

UNIVERSITY OF KENTUCKY  
MARTIN SCHOOL OF PUBLIC POLICY & ADMINISTRATION

DAVID R. AGRAWAL  
Section #001

PUBLIC ADMIN 752  
ECONOMICS OF POLICY  
ANALYSIS

SPRING 2019  
223J BE<sup>a</sup>: MW 3:00-4:15

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"On 1/16 and 2/11: 330 BE.

**EMAIL:** dragrawal@uky.edu (include "PA 752" in subject line)

**TELEPHONE:** 859-257-8608 (Martin School Main Office: 859-257-5594)

**OFFICE HOURS:** M 2:00-3:00 or by appointment, 223C BE

**COURSE WEBPAGE:** <https://www.uky.edu/canvas/>

**PERSONAL WEBPAGE:** <http://www.uky.edu/~drag222/>

**NATURE OF SYLLABUS:** The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

**COURSE DESCRIPTION:** From the University Catalog – "This course examines economic approaches to policy analysis. Included is an analysis of the major concepts of economic analysis and their application to a number of policy problems. Prereq: PA 652 and PA 750 or equivalent and Ph.D. program status or consent of the instructor."

**COURSE OBJECTIVES AND LEARNING OUTCOMES:** The objectives of this class are to acquire a working knowledge of how to apply an economist's toolkit to analyze public policy problems theoretically and empirically. Students will be exposed to policy problems that arise in public economics, labor economics, health economics, environmental economics, industrial organization, urban economics, and other applied microeconomics subfields, time permitting.

**TEXTBOOKS AND READINGS:** There is no required textbook for the class. Students should be familiar with basic economics and econometrics concepts. As a resource for economic theory, students may consult the 9th edition of *Intermediate Microeconomics with Calculus* by Hal R. Varian or the 11th edition of *Microeconomic Theory: Basic Principles and Extensions* by Walter Nicholson and Christopher Snyder. As a resource for applied microeconomics, students may consult *Microeconometrics: Methods and Applications* by Colin Cameron and Pravin Trivedi or *Mostly Harmless Econometrics: An Empiricist's Companion* by Joshua Angrist or Jörn-Steffen Pischke. Instead of a required textbook, we will rely heavily on academic articles and lecture notes.

**ONLINE MATERIALS:** We will use the canvas system (<http://www.uky.edu/canvas/>)

for this semester. It is important you check this website regularly as I will post assignments to canvas and will use the announcements tool to send you important information. You are responsible for maintaining and checking your University email account and the canvas announcements on a daily basis. Please use your university email account for your academic correspondence to me so that it does not go to my spam folder.

All academic readings will be made available online through canvas. You must read the required readings in advance of lecture. My lecture notes are also posted to canvas. You may not redistribute copies of my slides, lecture notes, or homework solutions to any other person or website.

**ONLINE MATERIALS:** The course will be broken into the following “modules” where we will study theory and empirical evidence from each of these subfields in economics: public economics, labor economics, health economics, industrial organization, urban and regional economics, and environmental economics. The first week of each module will consist of lectures by me on the theory related to that subfield. The second week of each module will consist of student presentations and student led discussions of empirical analysis in that module.

**GRADES:** Grades for the class will be assigned based on the following information.

Requirement	% of Final Grade
Problem Sets	10%
Final Exam	30%
Paper Summaries	30%
Presentations	10%
Participation	10%
Referee Report	10%

**PROBLEM SETS:** Problem sets for each module will be listed on canvas (as we progress). You may work in groups on the problem sets and studying in groups is highly encouraged. However, you must write up your own solution to each problem set. Solutions must be typeset and show all work. Given the large amount of mathematical calculations, I highly recommend using  $\LaTeX$  or Lyx to type your solutions. If you don't know these, now is a good time to learn.

**FINAL EXAM:** The course will contain a final exam. The final exam is cumulative. The final exam will be given in its university appointed time slot. An excused absence from the final exam will be given if you contact me *before* the exam and for an unexpected emergency (illness that prevents you from taking the exam or could harm the health of others; a documented family emergency). You must provide appropriate documentation; in the case of a medical excuse a Tier 2 or 3 document from UHS will be satisfactory. Leaving early for a vacation, for example, is not an appropriate reason to miss an exam.

