

Econ 8747: Industrial Organization Theory

Fall 2020

Professor Yongmin Chen

Office: Econ 108

Class Time (remote/online): TTH: 9:30-10:45 AM

Office Hours (remote/online): Wednesday: 1:00-5:00 PM

Recommended books: (1) *The Theory of Industrial Organization* by Jean Tirole (1988), MIT Press, (2) *Industrial Organization: Contemporary Theory and Practice* by Pepall, Richards, and Norman, and (3) *Handbook of Industrial Organization, Vol. 3 (HIO 3, 2007*, Mark Armstrong and Robert Porter edits). *HIO 3* surveys the major developments in IO after Tirole's book and can be downloaded electronically through CU library. Tirole (1988) remains as the classic graduate IO textbook. You are encouraged to read the entire book and work out the exercise problems there (even though we only cover a few parts of the book in the course).

Lecture Notes: I will make available some lecture notes/slides on the Canvas page for the course. These lecture notes/slides and other course material that I create are to be used only by students who are enrolled in the course. You may not reproduce, distribute, or display them without my written permission.

Grading: Grades are based on homework and class participation (30%), presentation (30%), and a term paper (40%).

Term Paper: The purpose of the term paper is to get you started on a research topic of your choice. You should have a research question, and can either (i) build and analyze a model, deriving results to answer the question; or (ii) conduct a literature review and discuss how you will proceed with the research, or (iii) extend the research from a published paper with new results. The term paper should contain a title, abstract, and references; about 10-16 pages long for the main body, double spaced.

A tentative course schedule is as follows. The starred articles are required readings. You should also read some additional assigned articles (at least briefly), especially on topics that you would like to explore more. You will be asked to write short reviews/discussions (each review/discussion is 1-2 pages long, double spaced). There can be changes to this schedule

during the semester, which will be announced in class. You are responsible for updating course information according to announcements made in class.

Course Schedule:

1. Introduction: Research Framework and Methods

8/25, 8/27

Readings:

- Tirole; Pepall et al.; Tables of Contents, HIO 3.
- Varian, H. “How to Build an Economic Model in Your Spare Time”, 1994, updated in 2009.
- Jonathan B. Berk, Campbell R. Harvey, and David Hirshleifer, “How to Write an Effective Referee Report and Improve the Scientific Review Process”, Journal of Economic Literature, 2017

Planning for presentation: Each student will choose a paper to make a 40-minute presentation in class.

2. Monopoly Pricing

9/1, 9/3, 9/8, 9/10

- Discrete-Choice Demand
- Multi-product Pricing
- Product Bundling
- Behavioral Consumers

Readings:

- Tirole Ch. 1.
- M. Armstrong and J. Vickers, “Multiproduct Pricing Made Simple”, JPE, 2018.
- M. Armstrong and Y. Chen, “Discount Pricing”, Economic Inquiry, 2019.
- *Ellison, Glenn, “Bounded Rationality in Industrial Organization”, 2006, MIT.
- *Shota Ichihashi, “Online Privacy and Information Disclosure by Consumers”, AER, 2020.
- Justin P Johnson, David P Myatt, “On the simple economics of advertising, marketing, and product design”, AER, 2006.
- Maskin, E., and J. Riley, “Monopoly with Incomplete Information”, RAND, 1984.
- *Chen, Y. and M. Riordan, “Profitability of Product Bundling”, IER, 2013.
- Chen, Y. and T. Zhang, “Interpersonal Bundling”, Management Science, 2015.

- Monika Mrázová and J. Peter Neary, “Not So Demanding: Demand Structure and Firm Behavior”, AER, 2017.
- *Andrew Rhodes and Chris Wilson, “False Advertising”, RAND, 2018

Assignment 1 (due 9/8):

- (1) Exercise 1.1-1.9 in Tirole.
- (2) Short reviews of Ichihashi (2020) and Rhodes and Wilson (2018).

