

ECON 7335: Applied Econometrics

Spring 2024 Course Syllabus

Mondays and Wednesdays 10:00-11:30am (Melcher Hall Room 120)

Instructor: **Professor Aimee Chin** (best way to contact me is by email: achin@uh.edu; some info about me here: www.uh.edu/~achin)

Office: Teaching Unit 2 Building Room 201N

Office hours: Meetings can be arranged via email

TA: **Shuan-Wen Lin** (email: slin27@uh.edu)

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Description

The purpose of this course is to expose students to some econometric techniques frequently used in applied microeconomic research. The course features critical reading of empirical research papers and the implementation of econometric methods using data sets.

Learning Outcomes

- Students will attain, through lectures, readings and problem sets, knowledge about how to analyze quantitative data and how to draw inferences from statistical measures.
- Students will be able to critically assess empirical research, and to thoughtfully produce their own empirical research.

Prerequisites

To take this course, you must have either: (1) passed ECON 7331 or (2) received prior explicit permission from me.

Summary Table of the Digital Tools for our Course

The digital tool	How we will use it
Canvas	<ul style="list-style-type: none">• To download lecture slides• To get problem set assignments and solutions
Stata (see next page for details)	<ul style="list-style-type: none">• The specific software we will use to implement the econometric methods we are learning• See below for details about this software
UH Microsoft Office 365	<ul style="list-style-type: none">• I will set up a Teams meeting link for our class to use in case we hold class online instead of in person. The default is we meet in person, but if I announce we are meeting online then we will use this Teams video conference link.• We will use Excel to do some class exercises• We will use Forms to submit responses to some class exercises• Some students use Word to type responses for problem sets

Note: If you need to contact me, please send me an email (achin@uh.edu). I do not regularly monitor messages sent to me via other means, such as phone, Canvas or Teams, the fastest way to reach me is via email.

Textbooks

There are two required books:

- 1) Jeffrey M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press, 2010 (Second Edition).
- 2) Joshua D. Angrist and Jorn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, 2009. [There is only one edition, however new copies contain some corrections to the original version (the book's website <http://www.mostlyharmlesseconometrics.com/> lists some errata under the Blog page, Corrections tab) so I recommend buying a new copy corrected for the errata. The data and commands used to produce the tables shown in the book are available here: <https://economics.mit.edu/people/faculty/josh-angrist/mhe-data-archive> .]

The following book is recommended:

- 3) Joshua D. Angrist and Jorn-Steffen Pischke, *Mastering 'Metrics: The Path from Cause to Effect*, Princeton University Press, 2015. [The book's website <http://masteringmetrics.com/resources/> contains the data and commands used to produce the tables shown in the book.]

In addition to textbook readings, there will be journal article and working paper readings required for this course. Journal articles can be obtained through UH Libraries by searching journal titles (<https://libraries.uh.edu/>), accessing the electronic version of the journal, then locating the specific article. For working papers on the reading list, typically the URL has been provided or you can find it by looking at an author's website or googling the title of paper.

Data Analysis Software

We will be using Stata, a statistical analysis software used widely by academics and policy analysts. Public versions of Stata are available at selected locations on UH campus including your computer lab and the library (on library computers, or remotely via the library's virtual software; see for info: <https://libraries.uh.edu/spaces-tech/software/virtual/>), but I recommend that you purchase your own copy. UH has an agreement with Stata Corp. which allows students to purchase its software at reduced rates; <https://www.stata.com/order/new/edu/profplus/student-pricing/> . For the purposes of our course, you should buy Stata/BE six-month license which costs \$48. If you have an older version of Stata already, that is fine to use for our course.

Requirements and Grading

1) problem sets	Approximately every 1-2 weeks	36%
2) final exam	Monday April 29 in class	50%
3) class participation	Combination of attendance, performance on class exercises, preparedness for class and quality of classroom comments	14%

Problem Sets: Problem set assignments will be posted on UH Canvas (from AccessUH click on Canvas icon, or go to <https://uh.edu/canvas/> and click on the "Log In Here: Canvas" button). Some will involve data exercises. For the data exercises, we will use Stata. Students are

encouraged to work together on problem sets. However, unless otherwise specified, each student must write up his/her own problem set—no copies will be accepted, and this includes programs.

