

ECON 8757-001 INDUSTRIAL ORGANIZATION AND PUBLIC POLICY**Empirical Methods in Industrial Organization**

Instructor: Professor Scott James Savage

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Office hours: T & TH 3.30 – 4.30pm or by appointment

Class time and location: T & TH 2 – 3.15pm, ECON 5

Course Description

Industrial organization studies firm behavior in markets where the assumptions of perfect competition do not hold. The focus is on the firm's choice of price, quantity of output, product variety, quality and market entry, and how public policy is used to promote competitive outcomes and control market power.

This course introduces the fundamental methods required to do empirical research in industrial organization. The course will be taught with formal lectures, the discussion of papers that emphasize relevant empirical issues and methods, and with regular problem sets in applied econometrics and empirical industrial organization. Theoretical work will also be discussed to show how theories can be tested and how theoretical models can be developed into empirical models to estimate structural parameters.

Class requirements

The class meets Tuesday and Thursday from 2 to 3.15pm. You are required to keep up with the weekly course readings and come to class prepared for lectures and the discussion of material with your class mates.

Assessment

Your final grade will be based on the following assessments: class preparation (30 percent); problem sets (30 percent); and exams (40 percent).

Class preparation: We will discuss about a dozen or so papers during the semester. Please read the assigned paper each week and come to class prepared for discussion. To help you organize your thoughts, please prepare a summary of the paper (no more than two pages) and submit the summary to me for assessment. In your summary, you will need to state the research question, explain why the question is important to industrial organization (and economics in general), briefly explain the estimation approach and data, and outline what you think are the most interesting aspects of the paper (see page 7 below for specific guidance). I will collect all your summaries during the semester and randomly grade seven (note: the lowest scoring summary will be dropped from your final grade).

Problem sets: You are required to complete one problem set about every two weeks for a total of seven during the semester (note: the lowest scoring problem set will be dropped from your final grade). Typically, each problem set will require you to use STATA and/or MATA to implement an econometric procedure to address an industrial organization question. You will also have to interpret your findings and sometimes answer theoretical or conceptual questions.

Exams: There will be a mid-term exam on Tuesday March 5 (2 – 3.15pm) and a final exam on Tuesday May 7 (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. Please feel free to form study groups to review and discuss lecture/reading material, but you must submit your own individual work for grading (note: if you work with class mates on assignments, please list the names of these persons on the front page of your submitted work).

Proposed topics

The proposed topics for this semester are:

- Introduction
- Consumer Demand
- Firm Conduct in Homogenous Product Markets
- Firm Conduct in Differentiated Product Markets
- Market Entry and Competition
- Product Quality, Product Variety and Competition

Readings

General references

The course will help you develop the empirical skills needed to research interesting questions in industrial organization and related fields (e.g., energy, trade, transport). I assume that you have the appropriate graduate-level microeconomic theory and econometrics skills to complete the course. The following general references will help you refresh your knowledge and skills where necessary throughout the course.

- Cabral, L. 2000. *Introduction to Industrial Organization*. The MIT Press, Cambridge, MA.
- Cameron, A. and Trivedi, P. 2009. *Microeconometrics Using Stata*. Stata Press, College Station, TX.
- Cameron, A. and Trivedi, P. 2005. *Microeconometrics*. Cambridge University Press, Cambridge, MA.
- Greene, W. 2012. *Econometric Analysis*, 7th edition. Prentice Hall. Upper Saddle River, NJ.
- Louviere, J., Hensher, D., and Swait, J. 2000. *Stated Choice Methods*. Cambridge University Press, New York.

- Pepall, L., Richards, D. and Norman, G. 2014. *Industrial Organization: Contemporary Theory and Practice*, 5th edition. John Wiley and Sons, Hoboken, NJ.
- 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, MA.
- Wooldridge, J. 2002. *Econometric Analysis of Cross Section and Panel Data*. The MIT Press. Cambridge, MA.
- Train, K. 2009. *Discrete Choice Methods with Simulation*. Cambridge University Press, New York.

Specific references

The list of specific references 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, for ideas, and for future reference. Most papers are readily available from JSTOR, and the respective journal and author web sites. Please let me know if you have any trouble locating a paper and I should be able to find a copy for you.

