

Ec1640: Industrial Organization

Fall 2024

Professor Robin S. Lee*

Tuesday, 12-2:45p (Location TBD)

Syllabus Updated August 10, 2024

PRELIMINARY AND SUBJECT TO CHANGE

1 Overview of the Course

This course is an introduction to the field of industrial organization. Broadly speaking, industrial organization is the study of *firms and markets*: in particular, how markets are organized and how firms compete when competition is “imperfect.” We focus on environments where firms have *market power*, defined often as the ability to profitably set prices above competitive levels.

We will cover a variety of topics related to:

- Market structure and equilibrium: How many firms do we expect to operate in an industry? Do we expect them to be of similar or different sizes? Why might firms choose to enter or exit particular markets?
- Competition: How do firms choose prices, quantities, what products to offer, levels of advertising, etc., when competing with rivals? How might firms attempt to relax or avoid competition?
- Horizontal and vertical mergers: Why would firms choose to merge or combine with other firms in the same or in different markets, and when would this be beneficial or harmful to society? What is the role of competition and antitrust policy?
- Market design: firms are able to often determine the rules of the marketplace by, for instance, running auctions or relying on non-price mechanisms to allocate goods and services. What additional considerations arise in these environments?
- Network & platform industries: many firms operate in so-called two-sided or multi-sided (platform) markets, where firms need to serve multiple types of consumers who value interacting with others on the same platform. How does traditional economic analysis change in these environments?
- Innovation and intellectual property rights: why are firms granted temporary “monopolies” on their inventions, and when might the incentives provided to engage in risky investment potentially excessive or insufficient?

Course Structure. The class relies on a *lecture and discussion* based format, and in-person attendance is required. In class:

- We will cover new theoretical frameworks and discuss how these relate to real-world cases and examples. We will occasionally work through numerical exercises together.
- In certain classes, we will also discuss academic papers (often empirical studies of concepts that we have covered) that are assigned for everyone to read beforehand. Since these papers may often be challenging (as they are often written for professional academic economists), I will provide brief reading notes (e.g., parts to focus on versus those to skim / skip if inaccessible) and questions to think about.

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Course Website: <https://canvas.harvard.edu/courses/139960>

Prerequisites: The following prerequisites are *strongly recommended*: intermediate microeconomics (Ec1010a or 1011a), multivariable calculus (differentiation), and introductory probability and statistics. Prior exposure to econometrics is helpful.

Enrollment and Lottery: To facilitate classroom discussion, enrollment will be capped.

To be considered for enrollment, please add the course to your course schedule (request enrollment) *AND* fill out the online form at: <https://tinyurl.com/Econ1640Fall2024Enrollment>.

If there is excess demand, spots in the course will be assigned via “lottery”, with priority given to seniors and economics concentrators, and those who have attempted to enroll in this course in the past.

I will maintain a waitlist if there is extra space in the course.

Late enrollments (additions) after the second week of class will not be permitted.

Textbook and References: The course will primarily rely on materials that are covered in lecture. A combination of blackboard work and slides will be used, with slides posted on the course website.

There is a textbook that supplements the materials in the course:

- Luis Cabral, *Introduction to Industrial Organization*, 2ed (MIT Press)

The book is strongly recommended, and problem sets will reference certain problems contained in the text. There is a list of suggested practice problems from Cabral that is posted on the course website.

Last, I will also and reference academic papers and other materials. These materials will be posted on the course website.

Other References: As an introduction to a large field, this class cannot possibly cover all the topics that it touches upon with the depth that they deserve. For those seeking additional reading, the following are **optional** (and some are more challenging than others):

- Robert Gibbons, *A Primer in Game Theory*, Prentice Hall, 1992. [An accessible reference to game theoretic concepts often employed in IO]
- Oz Shy, *Industrial Organization: Theory and Applications*, MIT Press 1995. [A (primarily theoretical) undergraduate reference]
- Jean Tirole, *The Theory of Industrial Organization* (Second Edition), MIT Press, 2000. [A (and perhaps *the*) classic graduate reference to core theoretical IO models and concepts.]
- John E. Kwoka, Jr. and Lawrence J. White eds., *The Antitrust Revolution* (7ed), Oxford University Press, 2014. [A frequently updated collection of cases involving antitrust issues.]

2 Expectations (Grading and Deliverables)

Grading in the class will be determined as follows:

1. Problem Sets (20%): There will be 4 problem sets due during the semester, and will be posted on the course website at least one week before the due date. They will be graded check+ (5), check (4), check- (2), or zero (0).