**PAPER SUMMARIES:** For each module, we will discuss several empirical readings. Students are expected to read all required readings in advance of class but will be assigned

one of the readings for each module to write a paper summary<sup>1</sup> (for a total of 6 during the semester). For the assigned paper in each module, students will write a two-page (type-written) summary of an empirical paper for the module. The summary must be turned in before the start of the first class where we discuss papers in that module. The summary must address the following (please number answers in the write-up): (1) What is the main question? (2) What does economic theory predict about the main question? (3) What data are used? (4) What are the key parameters to be identified? (5) What is the identification strategy of the empirical approach? (6) What are the threats to identification and does the author adequately address them? (7) What are the main findings of the paper? (8) How does the paper contribute to the relevant literature?

**PRESENTATION:** For the assigned paper for which a paper summary was written, students will present the paper to the class and facilitate the discussion on the paper. Students will be expected to prepare a 20 minute presentation for the class that includes a discussion of the research question, relevant background information, theory related to the research question and a detailed presentation of the empirical analyses, results, and contribution. Slides are required for the presentation.

**PARTICIPATION:** For one week in each module we will discuss papers presented by one of your classmates. After the paper is presented, there will be a discussion of the paper (in a seminar style) for which students are expected to contribute. We will also discuss other required readings that students do not present. For this reason, all students must read and be prepared to discuss all required readings and not just the one they are presenting. Participating in the discussion will be evaluated on the basis of insight provided to the learning of your classmates and the instructor.

**REFeree REPORT:** The referee report is a critical assessment of an unpublished paper that I will provide to students to review. This report should be no longer than 5 pages and typically is 2-3 single spaced pages. The report should (1) assess the paper's contribution to the relevant literature; (2) discuss key weaknesses of the paper; and (3) make suggestions for improvement. Students should also prepare a one page cover letter containing a confidential recommendation for the journal editor (accept, revise and resubmit, reject) along with a brief justification. Students may request a paper from a particular module in the course by emailing the instructor at least two weeks prior to its due date; otherwise, students will be assigned a random article.

**LETTER OF INTRODUCTION:** For the second lecture, please write a one-page letter of introduction of yourself to the instructor. Include your name and anything about yourself that you would like to share such as your future research interests, past preparations relevant to this class, and personal facts that help me to know you better. Please also upload a digital photo to your canvas profile (click account>profile and then edit the image). I want to learn about you and your interests throughout the semester and this will help start that process.

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<sup>1</sup>This, and other assignments, are inspired by Melissa S. Kearney's syllabus.

**ACCOMMODATIONS:** If you have a documented disability that requires academic accommodations, please see me no later than the second week of class during office hours or after class. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center for coordination of campus disability services available to students with disabilities.

**ACADEMIC HONESTY:** As a University of Kentucky student, you have agreed to abide by the University's academic honesty policy. All academic work must meet the standards described in "UK Student Code of Conduct." Cases of cheating on exams or plagiarizing material for a presentation or assignment will result in (as a minimum punishment) final grade of "zero" assigned for the incident and the incident will be reported to university officials. Questions about proper procedures are always appropriate – and welcome – before work is submitted.

**ELECTRONICS:** Cell phone usage during class is prohibited. When I am lecturing, laptops are unlikely to be helpful for taking notes and I suggest using pen and paper. See "Laptops Are Great. But Not During a Lecture...". You can download it here: <https://www.nytimes.com/2017/11/22/business/laptops-not-during-lecture-or-meeting.html> For the empirical part of each module you may wish to have access to papers that we are discussing. In this case, you might use a laptop or tablet (though paper copies of the articles may also be brought to class).

**SCHEDULE:** The following list indicates when we will cover various topics. All required readings will be provided online. The date when the paper summary (PS) and presentation (P) for that week's module must be completed by is listed on the schedule. Also listed are when the problem set (HW) are due for the prior module and when the referee report (RR) is due.

