

# AAE 737 – APPLIED ECONOMETRIC ANALYSIS III

## A.K.A. MICROECONOMETRICS USING REPLICATION

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Fall 2017  
University of Wisconsin, Madison  
Agricultural and Applied Economics  
Location: Engineering Hall 1213  
Time: TR 11:00 - 12:15 p.m.  
Office hours: W-R by appointment

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## Course Description and Objectives

The purpose of this course is to prepare students for their own empirical work by giving them hands-on experience in applying contemporary econometric techniques, with examples drawn from the literature on development, agricultural economics and environmental and natural resource economics. Taking a research-driven and applied approach, the course will guide students through a selection of methods in applied microeconometrics and a replication of a recently published paper in a top journal. By working through how other researchers have approached econometric problems, students will improve their understanding of empirical work – the good, the bad, and the ugly.

Students will work in groups on one main replication throughout the semester, presenting the methodology and discussing the identification assumptions to the class. The instructor will provide a list of papers for replication that fit the topics of the course, but students can propose alternatives; good alternatives will allow the student to become familiar with a method or a data set that they are considering using in their dissertation. Student teams will then write up the replication in a publishable format and present it to the class. The ideal final paper will describe the initial article, carefully delineate the ease with which the results replicate, and propose/carry out extensions or improvements to the research design.

In addition to the main replication, several problem sets will require students to manipulate and analyze data in various ways; the data sets for the problem sets will be available on Canvas. Students will also conduct a peer-review of one of their peers' replication projects.

We will focus quite heavily on estimating causal effects, and topics will include randomized experiments, matching, instrumental variables, regression discontinuity designs, difference-in-differences, synthetic control methods, panel data, various important adjustments for correct inference (clustering, bootstrapping), as well as falsification tests and sensitivity analysis.

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*“Economists treat replication the way teenagers treat chastity  
– as an ideal to be professed but not to be practiced.”*

– Dan Hamermesh

# 1 Course requirements & grades

## Course prerequisites

- Graduate-level training in econometrics/statistics; comfortable with data handling in a commonly-used statistical software.

## The course components are the following:

- Problem sets (25%)
- Class presentation of paper(s) relevant to replication (10%)
- Referee report of job market candidate paper (15%)
- Peer review of another team’s paper (15%)
- Final replication paper (35%)
- In borderline cases, I will use lecture attendance and the quality of your classroom comments as the ‘tie breaker’. Of course, I hope that you don’t need this extrinsic motivation, since active class participation enriches the course, benefiting yourself, other students, and me.

You should not be too worried about your grade; instead, you should focus on learning the tools taught in this course. Using these tools to write a great dissertation is far more important than your actual grade (when you are on the job market, no one will care what grade you got in your PhD courses). Instead, I recommend viewing your grade in this course as a signal of where I think you stand in terms of your understanding and ability to apply the tools of this course.

I strongly prefer that you submit assignments electronically on Canvas. Please include  
FirstName\_LastName in file names!

## Academic integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison’s community of scholars in which everyone’s academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Dean of Students Office for additional review. For more information, or if you have any doubts about how the above terms are defined, please refer to <http://www.students.wisc.edu/doso/academic-integrity/>.

The UW Writing Center has a [handout](#) on acknowledging, paraphrasing and quoting sources. For your final replication project, please read this [handout](#) – especially if you have any doubts about how to cite sources. I also recommend scheduling a writing consultation with the Writing Center to go over your writing; their trained instructors can offer feedback for revision.

## Religious observances

If a religious observance will require you to miss class time, please notify me *within the first two weeks of class* of the specific days or dates on which you request relief. If the date you will miss is an exam, we will schedule a make-up exam time either before or after the regularly scheduled exam.

## Communication and office hours

I usually respond to written requests and questions quite quickly, but please do not assume that I will respond in less than 48 hours (I may be traveling, or at a conference, for example). In other words, be prepared to email me questions or meeting requests well in advance. [Here](#) is a part-serious, part-humorous discussion on writing professional emails. Most of you will know most of it, but it is worth a glance if you ever find yourself foregoing punctuation or capitalization in professional correspondence.

My office hours are listed above, and will be held in my La Follette office.

## 2 Course materials

I will assign readings from this textbook, available at the UW Bookstore:

- Angrist, J.D. and Pischke, J.S., 2008. *Mostly harmless econometrics: An empiricist's companion*. Princeton university press.

