

PLCY 882 & HPM 882
Advanced Panel Data Methodology for Public Policy/Health Policy Management
Credit Hours: 3
Department of Public Policy
Disclaimer: This class uses STATA

Fall 2016 Syllabus
Class Location: Monday & Wednesday 11:15 am – 1:10 pm, 1005 Global

Prerequisites: HPM 881 or equivalent and knowledge of Stata.

Faculty:	Jeremy Moulton (moulton@email.unc.edu)	Teaching Assistant:	Dillan Bono-Lunn Office: 210 Abernethy Hall
Office:	105 Abernethy Hall	Office Hours:	12:30 to 1:10 Mon & Wed 1005 Global
Phone:	919-962-1002		
Office Hours:	4:00 to 5:00 Mon & Wed		

Course Overview

This course is designed to increase your ability to apply models and statistical techniques to problems in health, education, employment, poverty and other areas of population policy. Course objectives are to:

- Understand major techniques used to estimate causal relationships in quasi-experimental designs, with an emphasis on panel data.
- Gain intuition and skills about the “art” of econometrics, including techniques for using complex survey data and dealing with missing data.
- Conduct original research applying the techniques covered in class (especially panel data techniques) to population related fields.

Resources

Website

The course has its own website on Sakai. (See <http://sakai.unc.edu>) The most current version of the syllabus is always on the website. Be sure to check that the email address Sakai has for you is correct.

Texts: Material will be drawn from required texts, supplemental readings, and Sakai lecture slides. Links to required non-textbook readings are available on Sakai. Optional readings may not be on Sakai.

Required:

Wooldridge, Jeffrey M. *Introductory Econometrics: A Modern Approach*. Cengage Learning. (2012 5th edition, 2009 4th edition, or 2006 3rd edition)

Kennedy, Peter *A Guide to Econometrics*. (6th Edition from Blackwell Publishing preferred; older editions OK, e.g., 5th Edition by MIT Press) You can also access the third edition electronically through the UNC library website.

Cameron, A. Colin and Pravin Trivedi. *Microeconometrics Using Stata*. A Stata Press Publication. (Note: either the original 2009 edition or the more recent 2010 second edition is fine.)

Recommended (If you are interested in these books feel free to come by my office to look them over to see if they will be helpful):

Murnane, Richard and John B. Willett. *Methods Matter: Improving Causal Inference in Educational and Social Science Research*. Oxford University Press, 2011. (This book is very well written and explains the models in this class using examples from recent journal articles.)

Angrist, Joshua D. and Jorn-Steffen Pischke. *Mostly Harmless Econometrics: An Empiricists Companion*. Princeton University Press, 2009. (Murnane and Willett is an easier read, but there are a few additional methods and econometric issues that are dealt with in this book – quantile regression for instance.)

Stata Manuals

This class will heavily use Stata. Although there is an electronic help function, having easy access to Stata manuals (Stata Users's Guide, Reference manuals, Survey Data manual and Graphics manual) will provide useful examples and will save you much frustration. You do not have to buy Stata as there is a version available on the Virtual Lab, but I highly recommend it.

Recommended but I will provide access to any portions that you need to read:

Lee, Eun Sul, Ronald N. Forthofer, and Ronald J. Lorimor (1989) *Analyzing Complex Survey Data*. Sage University Paper Series on Quantitative Applications in Social Sciences, Number 71. Sage Publications.

Kalton, Graham (1983) *Introduction to Survey Sampling*, Sage University Paper Series on quantitative Application in the Social Sciences, 07-035.

Allison, Paul (2001). *Missing Data*. Number 07-136. Sage University Paper Series on Quantitative Applications in Social Sciences, Number 71. Sage Publications.

Advanced Texts and References for Further Reading (not recommended to buy now)

Cameron, A. Colin & Pravin K. Trivedi (2007) *Microeconometrics: Methods and Applications*. Cambridge University Press.

Greene, William. *Econometric Analysis*. Prentice Hall.