PLEASE NOTE:

- Everyone must write up and submit their own problem set; explicitly copying (electronically or otherwise) other’s work is not permissible. However, at the same time, discussion and the exchange of ideas are essential to doing academic work. For problem sets in this course, you may consult with your classmates as you work on problem sets. However, after discussions with peers, make sure that you can work through the problem yourself and ensure that any answers you submit for evaluation are the result of your own efforts.

List the names of students with whom you have collaborated on problem sets. Limit the number of collaborators on problem sets to at most three others.

- **PROBLEM SETS ARE DUE AT THE BEGINNING OF CLASS (UPLOADED TO CANVAS) BEFORE CLASS BEGINS (12 NOON):**

- (a) Problem Set 1: Oct 1
- (b) Problem Set 2: Oct 15
- (c) Problem Set 3: Nov 12
- (d) Problem Set 4: Dec 3

(If there are technical issues, please email them to the course TF).

- Every student will have a 24-hour grace period for **one** problem set. Any problem set submitted after 24 hours, or any additional problem set that misses the deadline after the grace period has been used up, will be counted as a 0.
2. Class Participation (10%): You are strongly encouraged to be engaged and a good citizen during class. Class participation is expected, particularly when reading and/or other tasks are assigned (with advance notice).
 3. Exams (70%): **Please ensure that you will be available on the exam dates.**
The midterm will be partially redemptive: i.e., if you perform better on the final than the midterm, the final will be weighted by more.
 - (a) Midterm Exam (25 or 15%): Held in class on Tuesday October 22.
 - (b) Final Exam (45 or 55%): The final is cumulative and held during exam period (to be determined).

For exams:

- You will be able to use a scientific calculator (but no online or phone access for reference is allowed).

Pass/Fail: The course can be taken pass/fail or for a letter grade.

Academic Integrity: Students should familiarize themselves with the Harvard College Honor Code (<http://honor.fas.harvard.edu/>). All materials for this course are for personal use only; they may not be posted online or shared without permission.

3 TF and Office Hours

- There is one TFs for the course:
 - Ruby Zhang (rzhang15@g.harvard.edu)

She will hold office hours and also schedule sections and review sessions once the term begins.

- I will hold office hours by appointment; use <http://bit.ly/rslee0H> (Google Calendar Appointments) to sign up for a slot. If you do not see one available, please email and we can coordinate a time.

4 Reading Notes and Discussion Questions

When reading an economic paper and preparing for in-class discussions, it will be useful to frame your thoughts and think through the following (types of) questions.

1. What is the research question?
2. What are the goals of the paper? For instance: does the paper aim to develop methods to analyze data, establish the causal impact of an intervention, provide support for a particular interpretation of data patterns, answer a policy question, measure the magnitude of an effect, and/or...?
3. What is the contribution of the paper relative to the literature? What was inadequate or incomplete about prior approaches?
4. What are the broader implications (e.g., to other industries, settings) of the paper, if any?

5. What are the data? What are its limitations? If you could design an ideal data set (or experiment), what would it be?
6. How appropriate is the underlying theoretical foundation that motivates the empirical work (if relevant)? What are the strongest assumptions that are being made (and are they realistic/testable)? How closely linked are the theoretical and empirical components?
7. What are the key variables or objects of interest that feed into the empirical analysis? What variation in the data are used to identify these objects? What is assumed to be endogenous or exogenous? (How are endogeneity problems addressed? Is it convincing?)
8. What are the conclusions of the author? Are they well founded / established? Are there alternative explanations for the findings that are not (convincingly) addressed?

Some prompts for the readings are provided with the papers in the schedule below.

5 Course Outline

What follows is an outline of the topics to be covered. Some material will spill-over to the next lecture (depending on pace and interest), so dates when materials are covered (with the exception of exam dates) are subject to change. Textbook references are optional and for your reference (not everything in the textbook will be covered or required).

Discussion readings that are listed are required and may be referenced in problem sets and exams.

1. (Sept 3) Intro, Competitive Markets and Market Power

- Text: Chapters 1, 4

2. (Sept 10) Consumer Demand: Theory and Estimation

- Text: 5.3, 3.1-3.2, 2
- **Read for class (no discussion):** Working, “What Do Statistical ‘Demand Curves’ Show?,” *QJE*, 1927.
 - Read only pp212-227. (Rest is optional).