Day	Module	Topics	What is due?
01/09	Preliminaries: Tools	Theory I	
01/14	Preliminaries: Tools	Theory II	
01/16	Preliminaries: Tools	Empirics I	
01/23	Preliminaries: Tools	Empirics II	
01/28	Labor Economics	Theory I	prelim HW
01/30	Labor Economics	Theory II	
02/04	Labor Economics	Empirics I	labor PS / P
02/06	Labor Economics	Empirics II	
02/11	Health Economics	Theory I	labor HW
02/13	Health Economics	Theory II	
02/18	Health Economics	Empirics I	health PS / P
02/20	Health Economics	Empirics II	
02/25	Public Economics	Theory I	health HW
02/27	Public Economics	Theory II	
03/04	Public Economics	Empirics I	public PS / P
03/06	Public Economics	Empirics II	
03/18	Urban Economics	Theory I	public HW
03/20	Urban Economics	Theory II	
03/25	Urban Economics	Empirics I	urban PS / P
03/27	Urban Economics	Empirics II	
04/01	Industrial Organization	Theory I	urban HW
04/03	Industrial Organization	Theory II	(reschedule class)
04/08	Industrial Organization	Empirics I	IO PS / P
04/10	Industrial Organization	Empirics II	
04/15	Environmental Economics	Theory I	IO HW
04/17	Environmental Economics	Theory II	
04/22	Environmental Economics	Empirics I	Enviro PS / P
04/24	Environmental Economics	Empirics II	
04/26	No class		RR / Enviro HW (to mailbox)
04/30	<b>Final Exam</b>		3:30-5:30

**MODULES:** The following is a list of topics that we will cover under each module. The readings in bold are the required readings. Some article citations are incomplete, but all are posted on canvas and can easily be found.

**TOOLS (THEORY):**

- Consumer Optimization (including Lagrangian optimization, Shephard's Lemma, Roy's Identity, Envelope Theorem, Compensated vs. uncompensated demand, Slutsky equation)
  - Nicholson Chapter 2 (from 9th edition)**
  - Nicholson Chapter 4 (from 9th edition)**
  - Nicholson Chapter 5 (from 9th edition)**
- Social welfare maximization and the theory of sufficient statistics.
  - Varian Chapter 34**
  - Arnold C. Harberger. 1964. The Measurement of Waste. *The American Economic Review*, Vol. 54, No. 3, *Papers and Proceedings of the Seventy-sixth Annual Meeting of the American Economic Association*, pp. 58-76
  - Raj Chetty. 2009. Sufficient Statistics for Welfare Analysis: A Bridge Between Structural and Reduced-Form Methods, *Annu. Rev. Econ.* 1:451–87.**
  - Nathan Hendren. 2016. "The policy elasticity". *Tax Policy and the Economy* 30 (1).
  - Amy Finkelstein. 2018. Welfare Analysis Meets Causal Inference: A Suggested Interpretation of Hendren, Working paper.**
  - Henrik J. Kleven. 2018. Sufficient Statistics Revisited, Working paper.

**TOOLS (EMPIRICS):**

- Cross-sectional and panel methods & Difference-in-difference (including generalized difference-in-difference)
  - Angrist and Pischke Chapter 3**
  - Angrist and Pischke Chapter 5**
  - Andrew Goodman-Bacon. 2018. Difference-in-difference with Variation in Treatment Timing. Working paper.
  - Raj Chetty, Adam Looney and Kory Kroft. 2009. Salience and Taxation: Theory and Evidence. *American Economic Review*.
  - Olga Malkova. 2018. Can Maternity Benefits Have Long-Term Effects on Child-bearing? Evidence from Soviet Russia. *Review of Economics and Statistics*.
- Regression discontinuity & Instrumental variables
  - Angrist and Pischke Chapter 4.**
  - Angrist and Pischke Chapter 6**
  - David S. Lee and Thomas Lemieux. 2010. Regression Discontinuity Designs in Economics. *Journal of Economic Literature* 48: 281–355.**
  - David Lee. 2008. Randomized Experiments from Non-random Selection in U.S. House Elections. *Journal of Econometrics*.

-Thomas Barnebeck Andersen, Jeanet Bentzen, Carl-Johan Dalgaard and Pablo Selaya. 2012. Lightning, IT Diffusion, and Economic Growth Across U.S. States. *Review of Economics and Statistics*.

#### LABOR ECONOMICS (THEORY)

- Selection and the Roy Model
  - Borjas Chapter 8.6
  - A.D. Roy. 1951. Thoughts on the Distribution of Earnings, *Oxford Economic Papers, New Series, Vol. 3, No. 2 pp. 135-146.***
- Human capital and signaling
  - Borjas Chapter 6
  - Jacob Mincer. 1958. Investment in Human Capital and Personal Income Distribution, *Journal of Political Economy, Vol. 66, No. 4, pp. 281-302***
  - Michael Spence. 1973. Job Market Signaling. *The Quarterly Journal of Economics, Vol. 87, No. 3, pp. 355-374.***