This is a great book to have on hand, and some of you may already have it. All other readings and class materials listed in this syllabus will be available available on Canvas, or via links in the syllabus.

## 3 Description of assignments

### Problem sets

Since we can't replicate a paper on each method, I will assign empirical problem sets that will allow you to get hands-on experience with a greater number of methods. You are free to collaborate in small groups on the problem sets, but please turn in your own answers and note who you worked with. Answers should be typed, and include key output and well-commented Stata .do files (or other log files) for performing the estimation. The problem sets will altogether account for 25% of your grade.

### Readings and paper presentations

For most classes, a number of papers will be assigned (marked with an asterisk) on the topic of that class. You are expected to read them and be prepared to discuss them in class. Hopefully your chosen replications will cover a variety of topics, as I will also assign you to lead the class discussion of papers a few times during the course of the semester. This discussion will be based on a brief presentation, followed by in-class discussion. The purpose of this assignment is twofold: (1) To give you practice presenting in front of an audience (presentations are how others assess you and your work); (2) To help you apply and think critically about the empirical tools that we are discussing. Depending on the quality of class discussions, I may also occasionally ask you to type up brief written paper summaries and/or questions on the papers before class. This will count as part of your class presentation grade.

## Referee report

You will choose a paper from a list of current job market candidate papers to referee. The referee report can be 3-5 typed pages (definitely not more than 5). The purpose of a referee report is to help the editor of a journal decide if they should reject the paper or request revisions (and if so, what revisions to request). Begin your report with a one-paragraph summary of the main argument of the article. You should describe your main 3-4 points in detail as if you were writing directly to the author. Conclude the report with more minor comments. A good referee report not only clearly states the shortcomings of the work, but also lays out constructive, detailed and realistic suggestions for improvement. I would also like you to comment specifically on whether the data and analyses are described in sufficient detail to allow for a replication. Imagine that you received the author's data: could you conduct their analysis without needing to see their code? If the data come from an experiment, is the randomization and treatment described in sufficient detail?

## Peer review of colleague's replication draft

You will be asked to write a brief, constructive review of another team's first paper draft. You should include a discussion both of the quality of the write-up and the code that the student is using for the replication. I would encourage you to sit down with a member of that team to discuss the code, since reading other people's code can be painfully slow.

## Final replication paper

You will work on one main replication throughout the semester, presenting various parts of the methodology and discussing the identification assumptions to the class. As the semester progresses, a variety of assignments are designed to keep you on track, and get help if you are stuck. I will provide a list of papers for replication that fit the topics of the course, but you can propose an alternative; good alternatives are those that allow you to become familiar with a method or a data set that you are considering using in your dissertation. The final paper should be written up in a publishable format and presented to the class. The ideal final paper will describe the initial article, carefully delineate the ease with which the results replicate, and propose/carry out extensions or improvements to the research design. If your paper is well-done, it can be submitted for publication either as a comment in the original journal or one of several journals that accept replications. For example, the *Journal of Applied Econometrics*<sup>1</sup> and *Public Finance Review*<sup>2</sup> both publish replications regardless of the outcome (i.e. even if the results replicate perfectly). I will advise you on appropriate potential outlets at the end of the semester.

As part of the replication paper submission, I will ask each of you for a brief summary of what you have learned from the assignment. Examples could include: details on issues obtaining data and/or code (incomplete data sets, flawed code, etc.) and how you have/will change your data management practices in response, what you learned about a certain estimator/method and whether you feel more prepared to apply it/them in your dissertation work, and surely many others.

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<sup>1</sup>For papers that were originally published in *Econometrica*, *AER*, *JPE*, *QJE*, *REStud*, *REStat*, *Journal of Econometrics*, *Journal of Business and Economic Statistics*, and *Economic Journal*

<sup>2</sup>For papers broadly in the area of public economics.

## 4 Schedule/overview

Rough outline of topics; full description of readings and assignments below. Please note that I may add or drop readings during the semester; I will announce changes in class and update the syllabus on Learn@UW.