Introduction

- Cameron, A. and Trivedi, P. 2005. *Microeconometrics*. Chapter 14. Cambridge University Press, Cambridge, MA.
- Keane, M. 2010. "Structural vs. Atheoretic Approaches to Econometrics." *Journal of Econometrics*, 156, 3-20.
- Liran, E., and Levin, J. 2010. "Empirical Industrial Organization: A Progress Report." *Journal of Economic Perspectives*, 24(2), 145-62.
- McAleer, M., Pagan, A., and Volker, P. 1985. "What Will take the Con out of Econometrics." *American Economic Review*, 75(3), 293-307.
- Nevo, A., and Whinston, M. 2010. "Taking the Dogma Out of Econometrics: Structural Modeling and Credible Inference." *Journal of Economic Perspectives*, Spring, 69-82.
- 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.
- 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.

Consumer Demand

- Ackerberg, D., Riordan, M., Rosston, G., and Wimmer, B. 2014. "Estimating the Impact of Low-Income Universal Service Programs." *International Journal of Industrial Organization*, 37, 84-98.
- Berry, S. 1994. "Estimating Discrete Choice Models of Product Differentiation." *Rand Journal of Economics*, 25, 242-262.
- Brownstone, D., and K. Train. 1999. "Forecasting New Product Penetration with Flexible Substitution Patterns." *Journal of Econometrics*, 89(1), 109-129.

- McFadden, D. 1974. "Conditional Logit Analysis of Qualitative Choice Behavior." In *Frontiers in Economics*. Edited by P. Zarembka. New York: Academic Press.
- McFadden, D. 1986. "Estimating Household Value of Electric Service Reliability with Market Research Data." *Marketing Science*, 5 (October), 275-297.
- Nevo, A.; Turner, J. and Williams, J., 2016. "Usage-Based Pricing and Demand for Residential Broadband." *Econometrica*, 84, 441-443.
- Revelt, D., and Train, K. 1998. "Mixed Logit with Repeated Choices: Households' Choices of Appliance Efficiency Level." *The Review of Economics and Statistics*, 80(4), 647-657.
- Rosston, G., Savage, S., and Waldman, D. 2010. "Household Demand for Broadband Internet in 2010." *The B.E. Journal of Economic and Policy Analysis (Advances)*, 10(1), 2010, Article 79.
- Savage, S., and Waldman, D. 2015. "Privacy Tradeoffs in Smartphone Applications." *Economics Letters*, 137, 2015, 171-175.

Firm Conduct in Homogenous Products Markets

- Bresnahan, T. 1982, "The Oligopolistic Solution Concept is Identified." *Economics Letters*, 10, 87-92.
- 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).
- Clay, K., and Troesken, W. 2003. "Further Tests of Static Oligopoly Models: Whiskey, 1882-1898." *The Journal of Industrial Economics*, 51(2), 151-166.
- Evans, W., and Kessides, I. 1994. "Living by the Golden Rule": Multimarket Contact in the U.S. Airline Industry." *Quarterly Journal of Economics*, 109(2), 341-366.
- 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.

Firm Conduct in Differentiated Products Markets

- Allenby, G., Brazell, J., Howell, J., and Rossi, P. 2014. "Valuation of Patented Product Features." *Journal of Law and Economics*, 57(3), 629-663.
- Berry, S. 1994. "Estimating Discrete Choice Models of Product Differentiation." *Rand Journal of Economics*, 25, 242-262.
- Berry, S., Levinsohn, J., and Pakes, A. 1995. "Automobile Prices in Market Equilibrium." *Econometrica*, 63(July), 841-990.
- Bresnahan, T. 1987. "Competition and Collusion in the American Automobile Industry: The 1955 Price War." *The Journal of Industrial Economics*, 35(4): 457-482.
- Hiller, R. S., Savage, S., and Waldman, D. 2018. "Using Aggregate Market Data to Estimate Patent Damages: An Application to United States Smartphones 2010 to 2015." *International Journal of Industrial Organization*, 60, 1-31.
- Mazzeo, M. 2002. "Competitive Outcomes in Product-Differentiated Oligopoly." *The Review of Economics and Statistics*, 84(4), 716-728.
- Miller, N., and Weinberg, M. 2017. "Understanding the Price Effects of the Miller-Coors Joint Venture." *Econometrica*, 85(6), 1763-1791.