Wooldridge, Jeffrey M. (2002) *Econometric Analysis of Cross Section and Panel Data*. MIT Press.

Odum courses on statistical computing are listed at:
<http://www.odum.unc.edu/odum/contentSubpage.jsp?nodeid=183>

Requirements and Expectations

Class Preparation and Participation

While students are expected to come to class, the most important requirements for this class are successful completion of all problem sets and demonstration of mastery of the material through the midterm, final, and paper. In other words, I am not going to be keeping track of your attendance, but if you miss class you need to get notes from a friend. If you are consistently absent it may reflect poorly on your final grade.

Cell Phones and Laptops

Turn off cell phones in class.¹ Laptops may be used to take notes during class and follow along when we use Stata. Please do not check or write e-mails or use the internet during class for anything aside from class purposes. Using the internet can be very distracting to people behind you.

Evaluation Method

Grade Components

Component	% of Grade
Homework	15%
Midterm Exam	20%
Final Exam (Cumulative)	30%
Empirical Paper	25%
Paper Proposal, Descriptive Statistics, Peer Review	10%
<i>Total</i>	<i>100%</i>

Exams

The midterm exam will be on Wednesday, October 19th during class. The final exam will be on Friday, December 13th from 12 (noon) to 3 pm as announced by the office of the University Registrar. Both exams will be closed book. No help from any other person or resource can be used on any exam, and full honor code rules apply.

Homework and Problem Sets

Your problem set answers should be submitted on Sakai by the deadline. Answers may be hand-written (scan any handwritten portions) or typed, copying Stata output from the log file where relevant. Problem sets will be graded as 2 points (full effort and mostly correct), 1 point (sufficient effort and at least a moderate understanding of concepts, but some problems with misunderstanding identified), or 0 (insufficient effort or poor understanding of concepts). The grader will make an attempt to help you identify larger problems/errors, but you should review the answer key to determine all errors. Persons submitting all homework on time with sufficient effort (i.e., at least a 1 or 2 on all problem sets) will receive all 15 points for the homework grade.

Doing the problem sets in a small group is an effective way to learn the material. Be sure to try to work all problems on your own before meeting with your group, so you can ensure that you are not just copying down answers but actually learning the material. Please write the names of the other students you have worked with at the top of your problem set, as this information can help the instructor identify any areas of group confusion. Please discontinue working in a group if you feel it is not an effective learning approach for you.

Original Empirical Paper and Peer Review

The paper will be based on a topic of your choice, using data of your choice, and should apply some of the panel data techniques covered in the first half of this class. You can also use some of the methods from the later portion of the class, but you should check with me before proceeding. You are encouraged to discuss your paper with others, but as always you must acknowledge any intellectual contributions made by others. See Sakai for more detailed guidelines and a list of possible panel datasets. There is often support available through the Odum Center to help with data preparation questions (e.g., accessing public use data, downloading, transferring between programs, manipulating, programming errors, etc.), but the TA and me will be available during office hours as well.

A two page proposal for the paper is due on or before Wednesday October 12th. Your proposal must be approved, and you may be asked to revise it before approval. Descriptive statistics for your paper will be due on Wednesday, November 2nd. Be sure to bring all prior submissions/paperwork whenever you want to discuss your paper with me.

¹ At the very least silence your phone and don't use it. And, I can tell when you are texting.

The paper is due on Wednesday December 7th. Please submit **two** hard copies of this paper. One copy will be turned in for grading with the graded proposal and descriptive statistics with my handwritten comments. The other copy will be randomly distributed to another class member for peer reviewing. Please do not put your name on the papers, but use your PID instead. Peer reviews, which consist of a single page listing three strengths and three weaknesses or area of improvement for the paper you review, are due by December 15th.