Week	Date	Topic	Assignment
1	09/07/17	Replication: what & why?	
2	09/12/17	Publication bias, file drawer, the GRIM test	
2	09/14/17	Causality	Repl: paper choice
3	09/19/17	Randomization: ethics, external validity	PS1 (Power & randomization)
3	09/21/17	Selection on observables (I)	
4	09/26/17	Selection on observables (II)	PS2 (ATEs)
4	09/28/17	Instrumental variables	Repl: data downloaded
5	10/03/17	IV with heterogeneous treatment effects	PS3 (Matching)
5	10/05/17	IV issues: weak instruments, etc.	
6	10/10/17	Regression discontinuity: sharp	PS4 (IV)
6	10/12/17	I am out of town	
7	10/17/17	Replication mini-presentations/updates	Repl: table of means + PS5 (RD)
7	10/19/17	RD: fuzzy, regression kink	
8	10/24/17	Diff-in-diff, ANCOVA	PS6 (D-D)
8	10/26/17	Nonlinear DD (changes-in-changes)	
9	10/31/17	Synthetic control methods	PS7 (Versions of D-D)
9	11/02/17	Panel models	
10	11/07/17	Panel models	Repl: Results tables
10	11/09/17	Inference - bootstrapping	
11	11/14/17	Inference - clustering & bounds	PS8 (Inference)
11	11/16/17	Inference - randomization inference	
12	11/21/17	Pre-analysis plans	Repl: Peer reviews due
12	11/23/17	Thanksgiving	
13	11/28/17	Catch-up class	Referee reports due
13	11/30/17	Supplementary analysis - falsification tests	Repl: First paper draft
14	12/05/17	Supplementary analysis - sensitivity	
14	12/07/17	Presentations	Repl: Peer review due
15	12/12/17	Presentations	

## 5 Detailed schedule & readings

Book readings are required; other required readings are marked with an asterisk

### 9/7/2017 – Introduction - what is reproducibility & why is it important?

- Clemens, Michael A. 2015. “The Meaning of Failed Replications: A Review and Proposal.” *Journal of Economic Surveys*: 1-17.
- Hamermesh, Daniel S. 2007. “Viewpoint: Replication in Economics.” *Canadian Journal of Economics/Revue Canadienne D’économique* 40 (3): 715–33.
- Ioannidis, John P. A. 2005. “Why Most Published Research Findings Are False.” *PLOS Med* 2 (8): 0696-0701
- Simmons, Joseph P., Leif D. Nelson, and Uri Simonsohn. 2011. “False-Positive Psychology Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant.” *Psychological Science* 22 (11): 1359–66.

### 9/12/2017 – Publication bias, file drawer problem, etc.

- Card, David, and Alan B. Krueger. 1995. “Time-Series Minimum-Wage Studies: A Meta-Analysis.” *The American Economic Review* 85 (2): 238–243.
- \* Brodeur, Abel, Mathias Lé, Marc Sangnier, and Yanos Zylberberg. 2016. “Star Wars: The Empirics Strike Back.” *American Economic Journal: Applied Economics* 8 (1): 1–32.
- Brown, Nicholas JL, and James AJ Heathers. 2016. “The GRIM Test: A Simple Technique Detects Numerous Anomalies in the Reporting of Results in Psychology.”
- Simonsohn, Uri, Leif D. Nelson, and Joseph P. Simmons. 2014. “P-Curve: A Key to the File-Drawer.” *Journal of Experimental Psychology: General* 143 (2): 534–47.

### 9/14/2017 – Causality, the experimental ideal, potential outcomes framework

Submit your preferences for replication paper

- Angrist & Pischke, Ch. 1 & 2
- \* Bruhn, Miriam, and David McKenzie. 2009. “In Pursuit of Balance: Randomization in Practice in Development Field Experiments.” *American Economic Journal: Applied Economics* 1 (4): 200–232.
- Holland, Paul W. 1986. “Statistics and Causal Inference.” *Journal of the American Statistical Association* 81 (396): 945–60.
- Miguel, Edward, and Michael Kremer. 2004. “Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities.” *Econometrica* 72 (1): 159–217.

## 9/19/2017 – Randomization: ethics, external validity

### Problem set 1 due (Power & randomization)

- Barrett, C. B., and M. R. Carter. 2010. “The Power and Pitfalls of Experiments in Development Economics: Some Non-Random Reflections.” *Applied Economic Perspectives and Policy* 32 (4): 515–48.
- Deaton, Angus. 2010. “Instruments, Randomization, and Learning about Development.” *Journal of Economic Literature* 48 (2): 424–55.
- \* Deaton, Angus, and Nancy Cartwright. 2016. “Understanding and Misunderstanding Randomized Controlled Trials.” Working Paper 22595. National Bureau of Economic Research.
- Vivalt, Eva. 2016. “How Much Can We Generalize from Impact Evaluations?” Working paper.