#### LABOR ECONOMICS (EMPIRICS)

- Minimum wage
  - Charles Brown, Curtis Gilroy and Andrew Kohen. 1982. The Minimum Wage on Employment and Unemployment. *Journal of Economic Literature, Vol. 20, No. 2, pp. 487-528.*
  - David Card and Alan Keuger. 1994. Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review.***
  - David Neumark and William Wascher. 2000. Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Comment. *The American Economic Review, Vol. 90, No. 5, pp. 1362-1396***
  - David Card and Alan Kreuger. 2000. Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Reply. *American Economic Review.*
  - Arindrajit Dube, T. William Lester, and Michael Reich. 2010. Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties. *Review of Economics and Statistics.***
  - David Neumark, Ian Salas and William Wascher. 2014. Revisiting the Minimum Wage-Employment Debate: Throwing the Baby Out with the Bathwater. *ILR Review.*
  - Sylvia Allegretto, Arindrajit Dube, Michael Reich and Ben Zipperer. 2017. Credible Research Designs for Minimum Wage Studies: A Response to Neumark, Salas and Wascher. *ILR Review.*
- Earned Income Tax Credit and labor supply
  - Nada Eissa and Jeffrey B. Liebman. 1996. Labor Supply Response to the Earned Income Tax Credit. *The Quarterly Journal of Economics, Vol. 111, No. 2. pp. 605-637.***

- Bruce D. Meyer and Dan T. Ronsenbaum. 2001. Welfare, The Earned Income Tax Credit, and the Labor Supply of Single Mothers. *Quarterly Journal of Economics*.
- Bruce D. Meyer. 2002. Labor Supply at the Extensive and Intensive Margins: The EITC, Welfare, and Hours Worked. *American Economic Review*.
- Nada Eissa and Hilary Hoynes. 2004. Taxes and the Labor Market Participation of Married Couples: The Earned Income Tax Credit. *Journal of Public Economics* 88 1931–1958.
- Raj Chetty and Emmanuel Saez. 2009. Teaching the Tax Code: Earnings Responses to an Experiment with EITC Recipients. *American Economic Journal: Applied Economics*, Vol. 5, No. 1 (January 2013), pp. 1-31.
- Jacob Bastian and Katherine Micheltore. 2018. The Long-Term Impact of the Earned Income Tax Credit on Children’s Education and Employment Outcomes. *Journal of Labor Economics*.
- Jacob Bastian. 2018. The Rise of Working Mothers and the 1975 Earned Income Tax Credit. Working Paper.

#### HEALTH ECONOMICS (THEORY)

- Rothschild and Stiglitz model of adverse selection
  - Michael Rothschild and Joseph Stiglitz. 1976. Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information. *The Quarterly Journal of Economics*, Vol. 90, No. 4, pp. 629-649
- Moral hazard
  - Kenneth J. Arrow. 1963. Uncertainty and the Welfare Economics of Medical Care. *The American Economic Review*, Vol. 53, No. 5, pp. 941-973.
  - Mark V. Pauly. 1968. The Economics of Moral Hazard: Comment. *The American Economic Review*, Vol. 58, No. 3, Part 1, pp. 531-537
  - Liran Einav and Amy Finkelstein. 2018. Moral Hazard in Health Insurance: What We Know and How We Know It. *Journal of the European Economic Association*.

#### HEALTH ECONOMICS (EMPIRICS)

- Oregon health experiment and RAND health experiment
  - Finkelstein, Amy, Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi Allen, Katherine Baicker, and the Oregon Health Study Group. 2012. “The Oregon Health Insurance Experiment: Evidence from the First Year.” *Quarterly Journal of Economics*.
  - Aron-Dine, Aviva, Liran Einav and Amy Finkelstein. 2013. “The RAND Health Insurance Experiment, Three Decades Later” *Journal of Economic Perspectives* 27(1): 197-222
  - Baicker K, Taubman S, Allen H, Bernstein M, Gruber J, Newhouse J, Schneider E, Wright B, Zaslabsky A, Finkelstein A. 2013. The Oregon experiment - effects of Medicaid on clinical outcomes. *New England Journal of Medicine* 386(18):1713-1722
  - Baicker K, Finkelstein A, Song J, Taubman S. 2014. The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health



Insurance Experiment. *American Economic Review Papers and Proceedings*, 104(5): 322-28