Doing research compliant with IRB procedures is very important. If you use a publicly available dataset for your class paper, you do not need to seek IRB determination or approval. If you are not using a publicly available dataset, you should seek IRB determination and approval as necessary. See http://ohre.unc.edu/guide_to_irb.php or the document on "Student Research IRB Guidance" that I have posted on Sakai. If you need to seek IRB determination or approval, you will also need proof of human subjects research ethics certification. (If you have not already been certified, please follow the instructions at <http://research.unc.edu/offices/human-research-ethics/index.htm> -- I highly recommend that you seek this certification anyway).

Evaluation Criteria

- Diligence in completing problem sets on time.
- Demonstration of competency with techniques on exams.
- Correct empirical analysis and clear presentation of findings in a paper on a topic of your choice.

UNC Honor Code

The principles of academic honesty, integrity, and responsible citizenship govern the performance of all academic work and student conduct at the University as they have during the long life of this institution. Your acceptance of enrollment in the University presupposes a commitment to the principles embodied in the Code of Student Conduct and a respect for this most significant Carolina tradition. Your reward is in the practice of these principles.

Your participation in this course comes with the expectation that your work will be completed in full observance of the Honor Code. Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work.

If you have any questions about your responsibility or the responsibility of faculty members under the Honor Code, please consult with someone in either the Office of the Student Attorney General (966-4084) or the Office of the Dean of Students (966-4042).

Read "The Instrument of Student Judicial Governance" (<http://instrument.unc.edu>). Also please take the quiz available at: <http://www.lib.unc.edu/instruct/plagiarism/>

Copyright Policy for Class Materials

UNC's Copyright Policy clearly prohibits students from making commercial use of notes taken in class or labs; you may not sell or otherwise acquire financial or commercial gain from notes you take in this class. Students found to have violated this prohibition are in violation of the Honor Code and are subject to Honor Court proceedings.

CLASS SCHEDULE, FALL 2016

**NOTE THAT THIS SCHEDULE IS SUBJECT TO CHANGE
I WILL KEEP YOU INFORMED OF WHICH PAPERS WILL BE MOST IMPORTANT FOR OUR
CLASS DISCUSSIONS.**

Session 1	Aug 24	Introduction and Course Overview
Learning Objectives:		<ul style="list-style-type: none"> • <i>Know what the course will cover and how it is structured</i> • <i>Know what is expected of students</i>
Readings:		Friedman, David A. (1991) "Statistical Models and Shoe Leather." <i>Sociological Methodology</i> , Vol. 21, 291-313.

I. INTERPRETING MULTIPLE REGRESSION

Session 2	Aug 29	I.1 Ceteris Paribus and Treatment Effects
Learning Objectives:		<ul style="list-style-type: none"> • <i>Experiments to estimate impact of racial discrimination</i>
Readings:		<p>Wooldridge: 1.4 and 3.2 Kennedy: Chapters 1 and 3 Kravitz, Richard L., Naihua Duan, and Joel Braslow (2004) "Evidence-Based Medicine, Heterogeneity of Treatment Effects, and the Trouble with Averages." <i>The Milbank Quarterly</i>, 82(4):661-687.</p> <p>Marianne Bertrand; Sendhil Mullainathan (2004). "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination," <i>The American Economic Review</i>, Vol. 94, No. 4., pp. 991-1013.</p> <p>Doleac, Jennifer L. and Luke C.D. Stein (2012). "The Visible Hand: Race and Online Market Outcomes." Working paper.</p> <p>Geisel, Theodore Seuss (1961). <i>The Sneetches and Other Stories</i>, Random House.</p> <p><u>Optional:</u> Manski, Charles F. (1996) "Learning About Treatment Effects from Experiments with Random Assignment of Treatments," <i>Journal of Human Resources</i> 31(4), pp. 709-733.</p>

Session 3	Aug 31	I.2. Using Control Variables to Reduce Bias: Theory and Examples
Learning Objectives:		<ul style="list-style-type: none"> • <i>Using Ballentine diagrams to depict implications of omitted variable bias</i> • <i>Formal derivation of bias when moving from simple to long regression</i>
Readings:		Wooldridge: 3.3, 3.4, 6.2, 7 (all), 9.2 Kennedy: Chapter 6.2 and General Notes 6.2