## 9/21/2017 – Selection on observables (matching, propensity scores, MD, genetic matching?)

- Angrist and Pischke, Ch. 3.2 - 3.3
- \* Ferraro, Paul J., and Juan José Miranda. 2014. “The Performance of Non-Experimental Designs in the Evaluation of Environmental Programs: A Design-Replication Study Using a Large-Scale Randomized Experiment as a Benchmark.” *Journal of Economic Behavior & Organization* 107, Part A (November): 344–65.
- Galiani, Sebastian, Paul Gertler, and Ernesto Schargrotsky. 2005. “Water for Life: The Impact of the Privatization of Water Services on Child Mortality.” *Journal of Political Economy* 113 (1): 83–120.
- Imai, Kosuke, and Marc Ratkovic. 2014. “Covariate Balancing Propensity Score.” *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 76 (1): 243–263
- Imbens, Guido W. 2015. “Matching Methods in Practice: Three Examples.” *Journal of Human Resources* 50 (2): 373–419. doi:10.3368/jhr.50.2.373.
- Sekhon, Jasjeet S. 2009. “Opiates for the Matches: Matching Methods for Causal Inference.” *Annual Review of Political Science* 12 (1): 487–508. doi:10.1146/annurev.polisci.11.060606.135444.
- \* Shadish, William R., M. H. Clark, and Peter M. Steiner. 2008. “Can Nonrandomized Experiments Yield Accurate Answers? A Randomized Experiment Comparing Random and Nonrandom Assignments.” *Journal of the American Statistical Association* 103 (484): 1334–44.

## 9/26/2017 – Selection on observables (II)

### Problem set 2 due: Estimating ATEs

## 9/28/2017 – Instrumental variables

**Replication deadline:** before class, you should have you should have downloaded the data for your replication project and opened it

- Angrist and Pischke, Ch. 4.1

- \* Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. “The Colonial Origins of Comparative Development: An Empirical Investigation.” *American Economic Review* 91 (5): 1369–1401.
- Albouy, David Y. 2012. “The Colonial Origins of Comparative Development: An Empirical Investigation: Comment.” *The American Economic Review* 102 (6): 3059–76.
- Angrist, Joshua D., and Alan B. Krueger. 2001. “Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments.” *The Journal of Economic Perspectives* 15 (4): 69–85.
- Kirwan, Barrett E. 2009. “The Incidence of U.S. Agricultural Subsidies on Farmland Rental Rates.” *Journal of Political Economy* 117 (1): 138–64.

### **10/3/2017 – Instrumental variables (cont.): heterogeneous treatment effects**

#### **Problem set 3 due: Matching**

- Angrist & Pischke, Ch. 4.4
- Heckman, James. 1997. “Instrumental Variables: A Study of Implicit Behavioral Assumptions Used in Making Program Evaluations.” *The Journal of Human Resources* 32 (3): 441–62.
- \* Imbens, Guido W. 2010. “Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009).” *Journal of Economic Literature* 48 (2): 399–423.

### **10/5/2017 – IV issues: dealing with weak instruments, etc.**

- Angrist & Pischke, Ch. 4.6
- Dunn, Richard A. 2010. “The Effect of Fast-Food Availability on Obesity: An Analysis by Gender, Race, and Residential Location.” *American Journal of Agricultural Economics* 92 (4): 1149–64.
- Imbens, Guido W., and Paul R. Rosenbaum. 2005. “Robust, Accurate Confidence Intervals with a Weak Instrument: Quarter of Birth and Education.” *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 168 (1): 109–126.
- Nevo, Aviv, and Adam M. Rosen. 2010. “Identification With Imperfect Instruments.” *Review of Economics and Statistics* 94 (3): 659–71.

### **10/10/2017 – Regression discontinuity (sharp)**

#### **Problem set 4 due (IVs)**

- Angrist & Pischke, Ch. 6.1
- Allcott, Hunt. 2011. “Social Norms and Energy Conservation.” *Journal of Public Economics, Special Issue: The Role of Firms in Tax Systems*, 95 (9–10): 1082–95.
- Chen, Yuyu, Avraham Ebenstein, Michael Greenstone, and Hongbin Li. 2013. “Evidence on the Impact of Sustained Exposure to Air Pollution on Life Expectancy from China’s Huai River Policy.” *Proceedings of the National Academy of Sciences* 110 (32): 12936–41.