Student Presentation 1 (9/10): Ichihashi (2020); Rhodes and Wilson (2018)

3. Product Differentiation and Price Competition

9/15, 9/17, 9/22, 9/24, 9/29, 10/1

- Equilibrium properties: existence, uniqueness, and comparative statics
- Random utility models of product differentiation
- Market Structure and Price
- Competitive Differential Pricing
- Evaluating Horizontal Mergers

Readings: Ch. 5, 6, 7 in Tirole

- *Armstrong and Vickers (2019), “Discriminating against Captive Customers”, AER: Insights.
- Chen, Y. and M. Riordan (2008), “Price-Increasing Competition”, RAND, 39 (4), 1042-1058.
- *Chen, Y., J. Li and M. Schwartz (2020). “Competitive Differential Pricing”. RAND, forthcoming.
- Perloff, J.M. and Salop, S.C. (1985). "Equilibrium with product differentiation", Review of Economic Studies, vol. 52, pp. 107-120.
- Deneckere, R. and C. Davidson (1985), “Incentives to form coalitions with Bertrand competition,” RAND, 473-486.
- *Stole, Lars, “Price Discrimination in imperfectly competitive markets.” HIO 3.
- *Tom Holmes, “The Effects of Third-degree price discrimination in oligopoly”, AER, 1989.
- *Zhou, J., “Competitive Product Bundling”, Econometrica, 2017.

- “Horizontal Merger Guidelines”, FTC and DOJ, 2010.
<https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>

Assignment 2 (due 9/29):

- (1) Exercise 5.1-5.9; 7.1-7.3 in Tirole;
- (2) Short reviews of Holmes (1989) and Armstrong and Vickers (2019).

Student Presentation 2 (10/1): Holmes (1989); Armstrong and Vickers (2019)

4. Dynamic Competition

10/6, 10/8, 10/13, 10/15

- Strategic Behavior: Ideas and Applications
- Dynamic Price Competition
- Dynamic Pricing Based on Consumer Purchase History
 - A Model of Ex-post Differentiation due to Consumer Switching Costs (Chen, 1997)
 - A Model of Ex ante Differentiation due to Heterogeneous Consumer Preferences (Fudenberg and Tirole, 2000)
- Repeated Interactions and Collusion

Readings:

- Ch. 6 in Tirole
- Klemperer, Paul, “The Competitiveness of Markets with Switching Costs”, RAND (1987), 138-150.
- *Joseph Farrell and P. Klemperer, “Competition in Markets with Switching Costs and Lock-In”, HIO 3.
- *Chen, Y. “Paying Customers to Switch”, JEMS (1997), 877-897.
- Chen, Y. and J. Percy, “Dynamic Pricing: When to Entice Brand Switching and When to Reward Consumer Loyalty”, RAND, 2010.
- *Curt Taylor, “Supplier Surfing: Competition and Consumer Behavior in Subscription Markets”, RAND, 2003, 34, 223–46.
- *Fudenberg, D and J. Tirole, “Consumer Poaching and Brand Switching,” RAND (2001), 634-657
- *B. Douglas Bernheim and Erik Madsen, “Price Cutting and Business Stealing in Imperfect Cartels”, AER, 2017

Assignment 3 (due 10/13):

- (1) Exercise 6.1-6.10 in Tirole;
- (2) Short reviews of Taylor (2003) and Bernheim and Madsen (2017).

Student Presentation 3 (10/15): Taylor (2003); Bernheim and Madsen (2017)

5. Privacy, Data, and Information Security

10/20, 10/22, 10/27, 10/29

Readings:

- *Acemoglu, D., Makhdoumi, A., Malekian, A. & Ozdaglar, A. (2019), ‘Too much data: Prices and inefficiencies in data markets’, NBER Working Paper No. 26296.
- Daron Acemoglu, Azarakhsh Malekian, Asu Ozdaglar, “Network security and contagion”, JET, 2016.
- *Bergemann, D., Bonatti, A. & Gan, T. (2019), ‘The economics of social data’, Cowles Foundation Discussion Paper.
- Shota Ichihashi, “Online Privacy and Information Disclosure by Consumers”, AER, 2020.
- Richard Posner, “The Economics of Privacy”, AER, 1981.
- Alessandro Acquisti, Curt Taylor and Liad Wagman, “The Economics of Privacy,” Journal of Economic Literature, June 2016.
- *Curt Taylor, “Consumer Privacy and the Market for Customer Information”, RAND, 2004.
- Athey, S. and J. Gans (2010). The impact of targeting advertising technology on advertising markets and media competition. AER, 100 (2), 608–613.
- Anderson, R. and T. Moore (2006). The economics of information security. Science 314 (5799), 610–613.
- Goldfarb, A. and C. Tucker (2011). Privacy regulation and online advertising. Management Science 57 (1), 57–71.
- Haan, M. A. and Moraga-González, J. L. (2011). "Advertising for Attention in a Consumer Search Model." Economic Journal, Vol. 121, pp. 552--579.
- Sanjeev Goyal and Adrien Vigier, “Attack, Defence, and Contagion in Networks”, REStud., 2014.
- Chen, Y. “Marketing Innovation”, JEMS, 2006.

- Chen, Y., X. Hua, and K. Maskus, “International Protection of Consumer Data”. Working paper, 2020.

Assignment 4 (due 10/27): Short reviews of the 4 papers below.

Student Presentations 4 and 5 (10/27, 10/29): Acemoglu et al. (2019); Acemoglu et al. (2016); Bergemann et al. (2019); Taylor (2004).

Planning for Term Paper

6. Platform Economics

11/3, 11/5, 11/10

Readings:

- Goldfarb, A. and C. Tucker (2019). “Digital Economics”, Journal of Economic Literature.
- *Athey, S. and G. Ellison, 2011, “Position Auctions with Consumer Search”, QJE.
- *Eliaz, K. and Spiegler, R. (2011). "A Simple Model of Search Engine Pricing." Economic Journal, Vol.121, pp F329-39.
- *Chen, Y. and C. He, 2011. “Paid Placement: Advertising and Search on the Internet,” Economic Journal.
- Chen, Y. and T. Zhang, “Entry and Welfare in Search Markets”, Economic Journal, 2016.
- Chen, Y. and T. Zhang, “Intermediaries and Consumer Search,” IJIO, 2018.
- *Chen, Y., Z. Li and T. Zhang, “Experience Goods and Consumer Search”, 2020.
- *Choi, M., Y. Dai and K. Kim (2018). "Consumer Search and Price Competition." Econometrica.
- *Andrew Rhodes et al. “Multiproduct Intermediaries” (2020), JPE, forthcoming.
- Edelman, B. and J. Wright (2014) “Price Coherence and Adverse Intermediation”, QJE, 2015.
- Bar-Isaac, H., Caruana, G. and V. Cunat, “Search, Design and Market Structure”, AER, 2012.
- *de Cornière, A., and G. Taylor (2013) "Integration and Search Engine Bias," RAND
- Dinerstein, M., Einav, L., Levin, J. and N. Sundaresany, “Consumer Price Search and Platform Design in Internet Commerce”, AER, 2018.

- Justin Johnson, “The Agency Model and MFN”, Review of Economic Studies, 2017
- Hagiu, A., and B. Jullien, "Search Diversion and Platform Competition," IJIO, 2014.
- Armstrong, M, Vickers, J, and Zhou, J., “Prominence and Consumer Search”, RAND, 2009.

Assignment 5 (due 11/5): Short reviews of the 4 papers below.

Student Presentations 6 and 7 (11/5, 11/10): Eliaz, and Spiegler (2011); de Cornière and Taylor (2013); Rhodes et al. (2020); Choi et al. (2018).

