

Economics 847
Empirical Industrial Organization and Applied Microeconomics
Fall 2019

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Class Time: Tuesdays and Thursdays 9:30am – 10:45am

Class location: Gardner 211

Office Hours: Mondays 9:30-11:30 and by appointment in Gardner 200C

Course organization and goals

This is the first of two empirical industrial organization (IO) courses offered at UNC during the 2019-20 academic year. The courses are designed to be taken in sequence. In this course we cover static demand estimation, information issues, vertical relations between firms, productivity, and platforms. The second course covers dynamic demand, auctions, and static and dynamic games.

If you intend to do dissertation research in empirical IO, you should also take a course in IO theory. Professor Gary Biglaiser is teaching a theory course (Econ 846) during fall 2019 that is designed, in part, to complement the UNC empirical IO sequence.

This course has three goals. Our main objective is to prepare you to do original research in empirical IO. To this end, we will survey some of the main areas of the IO literature. Our survey will focus on introducing some modeling and estimation techniques that are central to modern empirical IO, and we will also review some topics that are prominent in current research.

Our second objective is to improve your ability to do research in applied microeconomics, broadly defined. To satisfy this objective, we will put extra weight on parts of the empirical IO literature that are most likely to be beneficial for research outside of IO. In some cases these benefits will come through exposure to particular econometric techniques, and in other cases they will come through economic models or empirical results that are useful for all microeconomists to know.

The final objective is to show you some very successful dissertation papers in empirical IO. Successful dissertations across applied microeconomics will have much in common in terms of question selection, data construction, and methodology.

Our approach

We will read a selection of papers from the empirical IO literature. The emphasis will be on recent papers so that you can see the latest methods applied.

For each paper we read, you will need to evaluate:

- What new tools do I learn from this paper?
- How is the empirical exercise motivated by theory or policy relevance?
- What is the relationship between the relevant theory and the empirical exercise?
- What about the data and modeling assumptions do you believe and/or not believe?
- Why does the author think that the results answer the paper's main questions?
- How could this paper be extended to provide additional useful results? If the present data and model are insufficient, what is needed?

We will develop your ability to answer these questions through a series of in-class activities, homework assignments, and a final paper.

Graded work

Your grade will come from four distinct activities.

1. Class participation (25%). Our class meetings will involve balanced discussion among all of us. You need to contribute constructively and frequently to classroom discussion for your own grade and to help move the class along.
2. Paper presentations (20%). Each student will do one in-class presentation of a research article during the semester. Each presentation will last about 45 minutes and provide a discussion of some central points in an article. Once the presentation schedule and articles are set, I will assign the portions of each paper that a student will discuss. For example, a student may be asked to present the data and econometric model of a particular paper, but not the paper's introduction, theory section, or results.
3. Homework assignments (30%). There will be about 4 data-oriented homework assignments. You will need Stata for some of the assignments, and an advanced programming language such as Matlab or Fortran for others.
4. Final paper (25%). By noon on Tuesday December 10 you will turn in a brief paper (8-12 pages) that motivates and describes a novel empirical research idea that is part of industrial organization, broadly defined. Think of this paper as a condensed version of the material found in the first half of a traditional research article. You do not need to collect the data necessary to "complete" the article, but you must show that the data could be collected or created in a

reasonable amount of time or with finite financial resources. During the last week of class you will give a brief presentation on your paper topic and progress.

Sakai

I will use Sakai to distribute notes, readings, homework assignments, etc. Please verify that you can log on to Sakai and access the information for this class. All grades for the course will be stored and displayed on the Sakai course page. It is your responsibility to insure that the grades on this course page are accurate.

Homework assignments

I will post assignments to Sakai about one week before they are due. Some assignments must be done individually, while others can be completed in groups of 2 or 3 students. You are welcome to discuss all assignments and potential solutions freely with any students in the class, but each individual or group must turn in his or her own version of the homework. I will provide brief answers to the assignments about one week after they are due.