Generally, you get a score of zero when you do not submit your problem set by the deadline, but in certain situations a deadline extension is possible; email me to make a request for a deadline extension for a specific problem set and a reason for the request, and I will respond.

Final Exam: This will cover all the material of the course. It will be a closed-book exam; you may not consult your notes, the textbooks or any other resources—online or offline—during the exam. Your exam responses must be your own individual work; you are not allowed to work on the exam with others in any way, and this includes but is not limited to helping others, receiving help from others, working together and sharing responses.

Generally, you get a score of zero when you miss the exam, but in certain situations a make-up exam is possible; email me immediately if you expect to miss the exam or have missed the exam and a reason for missing it, and I will respond.

Class Participation: Students are expected to attend every class and participate in class activities, subject to the Excused Absence Policy described below. Multiple unexcused absences will lead to a reduction in the class participation part of your grade. If you miss a lecture, regardless of whether the absence is excused or unexcused, it is your responsibility to learn the material missed and complete any assignments assigned. The student is advised to review the lecture slides and readings associated with the missed lecture.

Optional Research Seminars: I encourage you to attend the University of Houston Empirical Microeconomics Workshop, a weekly seminar series featuring leading researchers in applied microeconomics. These seminars are usually Tuesdays 4:00-5:30pm (see <http://www.uh.edu/~achin/workshop/> for the schedule of speakers). Though seminar attendance is not counted in your grade for this class, attending seminars is an excellent way to expose yourself to current research, learn what a research paper comprises, and learn how to give oral presentations.

General Policies

- **Our Class Meetings**
Lectures will begin at 10:00am and end at 11:20am. We will meet every Monday and Wednesday between January 17 and April 29 except for March 11 and 13 (spring break).
- **Academic Honesty Policy**
High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed.
The UH **Academic Honesty Policy** (<https://uh.edu/provost/policies-resources/honesty/>) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

- Reasonable Academic Adjustments/Auxiliary Aids
The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: <https://uh.edu/accessibility/> calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU.
- Excused Absence Policy
Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston **Graduate Excused Absence Policy** (<http://publications.uh.edu/content.php?catoid=50&navoid=19270>) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to **military service** (<http://publications.uh.edu/content.php?catoid=49&navoid=18634>), religious holy days (<http://publications.uh.edu/content.php?catoid=44&navoid=15699>), **pregnancy and related conditions** (<https://www.uh.edu/equal-opportunity/anti-discrimination/policies/>), and **disability** (https://uhsystem.edu/compliance-ethics/_docs/sam/01/1d9.pdf).
- Recording of Class
Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the **Justin Dart, Jr. Student Accessibility Center** (<https://uh.edu/accessibility/>). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

- Mental Health and Wellness Resources

The University of Houston has a number of resources to support students' mental health and overall wellness, including CoogsCARE (<https://uh.edu/coogs-care/>) and the UH Go App (<https://uh.edu/go/>). UH Counseling and Psychological Services (CAPS) (<https://uh.edu/caps/>) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off-campus. For assistance visit <https://uh.edu/caps/>, call 713-743-5454, or visit a **Let's Talk** (<https://www.uh.edu/caps/outreach/lets-talk/>) location in-person or virtually. **Let's Talk** are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

The **Student Health Center** offers a Psychiatry Clinic for enrolled UH students (<https://uh.edu/healthcenter/services/medical-services/psychiatry-clinic/>). Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The **A.D. Bruce Religion Center** offers spiritual support and a variety of programs centered on well-being (<https://www.uh.edu/adbruce/>).

Need Support Now?

If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline (<https://988lifeline.org/>): call or text **988, or chat **988lifeline.org**.**

- Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at <https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/>.

- Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our **Power-On** website (<https://uh.edu/power-on/learning/>). Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, Blackboard, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

Course Outline and Reading List (*subject to minor changes*)

1. Introduction

Angrist and Pischke *Mostly Harmless Econometrics (MHE)* Chapter 1 / *Mastering 'Metrics* Introduction

Wooldridge, Chapters 1-4

2. The Selection Problem and Random Assignment

Angrist and Pischke *MHE* Chapter 2 / *Mastering 'Metrics* Chapter 1

Wooldridge, Chapter 21

Abadie, Alberto and Matias D. Cattaneo. 2018. "Econometric Methods for Program Evaluation." *Annual Review of Economics* 10: 465-503.

<https://economics.mit.edu/sites/default/files/publications/ARE-typo-Fig4-corrected.pdf>

Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura Rawlings and Christel Vermeersch. 2016. *Impact Evaluation in Practice*, Second Edition, World Bank.

<http://hdl.handle.net/10986/25030>

Lalonde, Robert J. 1986. "Evaluating the Econometric Evaluations of Training Programs Using Experimental Data." *American Economic Review* 76 (4): 604-620.

de Mel, Suresh, David McKenzie, and Christopher Woodruff. 2008. "Returns to Capital in Microenterprises: Evidence from a Field Experiment." *Quarterly Journal of Economics* 123 (4): 1329-1372.

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* 127 (3): 1057-1106.

Dobbie, Will and Roland G. Fryer Jr. 2015. "The Medium-Term Impacts of High-Achieving Charter Schools." *Journal of Political Economy* 123 (5): 985-1037.

Sacerdote, Bruce. 2001. "Peer Effects with Random Assignment: Results for Dartmouth Roommates." *Quarterly Journal of Economics* 116 (2):681-704.

Krueger, Alan B. 1999. "Experimental Estimates of Educational Production Functions." *Quarterly Journal of Economics* 114 (2):497-532.

Chetty, Raj, John Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Schanzenbach, and Danny Yagan. 2011. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR." *Quarterly Journal of Economics* 126 (4): 1593-1660.

Abhijit Banerjee, Esther Duflo, Nathanael Goldberg, Dean Karlan, Robert Osei, William Parienté, Jeremy Shapiro, Bram Thuysbaert, and Christopher Udry. 2015. "A Multifaceted Program Causes Lasting Progress for the Very Poor: Evidence from Six Countries." *Science* 348 (6236).

Kling JR, Liebman JB, Katz LF. 2007. "Experimental Analysis of Neighborhood Effects." *Econometrica* 75 (1): 83-119.

Anderson, Michael. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103 (484): 1481-1495.

Lee, D.S. 2009. "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects." *Review of Economic Studies* 76 (3): 1071-1102.

Christensen, Garret, and Edward Miguel. 2018. "Transparency, Reproducibility, and the Credibility of Economics Research." *Journal of Economic Literature* 56 (3): 920-80.

Banerjee, Abhijit, Esther Duflo, Amy Finkelstein, Lawrence F. Katz, Benjamin A. Olken, and Anja Sautmann. 2020. "In Praise of Moderation: Suggestions for the Scope and Use of Pre-Analysis Plans for RCTs in Economics." NBER Working Paper No. 26993.
<https://www.nber.org/papers/w26993>

3. Controlling for Confounding Variables (Regression, Matching)

Angrist and Pischke *MHE* Chapter 3 / *Mastering Metrics* Chapter 2

Wooldridge, Chapters 21.3

Rosenbaum, Paul R., and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70 (1): 41-55.

Angrist, Joshua D. 1998. "Estimating the Labor Market Impact of Voluntary Military Service Using Social Security Data on Military Applicants." *Econometrica* 66 (2): 249-288.

Dale, Stacy Berg and Alan B. Krueger. 2002. "Estimating the Payoff to Attending a More Selective College: An Application of Selection on Observables and Unobservables." *Quarterly Journal of Economics* 117 (4): 1491-1527.

Dehejia, Rajeev H. and Sadek Wahba. 1999. "Causal Effects in Nonexperimental Studies: Reevaluating the Evaluation of Training Programs." *Journal of the American Statistical Association* 94 (448): 1053-1062.

Imbens, Guido W. 2015. "Matching Methods in Practice: Three Examples." *Journal of Human Resources* 50 (2): 373-419.