Working on the Term Paper

7. Innovation and Intellectual Property Rights

11/12, 11/17, 11/19, 11/24

A. Overview

- Basic Questions for the Economic Analysis of Innovation
- Some Statistics about Innovation Inputs and Outputs
- Analytical Framework

B. Market Structure and Innovation Incentive

- The Schumpeterian View (1942)
- Arrow’s Analysis (1962): Process Innovation
- Preempting Monopoly: Gilbert and Newbery (1982)
- Product Innovation: When is Arrow’s Ranking Reversed?
- Vertical Organization and Innovation Incentive
- Exclusive Contracts and Innovation

C. Intellectual Property Rights (IPRs) and Innovation

- The Fundamental Trade-off: Static vs. Dynamic Efficiency
- Common Forms of IPRs
- Optimal Patents: Single Innovation
- The Division of profits in sequential innovation

- Antitrust and Innovation
- Patent Damages/Remedies
- IPRs and Continual Innovation
- IPRs and Innovation in Developing Countries

Readings:

- U.S. National Science Board. "[Science and Engineering Indicators 2014](http://www.nsf.gov/statistics/seind14/)".
<http://www.nsf.gov/statistics/seind14/>
- Arrow, K. (1962). "Economic Welfare and the Allocation of Resources for Innovations," R. Nelson ed. *The Rate and Direction of Inventive Activity*, Princeton University Press.
- Chen, Y and T. Puttitanun (2005). "Intellectual Property Rights and Innovation in Developing Countries", *Journal of Development Economics*, 78: 474-493.
- *Gilbert, R. and Newbery, D. (1982). "Preemptive Patenting and the Persistence of Monopoly," *American Economic Review*, 72: 514-526.
- Chen, Y and M. Schwartz (2013). "Product Innovation Incentives: Monopoly vs. Competition", *Journal of Economics and Management Strategy*.
- Chen, Y and D. Sappington (2010). "Innovation in Vertically Related Markets", *Journal of Industrial Economics*.
- Chen, Y and D. Sappington (2011). "Exclusive Contracts, Innovation, and Welfare", *American Economic Journals: Microeconomics*.
- Chen, Y. (2014) "Refusal to Deal, Intellectual Property Rights, and Antitrust". *Journal of Law, Economics, and Organization*.
- *Chen, Y., S. Pan and T. Zhang (2018). "Patentability, R&D Direction, and Cumulative Innovation" *International Economic Review*.
- Chen, Y. and D. Sappington (2018). "An Optimal Rule for Patent Damages under Sequential Innovation," *RAND*.
- *Green, J. and S. Scotchmer (1995). "On the Division of Profits in Sequential Innovation". *RAND Journal of Economics*, 26: 20-33.
- Gilbert, R. and C. Shapiro. (1990). "Optimal Patent Length and Breadth," *RAND Journal of Economics*, 21: 106-112.
- Hunt, R. (2004) "Patentability, Industrial Structure, and Innovation". *Journal of Industrial Economics*.
- O'Donoghue, T., S. Scotchmer, and J-F. Thisse (1998). "Patent Breadth, Patent Life and the Pace of Technological Progress". *Journal of Economics and Management Strategy*.

- Scotchmer, Suzanne. 2004. *Innovation and Incentives*. Cambridge: MIT Press.
- *Segal, I. and M. Whinston. (2007) "Antitrust in Innovative Industries". American Economic Review.
- Shapiro, C. (2016). "Patent Remedies," American Economic Review, 106: 198-202.
- Vickers, John. 2010. "Competition Policy and Property Rights." Economic Journal, 120: 375-392.

Assignment 6 (due 12/3): (1) Exercise 10.1-10.10 in Tirole; (2) Discuss an issue or a case related to patenting or innovation.

12/1, 12/3: working on the term paper.

Term paper due on 12/10, before or at 9pm.

University Policies

Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. 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 race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

Requirements for COVID-19

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.

Accommodation for Disabilities

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, see [Temporary Medical Conditions](#) on the Disability Services website.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code

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 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](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or 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, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Religious Holidays

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 make your requests to me within the first two weeks of the semester. See the [campus policy regarding religious observances](#) for full details.