- Miravete, E., Seim, K., and Thurk, J. 2018. "One Markup to Rule Them All: Taxation by Liquor Pricing Regulation." Forthcoming in *American Economic Journal: Microeconomics*.
- Nevo A. 1998. "Identification of the Oligopoly Solution Concept in a Differentiated-Products Industry." *Economic Letters*, 59, 391-395.
- 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.
- Nevo, A. 2001. "Measuring Market Power in the Ready-to-Eat Cereal Industry." *Econometrica*, 69(2), 307-322.
- Petrin, A., and Goolsbee, A. 2004. "The Consumer Gains from Direct Broadcast Satellite and the Competition with Cable Television." *Econometrica*, 72(2), 351-381.
- Petrin, A., and Train, K. 2010. "A Control Function Approach to Endogeneity in Consumer Choice Models." *Journal of Marketing Research*, 47(1), 3-13.
- Shum, M. 2004. "Does Advertising Overcome Brand Loyalty? Evidence from the Breakfast-Cereals Market." *Journal of Economics and Management Strategy*, 13(2), 242-272.

Market Entry and Competition

- Berry, S., and Waldfogel, J. 1999. "Free Entry and Social Inefficiency in Radio Broadcasting." *Rand Journal of Economics*, 30(3), 397-420.
- Bresnahan, T., and Reiss, P. 1991. "Entry and Competition in Concentrated Markets." *Journal of Political Economy*, 99(5), pp. 977-1009.
- Bresnahan, T., and Reiss, P. 1990. "Entry in Monopoly Markets." *Review of Economics Studies*, 57(4), 531-553.
- Goolsbee, A., and Syverson, C. 2008. "How Do Incumbents Respond to the Threat of Entry? Evidence from the Major Airlines." *Quarterly Journal of Economics*, 123(4), 1611-1633.
- Manuszak, M., and Moul, C., 2008, "Prices and Endogenous Market Structure in Office Supply Superstores." *The Journal of Industrial Economics*, 56, 94-112.
- Mazzeo, M. 2002. "Product Choice and Oligopoly Market Structure." *Rand Journal of Economics*, 33(2), 221-242.
- Singh, V., and Zhu, T. 2008. "Pricing and Market Concentration in Oligopoly Markets." *Marketing Science*, 27(6), 1020-1035.
- Toivanen, O., and Waterson, M. 2005. "Market Structure and Entry: Where's the Beef?" *Rand Journal of Economics*, 36(3), 680-699.
- Xiao, M., and Orazem, P. 2011. "Does the Fourth Entrant Make Any Difference? Entry and Competition in the Early U.S. Broadband Market." *International Journal of Industrial Organization*, 29(5), 547-561.

Product Quality, Product Variety and Competition

- Berry, S., and Waldfogel, J. 2010. "Product Quality and Market Size." *The Journal of Industrial Economics*, 58(1), 1-31.
- Economides, N., Seim, K., and Viard, B. 2008. "Quantifying the Benefits of Entry into Local Phone Service." *RAND Journal of Economics*, 39(3), 699-730.

- Matsa, D. 2011. "Competition and Product Quality in the Supermarket Industry." *Quarterly Journal of Economics*, 126(3), 1539-1591.
- Molnar, G., and Savage, S. 2017. "Market Structure and Broadband Performance." *The Journal of Industrial Economics*, 65(1), 73-104.
- Olivares, M., and Cachon, G. 2009. "Competing Retailers and Inventory: An Empirical Investigation of General Motors' Dealerships in Isolated U.S. Markets." *Management Science*, 55(9), 1586-1604.
- Prince, J., and Simon, D. 2015. "Do Incumbents Improve Service Quality in Response to Entry? Evidence from Airlines' On-Time Performance." *Management Science*, 61(2), 372-390.
- Watson, R. 2009. "Product Variety and Competition in the Retail Market for Eyeglasses." *The Journal of Industrial Economics*, 57(2), 217-251.

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. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students who are found responsible for violating

the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please indicate by email, by the end of the first week, if there is a conflict. See the [campus policy regarding religious observances](#) for full details.

Guide to reading papers for class discussion

We will discuss about a dozen papers during the semester. Please prepare a one to two page summary for the designated paper that considers the following questions:

1. What is the research question and why is it interesting?
2. What theory is related to the question and what is the empirically testable implication of the theory?
3. Which market/industry is studied? Do the results generalize to other industries?
4. How were the data obtained, e.g., experimental and/or observational, public availability, single vs. multiple data sources, etc.,?
5. Describe the dependent variable and the important independent variable(s) of interest. State the parameter(s) of interest and describe how it relates to theory.
6. How is the parameter(s) 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. Interpret the estimated parameter(s) of interest.
8. Are there plausible alternative interpretations of the estimated parameter(s)?
9. Do the findings from the study have public policy implications?
10. What have you learned from the paper? What did you like and/or dislike about the paper (*this is very important: I am interested in your personal views*)?