

Graduate Economics Module 395.22
Soc Sci 327, Th 9:00-11:30
Fall 2007, August 30-October 4

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Empirical Techniques for Applied Micro

This course focuses on two important techniques in applied microeconomics: production function estimation and demand estimation. I will focus on applications in Industrial Organization, which is where most of these techniques were developed. However, these techniques have also been and are increasingly applied in labor, macro, trade, public finance, education and development. This emphasis will be on methodology, but I will also discuss several applications in some detail. The next module (395.23) will have more applications of these techniques.

Problem Sets: there will be weekly empirical problem sets which will determine your grade for the course. The problem sets are vital for understanding what is going on, not an optional extra. They will not be too long, so you should do them between the classes, and you should also be ready to talk about the results in class. I am happy for you to work in small groups of two or three people, but each student must submit their own write-up of the results. The empirical work can be done in STATA and/or MATLAB, but feel free to use other languages if you are more familiar with them.

Reading List: the starred papers are of particular importance and you should read the papers we discuss in class. The other papers are listed to guide further reading. Feel free to make suggestions if you find other papers you like and I may well add papers as we go along.

There is no required textbook, but you may want to look at

H. Varian, *Microeconomic Analysis*, Norton, 1992 (chapter 1-13 are a great reference for basic micro theory)

J. Wooldridge, *Econometric Analysis of Cross-Section and Panel Data*, MIT, 2002

J. Tirole, *The Theory of Industrial Organization*, MIT Press, 1988

A forthcoming chapter from the Handbook of Econometrics is recommended

D. Akerberg, L. Benkard, S. Berry and A. Pakes, *Econometric Tools for Analyzing Market Outcomes*, <http://www.stanford.edu/~lanierb/research/tools81-6-8.pdf>

1. Production Function Estimation

* D. Akerberg, K. Caves and G. Frazer, "Structural Estimation of Production Functions," mimeo, UCLA.

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

U. Doraszelski and J Jaumandreu, "[R&D and Productivity: The Knowledge Capital Model Revisited](#)," 2006. Harvard.

* Z. Griliches and J. Mairesse, "[Production Functions: The Search for Identification](#)," NBER Working Paper No.w5067.

Z. Griliches and J. Hausman, "Errors in Variables in Panel Data", *Journal of Econometrics*, 1986, 31, 93-118

T. Klette and Z. Griliches, "[The Inconsistency of Common Scale Estimators When Output Prices Are Unobserved and Endogenous](#)", *Journal of Applied Econometrics*, 1996, 343-361

D. Greenstreet, "Exploiting [Sequential Learning to Estimate Establishment-Level Productivity Dynamics and Decision Rules](#)," 2006. Michigan.

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

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

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

L. Foster, J. Haltiwanger and C. Syverson, "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?", forthcoming *AER*, <http://home.uchicago.edu/~syverson/selection.pdf>

* C. Syverson, "Market Structure and Productivity: A Concrete Example", *Journal of Political Economy*, 2004, 112(6), 1181-1222

R. Blundell and S. Bond, "GMM Estimation with Persistent Panel Data: An Application to Production Functions", *Econometric Reviews*, 2000, 19, 321-340

*S. Olley and A. Pakes, "The Dynamics of Productivity in the Telecommunications Equipment Industry," *Econometrica*, 1996, 64(6), 1263-1298

N. Pavcnik, "Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants", *Review of Economic Studies*, 2002, 245-76.

2. Static Demand: Homogenous Goods

Note: in these papers it is assumed that demand is static but firms may be forward looking (and colluding).

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. A

* T. Bresnahan, "The Oligopoly Solution is Identified," *Economics Letters*, 1980, 10, 87-92.

* T. Bresnahan, "Empirical Studies of Industries with Market Power," *HIO*, Vol. 2, Chapter 17.

K. Corts, "Conduct Parameters and the Measurement of Market Power," *JE*, November 1998, 227-50.

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.), *The 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," *HIO*, Vol. 2, Chapter 16.

C. Wolfram, "Measuring Duopoly Power in the British Electricity Spot Market," *AER*, September 1999, 805-26.

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.

* G. Ellison, "Theories of Cartel Stability and the Joint Executive Committee," RJE, Spring 1994, 37-57 (read Porter first)

* R. Porter, "[A Study of Cartel Stability: The Joint Executive Committee, 1880-1886](#)," BJE, Autumn 1983, 301-14.

Evans, W. and I. Kessides, "Living by the 'Golden Rule': Multimarket Contact in the U.S. Airline Industry," QJE, May 1994, 341-66.

Phillips, O. and C. Mason, "Mutual Forbearance in Experimental Conglomerate Markets," RJE, Autumn 1992, 395-414.