Classroom etiquette

My goal is to maintain a classroom environment that provides a good learning environment for everyone. To minimize distractions, you must turn off all phones, laptops, and other electronic devices during class. I expect you to arrive on time and prepared for the day's class.

Readings and outline

There are several high-quality background sources that you should be ready to consult. They are:

- D. Carlton and J. Perloff, *Modern Industrial Organization*, Addison Wesley, 2004.
- J. Wooldridge, *Econometric Analysis of Cross-Section and Panel Data*, MIT, 2002
- J. Tirole, *The Theory of Industrial Organization*, MIT Press, 1988
- T. Bresnahan, "Empirical Studies of Industries with Market Power," in Schmalensee and Willig (Eds.), *Handbook of Industrial Organization*, Vol. 2, Ch. 17, pp. 1011-58. 1989.
- D. Akerberg, C.L. Benkard, S. Berry, and A. Pakes, "Econometric Tools for Analyzing Market Outcomes," in Heckman and Leamer (Eds), *Handbook of Econometrics*, Vol. 6, Ch. 63, pp. 4171-4276.
- P. Reiss and F. Wolak "Structural Econometric Modeling: Rationales and Examples from Industrial Organization," in Heckman and Leamer (Eds), *Handbook of Econometrics*, Vol. 6, Ch. 64, pp. 4277-4415.

The books are available for purchase or at the library. The handbook chapters are available at the course Sakai page.

The specific readings for this course are listed below and separated by topic. I have provided estimates of how much time each topic will take us to cover. These estimates are likely to be wrong, and we will adjust our topic coverage as needed throughout the semester.

Each listed topic identifies some papers we will cover in class, plus some extra material for students interested in any particular topic. You are required to read all of the papers under each "In class" heading before we discuss them in class. I will give you advance notice on what papers we will cover in upcoming classes. Count on reading about one paper per class meeting.

About a month into the semester, we will begin having student presentations of papers. These are likely to be drawn from the collection of papers we will cover in class. Presentation topics and timing will be assigned about two weeks before the presentations begin.

Policy background (first meeting)

In class:

- Various recent popular press articles on current IO applications.
- S. Berry, M. Gaynor, F. Scott Morton, "Do Increasing Markups Matter? Lessons from Empirical Industrial Organization," JEP 33(3), pp. 44-68.

Static demand

Homogeneous goods (0.5 week)

In class:

- R. Porter, "A Study of Cartel Stability: The Joint Executive Committee, 1880-1886," BJE 14(2), Autumn 1983, pp. 301-314.

Supplemental papers:

- T. Bresnahan, "The Oligopoly Solution Is Identified," *EL* 10(1-2), 1982, pp. 87-92.
- K. Graddy, "Testing for Imperfect Competition at the Fulton Fish Market," *RJE* 26(1), Spring 1995, pp. 75-92.
- D. Genesove and W. Mullin, "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914," *RJE* 29(2), Summer 1998, pp. 355-377.

Differentiated products (2 weeks)

In class:

- T. Bresnahan, "Competition and Collusion in the American Automobile Industry: The 1955 Price War," *JIE* 35(4), June 1987, pp. 457-482.
- S. Berry, "Estimating Discrete-Choice Models of Product Differentiation," *RJE* 25(2), Summer 1994, pp. 242-262.
- S. Berry, J. Levinsohn, and A. Pakes. "Automobile Prices in Market Equilibrium." *ECMA* 63(4), July 1995, pp. 841-890.

Supplemental papers:

- D. Epple, "Hedonic Prices and Implicit Markets: Estimating Demand and Supply Functions for Differentiated Products," *JPE* 95(1), February 1987, pp. 59-80.
- P. Goldberg, "Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry," *ECMA* 63(4), July 1995, pp. 891-951.
- I. Hendel, "Estimating Multiple Discrete Choice Models: An Application to Computerization Returns," *REStud* 66(2), April 1999, pp. 423-446.
- A. Nevo, "A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand," *JEMS* 9(4), December 2000, pp. 513-548.
- P. Bajari and L. Benkard "Demand Estimation with Heterogeneous Consumers and Unobserved Product Characteristics: A Hedonic Approach," *JPE* 113(6), December 2005, pp. 1239-1276.
- S. Berry, J. Levinsohn, and A. Pakes, "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market," *JPE* 112(1), February 2004, pp. 68-105.

