

**ECON 8747-001 INDUSTRIAL ORGANIZATION****Empirical Methods in Industrial Organization and Regulation**

Instructor: Scott Savage, Assistant Professor  
Office: ECON 11 (south-west corner of basement)  
Email: [scott.savage@colorado.edu](mailto:scott.savage@colorado.edu) Phone: (303) 735-1165  
Office hours: TR 10.30-11:30am or by appointment  
Class time and location: TR 2.00-3.15pm, ECON 5  
Class website: CULearn

**Course Description**

*ECON 8747* introduces students to research methods used in empirical studies of industrial organization (IO) and regulation. The course focuses on the use of econometric methods and data for descriptive analysis (i.e., summarization of data), measurement, and examining the predictions of economic theories. We are particularly interested in: investigating interesting research questions in IO and regulation; matching experimental and observational data to IO theory; estimation techniques; identification; and evaluation of results, both in terms of economics and public policy. The course will be taught with formal lectures, the discussion of papers that emphasize the relevant empirical issues and methods described above, and with problem sets in applied econometrics and IO.

**Class requirements**

Class meets TR from 2:00-3.15pm. Attendance is compulsory. You are required to keep up with weekly course readings and to come to class prepared for lectures and discussion.

**Grading**

The final grade will be based on four assessments: class preparation (20 %); problem sets (20 %); mid-term exam (30 %); and final exam (30 %).

*Class preparation:* We will discuss about 15 to 20 papers during the semester. Using the Course Schedule / Reading List, please read the assigned reading(s) each week and come to class prepared for discussion. The assigned papers will be announced ahead of time during class. To help you organize your thoughts, please prepare a 1-2 page summary of the paper and submit the summary to the instructor. Here, you will need to state the research question, explain why the question is important to IO (and economics in general), briefly explain the estimation approach and data, and outline what you think are the most interesting aspect(s) of the paper. During the semester, about five or six of your summaries will be randomly graded.

*Problem sets:* you are required to complete five or six problem sets, about one problem set every two weeks. Typically, each problem set will require use to use STATA to estimate an econometric model, and interpret your findings.

*Mid-term examination:* there will be a mid-term exam on March 20.

*Final examination:* there will be a final exam on May 3.

There will be no make up for late submissions unless there is a unusual circumstance that is discussed with the instructor. If you aware of any problems that may hinder your performance in the class please discuss with me sooner than later. Feel free to form study groups to review and discuss lecture/reading material, but you must submit individual work for grading.

### **Background**

The course intends to develop the empirical research skills you will require to examine questions of interest in IO and regulation. Students are assumed to be familiar with IO theory and Applied Econometrics at the undergraduate level. The following references will permit you to refresh your knowledge where necessary throughout the course:

- Baum, C., Schaffer, M., and Stillman, S. 2003. "Instrumental Variables and GMM: Estimation and Testing." Boston College Working Paper No. 545 (available from <http://fmwww.bc.edu/ec-p/wp526-550.php>).
- Baum, C. 2006. *An Introduction to Modern Econometrics Using Stata*. Stata Press.
- Cabral, L. 2000. *Introduction to Industrial Organization*. The MIT Press, Cambridge, Massachusetts.
- Cameron, A. and Triveldi, P. 2005. *Microeconometrics*. Cambridge University Press.
- Greene, W. 1997. *Econometric Analysis*. Prentice Hall. Upper Saddle River, New Jersey.
- Pepall, L., Richards, D. and Norman, G. *Industrial Organization: Contemporary Theory and Practice*, 2nd or 3<sup>rd</sup> edition, Prentice Hall.
- Schmalensee, R. and Willig, R. (1989), *Handbook of Industrial Organization*, Volume II, Elsevier, New York.
- Tirole, J. 1988. *The Theory of Industrial Organization*. The MIT Press. Cambridge, Massachusetts.

There are also many IO, regulation and econometric books in the library that would be suitable references for this course.

### **Course Schedule / Reading List**

The reading list below includes more papers than we will cover in the course. You should use the list as a guide for reading outside of the class, ideas and future reference. Most papers are easily available from JSTOR and/or directly from journal web sites. For working papers, I have provided a web site address so that you can directly download the papers. Please see me directly for any other papers.