3. Static Demand (and Conduct): Differentiated Products

S. Anderson, A. dePalma and J. Thisse. Discrete Choice Theory of Product Differentiation, 1992, Cambridge and London, MIT Press.

* T. Bresnahan, "[Competition and Collusion in the American Automobile Market: The 1955 Price War](#)," JIE, June 1982, 457-482.

F. Gasami, J. Laffont, and Q. Vuong, "Econometric Analysis of Collusive Behavior in a Soft-Drink Market," JEMS, 1992, 277-311.

J. Baker and T. Bresnahan, "Estimating the Residual Demand Curve Facing a Single Firm," International Journal of Industrial Organization, 1988, 283-300.

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

D. McFadden, "Econometric Analysis of Qualitative Response Models," in Griliches and Intilligator (eds.), Handbook of Econometrics, Volume III, 1984 Amsterdam: North-Holland.

* S. Berry, 1994, "[Estimating Discrete-Choice Models of Product Differentiation](#)," RJE Summer 1994, 242-262.

* A. Nevo, Aviv, "[A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand](#)," JEMS, 2000, 513-548.

* S. Berry, J. Levinsohn, and A. Pakes, "[Automobile Prices in Market Equilibrium](#)," EMA, July 1995, 841-990.

* A. Nevo, "[Measuring Market Power in the Ready-to-Eat Cereal Industry](#)," EMA, March 2001, 307-342

* P. Goldberg, "[Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry](#)," EMA, July 1995, 891-951.

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

S. Berry, J. Levinsohn and A. Pakes, "[Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The new Car Market](#)," JPE, 2004, 68-105.

S. Berry, and A. Pakes, "[Estimating the Pure Hedonic Discrete Choice Model with Application to Price Indices](#)," 2001, mimeo, Yale.

C. Mela and J. Duan, "[The Role of Spatial Demand on Outlet Location and Pricing](#)", WP, Fuqua

4. Welfare Calculations Using Demand Systems

* M. Trajtenberg, "[The Welfare Analysis of Product Innovations, with an Application to Computed Tomography Scanners](#)," JPE 1999, 444-79.

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

A. Petrin, "Quantifying the Benefits of New Products: The Case of the Minivan," JPE, 2002, 705-729.

* J. Hausman, "Valuation of New Goods Under Perfect and Imperfect Competition," in Bresnahan and Gordon (eds) The Economics of New Goods, Studies in Income and Wealth, 1996, Vol. 58, Chicago: NBER. 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, 85(2), 266-275.

D. Akerberg and M. Rysman., "[Unobservable Product Differentiation in Discrete Choice Models: Estimating Price Elasticities and Welfare Effects](#)," RJE, Winter 2005, 771-788.

5. Price Indices and Hedonics

Z. Griliches, "Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," In The Price Statistics of the Federal Government (General Series No. 73). New York: National Bureau of Economic Research, 1961, 173-176. Reprinted in Griliches (ed.), Price Indices and Quality Change: Studies in New Methods of Measurement. Cambridge, Mass.: Harvard University Press, 1971.

R. Feenstra, "Exact Hedonic Price Indexes," ReStat, 1995 (4), 634-53.

A. Pakes, "[A Reconsideration of Hedonic Price Indices with an Application to PC's](#)," AER, 2003, 1578-1596.

* S. Rosen, "[Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition](#)," JPE Jan./Feb. 1974, 34-55.

D. Epple, "Hedonic Prices and Implicit Markets: Estimating Demand and Supply Functions for Differentiated Products," JPE, January 1987, 59-80.

* P. Bajari, and L. Benkard, "[Demand Estimation With Heterogeneous Consumers and Unobserved Product Characteristics: A Hedonic Approach](#)," JPE, December 2005, 1239-1276.

6. Dynamic Demand

If we have time I will talk about a couple of papers. Here is a list of papers discussed in the reading group over the summer.

O. Melnikov (2001) "[Demand for Differentiated Products: the Case of the U.S. Computer Printer Market](#)"

J. Carranza (2006) "[Consumer Heterogeneity, Demand for Durable Goods and the Dynamics of Quality](#)"

* A. Nevo and I. Hendel (2007) "[Measuring the Implications of Sales and Consumer Stockpiling Behavior](#)"

* G. Gowrisankaran and M. Rysman (2006) "[Dynamics of Consumer Demand for New Durable Goods](#)"

P. Schiraldi (2007) "[Automobile Replacement: A Dynamic Structural Approach](#)"

B. Gordon (2006) "[Estimating a Dynamic Model of Demand for Durable Goods](#)"

Y. Zhao (2007) [“Why Are Prices Falling Fast? Empirical Modeling of Dynamic Equilibria in Durable Goods Markets”](#)