (1986). “Patents as Options: Some Estimates of the Value of Holding European Patent Stocks,” *Econometrica*, 54, 755–784.
- Pakes, A. and P. McGuire (1994). “Computing Markov Perfect Nash Equilibrium: Numerical Implications of a Dynamic Differentiated Product Model,” *Rand Journal of Economics*, 555-589.
- Pakes, A. (2003). “A Framework for Applied Dynamic Analysis in I.O.” working paper.
- Ryan, S. (2005), “The Costs of Environmental Regulation in a Concentrated Industry,” working paper, MIT.
- Rust, J. (1987). “Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher,” *Econometrica*, 55, 999-1033.
- Rust, J. (1994). “Structural Estimation of Markov Decision Processes,” *Handbook of Econometrics*.

Rust, J. (1996). “Numerical Dynamic Programming in Economics,” *Handbook of Computational Economics*.

Schmidt-Dengler, P. (2004). “Timing of MRI Adoption in the U.S. Hospital Industry,” working paper.

Auctions

Athey, S. and P. Haile (2007). “Nonparametric Approaches to Auctions,” *Handbook of Econometrics*, forthcoming.

Athey, S. and P. Haile (2002). “Identification of Standard Auction Models,” *Econometrica*, 70(6), 2107–2140.

Athey, S. and J. Levin (2001). “Information and Competition in U.S. Forest Service Timber Auctions,” *Journal of Political Economy*, 109, 375–417.

Athey, Levin and Seira (2004). “Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions,” Working paper, Stanford.

Baldwin, L., R. Marshall, and J. Richard (1997). “Bidder Collusion at Forest Service Timber Sales,” *Journal of Political Economy*, 105, 657–699.

Bajari, P. and L. Ye (2002). “Detecting Collusion in Procurement Auctions,” working paper, Stanford University.

Bajari, P. and A. Hortacsu (2003). “Winner’s Curse, Reserve Prices and Endogenous Entry: Empirical Insights from eBay,” *Rand Journal of Economics*, pp. 329–355.

Cantillon, E. and M. Pesendorfer (2001). “Combination Bidding in Multi-Unit Auctions,” working paper, HBS and LSE.

Gans, J. and F. Wolak (2007). “A Comparison of Ex Ante versus Ex Post Vertical Market Power: Evidence from the Electricity Supply Industry,” working paper.

Guerre, E., I. Perrigne, and Q. Vuong (2000): “Optimal Nonparametric Estimation of First-Price Auctions,” *Econometrica*, 68, 525–574 .

Haile, P. (2001). “Auctions with Resale Markets: An Application to U.S. Forest Service Timber Sales,” *American Economic Review*, 91, 399–427.

Haile, P. and E. Tamer (2003). “Inference with an Incomplete Model of English Auctions,” *Journal of Political Economy*, 111 (1). 1–51.

Haile, P., Han Hong, and Matthew Shum (2007). “Nonparametric Tests for Common Values in First-Price Auctions,” working paper.

Harrison, G. (1989). “Theory and Misbehavior in First-Price Auctions,” *American Economic Review*, 79, 749–762.

Hendricks, K., J. Pinkse and R. Porter (2002): “Empirical Implications of Equilibrium Bidding in First-Price, Symmetric, Common Value Auctions,” forthcoming in *Review of Economic Studies*.

Hendricks, K. and R. Porter (1988). “An Empirical Study of an Auction with Asymmetric Information,” *American Economic Review*, 12, 865–883.

Hortacsu, A. (2001). “Mechanism Choice and Strategic Bidding in Divisible Goods Auctions: An

- Empirical Analysis of the Turkish Treasury Auction Market,” working paper, Chicago.
- Hortaçsu, A. and S. Puller (2007). “Understanding Strategic Models of Bidding in Deregulated Electricity Markets: A Case Study of ERCOT,” forthcoming *Rand Journal of Economics*.
- Kagel, J. (1995). “Auctions: A Survey of Experimental Research,” *Handbook of Experimental Economics*, J. Kagel and A. Roth eds., Princeton University Press.
- Kastl, J. (2006). “Discrete Bids and Empirical Inference in Divisible Good Auctions,” working paper.
- Krasnokutskaya, E. (2003). “Auction Models with Unobserved Heterogeneity: Application to the Michigan Highway Procurement Auctions,” working paper, University of Pennsylvania.
- Krasnokutskaya, E. and K. Seim (2005). “Preferential treatment Program and Participation Decisions in Highway Procurement,” working paper.
- Krishna, V. (2002). *Auction Theory*, Academic Press.
- Laffont, J., H. Ossard, and Q. Vuong (1995). “Econometrics of First-Price Auctions,” *Econometrica*, 63, 953–980.
- Li, T. (2002) “Econometrics of First-Price Auctions with Entry and Binding Reservation Prices,” working paper, Indiana University.
- Li, T. I. Perrigne, and Q. Vuong (2002). “Structural Estimation of the Affiliated Private Value Auction Model,” *Rand Journal of Economics*, 33(2), 171–193.
- Milgrom, P. and R. Weber (1982). “A Theory of Auctions and Competitive Bidding,” *Econometrica*, 50, 1089–1122.
- Myerson, R. (1981). “Optimal Auction Design,” *Mathematics of Operations Research*, 6, 58–73.
- Paarsch, H. (1992). “Deciding Between the Common and Private Value Paradigms in Empirical Models of Auctions,” *Journal of Econometrics*, 51, 191–215.
- Paarsch, H. (1997). “Deriving an Estimate of the Optimal Reserve Price: An Application to British Columbian Timber Sales,” *Journal of Econometrics*, 78:333–357.
- Pinkse, J. and G. Tan (2005). “The Affiliation Effect in First-Price Sealed Bid Auctions,” *Econometrica*, 73, 263–277.
- Porter R. (1995). “The Role of Information in U.S. Offshore Oil and Gas Lease Auctions,” *Econometrica*, 63, 1–28.
- Song, U. (2004). “Nonparametric Estimation of an eBay Auction Model with an Unknown Number of Bidders,” working paper, University of British Columbia.
- Wolak, F. (2003). “Identification and Estimation of Cost Functions Using Observed Bid Data: An Application to Electricity Markets,” in *Advances in Economics and Econometrics - Theory and Applications, Eighth World Congress*, M. Dewatripont, L. Hansen and S. Turnovsky eds., Cambridge, Cambridge University Press.

Collusion

- Athey, S. and J. Levin (2004). “Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions,” working paper.

- Bajari, P. and L. Ye (2003). ‘Deciding Between Competition and Collusion (with Lixin Ye, *Review of Economics and Statistics*, 971-989).
- Borenstein, S. and A. Shepard (1996). “Dynamic Pricing in Retail Gasoline Markets,” *Rand Journal of Economics*, 27, 429–451.
- Ellison, G. (1994). “Theories of Cartel Stability and the Joint Executive Committee,” *Rand Journal of Economics*, 25, 37–57.
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