	Sep 5	Labor Day – NO CLASS
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Session 4	Sep 7	I.3. Monte Carlo Examples of Multiple Regression Limitations
Learning Objectives:		<ul style="list-style-type: none"> • <i>Review of concepts of bias, consistency, and efficiency</i> • <i>Value of Monte Carlo Experiments</i> • <i>Using Monte Carlo to assess implications of measurement error</i> • <i>Analogy between Monte Carlo and bootstrapping as they relate to sampling</i>

		<i>distributions</i>
Readings:		Wooldridge: Chapter 5: Intro and 5.1; Chapter 9.4 Kennedy: chapter 2 (especially 2.10), Section 4.6, and Appendix A

Session 5	Sep 12	I.4 Modeling: Controls vs. Mediating Variables
Learning Objectives:		<ul style="list-style-type: none"> • <i>See the importance of the “way you think the world works” in terms of understanding the interpretation and value of parameters from different models</i>
Readings:		<i>Optional reading:</i> Heckman, JJ. (2001) Micro data, heterogeneity, and the evaluation of public policy: Nobel lecture. <i>Journal of Political Economy</i> 109(4), pp. 673-748.

II. PANEL DATA, SURVEYING, AND MISSING DATA

Session 6	Sep 14	II.1 Introduction to Panel Data Models
Learning Objectives:		<ul style="list-style-type: none"> • <i>Consider data sets with two or more dimensions, and review key issues pertaining to their analysis</i> • <i>Overview of Complex Survey Designs</i>
Readings:		Wooldridge: Intro to 13, and 13.1 Kalton, Graham (1983) <i>Introduction to Survey Sampling</i> , Sage University Paper Series on Quantitative Application in the Social Sciences, 07-035. Pages 5-29. <i>Optional:</i> Kalsbeek, W. and G. Heiss (2000) “Building Bridges Between Populations and Samples in Epidemiological Studies,” <i>Annual Review of Public Health</i> , Vol. 21: 147-169.

Session 7	Sep 19	II.2 Survey Data Analysis Estimation Strategies
Learning Objectives:		<ul style="list-style-type: none"> • <i>Types of weights, and implications of using weights or adjusting standard errors for the complex survey design</i>
Readings:		Lee, Eun Sul, Ronald N. Forthofer, and Ronald J. Lorimor (1989) <i>Analysis of Complex Survey Data</i> . Sage University Paper Series on Quantitative Applications in Social Sciences, Number 71. Sage Publications. Pages 7-21. <i>Stata User's Guide</i> entries on: svy commands and weights <ul style="list-style-type: none"> • Weighted estimation • Overview of survey estimation <i>Optional:</i> Korn, Edward L., and Barry I. Graubard (1995) “Analysis of Large Health Surveys: Accounting for the Sampling Design,” <i>Journal of the Royal Statistical Society Series A</i> (Statistics in Society), Vol. 158, No. 2, pp. 263-295.

Session 8	Sep 21	II.3 Missing Data
Learning Objectives:		<ul style="list-style-type: none"> • <i>Implications of the alternative assumptions for missing data</i> • <i>Practical aspects of dealing with missing data, including the problem with the dummy variable approach to missing data</i> • <i>How do you know if your survey will be large enough to find significant results</i>

Readings:		<p>Wooldridge 9.5</p> <p>Allison, Paul (2001). <i>Missing Data</i>. Sage University Paper Series on Quantitative Applications in Social Sciences, Number 136. Sage Publications. Pp 1-12</p> <p>Optional: Little, Roderick J.A. (1992) "Regression With Missing X's: A Review." <i>Journal of the American Statistical Association</i>, Vol. 87, No. 420., pp. 1227-1237.</p>
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III. PANEL DATA ANALYSIS