Demand applications

Welfare effects (2 weeks)

In class:

- A. Nevo, "Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal Industry," *RJE* 31(3), Autumn 2000, pp. 395-421.
- A. Petrin, "Quantifying the Benefits of New Products: The Case of the Minivan," *JPE* 110(4), August 2002, pp. 705-729.
- M. Gentzkow, "Valuing New Goods in a Model with Complementarity: Online Newspapers," *AER* 97(3), June 2007, pp. 713-744.

Supplemental papers:

- M. Trajtenberg, "The Welfare Analysis of Product Innovations, with an Application to Computed Tomography Scanners," JPE 97(2), April 1989, pp. 444-479.
- A. Goolsbee and A. Petrin, "Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV," ECMA 72(2), March 2004, pp. 351-381.

Price discrimination and bargaining models (1.5 weeks)

In class:

- P. Leslie, "Price Discrimination in Broadway Theater," RJE 35(3), Autumn 2004, pp. 520-541.
- G. Crawford and A. Yurukoglu, "The Welfare Effects of Bundling in Multichannel Television Markets," AER 102 (2), April 2012, pp. 643-85.

Supplemental papers:

- A. Shepard, "Price Discrimination and Retail Configuration," JPE 99(1), February 1991, pp. 30-53.
- B. McManus, "Nonlinear Pricing in an Oligopoly Market: The Case of Specialty Coffee," RJE 38(2), Summer 2007, pp. 512-532.
- G. Crawford, "The Discriminatory Incentives to Bundle in the Cable Television Industry," QME 6(1), March 2008, pp. 41-78.
- M. Grennan, "Price Discrimination and Bargaining: Empirical Evidence from Medical Devices," AER 103(1), February 2013, pp. 145-177.
- G. Gowrisankaran, A. Nevo, and R. Town "Mergers when Prices Are Negotiated: Evidence from the Hospital Industry," AER 105(1), January 2015, pp.172-203.

Information in markets (1.5 weeks)

In class:

- G. Jin and P. Leslie, "The Effects of Information on Product Quality: Evidence from Restaurant Hygiene Grade Cards," QJE 118(2), May 2003, pp. 409-451.
- B. De Los Santos, A. Hortacsu, and M. Wildenbeest, "Testing Models of Consumer Search Using Data on Web Browsing and Purchasing Behavior," AER 102(6), October 2012, pp. 2955-2980.

Supplemental papers:

- D. Genesove, "Adverse Selection in the Wholesale Used Car Market." JPE 101(4), August 1993, pp. 644-665.
- J. Milyo and J. Waldfogel, "The Effect of Price Advertising on Prices: Evidence in the Wake of 44 Liquormart," AER 89(5), December 1999, pp. 1081-96.
- A. Sorensen, "Equilibrium Price Dispersion in Retail Markets for Prescription Drugs," JPE 108(4), August 2000, pp. 833-850.
- D. Akerberg, "Empirically Distinguishing Informative and Prestige Effects of Advertising," RJE 32(2), Summer 2002, pp. 100-118.
- D. Dranove, D. Kessler, M. McClellan and M. Satterthwaite, "Is More Information Better? The Effects of 'Report Cards' on Health Care Providers" JPE 111(3), June 2003, pp. 555-588.

