ECON 8757-001 INDUSTRIAL ORGANIZATION AND PUBLIC POLICY

Empirical Methods in Industrial Organization and Regulation

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Office hours: TR 11am-12pm or by appointment
Class time and location: TR 9-30-10.45pm, ECON 5
Class website: *CULearn*; see https://culearn.colorado.edu/
Personal website: http://www.colorado.edu/Economics/people/faculty/savage.html

Course Description

ECON 8747 introduces students to empirical methods used in studies of industrial organization (IO) and regulation. The course focuses on the use of econometric methods for descriptive analysis, examining the predictions of IO theories, and estimating structural parameters. The course will be taught with formal lectures, the discussion of papers that emphasize relevant empirical issues and methods, and with problem sets in applied econometrics and IO.

Class requirements

Class meets Tuesday and Thursday from 9.30am-10.45am. Attendance is compulsory. You are required to keep up with weekly course readings and come to class prepared for lectures and discussion.

Grading

The final grade will be based on four assessments: class preparation (25%); problem sets (25%); mid-term exam (25%); and final exam (25%).

Class preparation: We will discuss about a dozen papers during the semester. Please use the "Reading List" below to read the assigned papers each week and come to class prepared for discussion. 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 aspects of the paper. During the semester, several or 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 you to use STATA to implement an econometric procedure and interpret your findings.

Mid-term examination: There will be a mid-term exam on Monday, March 2.

Final examination: There will be a final exam on Monday, May 3,1.30-4pm .

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.

Proposed topics

Introduction to IO
Empirical IO
Data
Production and Costs
Demand
Conduct in Homogenous Product Markets
Conduct in Differentiated Product Markets
Entry and Potential Competition
Regulation
Networks and Standards

Reading list

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 3rd 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.

The reading list below includes more papers than we may 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, journal and author web sites. Please let me know if you have any trouble locating a paper.

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).

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.
Ackerberg, D. and Caves, K. (2003), "Structural Identification of Production Functions," mimeo, UCLA (http://www.bol.ucla.edu/~kcaves/prodfunct3.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.

Demand

Ackerberg, 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).

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.

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).

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).

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 Waldfogel, 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/clec_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).

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
Ellison, S. and Wolfram, C. (2000), "Pharmaceutical Prices and Political Activity," (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)
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.

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.
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).
Savage, S. (2007), "Innovation and the Production of Learning: The Effect of Information Technology on Economic Education," (see me for copy).

Campus policies

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See polices at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH, the above referenced policies and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh.

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/.

Disability Services' letters for students with disabilities indicate legally mandated reasonable accommodations. The syllabus statements and answers to Frequently Asked Questions can be found at http://www.colorado.edu/disabilityservices.

Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please indicate by email, near the beginning of the semester, if there is a conflict. See full details at http://www.colorado.edu/policies/fac_relig.html.

Guide to reading papers for class discussion

We will discuss about a dozen papers during the semester. Please prepare a 1-2 page summary for the designated paper that considers the following questions:

1. What is the research question and why is it interesting?

2. What economic theory is related to the empirical study in IO, and what is the empirically testable hypothesis (implication, prediction) of the theory?

3. Which market or industry is studied? Do you think the answers obtained using data from this industry will generalize to other industries and/or other sectors of the economy?

4. How is the data obtained? For instance, is it experimental, observational, publicly available, from single or multiple sources, etc?

5. Describe the dependent variable and independent variable(s) of interest, and the unit of observation. State the parameter of interest and describe how it relates to the theory and prediction described in point 3 above.

6. How is the parameter of interest identified (i.e., how does the study use information from the sample data to estimate the population parameter of interest)? Can you think of alternative means of identification?

7. What is the estimated parameter of interest? Briefly interpret.

8. Describe the economic explanation of the estimated parameter of interest and any alternative explanation(s). Does the study differentiate between these competing explanations?

9. Do the findings of the study have public policy implications?

10. Very simply, describe what you have learned from the paper in terms of economics and applied econometrics.