-Taubman, Sarah, Heidi Allen, Bill Wright, Katherine Baicker, and Amy Finkelstein. 2014. "Medicaid Increases Emergency Department Use: Evidence from Oregon's Health Insurance Experiment." *Science* 343(6168): 263-268. DOI: 10.1126/science.1246183

-Finkelstein A, Taubman S, Allen H, Wright B, Baicker K. 2016. Effect of Medicaid coverage on ED use - further evidence from Oregon's experiment. *New England Journal of Medicine* 375(16):1505-1507

- Effects of insurance and welfare on health outcomes and mortality

-Hilary Hoynes, Marianne Page, Ann Huff Stevens. 2011. Can targeted transfers improve birth outcomes? Evidence from the introduction of the WIC program. *Journal of Public Economics*

-Hilary Hoynes, Doug Miller, and David Simon. 2015. Income, the Earned Income Tax Credit and Infant Health. *American Economic Journal: Economic Policy*.

-Hilary Hoynes, Diane Whitmore Schanzenbach, and Douglas Almond. 2016. Long-Run Impacts of Childhood Access to the Safety Net. *American Economic Review*.

-**Martha Bailey and Andrew Goodman-Bacon. 2015. The War on Poverty's Experiment in Public Medicine: Community Health Centers and the Mortality of Older Americans. *The American Economic Review*, Vol. 105, No. 3, pp. 1067-1104**

-**Andrew Goodman-Bacon. 2018. Public Insurance and Mortality: Evidence from Medicaid Implementation. *Journal of Political Economy*.**

-**Andrew Godman-Bacon. 2018. The Long-run Effects of Childhood Insurance Coverage: Medicaid Implementation, Adult Health, and Labor Market Outcomes. Working paper.**

#### PUBLIC ECONOMICS (THEORY)

- Optimal commodity taxation

-**F. P. Ramsey. 1927. A Contribution to the Theory of Taxation. *The Economic Journal*, Vol. 37, No. 145, pp. 47-61.**

- Optimal income taxation

-**Emmanuel Saez. 2001. Using Elasticities to Derive Optimal Income Tax Rates. *Review of Economic Studies*.**

#### PUBLIC ECONOMICS (EMPIRICS)

- The elasticity of taxable income

-**Martin Feldstein. 1995. The Effect of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act. *Journal of Political Economy*, Vol. 103, No. 3, pp. 551-572**

-Martin Feldstein. 1999. Tax Avoidance and the Deadweight Loss of the Income Tax. *The Review of Economics and Statistics*, Vol. 81, No. 4, pp. 674-680

-Austan Goolsbee. 2000. What Happens When You Tax the Rich? Evidence from Executive Compensation. *Journal of Political Economy*, Vol. 108, No. 2, pp. 352-378

- Jon Gruber and Emmanuel Saez. 2002. The elasticity of taxable income: evidence and implications. *Journal of Public Economics*.
- Emmanuel Saez, Joel Slemrod and Seth H. Giertz. The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review. *Journal of Economic Literature*.
- Henrik Kleven and Esben Anton Schultz. 2014. Estimating Taxable Income Responses Using Danish Tax Reforms. *American Economic Journal: Economic Policy*.
- Emmanuel Saez. 2016. Taxing the Rich More: Preliminary Evidence from the 2013 Tax Increase. *Tax Policy and the Economy*.
- Policy and sorting
  - Edward M. Gramlich and Daniel L. Rubinfeld. 1982. Micro Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses. *Journal of Political Economy*, Vol. 90, No. 3, pp. 536-560. *Journal of Political Economy*, Vol. 106, No. 4, pp. 667-705.
  - Thomas J. Holmes. 1998. The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders. *Journal of Political Economy*.
  - Sandra Black. 1999. Do Better Schools Matter? Parental Valuation of Elementary Education. *The Quarterly Journal of Economics*, Vol. 114, No. 2, pp. 577-599
  - Dennis Epple, Thomas Romer and Holger Sieg. 2001. Interjurisdictional Sorting and Majority Rule: An Empirical Analysis. *Econometrica*.
  - Paul Rhode and Koleman S. Strumpf. 2003. Assessing the Importance of Tiebout Sorting: Local Heterogeneity from 1850 to 1990. *American Economic Review*.
  - Patrick Bayer, Fernando Ferreira, and Robert McMillan. 2007. A Unified Framework for Measuring Preferences for Schools and Neighborhoods. *Journal of Political Economy*, Vol. 115, No. 4, pp. 588-638
  - H. Spencer Banzhaf and Randall Walsh. 2008. Do People Vote with Their Feet? An Empirical Test of Tiebout's Mechanism. *The American Economic Review*, Vol. 98, No. 3, pp. 843-863