- M.S. Goeree, "Limited Information and Advertising in the US Personal Computer Industry," ECMA 76(5), September 2008, pp. 1017-1074.
- D. Elfenbein, R. Fisman, and B. McManus, "Market Structure, Reputation, and the Value of Certification," AEJ Micro, 2015

Inter-firm relationships (1.5 weeks)

In class:

- J. Mortimer, "Vertical Contracts in the Video Rental Industry," REStud 75(1), January 2008, pp. 165-199.
- A. Hortcasu and C. Syverson, "Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices", JPE 115(2), April 2007, pp. 250-301.
- G. Crawford, R. Lee, M. Whinston, A. Yurukoglu, "Welfare Effects of Vertical Integration in Multichannel Television Markets," ECMA 86(3), May 2018, 891-954.

Supplemental papers:

- F. Lafontaine, "Agency Theory and Franchising: Some Empirical Results," RJE 23(2), Summer 1992, pp. 263-283.
- J. Hastings, "Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California," AER 94(1), March 2004, pp. 317-328.
- G. Baker and T. Hubbard, "Make vs. Buy in Trucking: Asset Ownership, Job Design and Information," AER 93(3), June 2003, pp. 551-572.
- R. Kellogg, "Leaning by Drilling: Interfirm Learning and Relationship Persistence in the Texas Oilpatch," QJE 126(4), November 2011, pp. 1961-2004.
- P. Joskow, "Contract Duration and Relationship-Specific Investments: Empirical Evidence from Coal Markets," AER 77(1), March 1987, pp. 168-85.

Production and technology (1.5 weeks)

In class:

- D. Akerberg, K. Caves and G. Frazer, "Identification Properties of Recent Production Function Estimators," ECMA 83(6), November 2015, pp. 2411-2451.
- A. Collard-Wexler and Jan De Loecker, "Reallocation and Technology: Evidence from the U.S. Steel Industry," AER 105(1), January 2015, pp. 131-171.

Supplemental papers:

- S. Olley and A. Pakes. "The Dynamics of Productivity in the Telecommunications Equipment Industry." ECMA 64(6), November 1996, pp.1263-1298.
- C. Syverson, "Market Structure and Productivity: A Concrete Example," JPE 112(6), December 2004, pp. 1181-1222.
- N. Bloom and J. van Reenen. "Measuring and Explaining Management Practices Across Firms and Countries," QJE 122(4), November 2007, pp. 1351-1408.

Platforms (1.5 weeks)

In class, choice of:

- B. McManus, A. Nevo, Z. Nolan, and J. Williams, "Steering Incentives and Bundling Practices in the Telecommunications Industry," UNC working paper 2019.
- M. Dinerstein, L. Einav, J. Levin, and N. Sundaresan, "Consumer Price Search and Platform Design in Internet Commerce," *AER* 108(7), July 2018, pp. 1820-59.
- C. Farronato and A. Fradkin, "The Welfare Effects of Peer Entry in the Accommodation Market: The Case of AirBNB," NBER working paper 24361, March 2018.
- K. Chen, J. Chevalier, P. Rossi, E. Oehlsen, "The Value of Flexible Work: Evidence from Uber Drivers," NBER working paper 23296, June 2017.

Supplemental papers:

- G. Saloner and A. Shepard, "Adoption of Technologies with Network Effects: An Empirical Examination of the Adoption of Automated Teller Machines," *RAND* 26(3), Autumn 1995, pp. 479-501.
- M. Rysman, "Competition between Networks: A Study of the Market for Yellow Pages," *REStud* 71(2), April 2004, pp. 483-512.
- D. Akerberg and G. Gowrisankaran, "Quantifying Equilibrium Network Externalities in the ACH Banking Industry," *RAND* 37(3), Autumn 2006, pp. 738-61.

Abbreviations for journal names:

AER – American Economic Review

BJE – Bell Journal of Economics

ECMA – Econometrica

EL - Economics Letters

IER – International Economic Review

JEMS – Journal of Economics and Management Strategy

JIE – Journal of Industrial Economics

JEP – Journal of Economic Perspectives

JPE - Journal of Political Economy

RJE – RAND Journal of Economics

REStud – Review of Economic Studies

QJE – Quarterly Journal of Economics

QME – Quantitative Marketing and Economics