(Sept 17) NO CLASS

3. (Sept 24) Pricing w/ Market Power - Price Discrimination & Non-Linear Pricing

- Text: Chapter 6.0-6.3

4. (Oct 1) Strategic Interactions: Basic Game Theory, Pricing (Cournot, Bertrand)

- Text: Chapters 7.0-7.2, 8
- **Paper Discussion:** Graddy, K., “Testing for Imperfect Competition at the Fulton Fish Market,” *The RAND Journal of Economics*, 1995.
 - Why would or would we not expect this market to be (perfectly) competitive?
 - How does Graddy “identify” the demand curve here? What is she controlling for?
- **PROBLEM SET #1 DUE AT START OF CLASS**

5. (Oct 8) Product Differentiation, Collusion

- Text: 7.3, 9, 14.0-14.2

6. (Oct 15) Market Structure and Entry

- **Paper Discussion:** Bresnahan, T., “Competition and Collusion in the American Automobile Industry,” *Journal of Industrial Economics*, 1987. (Skip/Omit Section II).
 - What are the patterns in the data that Bresnahan uses to support a supply- as opposed to demand-side story for price and quantity movements?
 - What is the key idea behind Bresnahan’s test of competitive versus collusive conduct? (See Figure 2)

- Text: Chapters 10, 12.1
- **PROBLEM SET #2 DUE AT START OF CLASS**

7. (Oct 22) MIDTERM.

- Midterm will be conducted during class time.
- SEE EARLIER DISCUSSION ABOUT EXAM POLICY.

8. (OCT 29) Advertising; Intro to Antitrust Issues and Merger Analysis

- Text: Chapters 14.3; 5.5, 6.5, 11
- **Paper Discussion:** Sinkinson, M. and A. Starc, “Ask Your Doctor? Direct-to-Consumer Advertising of Pharmaceuticals,” *Review of Economic Studies*, 2018.
 - (Skim/omit Section 5)
 - What different effects of advertising are the authors trying to measure?
 - What are the two main components of the authors’ “identification strategy” to detect the impact of DTCA?
 - What does the first source of variation allow the authors to conclude? The second?

9. (Nov 5) Vertical Markets and Mergers

- Text: Chapter 13
- **Paper Discussion:** Ashenfelter, O. C. et al, “Efficiencies Brewed: Pricing and Consolidation in the US Beer Industry,” *RAND Journal of Economics*, 2015.
 - What are the main effects of the joint venture between Miller and Coors that the authors focus on?
 - What are reasons that the simulated change in HHI might differ from the actual change in HHI?
 - What’s the “identification strategy” for the different effects?
 - Do you believe the results? What are the most problematic / questionable assumptions that are being employed?

10. (Nov 12) Asymmetric Information: Adverse Selection, Moral Hazard

- Text: Chapter 5.2, 7.4
- **Paper Discussion:** Dafny, L. et al, “Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry,” *American Economic Review*, 2012.
 - What is the authors’ “identification strategy” for estimating the effect of concentration on insurance premiums?
 - Other than premiums, what other outcomes are the authors examining?
- (OPTIONAL READING, not for class) Ho, K. and R. S. Lee, “Insurer Competition in Health Care Markets,” *Econometrica*, 2017.¹
- **PROBLEM SET #3 DUE AT START OF CLASS**

11. (Nov 19) Auctions

- Text: Chapters 6.4
- **Paper Discussion:** Jin, G. Z. and P. Leslie, “The Effect of Information on Product Quality,” *Quarterly Journal of Economics*, 2003.
 - How do grade cards address an adverse selection problem? A moral hazard problem?
 - How do the authors establish that grade cards have real effects?

12. (Nov 26) Network Effects, Platform Markets

- Text: Chapter 16

¹See <http://microeconomicinsights.org/health-insurance-competition-effects-premiums-hospital-rates-welfare/> for a non-technical summary.

- **Paper Discussion:** Einav, L. and M. Jenkins and J. Levin, “The Impact of Credit Scoring on Consumer Lending,” *The RAND Journal of Economics*, 2013.
 - How does better credit scoring help the auto finance company improve its profitability?
 - How does the auto finance company change its strategy depending on the credit-risk of the borrower?

13. (Dec 3). Innovation, R&D

- Text: Chapter 15
- **Paper Discussion:** Budish, E. et al, “Do Firms Underinvest in Long-Term Research? Evidence from Cancer Clinical Trials,” *American Economic Review*, 2015.
 - Why do the authors examine cancer treatments?
 - What are surrogate endpoints, and how do the authors use them to identify the impact of commercialization lags on investment?
- **PROBLEM SET #4 DUE AT START OF CLASS**

(TBD) Final Exam