#### URBAN ECONOMICS (THEORY)

- Monocentric city model
  - MacDonald and McMillen Chapter 6 & 7.
  - Jan Brueckner. 1987. The Structure of Urban Equilibria: A Unified Treatment of the Muth-Mills Model. *Handbook of Regional and Urban Economics*.
- The Rosen-Roback model
  - Brueckner Chapter 11.
  - Jennifer Roback. 1982. Wages, Rents, and the Quality of Life. *Journal of Political Economy*, Vol. 90, No. 6, pp. 1257-1278
  - David Albouy. 2009. The Unequal Geographic Burden of Federal Taxation. *Journal of Political Economy*.

#### URBAN ECONOMICS (EMPIRICS)

- Place based policies
  - Roger Bolton. 1992. Place Prosperity vs. People Prosperity Revisited: An Old Issue with a New Angle. *Urban Studies*.**
  - David Neumark and Jed Kolko. 2010. Do Enterprise Zones Create Jobs? Evidence from California's Enterprise Zone Program. *Journal of Urban Economics*.
  - Matthew Freedman. 2012. Teaching New Markets Old Tricks: The Effects of Subsidized Investment on Low-Income Neighborhoods. *Journal of Public Economics*.**
  - Matias Busso, Jesse Gregory and Patrick Kline. 2013. Assessing the Incidence and Efficiency of a Prominent Place Based Policy. *American Economic Review*.
  - Patrick Kline and Enrico Moretti. 2013. Local Economic Development, Agglomeration Economies, and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority. *Quarterly Journal of Economics*.**
  - Patrick Kline and Enrico Moretti. 2014. People, Places, and Public Policy: Some Simple Welfare Economics of Local Economic Development Programs. *Annu. Rev. Econ.* 2014. 6:629–62.
  - David Neumark and Helen Simpson. 2015. Place-based Policies. *Handbook of Regional and Urban Economics*.
- Highways
  - Nathaniel Baum-Snow. 2007. Did Highways Cause Suburbanization. *Quarterly Journal of Economics*.**
  - Nathaniel Baum-Snow. 2010. Changes in Transportation Infrastructure and Commuting Patterns in US Metropolitan Areas, 1960–2000. *American Economic Review*.
  - Gilles Duranton and Matthew A. Turner. 2012. Urban Growth and Transportation. *Review of Economic Studies*.**
  - Gilles Duranton, Peter M. Morrow, and Matthew A. Turner. 2014. Roads and Trade: Evidence from the US. *Review of Economic Studies*.**
  - Nathaniel Baum-Snow. 2017. Urban Transport Expansions, Employment Decentralization, and the Spatial Scope of Agglomeration Economies. Working paper.
  - Nathaniel Baum-Snow, Loen Brandt, J. Vernon Henderson, Matthew Turner, Qing-hau Zhang. 2017. Roads, Railroads, and Decentralization of Chinese Cities. *Review of Economics and Statistics*.
  - Marco Gonzalez-Navarro and Matthew A. Turner. 2019. Subways and Urban Growth: Evidence from Earth. *Journal of Urban Economics*.

## INDUSTRIAL ORGANIZATION (THEORY)

- Imperfect competition
  - Tirole Chapter 5.
  - Carl Shapiro. 1989. Theories of Oligopoly Behavior. *The Handbook of Industrial Organization*.**
- Product differentiation and spatial price competition
  - Tirole Chapter 7-1.
  - Harold Hotelling. 1929. Stability in Competition. *The Economic Journal*, Vol. 39,**

No. 153, pp. 41-57

-Steven C. Salop. 1979. Monopolistic Competition with Outside Goods. *The Bell Journal of Economics*, Vol. 10, No. 1, pp. 141-156

#### INDUSTRIAL ORGANIZATION (EMPIRICS)

- Antitrust policy

-Severin Borenstein. 1989. Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry. *The RAND Journal of Economics*, Vol. 20, No. 3, pp. 344-365.

-Severin Borenstein. 1990. Airline Mergers, Airport Dominance, and Market Power. *American Economic Review*.