#### **I. Introduction**

- McAleer, M., Pagan, A. and Volker, P. (1985), "What Will take the Con out of Econometrics," *American Economic Review*, 75(3), 293-307.
- Reiss, P. and Wolak, F. (2004), "Structural Econometric Modeling: Rationales and Examples from Industrial Organization," in Engle and McFadden (eds.), *Handbook of Econometrics*, Volume V, 1-5, North-Holland, Amsterdam (<http://www.stanford.edu/~preiss/makeit.pdf>).

Schmalensee, R. (1989), "Inter-Industry Studies of Structure and Performance," in Schmalensee and Willig (eds), *Handbook of Industrial Organization*, Volume II, Elsevier, New York, Chapter 16. (please see me: this paper provides historical background to issues outlined by Salinger and Bresnahan. We will be discussing the latter papers in future weeks).

## II. Production and Costs

- Evans, D. and Heckman, J. (1984), "A Test of Subadditivity of the Cost Function with an Application to the Bell System," *American Economic Review*, 74(4), 615-623.
- Levinsohn, J. and Petrin, A. (2003), "Estimation of Production Functions using Inputs to Control for Unobservables," *Review of Economic Studies*, 70(2), 317-342.
- Olley, S. and Pakes, A. (1996), "The Dynamics of Productivity in the Telecommunications Equipment Industry," *Econometrica*, 64(6), 1263-97.
- Akerberg, D. and Caves, K. (2003), "Structural Identification of Production Functions," mimeo, UCLA (<http://www.bol.ucla.edu/~kcaves/prodfunc3.pdf>).
- Bloch, H., Coble-Neal, G., Madden, G. and Savage, S. (2001), "The Cost Structure of Australian Telecommunications," *Economic Record*, 77, 338-350.
- Christensen, L. and Greene, W. (1976), "Economies of Scale in U.S. Electric Power Generation," *Journal of Political Economy*, 84(4) 655-676.
- Griliches, Z. and Jacques, M. (1995). "Production Functions: The Search for Identification" (<http://papers.nber.org/papers/w5067.v5.pdf>). (<http://gsbwww.uchicago.edu/fac/amil.petrin/research/intermediateinput.pdf>).
- Maher, M. (1999), "Access Costs and Entry in the Local Telecommunications Network: A Case for De-averaged Rates," *International Journal of Industrial Organization*, 17, 593-609.
- Palmer, K. (1992), "A Test for Cross Subsidies in Local Telephone Rates: Do Business Customers Subsidize Residential Customers," *Rand Journal of Economics*, 23, 415-431.
- Thorton, R. and Thompson, P. (2001), "Learning and Experience from Others: An Exploration of Learning and Spillovers in Wartime Shipbuilding," *American Economic Review*, 91(5), 1350-1368.

## III. Demand

- Akerberg, D., Riordan, M., Rosston, G. and Wimmer, B. (2003), "Low-Income Demand for Local Telephone Service: The Effects of Lifeline and Linkup" (see me for a copy).
- Berry S. (1994), "Estimating Discrete Choice Models of Product Differentiation," *Rand Journal of Economics*, 25, 242-262.
- Savage, S. and Waldman, D. (2004), "United States Demand for Internet Access," *Review of Network Economics*, 2004, 3(3), 228-247.
- Hausman, J. (1996), "Valuation of New Goods Under Perfect and Imperfect Competition," in Bresnahan and Gordon (eds), *The Economics of New Goods, Studies in Income and Wealth*, Volume 58, NBER, Chicago.
- Hausman, J. (1999), "Cellular Telephone, New Products and the CPI," *Journal of Business and Economic Statistics*, 17(2), 188-94.

- Hausman J., Rosston, G. and Pakes, A. (1997). "Valuing the Effect of Regulation on New Services in Telecommunications," *Brookings Papers on Economic Activity: Microeconomics*: 1-54.
- Train, K., McFadden, D. and Ben-Akiva, M. (1987), "The Demand for Local Telephone Service", *Rand Journal of Economics*, 18, 109-123.
- Savage, S. and Waldman, D. (2007), "Learning and Fatigue During Choice Experiments: A Comparison of Online and Mail Survey Modes," forthcoming in *Journal of Applied Econometrics* (useful description of survey data collection issues with an IO application).

