

ECON 8757-001 INDUSTRIAL ORGANIZATION AND PUBLIC POLICY

Empirical Methods in Industrial Organization

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Class time and location: T & TH 12.45pm to 2pm, HLMS 252

Course format

ECON 8757 is an in-person class. The classroom at HLMS 252 has enough capacity to accommodate the enrollment limit with appropriate social distancing. Please wear an appropriate mask to class.

Spring 2021 semester will begin in a fully remote instruction mode. Campus leadership will approve the resumption of in-person courses no earlier than Monday, February 15. In the meantime, look to the announcements section of Canvas and your email for zoom invitations to our weekly lectures.

Due to the unusual circumstances from COVID-19, I reserve the right to update and/or modify my course format and syllabus, if necessary, as conditions change, and additional information is produced by the University of Colorado. Please check the syllabus and Canvas regularly throughout the semester for potential changes. Thank you and stay safe.

There will be no in-person office hours this semester. I will be available Wednesday 2.30pm to 5pm for questions by email and Zoom (if necessary).

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.

By the end of the course, you will be able to use Stata/Mata to estimate a simple Bertrand model of price competition in a differentiated products market. Model estimates can be used to recover marginal costs, estimate market power, conduct merger analysis, and examine the effects of new technologies, subsidies and tariffs on equilibrium prices, demand and welfare.

Class requirements

The class meets Tuesday and Thursday from 12.45pm to 2pm. 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 classmates.

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 ten 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 of two pages or fewer and submit the summary 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 8 below for specific guidance. I will collect all your summaries during the semester and randomly grade seven. 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. The lowest scoring problem set will be dropped from your final grade. Typically, each problem set will require you to use Stata/Mata to implement econometric procedures 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 2 during class and a final exam on Sunday, May 2 from 4.30pm to 7pm.

There will be no make up for late submissions unless there is an 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. If you work with classmates 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 Price Discrimination

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 micro and econometrics skills to complete the course. The following general references will help you refresh your knowledge and skills where necessary throughout the course.

- 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.
- Pepall, L., Richards, D. and Norman, G. 2014. *Industrial Organization: Contemporary Theory and Practice*, 5th edition. John Wiley and Sons, Hoboken, NJ.
- 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

This list includes many 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. If you have any trouble locating a paper, I should be able to find a copy for you.

Introduction

- Liran, E., and Levin, J. 2010. "Empirical Industrial Organization: A Progress Report." *Journal of Economic Perspectives*, 24(2), 145-62.
- 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.

Consumer Demand

- 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.

- 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.

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

- 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.
- Fan, Y., and C. Yang. 2016. "Competition, Product Proliferation and Welfare: A Study of the U.S. Smartphone Market." Working paper, March 25.
- Fershtman, C., N. Gandal, and S. Markovich. 1999. "Estimating the Effect of Tax Reform in Differentiated Product Oligopolistic Markets." *Journal of Public Economics*, 74, 151-170.
- Hiller, R. S., and Savage, S. "Tariff Pass-Through and Welfare in the Tablet Computer Market," *Journal of Industrial Economics*, forthcoming
- Kim, D. and R. Cotterill. 2008. "Cost Pass-Through in Differentiated Product Markets: The Case of U.S. Processed Cheese." *The Journal of Industrial Economics*, 55(1), 32-48.
- 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. 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. 2000. "Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal Industry." *RAND Journal of Economics*, 31(3), 395-421.
- 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.
- Richards, T., Acharya, R., and Molina, I. 2009. "Retail and Wholesale Market Power in Organic Foods." Presented at the Agricultural and Applied Economics Association 2009 Annual Meeting.
- 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.
- 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

- 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., and Waldfogel, J. 2010. "Product Quality and Market Size." *The Journal of Industrial Economics*, 58(1), 1-31.
- Crawford, G. 2005. "The Discriminatory Incentives to Bundle in the Cable Television Industry. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=829286.

- Decarolis, F., M. Polyakova, and S. Ryan. 2018. "Subsidy Design in Privately-Provided Social Insurance: Lessons from Medicare Part D." forthcoming in *Journal of Political Economy*.
- D'Haultfoeuille, X., I. Durrmeyer, and P. Février. 2018. "Automobile Prices in Market Equilibrium with Unobserved Price Discrimination." *Review of Economic Studies*, **0**, 1-26.
- 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.
- 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.
- Matsa, D. 2011. "Competition and Product Quality in the Supermarket Industry." *Quarterly Journal of Economics*, 126(3), 1539-1591.
- Miller, N., and M. Osborne. 2014. "Spatial Differentiation and Price Discrimination in the Cement Industry: Evidence from a Structural Model." *The RAND Journal of Economics*, 45, 221-247.
- 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

The Department of Economics enforces prerequisites. Students without the appropriate prerequisite(s) may be administratively dropped.

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](#).

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible;
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders;
- clean local work area;
- practice hand hygiene;
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert [CU Boulder Medical Services](#).

Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to [Student Conduct and Conflict Resolution](#). For more information, see the policies on [COVID-19 Health and Safety](#) and [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the “Accommodation for Disabilities” statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#).

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the [Health Questionnaire and Illness Reporting Form](#) remotely. In this class, please inform me as soon as possible if you may be absent due to illness or quarantine.

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 discussed and addressed. For this class, “timely” means during the first week of the semester. 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 for paper summary

We will discuss about ten 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 especially important: I am interested in your personal views*)?