Session 9	Sep 26	II.2 Natural Experiments and Difference Estimators
Learning Objectives:		<ul style="list-style-type: none"> • <i>Use a simple two period treatment-control comparison to see the essence of difference in difference models and how such models relate to the idea of first differencing.</i> <p>Eissa, Nada and Jeffrey B. Liebman. "Labor Supply Responses to the Earned Income Tax Credit." <i>Quarterly Journal of Economics</i>, Vol. 111, No. 2 (May 1996), pp. 605-637.</p> <p><u>Examples of Natural Experiments (some personal):</u></p> <p>Card, David (1990) "The impact of the Mariel Boatlift on the Miami Labor Market," <i>Industrial and Labor Relations Review</i> Vol. 43, No. 2, pp. 245-257.</p> <p>Krueger, Alan & Jorn-Steffen Pischke (1992) "The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation," <i>Journal of Labor Economics</i>, V. 10, No. 4, pp. 412-437.</p> <p>Larsen, Matthew, T.J. McCarthy, Jeremy Moulton, Marianne Page, and Ankur Patel, "War & Marriage: Assortative Mating and the World War II G.I. Bill," Forthcoming in <i>Demography</i>.</p> <p>Moulton, Jeremy and Ann Huff Stevens. "The Social Security Notch and Retirement: Wealth and Incentive Effects." <i>Economics Letters</i>, 2015, 132: 65-68.</p>
Readings:		Wooldridge: 13.2 - 13.4, Kennedy Chapter 18, C&T, 8.1-8.2

Session 10	Sep 28	II.4 Difference-in-Difference-in-Differences Empirical Example
Learning Objectives:		<ul style="list-style-type: none"> • <i>If you thought two differences was awesome, then three is "awesomer"</i>
Readings:		<p>Chetty, Raj, Adam Looney, and Kory Kroft (2009) "Salience and Taxation: Theory and Evidence." <i>American Economic Review</i>, Vol. 99, No. 4, pp. 1145-1177.</p> <p>Davidoff A, Blumberg L, Nichols L. (2005) "State health insurance market reforms and access to insurance for high-risk employees." <i>Journal of Health Economics</i> 24 (4): 725-750.</p>

Session 11	Oct 3	II.5 First Differences and Deviations from Means Estimators
Learning Objectives:		<ul style="list-style-type: none"> • <i>How are fixed effects models actually estimated?</i>
Readings:		Wooldridge 13.5, 14.1, pp. 487-489, C&T 8.3, 8.5, 8.9, 8.11

Session 12	Oct 5	II.6 Fixed Effects in Practice: Limitations and Tests
Learning Objectives:		<ul style="list-style-type: none"> • <i>Are there any problems with Fixed Effects?</i>
Readings:		<p>Bertrand M, Duflo E, Mullainathan S. (2004) "How much should we trust differences-in-differences estimates?" <i>Quarterly Journal Of Economics</i> 119 (1): 249-275.</p> <p>Wooldridge: 13.5, Summary of 13, App 13A, and 14.1 (pp. 481-487) Kennedy: Section 18.2 and 18.3</p>

Session 13	Oct 10	II.7 Random Effects Estimators
Learning Objectives:		<ul style="list-style-type: none"> • <i>If the unit-specific component of the error term is not causing bias, how do we get more efficient estimators than pooled OLS or FE models?</i>
Readings:		Wooldridge: 14.2 (Also, review Chapter 8), Appendix 14A. C&T 8.6-8.7

Session 14	Oct 12	II.8 Random Effects Specification Tests and Clustering
Learning Objectives:		<ul style="list-style-type: none"> • <i>Choosing between various models based on both bias and efficiency considerations.</i> • <i>Clustering or how to make "significant" results disappear...</i>
Readings:		<p>McCall, Nelda and Hoi S. Wai (1983) "An Analysis of the Use of Medicare Services by the Continuously Enrolled Aged," <i>Medical Care</i>, 21(6), pp. 567-585.</p> <p>Wooldridge 14.3 and Summary Kennedy, Chapter 18, C&T 8.10.6</p> <p><u>Optional:</u> Moulton, Brent R. (1986) "Random Group Effects and the Precision of Regression Estimates." <i>Journal of Econometrics</i>, Vol. 32, Issue 3, pp. 385-397.</p> <p>Moulton, Brent R. (1990) "An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables in Micro Units." <i>Review of Economics and Statistics</i>, Vol. 72, No. 2, pp. 334-38.</p> <p>Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller (2008). "Bootstrap-Based Improvements for Inference with Clustered Errors." <i>The Review of Economics and Statistics</i>, Vol. 90, No. 3, pp. 414-427.</p>
Paper:		Paper proposal due (Two pages, hard copy to my mailbox in Abernethy)