#### IV. Conduct in Homogenous Products Markets

- Bresnahan, T. (1982), "The Oligopolistic Solution Concept is Identified," *Economics Letters*, 10, 87-92.
- Bresnahan, T. (1989), "Empirical Studies of Industries with Market Power," *Handbook of Industrial Organization*, Volume II, Elsevier, New York, Chapter 17.
- Clay, K. and Troesken, W. (2003), "Further Tests of Static Oligopoly Models: Whiskey, 1882-1898," *Journal of Industrial Economics*, Vol. 51, 151-166, available at SSRN: <http://ssrn.com/abstract=418942>.
- Genesove, D. and Mullin, W. (1998), "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914," *Rand Journal of Economics*, 29(2), 355-77.
- Knittle, C. and Kim, Dae-Wook, "Biases in Static Oligopoly Models?" *forthcoming in The Journal of Industrial Economics*, <http://www.econ.ucdavis.edu/faculty/knittel/papers/mp061305.pdf>.
- Kahai, S., Kaserman, D. and Mayo, J. (1996), "Is the 'Dominant Firm' Dominant? An Empirical Analysis of AT&T's Market Power," *Journal of Law and Economics*, 39, 499-517.
- Salinger, M. 1990. "The Concentration-Margin Relationship Reconsidered," *Brookings Papers on Economic Activity Micro*: 287-335.
- Chevalier, J., Kashyap, A. and Rossi, P. (2003), "Why Don't Prices Rise During Periods of Peak Demand? Evidence from Scanner Data," *American Economic Review*, 93(1), 15-37 (reduced-form model).
- Corts, K. (1998), "Conduct Parameters and the Measure of Market Power," *Journal of Econometrics*, 88(2), 227-50.
- Ellison, G. (1994), "Theories of Cartel Stability and the Joint Executive Committee," *Rand Journal of Economics*, 25(1) 37-57.
- Evans, W. and Kessides, I. (1994), "Living by the Golden Rule": Multimarket Contact in U.S. Airline Industry," *Quarterly Journal of Economics*, 109(2), 341-366 (reduced-form model).
- Gollop, F and Roberts, M. (1979), "Firm Interdependence in Oligopolistic Markets," *Journal of Econometrics*, 10, 313-331.
- Madden, G. and Savage, S. (2000), "Market Structure, Competition and Pricing in United States International Telephone Services Markets," *Review of Economics and Statistics*, 2000, 82, 291-296.
- Porter, R. (1983), "A Study of Cartel Stability: The Joint Executive Committee, 1880-1886," *Rand Journal of Economics*, 14, 301-314.

- Sullivan, D. (1985) "Testing Hypotheses about Firm Behavior in the Cigarette Industry", *Journal of Political Economy*, 93, 586-598.
- Wolfram, C. (1999) "Measuring Duopoly Power in the British Electricity Spot Market" *American Economic Review*, 89, 805-826.

#### V. Conduct in Differentiated Products Markets

- Berry, S., Levinsohn, J. and Pakes, A. (1995), "Automobile Prices in Market Equilibrium," *Econometrica*, 63(July), 841-990.
- Borenstein. 1989. "Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry," *Rand Journal of Economics*, 2(3), 344-365.
- Petrin, A. and Goolsbee, A. (2004), "The Consumer Gains from Direct Broadcast Satellite and the Competition with Cable Television," *Econometrics*, 72(2), 351-381.
- Bresnahan, T. (1987), "Competition and Collusion in the American Automobile Industry: The 1955 Price War," *Journal of Industrial Economics* 35(4): 457-482.
- Crawford, G. (2000), "The Impact of the 1992 Cable Act on Household Demand and Welfare," *Rand Journal of Economics*, 31(3), 422-449.
- Goldberg, Pinelopi Koujianou. 1995. "Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry," *Econometrica*, 63(July): 891-951.
- Nevo, A. (2001), "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica*, 69 (2), 307-322.
- Nevo A. (2000), "A Research Assistant's Guide to Random Coefficients Discrete Choice Models of Demand," *Journal of Economics and Management Strategy*, 9(4), 513-548..
- Petrin, A. and Train, K. (2004), "Omitted Product Attributes in Differentiated Product Models," (<http://elsa.berkeley.edu/~train/pt42504.pdf>).