- \* Crost, Benjamin, Joseph Felter, and Patrick Johnston. 2014. “Aid Under Fire: Development Projects and Civil Conflict.” *American Economic Review* 104 (6): 1833–56.
- Gelman, Andrew, and Guido Imbens. 2014. “Why High-Order Polynomials Should Not Be Used in Regression Discontinuity Designs.” National Bureau of Economic Research.
- Imbens, Guido W., and Thomas Lemieux. 2008. “Regression Discontinuity Designs: A Guide to Practice.” *Journal of Econometrics*, The regression discontinuity design: Theory and applications, 142 (2): 615–35.
- Ito, Koichiro. 2014. “Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing.” *American Economic Review* 104 (2): 537–63.
- Lee, David S., and Thomas Lemieux. 2010. “Regression Discontinuity Designs in Economics.” *Journal of Economic Literature* 48 (2): 281–355.

### **10/12/2017 – I am out of town**

### **10/17/2017 – Replication mini-presentations / updates**

**Replication deadline: table of means due.** Submit a table of means comparing your sample to the original sample, to be presented in class

**Problem set 5 due (RDD)**

### **10/19/2017 – Regression discontinuity (fuzzy, regression kink)**

- Angrist & Pischke, Ch. 6.2
- Behaghel, Luc, Adrien Lorraineau, and Simon Quantin. 2015. “Replacing Churches and Mason Lodges? Tax Exemptions and Rural Development.” *Journal of Public Economics* 125 (May): 1–15.
- Boomhower, Judson, and Lucas W. Davis. 2014. “A Credible Approach for Measuring Inframarginal Participation in Energy Efficiency Programs.” *Journal of Public Economics* 113 (May): 67–79.
- Card, David, David S. Lee, Zhuan Pei, and Andrea Weber. 2015. “Inference on Causal Effects in a Generalized Regression Kink Design.” *Econometrica* 83 (6): 2453–83.
- \* McCrary, Justin. 2008. “Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test.” *Journal of Econometrics* 142 (2): 698–714.
- Meng, Lingsheng. 2013. “Evaluating China’s Poverty Alleviation Program: A Regression Discontinuity Approach.” *Journal of Public Economics* 101 (May): 1–11.

### **10/24/2017 – Difference-in-differences + ANCOVA**

**Problem set 6 due (D-D)**

- Angrist & Pischke, Ch. 5.2
- \* Beatty, Timothy K. M., and Charlotte J. Tuttle. 2015. “Expenditure Response to Increases in In-Kind Transfers: Evidence from the Supplemental Nutrition Assistance Program.” *American Journal of Agricultural Economics* 97 (2): 390–404.

- Heckman, James J., and Jeffrey A. Smith. 1999. “The Pre-Programme Earnings Dip and the Determinants of Participation in a Social Programme. Implications for Simple Programme Evaluation Strategies.” *The Economic Journal* 109 (457): 313–48.
- \* McKenzie, David. 2012. “Beyond Baseline and Follow-up: The Case for More T in Experiments.” *Journal of Development Economics* 99 (2): 210–21.

### 10/26/2017 – Nonlinear DD (changes-in-changes) & long differences

- Athey, Susan, and Guido W. Imbens. 2006. “Identification and Inference in Nonlinear Difference-in-Differences Models.” *Econometrica* 74 (2): 431–97.
- Burke, Marshall, and Kyle Emerick. 2016. “Adaptation to Climate Change: Evidence from US Agriculture.” *American Economic Journal: Economic Policy* 8 (3): 106–40.
- \* Lucas, Adrienne M., and Isaac M. Mbiti. 2012. “Access, Sorting, and Achievement: The Short-Run Effects of Free Primary Education in Kenya.” *American Economic Journal: Applied Economics* 4 (4): 226–53.