Session 15	Oct 17	Pre-Exam Review
Learning Objectives:		<ul style="list-style-type: none"> • <i>Summary of material through Section II</i>

Session 16	Oct 19	MIDTERM (closed book exam in class)
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Session 17	Oct 24	Midterms Returned & Paper Workshop
Learning Objectives:		<ul style="list-style-type: none"> • <i>Return midterms</i> • <i>Cover common mistakes on midterm</i> • <i>The TA and I will be available to help answer questions for your final paper.</i>
Readings:		None

IV. MORE CAUSAL MODELS (THESE DON'T REQUIRE PANEL DATA)

Session 18	Oct 26	IV.1 Overview of Instrumental Variables and Overcoming Bias
Learning Objectives:		<ul style="list-style-type: none"> • <i>Overview of IV</i>
Readings:		<p>Wooldridge: Chapter 15 intro, 15.1, 15.2, 16 Intro, 16.1, 16.2 Kennedy Chapter 9</p> <p><i>Optional :</i> Michael Shwartz and Arlene Ash. "Estimating the Effect of an Intervention from Observational Data." In: <i>Risk Adjustment for Measuring Health Care Outcomes</i>. Edited by Lisa I. Iezzoni, Third Edition, Health Administration Press. 2003</p>
Paper:		Descriptive Statistics for Paper due (Hard copy in envelope with approved proposal)

Session 19	Oct 31	IV.2 IV in Practice
Learning Objectives:		<ul style="list-style-type: none"> • <i>Using quarter of birth as an instrument for education and the weak instrument critique</i>
Readings:		<p>Angrist, Joshua D. and Alan B. Krueger, (1991) "Does Compulsory School Attendance Affect Schooling and Earnings," <i>Quarterly Journal of Economics</i>, Vol. 106, No. 4.</p> <p>Bound, John, David A. Jaeger, and Regina M. Baker, (1995) "Problems with Instrumental Variables Estimation When Correlation Between Instruments and the Endogenous Explanatory Variable is Weak," <i>Journal of the American Statistical Association</i>, Vol. 90, No. 430.</p> <p>Newhouse, Joseph and Mark McClellan (1998) "Econometrics in outcomes research: The use of instrumental variables," <i>Annual Review of Public Health</i>, 19:17-34. [http://publhealth.annualreviews.org]</p> <p><i>Optional:</i> McClellan, Mark, Barbara McNeil, and Joseph Newhouse (1994) "Does more intensive treatment of acute myocardial infarction in the elderly reduce mortality? Analysis using instrumental variables," <i>JAMA</i> 272(11):859-866. See also the editorial pp. 891-893, and the Letters and Reply May 3, 1995 <i>JAMA</i>, 275(17) :1331-1333.</p> <p><i>Optional: A more technical version is published as:</i> McClellan, Mark and Joseph Newhouse (1997) "The marginal costs and benefits of medical technology: a panel instrumental-variables approach." <i>Journal of Econometrics</i>, 77:39-64.</p> <p><i>Optional: Comments on the above paper:</i> Harris, Katherine and Dahlia Remler (1998) "Who is the marginal patient? Understanding instrumental variables estimates of treatment effects," <i>Health Services Research</i> 33(5):1337-1360. [http://hsr.org]</p>