#### VI. Entry and Potential Competition

- Bergman, M. and Rudholm, N. (2003), "The Relative Importance of Actual and Potential Competition: Empirical Evidence from the Pharmaceuticals Market," *Journal of Industrial Economics*, 51(4), 455-466.
- Bresnahan, T. and Reiss, P. (1990), "Entry in Monopoly Markets," *Review of Economics Studies*: 531-53.
- Ellison, G. and Ellison, S. (2000), "Strategic Entry Deterrence and the Behavior of Pharmaceuticals Incumbents Prior to Patent Expiration," ([http://econ-www.mit.edu/faculty/download\\_pdf.php?id=217](http://econ-www.mit.edu/faculty/download_pdf.php?id=217)).
- Goolsbee, A., and Syverson, C. (2004), "How Do Incumbents Respond to the Threat of Entry?" Evidence from the Major Airlines, (<http://home.uchicago.edu/~syverson/southwestentry.pdf>).
- Berry, S. (1992), "Estimation of a Model of Entry in the Airline Industry," *Econometrica*, 60(4), 889-918.
- Berry, S. and Waldfoegel, J. (1999), "Free Entry and Social Inefficiency in Radio Broadcasting," *Rand Journal of Economics*, 30(3), 397-420.
- Greenstein, S. and Michael, M. (2005), "The Role of Differentiation Strategy in Local Telecommunication Entry and Market Evolution: 1999-2002,"

([http://www.kellogg.northwestern.edu/faculty/greenstein/images/htm/Research/WP/cle\\_c\\_entry\\_march05.pdf](http://www.kellogg.northwestern.edu/faculty/greenstein/images/htm/Research/WP/cle_c_entry_march05.pdf)).

Reiss, P. (1996), "Empirical Models of Discrete Strategic Choices," *American Economic Review*, 86(2), 421-426.

Savage, S. and Wirth, M. (2005), "Price, Programming, and Potential Competition in US Cable Television Markets," *Journal of Regulatory Economics*, 27(1), 25-46.

Strassmann, D., Xiao, M. and Orazem, P. (2004), "Do Entry Conditions Vary over Time? Entry and Competition in the Broadband Market 1999-2003," ([http://www.econ.rochester.edu/Faculty/Xiao/research/ETtime\\_Xiao\\_Orazem.pdf](http://www.econ.rochester.edu/Faculty/Xiao/research/ETtime_Xiao_Orazem.pdf)).

## VII. Politics and Regulation

Lafontaine, F. and Sivadasan, J. (2006), "[The Microeconomic Implications of Input Market Regulations: Cross-country Evidence from Within the Firm](#)," available at <http://www.colorado.edu/Economics/seminars/lafontaine.pdf>.

Lafontaine, F. and Malaguzzi Valeri, L. (2005), "The Deregulation of International Trucking in the European Union: Form and Effect," Michigan Law and Economics Working Paper No. 05-006, available at SSRN: <http://ssrn.com/abstract=730108> or DOI: [10.2139/ssrn.730108](https://doi.org/10.2139/ssrn.730108)

Ellison, S. and Wolfram, C. (2000), "Pharmaceutical Prices and Political Activity," ([http://econ-www.mit.edu/faculty/download\\_pdf.php?id=224](http://econ-www.mit.edu/faculty/download_pdf.php?id=224))

Edwards, G. and Waverman, L. (2004), "The Effects of Public Ownership & Regulatory Independence on Regulatory Outcomes," ([http://facultyresearch.london.edu/docs/The\\_Effects\\_of\\_Public\\_Ownership1.pdf](http://facultyresearch.london.edu/docs/The_Effects_of_Public_Ownership1.pdf))

Knittel, C. (2004), "Regulatory Restructuring and Incumbent Price Dynamics: The Case of U.S. Local Telephone Markets," *Review of Economics and Statistics*, 86(2), 614-625.