### 10/31/2017 – Synthetic control methods

#### Problem set 7 due (Versions of D-D)

- 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.
- \* Cavallo, Eduardo, Sebastian Galiani, Ilan Noy, and Juan Pantano. 2013. “Catastrophic Natural Disasters and Economic Growth.” *Review of Economics and Statistics* 95 (5): 1549–61.
- Meyersson, Erik. 2016. “Evaluating the Political Man on Horseback—Coups and Economic Development.” Working paper
- Mideksa, Torben K. 2013. “The Economic Impact of Natural Resources.” *Journal of Environmental Economics and Management* 65 (2): 277–89. doi:10.1016/j.jeem.2012.07.005.

### 11/2/2017 & – Panel data methods

- Almond, Douglas, Lena Edlund, and Mårten Palme. 2009. “Chernobyl’s Subclinical Legacy: Prenatal Exposure to Radioactive Fallout and School Outcomes in Sweden.” *Quarterly Journal of Economics* 124 (4): 1729–72.
- \* Deschênes, Olivier, and Michael Greenstone. 2007. “The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather.” *The American Economic Review* 97 (1): 354–85.
- \* Fisher, Anthony C., W. Michael Hanemann, Michael J. Roberts, and Wolfram Schlenker. 2012. “The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather: Comment.” *The American Economic Review* 102 (7): 3749–60.

## 11/7/2017 – Panel data methods (cont.)

**Replication deadline: Table of results.** Submit a table comparing your estimates to the ones in the original paper, a brief write-up of discrepancies and trouble that you have faced, and the code you have used to replicate these tables. If your replication is going very smoothly, please also suggest potential extensions to the paper.

## 11/09/2017 – Inference: bootstrapping, clustering, bounds

- Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. “How Much Should We Trust Differences-in-Differences Estimates?” *Quarterly Journal of Economics* 119 (1): 249–75.
- \* Cameron, A. Colin, and Douglas L. Miller. 2015. “A Practitioner’s Guide to Cluster-Robust Inference.” *Journal of Human Resources* 50 (2): 317–372.
- Moulton, Brent R. 1990. “An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units.” *The Review of Economics and Statistics* 72 (2): 334–38.

## 11/14/2017 – Inference (cont.)

**Problem set 8 due (Inference)**

## 11/16/2017 – Inference: randomization inference

- Bloom, Nicholas, Benn Eifert, Aprajit Mahajan, David McKenzie, and John Roberts. 2013. “Does Management Matter? Evidence from India.” *The Quarterly Journal of Economics* 128 (1): 1–51.
- Cohen, Jessica, and Pascaline Dupas. 2010. “Free Distribution or Cost-Sharing? Evidence from a Randomized Malaria Prevention Experiment.” *Quarterly Journal of Economics* 125 (1): 1–45.
- Rosenbaum, Paul R. 2002. “Covariance Adjustment in Randomized Experiments and Observational Studies.” *Statistical Science* 17 (3): 286–327. doi:10.1214/ss/1042727942.
- Young, Alwyn. 2016. “Channeling Fisher: Randomization Tests and the Statistical Insignificance of Seemingly Significant Experimental Results.” Working paper.

## 11/21/2017 – Pre-analysis plans: Pros and cons and methods

## 11/23/2017 – Thanksgiving

## 11/28/2017 – Catch-up class

**Referee reports of job market papers due.** Review one of the posted JMPs (TBD)

## 11/30/2017 – Supplementary analysis: falsification tests

**First draft of replication paper due**

- Fisman, Raymond, and Shang-Jin Wei. 2009. “The Smuggling of Art, and the Art of Smuggling: Uncovering the Illicit Trade in Cultural Property and Antiques.” *American Economic Journal: Applied Economics* 1 (3): 82–96.

- Galiani, Sebastian, Paul Gertler, and Ernesto Schargrotsky. 2005. “Water for Life: The Impact of the Privatization of Water Services on Child Mortality.” *Journal of Political Economy* 113 (1): 83–120.
- \* Ladd, Jonathan McDonald, and Gabriel S. Lenz. 2009. “Exploiting a Rare Communication Shift to Document the Persuasive Power of the News Media.” *American Journal of Political Science* 53 (2): 394–410.

### **12/5/2017 – Supplementary analysis - sensitivity**

- \* Kahn, Matthew E., and Erin T. Mansur. 2013. “Do Local Energy Prices and Regulation Affect the Geographic Concentration of Employment?” *Journal of Public Economics* 101 (May): 105–14.

### **12/7/2017 – Presentations**

Peer review due.

### **12/12/2017 – Presentations**

Final replication paper due during finals period, date TBD.