Session 20	Nov 2	IV.3 Two Stage Least Squares Estimation
Learning Objectives:		<ul style="list-style-type: none"> • <i>Mechanics of IV estimation</i>

Readings:		<p>Basu A, Heckman JJ, Navarro-Lozano S, et al. (2007) Use of instrumental variables in the presence of heterogeneity and self-selection: An application to treatments of breast cancer patients. <i>Health Economics</i> 16(11): 1133-1157</p> <p>Wooldridge 15.3-15.5, 15.8, Appendix 15A, 16.3, 16.4, 16.6 Kennedy Chapter 11, Section 22.5 (skim)</p> <p><u>Optional:</u> Cook, Thomas, William Shadish and Vivian Wong (2008), "Three Conditions under Which Experiments and Observational Studies Produce Comparable Causal Estimates," <i>Journal of Policy Analysis & Management</i> Vol. 27(4):724-750.</p> <p>Murray, MP "Avoiding invalid instruments and coping with weak instruments." <i>Journal of Economic Perspectives</i> 20(4):111-132, Fall 2006</p>
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Session 21	Nov 7	Regression Discontinuity
Learning Objectives:		<ul style="list-style-type: none"> • <i>Similar to IV, but uses a discontinuity in the rule governing the assignment to treatment/control group</i>
Readings:		<p>J. Angrist and V. Lavy (1999) "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," <i>Quarterly Journal of Economics</i>, 114:2, 533-575.</p> <p>Carrell, Scott E., Mark Hoekstra, and James E. West. (2011) "Does Drinking Impair College Performance? Evidence from a Regression Discontinuity Approach." <i>Journal of Public Economics</i>, Vol. 95, Issue 1-2, pp. 54-62.</p> <p>Imbens, Guido and Thomas Lemieux (2008) "Regression Discontinuity Designs: A Guide to Practice", <i>Journal of Econometrics</i>, Vol. 142, Issue 2</p> <p><u>Optional:</u> Shadish, Cook, and Campbell; "Experimental and Quasi-experimental Designs for Generalized Causal Inference". Chapter 7, pages 207-243.</p> <p>William Trochim "The Regression-Discontinuity Design in AHCPR Conference Proceedings" <i>Research Methodology: Strengthening Causal Interpretations of Non-Experimental Data</i>. May 1990.</p> <p>Elder, Todd E. "The importance of relative standards in ADHD diagnoses: Evidence based on exact birth dates." <i>Journal of Health Economics</i> 29 (2010) 641–656.</p> <p>Van der Klauww, W. (2002). "Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression-Discontinuity Approach, <i>International Economic Review</i>, Vol 43(4).</p>

Session 22	Nov 14	Regression Discontinuity Application
Learning Objectives:		<ul style="list-style-type: none"> • <i>How do you actually use Regression Discontinuity?</i>

Session 23	Nov 16	Last of Regression Discontinuity
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Learning Objectives:		<ul style="list-style-type: none"> • <i>Finalize discussion of regression discontinuity</i> • <i>Tests for Regression Discontinuity</i> • <i>Placebo Tests</i>
Readings:		<p>Almond, D., Doyle, J. J., Kowalski, A. E., & Williams, H. (2010). Estimating Marginal Returns to Medical Care: Evidence from At-risk Newborns. <i>The Quarterly Journal of Economics</i>, 125(2), 591-634.</p> <p>Barreca, A. I., Guldi, M., Lindo, J. M., & Waddell, G. R. (2011). Saving babies? Revisiting the effect of very low birth weight classification. <i>The Quarterly Journal of Economics</i>, 126(4), 2117-2123.</p> <p><u>Optional</u> Almond, D., Doyle, J. J., Kowalski, A. E., & Williams, H. (2011). The Role of Hospital Heterogeneity in Measuring Marginal Returns to Medical Care: A Reply to Barreca, Guldi, Lindo, and Waddell. <i>The Quarterly Journal of Economics</i>, 126(4), 2125-2131.</p> <p>Barreca, A. I., Lindo, J. M., & Waddell, G. R. (2016). Heaping-Induced Bias in Regression-Discontinuity Designs. <i>Economic Inquiry</i>, 54(1), 268-293.</p> <p>Lee, D. S., & Card, D. (2008). Regression discontinuity inference with specification error. <i>Journal of Econometrics</i>, 142(2), 655-674.</p> <p>McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. <i>Journal of Econometrics</i>, 142(2), 698-714.</p> <p>Snyder, S. E., & Evans, W. N. (2006). The effect of income on mortality: evidence from the social security notch. <i>The Review of Economics and Statistics</i>, 88(3), 482-495.</p> <p>Handwerker, E. W. (2011). What can the Social Security Notch tell us about the impact of additional income in retirement?. <i>Journal of Economic and Social Measurement</i>, 36(1-2), 71-92.</p> <p><u>Example from:</u> Moulton, Jeremy, Bennie D. Waller, and Scott Wentland. "Capitalization of Targeted Property Tax Relief in Home Prices: Evidence from Virginia Elections."</p>