Knittel, C. (2003), "Market Structure and the Pricing of Electricity and Natural Gas," *The Journal of Industrial Economics*, LI(2), 167-192, available at <http://www.econ.ucdavis.edu/faculty/knittel/papers/mp061305.pdf>

Rosston, G., Savage, S. and Wimmer, B. (2005), "Regulated Prices with Competition and Heterogeneous Consumers (see me for copy).

Abel, J. (2002), "Entry in Regulated Markets: The Development of a competitive Fringe in the Local Telephone Industry," *Journal of Law and Economics*, 45, 289-316.

Blank, L., Kaserman, D. and Mayo, J. (1998), "Dominant Firm Pricing with Competitive Entry and Regulation: The Case of IntraLATA Toll," *Journal of Regulatory Economics*, 14, 35-53.

Borenstein, S., Bushnell, J. and Wolak, F. (2002), "Measuring Market Inefficiencies in California's Restructured Wholesale Electricity Market," *American Economic Review*, 92(5), 1376-1405.

de Figueiredo, Jr., R. and Edwards, G. (2004), "Why do Regulatory Outcomes Vary So Much?" Hass School of Business Working Paper (see me for copy).

Eriksson, Ross C., Kaserman, David L. and Mayo, John W. (1998) "Targeted and Untargeted Subsidy Schemes: Evidence from Post-divestiture Efforts to Promote Universal Telephone Service," *Journal of Law and Economics*, XLI, 477.

- Rubinovitz, R. (1993), "Market Power and Price Increases for Basic Cable Since Deregulation," *Rand Journal of Economics*, 24, 1-18.
- Smart, S. (1994), "The Consequences of Appointment Methods and Party Control for Telecommunications Pricing," *Journal of Economics & Management Strategy*, 3(2), 301-323.
- Steiner, F. (2004), "The Market Response to Restructuring: A Behavioral Model," *Journal of Regulatory Economics*, 25, 59-80.

#### VIII. Networks and Standards

- Asvanund, A., Clay, K., Krishnan, R. and Smith, M. (2003), "An Empirical Analysis of Network Externalities in Peer-To-Peer Music Sharing Networks," available at SSRN: <http://ssrn.com/abstract=433780> or DOI: [10.2139/ssrn.433780](https://doi.org/10.2139/ssrn.433780).
- Clay, K., Krishnan, R., Wolff, E. and Fernandes, D. (2002), "Retail Strategies on the Web: Price and Non-price Competition in the Online Book Industry," *Journal of Industrial Economics*, Vol. 50, 351-367, available at SSRN: <http://ssrn.com/abstract=330411>.
- Gandal, N. (1994) "Hedonic Price Indexes for Spreadsheets and an Empirical Test for Network Externalities," *Rand Journal of Economics*, 25(1), 160-170.
- Goolsbee, A. and Klenow, P. (2002), "Evidence on Learning and Network Externalities in the Diffusion of Home Computers," *Journal of Law and Economics*, XLV(2), 317-344.
- Wright, J. (1999), "International Telecommunications, Settlement Rates, and the FCC," *Journal of Regulatory Economics*, 15(3), 267-292.
- Gandal, N., Kende, M. and Rafi R. (2000), "The Dynamics of Technological Adoption in Hardware/Software Systems: The Case of Compact Disk Players," *Rand Journal of Economics*, 31(1), 43-61.
- Karaca-Mandic, P. (2004), "Network Effects in Technology Adoption: The Case of DVD Players," (see me for copy).
- Saloner, G. and Shepard, A. (1995), "Adoption of Technologies with Network Effects: An Empirical Examination of the Adoption of Automated Teller Machines," *Rand Journal of Economics*, 26, 479-501.
- Savage, S. and Waldman, D. (2006), "High-Technology Goods in Household Production Functions: The Demand for Internet Bandwidth," (see me for copy).

#### **Campus policies**

Campus policy states that every effort shall be made to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students should notify the instructor of anticipated conflicts as early in the semester as possible so that there is adequate time to make necessary arrangements. The full text of the Boulder campus policy is available at [http://www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html).

The University has recently adopted a student Honor Code. Students should familiarize themselves with its tenets at <http://www.colorado.edu/academics/honorcode/>.

If you qualify for accommodations because of a disability please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities (303-492-8671, Willard 322, [www.colorado.edu/disabilityservices](http://www.colorado.edu/disabilityservices)).