Agricultural and Applied Economics
Time: MW 1:00 - 2:15 p.m.
Office hours: T 2:00-4:00 p.m. or by appointment
This version: November 14, 2016

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 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. Students 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 Learn@UW. 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, imited dependent variables, 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 (15%)
- Referee report of job market candidate paper (15%)
- Peer review of colleague’s progress (10%)
- 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 through Learn@UW.

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:


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 on Learn@UW, 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 (likely 3-4) that will allow you to get hands-on experience with a greater number of methods. The first two problem sets will use a household panel data set from rural Nicaragua, and you will be asked to use Stata (or another statistical package) to estimate the types of models that we discuss in class. 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 (or other files) for performing the estimation in other languages. 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 a colleague’s referee report. 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 together (if possible, we will try to do this in pairs) 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 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\(^1\) and Public Finance Review\(^2\) 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.

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\(^1\)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

\(^2\)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.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>9/7/2016</td>
<td>Replication: what &amp; why?</td>
<td></td>
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<tr>
<td>2</td>
<td>9/12/2016</td>
<td>Publication bias, file drawer, the GRIM test</td>
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<tr>
<td>2</td>
<td>9/14/2016</td>
<td>Causality</td>
<td>Replication: paper choice</td>
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<td>3</td>
<td>9/19/2016</td>
<td>Randomization: ethics, external validity</td>
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<td>3</td>
<td>9/21/2016</td>
<td>Selection on observables (I)</td>
<td>Problem set 1</td>
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<tr>
<td>4</td>
<td>9/26/2016</td>
<td>Lab workshop</td>
<td>Repl: data downloaded</td>
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<tr>
<td>4</td>
<td>9/28/2016</td>
<td>I am out of town</td>
<td></td>
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<tr>
<td>5</td>
<td>10/3/2016</td>
<td>Selection on observables (II)</td>
<td></td>
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<td>5</td>
<td>10/5/2016</td>
<td>Instrumental variables</td>
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<td>6</td>
<td>10/10/2016</td>
<td>IV with heterogeneous treatment effects</td>
<td>Problem set 2</td>
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<td>6</td>
<td>10/12/2016</td>
<td>IV issues: weak instruments, etc.</td>
<td>Repl: table of means</td>
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<td>7</td>
<td>10/17/2016</td>
<td>Regression discontinuity: sharp</td>
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<td>7</td>
<td>10/19/2016</td>
<td>RD: fuzzy, regression kink</td>
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<td>8</td>
<td>10/24/2016</td>
<td>Diff-in-diff, ANCOVA</td>
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<td>8</td>
<td>10/26/2016</td>
<td>Nonlinear DD (changes-in-changes)</td>
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<td>9</td>
<td>10/31/2016</td>
<td>Synthetic control methods</td>
<td>Problem set 3</td>
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<tr>
<td>9</td>
<td>11/2/2016</td>
<td>Limited dependent variable</td>
<td></td>
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<tr>
<td>10</td>
<td>11/7/2016</td>
<td>Multinomial logit models</td>
<td>Repl: Results tables</td>
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<tr>
<td>10</td>
<td>11/9/2016</td>
<td>Multinomial logit models</td>
<td></td>
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<td>11</td>
<td>11/14/2016</td>
<td>Student meetings re: peer review</td>
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<td>11</td>
<td>11/16/2016</td>
<td>Panel models</td>
<td>Repl: Peer reviews due</td>
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<tr>
<td>12</td>
<td>11/21/2016</td>
<td>Panel models</td>
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<td>12</td>
<td>11/23/2016</td>
<td>Inference - bootstrapping</td>
<td>Referee reports due</td>
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<td>13</td>
<td>11/28/2016</td>
<td>Inference - clustering &amp; bounds</td>
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<td>13</td>
<td>11/30/2016</td>
<td>Inference - randomization inference</td>
<td>Repl: First paper draft</td>
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<td>14</td>
<td>12/5/2016</td>
<td>Supplementary analysis - falsification tests</td>
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<td>14</td>
<td>12/7/2016</td>
<td>Supplementary analysis - sensitivity</td>
<td>Problem set 4?</td>
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<tr>
<td>15</td>
<td>12/12/2016</td>
<td>Presentations</td>
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<td>15</td>
<td>12/14/2016</td>
<td>Presentations</td>
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5 Detailed schedule & readings

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

9/7/2016 – Introduction - what is reproducibility & why is it important?


9/12/2016 – Publication bias, file drawer problem, etc.


9/14/2016 – Causality, the experimental ideal, potential outcomes framework

Submit your preferences for replication paper

- Angrist & Pischke, Ch. 1 & 2
9/19/2016 – Randomization: ethics, external validity


9/21/2016 – Selection on observables (matching, propensity scores, MD, genetic matching?)

- Angrist and Pischke, Ch. 3.2 - 3.3


9/26/2016 – Lab workshop

Problem set 1 due: Randomized experiment & power calculations

Due: Before the lab session you should have downloaded the data for your replication project and opened it

9/28/2016 – I am out of town

10/3/2016 – Catch-up class / Selection on observables cont.

10/5/2016 – Instrumental variables

- Angrist and Pischke, Ch. 4.1


10/10/2016 – Instrumental variables (cont.): heterogeneous treatment effects

Problem set 2 due: Selection on observables & IV

• Angrist & Pischke, Ch. 4.4


10/12/2016 – IV issues: dealing with weak instruments, etc.

Table of means due. Submit a table of means comparing your sample to the original sample, to be presented in class

• Angrist & Pischke, Ch. 4.6


10/17/2016 – Regression discontinuity (sharp)

• Angrist & Pischke, Ch. 6.1


10/19/2016 – Regression discontinuity (fuzzy, regression kink)

- Angrist & Pischke, Ch. 6.2


10/24/2016 – Difference-in-differences + ANCOVA

- Angrist & Pischke, Ch. 5.2


10/26/2016 – Nonlinear DD (changes-in-changes) & long differences


10/31/2016 – Synthetic control methods

Problem set 3 due: DD and/or RD


11/2/2016 & 11/7/2016 – Limited dependent variables

Table of results due on 11/7/2016. 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 all the code you have used to replicate these tables. If your replication is going very smoothly, please also suggest potential extensions to the paper. This write-up will be peer-reviewed by another student. I strongly encourage you to meet to discuss each others’ code and write-ups – this is meant to also be a learning experience, whereby you get a chance to examine another data set and empirical method.

• Readings TBD

11/14/2016 – Meet with the person whose replication project you are reviewing

11/16/2016 – Panel data methods

Peer reviews of replication project due.


11/21/2016 – Panel data methods (cont.)

11/23/2016 – Inference: bootstrapping, clustering, bounds

Referee reports of job market papers due

Review one of the following JMPs:
Andrew Stevens. 2016. “Temperature, Wages, and Agricultural Labor Productivity”
C. Austin Davis. 2016. “Why Did Sugarcane Growers Suddenly Adopt Old Technology”
...and a highly topical JMP: Mitch Downey. 2016. “Losers Go to Jail: Congressional Elections and Union Officer Prosecutions”


11/28/2016 – Inference (cont.)

11/30/2016 – Inference: randomization inference

First draft of replication paper due


12/5/2016 – Supplementary analysis: falsification tests


12/7/2016 – Supplementary analysis - sensitivity

Problem set 4 due (maybe): sensitivity analysis


12/12/2016 – Presentations

12/14/2016 – Presentations / additional topics

• How to use GIS for identification

• Visually representing data transparently and effectively

Final replication paper due during finals period, date TBD.