Abadie, Alberto and Guido W. Imbens. 2016. "Matching on the Estimated Propensity Score." *Econometrica* 84 (3): 781-807.

Caliendo, Marco and Sabine Kopeinig. 2008. "Some Practical Guidance for the Implementation of Propensity Score Matching." *Journal of Economic Surveys* 22(1): 31-72. Working paper version is here: <https://docs.iza.org/dp1588.pdf>

4. Panel Data Methods (Fixed Effects, Difference-in-Differences, Synthetic Control)

Angrist and Pischke *MHE* Chapter 5 and 8 / *Mastering Metrics* Chapter 5

Wooldridge Chapters 6.5, 10, 11

Hallock, Kevin. 1998. "Layoffs, Top Executive Pay, and Firm Performance." *American Economic Review* 88 (4): 711-723.

Kinsler, Josh and Ronni Pavan. 2015. "The Specificity of General Human Capital: Evidence from College Major Choice." *Journal of Labor Economics* 33 (4): 933-972.

Currie, Janet and Duncan Thomas. 1995. "Does Head Start Make a Difference?" *American Economic Review* 85 (3): 341-364.

Ashenfelter, Orley and Cecilia Rouse. 1998. "Income, Schooling and Ability: Evidence from a New Sample of Twins." *Quarterly Journal of Economics* 113 (1): 253-284.

Meyer, Bruce D., W. Kip Viscusi and David L. Durbin. 1995. "Worker's Compensation and Injury Duration: Evidence from a Natural Experiment." *American Economic Review* 85 (3): 322-340.

Card, David and Alan Krueger. 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." *American Economic Review* 84 (4): 772-793.

Draca, Mirko, Stephen Machin, and Robert Witt. 2011. "Panic on the Streets of London: Police, Crime, and the July 2005 Terror Attacks." *American Economic Review* 101 (5): 2157-81.

Dynarski, Susan M. 2003. "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion." *American Economic Review* 93 (1): 279-288.

Duflo, Esther. 2001. "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment." *American Economic Review* 91 (4): 795-813.

Gruber, Jonathan. 1994. "The Incidence of Mandated Maternity Benefits." *American Economic Review* 84 (3): 622-641.

Bailey, Martha and Andrew Goodman-Bacon. 2015. "The War on Poverty's Experiment in Public Medicine: Community Health Centers and the Mortality of Older Americans." *American Economic Review* 105 (3): 1067-1104.

de Chaisemartin, Clément and Xavier D'Haultfoeuille. 2020. "Two-way Fixed Effects Estimators with Heterogeneous Treatment Effects." *American Economic Review* 110 (9): 2964-2996.

Goodman-Bacon, Andrew. 2021. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics* 225 (2): 254-277.

Callaway, Brantly and Pedro H. C. Sant'Anna. 2021. "Difference-in-Differences with Multiple Time Periods." *Journal of Econometrics* 225 (2): 200-230.

Sun, Liyang and Sarah Abraham. 2021. "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects." *Journal of Econometrics* 225 (2): 175-199.

Borusyak, Kirill, Xavier Jaravel and Jann Spiess. Forthcoming. "Revisiting Event Study Designs: Robust and Efficient Estimation." *Review of Economic Studies*.
<https://arxiv.org/pdf/2108.12419.pdf>

Roth, Jonathan, Pedro H.C. Sant'Anna, Alyssa Bilinski, and John Poe. 2023. "What's Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature." *Journal of Econometrics* 235 (2): 2218-2244.

Evans, William and Jeanne Ringel. 1999. "Can Higher Cigarette Taxes Improve Birth Outcomes?" *Journal of Public Economics* 72 (1): 135-154.

Bleakley, Hoyt. 2007. "Disease and Development: Evidence from the Hookworm Eradication in the American South." *Quarterly Journal of Economics* 122 (1): 73-117.

Chin, Aimee. 2005. "Long-Run Labor Market Effects of Japanese-American Internment during World War II on Working-Age Male Internees." *Journal of Labor Economics* 23 (3): 491-525.

Bertrand, Marianne, Esther Duflo and Sendhil Mullainathan. 2004. "How Much Should We Trust Difference-in-Differences Estimates?" *Quarterly Journal of Economics* 119 (1): 249-275.