Session 24	Nov 21	Propensity Scores
Learning Objectives:		<ul style="list-style-type: none"> • <i>Rather than control for observables, match individuals in treatment group to similar people in a potential control pool</i>
Readings:		<p>R. Lalonde, (1986) "Evaluating Econometric Evaluations of Training Programs with Experimental Data," <i>American Economics Review</i>, Vol. 76, No. 4, pp. 604-620.</p> <p>R. Dehejia and S. Wahba. (1999) "Causal Effects in Nonexperimental Studies: Reevaluating the Evaluation of Training Programs." <i>Journal of the American Statistical Association</i>. 94:448, 1062.</p> <p><u>Optional:</u> Rosenbaum, Paul and Donald Rubin (1983) "The Central Role of the Propensity Score in Observational Studies for Causal Effects." <i>Biometrika</i>. 70: 41-50.</p> <p>Diaz, J.J. and S. Handa (2006). "Propensity Score Matching as a Non-Experimental Impact Estimator: Evidence from Mexico's PROGRESA." <i>Journal of Human Resources</i>, Vol. 41(2): 319-345.</p>

		<p>Brookhart, M. A., S. Schneeweiss, et al. (2006). "Variable selection for propensity score models." <i>Am J Epidemiol</i> 163(12): 1149-1156. Available from http://aje.oxfordjournals.org/content/163/12/1149.long [Please read abstract and discussion. Feel free to read more if interested!]</p> <p>Austin PC. A critical appraisal of propensity-score matching in the medical literature between 1996 and 2003. <i>Statist. Med.</i> 2008; 27:2037–2049. Available from http://www.epi.msu.edu/janthony/requests/propensity/Austin_A%20critical%20appraisal%20of%20propensity%20score.pdf</p>
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Session 25	Nov 28	Application of Propensity Scores
Learning Objectives:		<ul style="list-style-type: none"> • <i>How do you actually use propensity scores?</i>

Session 26	Nov 30	Synthetic Control Method
Learning Objectives:		<ul style="list-style-type: none"> • <i>Learn a relatively new method that creates a counterfactual trend using weighted values from several controls</i>
Readings:		Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. (2010) "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program", <i>Journal of the American Statistical Association</i> , Vol. 105, No. 490.

Session 27	Dec 5	Finalize Discussion
Learning Objectives:		<ul style="list-style-type: none"> • <i>I am fairly certain we will need this day to finalize Synthetic Control, but if not we will cover a new method.</i>

Session 28	Dec 7	Final Exam Review Session
Learning Objectives:		<ul style="list-style-type: none"> • <i>Review session</i>
Readings:		 <p>All the papers</p>
Paper:		Empirical paper due in class (One copy in envelope with all other paper documents. A second hard copies with PID only for peer review.)

	Dec 13	FINAL EXAM (closed book) 12 noon – 3 pm
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	Dec 15	NO CLASS
Paper:		Email me your peer review by 5:00 PM