-Timothy F. Bresnahan and Peter C. Reiss. 1991. Entry and Competition in Concentrated Markets. *Journal of Political Economy*, Vol. 99, No. 5 (Oct., 1991), pp. 977-1009.

-**E. Han Kim and Vijay Singal. 1993. Mergers and Market Power: Evidence from the Airline Industry. *The American Economic Review*, Vol. 83, No. 3, pp. 549-569**

-George L. Mullin, Joseph C. Mullin and Wallace P. Mullin. 1995. The Competitive Effects of Mergers: Stock Market Evidence from the U.S. Steel Dissolution Suit. *The RAND Journal of Economics*, Vol. 26, No. 2 (Summer, 1995), pp. 314-330.

-Elizabeth Granitz and Benjamin Klein. 1996. Monopolization by Raising Rivals Costs: The Standard Oil Case. *The Journal of Law & Economics*, Vol. 39, No. 1, pp. 1-47

-Pauline M. Ippolito, Thomas R. Overstreet. 1996. Resale Price Maintenance: An Economic Assessment of the Federal Trade Commission's Case against the Corning Glass Works. *The Journal of Law & Economics*, Vol. 39, No. 1, pp. 285-328

-Ali Hortaçsu and Chad Syverson. 2007. Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices. *Journal of Political Economy*, Vol. 115, No. 2 (April 2007), pp. 250-301.

-**Austan Goolsbee and Chad Syverson. 2008. How Do Incumbents Respond to the Threat of Entry? Evidence from the Major Airlines. *Quarterly Journal of Economics*.**

-Leemore Dafny, Mark Duggan, and Subramaniam Ramanarayanan. 2012. Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry. *American Economic Review*.

-**Connan Snider and Jonathan W. Williams. 2015. Barriers to Entry in the Airline Industry: A Multidimensional Regression Discontinuity Analysis of AIR-21. *Review of Economics and Statistics*.**

-Orley C. Ashenfelter, Daniel S. Hosken and Matthew C. Weinberg. 2015. Efficiencies Brewed: Pricing and Consolidation in the US Beer Industry. *RAND Journal of Economics*.

- Patents and R&D policy

-Petra Moser. 2002. How Do Patent Laws Influence Innovation? Evidence from Nineteenth Century World's Fairs. *American Economic Review*.

-Liam Brunt, Josh Lerner and Tom Nicholas. 2012. Inducement Prizes and Innovation. *The Journal of Industrial Economics*.

-**Petra Moser. 2012. Innovation without Patents: Evidence from World's Fairs.**

*Journal of Law and Economics.*

-Mark Duggan, Craig Garthwaite, and Aparajita Goyal. 2016. The Market Impacts of Pharmaceutical Product Patents in Developing Countries: Evidence from India. *American Economic Review*.

**-Heidi L. Williams. 2013. Intellectual Property Rights and Innovation: Evidence from the Human Genome. *Journal of Political Economy*.**

-Sabrina T. Howell. 2017. Financing Innovation: Evidence from R&D Grants. *American Economic Review*.

**-Hans K. Hvide and Benjamin F. Jones. 2018. University Innovation and the Professor's Privilege. *American Economic Review*.**

-Ufuk Akcigit John Grigsby, Tom Nicholas and Stefanie Stantcheva. 2018. Taxation and Innovation in the 20th Century. Working Paper.

-Bhaven Sampat and Heidi L. Williams. 2019. How Do Patents Affect Follow-On Innovation? Evidence from the Human Genome. *American Economic Review*.

-Patrick Kline, Neviana Petkova, Heidi Williams, and Owen Zidar. 2019. Who Profits from Patents? Rent Sharing at Innovative Firms. *Quarterly Journal of Economics*.

-Ruben Jacobo-Rubio, John Turner and Jonathan W. Williams. 2019. The Distribution of Surplus in the US Pharmaceutical Industry: Evidence from Paragraph (iv) Patent Litigation Decisions. *Journal of Law and Economics*.

ENVIRONMENTAL ECONOMICS (THEORY)

• Externalities and corrective mechanisms

**-Gloria E. Helfand, Peter Berck, and Tim Maull. 2003. The Theory of Pollution Policy. *Handbook of Environmental Economics*.**

• Hedonics

**-Sherwin Rosen. 1974. Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy*, Vol. 82, No. 1, pp. 34-55.**

ENVIRONMENTAL ECONOMICS (EMPIRICS)

• Sorting and hedonics applications

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