Cameron, C. and D. Miller. 2015. "A Practitioner's Guide to Cluster-Robust Inference." *Journal of Human Resources* 50 (2): 317-372.

Abadie, Alberto, Susan Athey, Guido Imbens and Jeffrey Wooldridge. 2023. "When Should You Adjust Standard Errors for Clustering?" *Quarterly Journal of Economics* 138 (1): 1-35. Can find on Professor Abadie's website: <https://economics.mit.edu/sites/default/files/2022-09/When%20Should%20You%20Adjust%20Standard%20Errors%20for%20Clustering.pdf>

MacKinnon, James G. Morten Ørregaard Nielsen and Matthew D. Webb. 2023. “Cluster-Robust Inference: A Guide to Empirical Practice.” *Journal of Econometrics* 232 (2): 272-299.

Abadie, A. 2021. “Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects.” *Journal of Economic Literature* 59 (2): 391-425.

Abadie, Alberto, Alexis Diamond and Jens Hainmueller, 2010. “Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California’s Tobacco Control Program.” *Journal of the American Statistical Association* 105 (490): 493-505.

5. Instrumental Variables

Angrist and Pischke *MHE* Chapter 4 / *Mastering Metrics* Chapter 3

Wooldridge Chapter 5, 21.4

Angrist, Joshua D., Guido W. Imbens and Donald B. Rubin. 1996. “Identification of Causal Effects Using Instrumental Variables.” *Journal of the American Statistical Association* 91 (434): 444-455.

Guido W. Imbens and Joshua D. Angrist. 1994. “Identification and Estimation of Local Average Treatment Effects.” *Econometrica* 62 (2): 467-475.

Angrist, Joshua D. and Alan B. Krueger. 2001. “Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments.” *Journal of Economic Perspectives* 13 (2): 69-85.

Imbens, Guido. 2014. “Instrumental Variables: An Econometrician’s Perspective.” *Statistical Science* 29 (3): 323-358. Working paper version is here: <http://www.nber.org/papers/w19983>

Keane, Michael and Timothy Neal. 2023. “Instrument Strength in IV Estimation and Inference: A Guide to Theory and Practice.” *Journal of Econometrics* 235 (2): 1625-1653.

Angrist, Joshua D. 1990. “Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records.” *American Economic Review* 80 (3): 313-336. (Note Errata in December 1990 issue.)

Angrist, Joshua D. and Alan B. Krueger. 1991. “Does Compulsory School Attendance Affect Schooling and Earnings?” *Quarterly Journal of Economics* 106 (4): 979-1014.

Bleakley, C. Hoyt and Aimee Chin. 2004. “Language Skills and Earnings: Evidence from Childhood Immigrants.” *Review of Economics and Statistics* 86 (2): 481-496.

Goldsmith-Pinkham, Paul, Isaac Sorkin and Henry Swift. 2019. “Bartik Instruments: What, When, Why, and How.” *American Economic Review* 110 (8): 2586-2624.

Adão, Rodrigo, Michal Kolesár and Eduardo Morales. 2019. “Shift-Share Designs: Theory and Inference.” *Quarterly Journal of Economics* 134 (4): 1949-2010.

Borusyak, Kirill, Peter Hull, Xavier Jaravel and Dirk Krueger. 2022. “Quasi-Experimental Shift-Share Research Designs.” *Review of Economic Studies* 89 (1): 181-213.

Jaeger, David, Joakim Ruist and Jan Stuhler. 2018. “Shift-Share Instruments and the Impact of Immigration.” NBER Working Paper No. 24285. <https://www.nber.org/papers/w24285>

6. Regression Discontinuity Designs

Angrist and Pischke *MHE* Chapter 6 / *Mastering Metrics* Chapter 4

Wooldridge Chapter 21.5

Cattaneo, Matias D. and Rocío Titiunik. 2022. “Regression Discontinuity Designs.” *Annual Review of Economics* 14: 821–851. You can find on authors’ website: <https://titiunik.mycpanel.princeton.edu/papers/CattaneoTitiunik2022-ARE.pdf>

Cattaneo, Matias D., Nicolas Idrobo and Rocío Titiunik. 2019. *A Practical Introduction to Regression Discontinuity Designs: Foundations*. Elements in Quantitative and Computational Methods for the Social Sciences, Cambridge University Press. You can find on authors’ website: https://mdcattaneo.github.io/books/Cattaneo-Idrobo-Titiunik_2020_CUP.pdf

Cattaneo, Matias D., Nicolas Idrobo and Rocío Titiunik. Forthcoming. *A Practical Introduction to Regression Discontinuity Designs: Extensions*. Elements in Quantitative and Computational Methods for the Social Sciences, Cambridge University Press. You can find on authors’ website: https://mdcattaneo.github.io/books/Cattaneo-Idrobo-Titiunik_2023_CUP.pdf

Lee, David S. and Thomas Lemieux. 2010. “Regression Discontinuity Designs in Economics.” *Journal of Economic Literature* 48 (2): 281-355.

Imbens, Guido and Thomas Lemieux. 2008. “Regression Discontinuity Designs: A Guide to Practice.” *Journal of Econometrics* 142 (2): 615-635.

Bleemer, Zachary and Aashish Mehta. 2022. “Will Studying Economics Make You Rich? A Regression Discontinuity Analysis of the Returns to College Major.” *American Economic Journal: Applied Economics* 14 (2): 1-22,

Hoekstra, Mark. 2009. “The Effect of Attending the Flagship State University on Earnings: A Discontinuity-Based Approach.” *Review of Economics and Statistics* 91 (4): 717-724.

Zimmerman, Seth D. 2014. “The Returns to College Admission for Academically Marginal Students.” *Journal of Labor Economics* 32 (4): 711-754.

Carpenter, Christopher and Carlos Dobkin. 2011. “The Minimum Legal Drinking Age and Public Health.” *Journal of Economic Perspectives* 25 (2): 133-156.

Angrist, Joshua D. and Victor Lavy. 1999. “Using Maimonides’ Rule to Estimate the Effects of Class Size on Scholastic Achievement.” *Quarterly Journal of Economics* 114 (2): 533-575.

Urqiola, Miguel and Eric Verhoogen. 2009. "Class-size Caps, Sorting and the Regression-Discontinuity Design." *American Economic Review* 99 (1): 179-215.

Almond, Douglas, Joseph Doyle, Amanda Kowalski and Heidi Williams. 2010. "Estimating Marginal Returns to Medical Care: Evidence from At-risk Newborns." *Quarterly Journal of Economics* 125 (2): 591-634.

Barreca, Alan, Melanie Guldi, Jason Lindo and Glen Waddell. 2011. "Saving Babies? Revisiting the Effect of Very Low Birth Weight Classification." *Quarterly Journal of Economics* 126 (4): 2117-2123.

Bharadwaj, Prashant, Katrina Vellesen Loken and Christopher Neilson. 2013. "Early Life Health Interventions and Academic Achievement." *American Economic Review* 103 (5): 1862-91.

Black, Sandra. 1999. "Do Better Schools Matter? Parental Valuation of Elementary Education?" *Quarterly Journal of Economics* 114 (2): 577-599.

7. Regression Kink Designs

Nielsen, Helena, Torben Sorensen and Christopher Taber. 2010. "Estimating the Effect of a Student Aid Program on College Enrollment: Evidence from a Government Grant Policy Reform." *American Economic Journal: Economic Policy* 2 (2): 185-215.

Lundqvist, Heléne, Matz Dahlberg and Eva Mörk. 2014. "Stimulating Local Public Employment: Do General Grants Work?" *American Economic Journal: Economic Policy* 6 (1): 167-192.

Manoli, Day and Nicholas Turner. 2018. "Cash-on-Hand and College Enrollment: Evidence from Population Tax Data and Policy Nonlinearities." *American Economic Journal: Economic Policy* 10 (2): 242-71.

Card, David, David Lee, Zhuan Pei and Andrea Weber. 2015. "Inference on Causal Effects in a Generalized Regression Kink Design." *Econometrica* 83 (6): 2453-2483.