PAM 6090—ECON 6590 Syllabus
Empirical Strategies for Policy Research
Cornell University
Fall 2012

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Course Meetings: TR 2:55 to 4:10pm in G71

Course Description

This course is essentially one in applied econometrics, but is well suited to anyone in sociology, political science, etc. looking to do empirical research about the effects of some X on some Y. The goal of this class is for students to learn a set of statistical tools and research designs that are useful in conducting good empirical research on public policy topics. The course will emphasize the importance of research design (relative to statistical technique) for the identification of causal effects, as well as the limitations in the applicability of many commonly used techniques. The pedagogical philosophy behind the class is colorfully summarized by Ed Leamer (“Let’s take the Con out of Econometrics”, AER 1992):

This rhetoric is understandably tiring. Methodology, like sex, is better demonstrated than discussed, though often better anticipated than experienced.

Accordingly, while we will learn the statistical properties of a variety of common estimators, the formal requirements of the class will consist primarily of problem sets requiring students to analyze real data and replicate results from published papers in the hope that doing applied work will help you to learn the theory behind it.

Note that this course is the first of a two course sequence (PAM 6091 is the second), taught together with Damon Clark. This course focuses on ‘core’ methods in applied research, whereas the second is a ‘topics’ class covering important, but less commonly encountered or more advanced, econometric problems.

Prerequisites

Students should be familiar with matrix algebra, basic (asymptotic) statistics/econometrics, and basic inference procedures at the level of Johnston and DiNardo. I don’t enforce any of these, but you won’t enjoy yourself or get much out of the course without this prior training. When in doubt, ask me.

“Post-requisites”

Of course this is not required, but I recommend following this course with PAM 6091: “Topics in applied econometrics”. Among other things, that course will cover panel data in greater detail, ‘non-standard’ standard error estimation, non-linear models including discrete dependent variable techniques and more emphasis on maximum-likelihood. You are strongly encouraged to take these courses as a sequence, as 6091 builds on 6090.

Assignments and Grading

I will assign about 5 or 6 problem sets during the semester, requiring hands-on analysis of real data. In many instances you will be required to produce publication quality tables and figures showing the major
results of these analyses, and you will be required to submit all programs used in generating your results. There will be one 48 hour take-home midterm exam given in mid-October (date TBA), testing some basic skills and conceptual understanding of the material. In addition, you are required either to conduct a replication study of a published piece of research in an area of your interests (of your choosing) or to complete a take-home final exam, which will involve replicating a study I choose for you along with some other econometric gymnastics. Any replication study topic must be approved by me by October 4th along with proof that you have the data in hand. Your replication paper should principally involve one of the research designs listed on the course outline below, or some variation—no exceptions to that rule. Anyone not meeting these deadline will be assigned a paper (potentially with some choice among a set) to replicate as a take-home final exam during the exam period. Your grade will be based on your performance on these problem sets, the midterm, your grade on the replication exercise or final, and class participation with roughly equal weight given to the first 3 and the last used to determine grades on the margin.

At this point in your career the grade you receive in this course should have little impact on the quality of your future life. Nonetheless, I will give grades. One rule I follow is that no one will receive a grade in the ‘A range’ without completing all problem sets (i.e., making a good faith attempt at every question asked). I will expect you to check your work against detailed answer keys that I will provide, and you are strongly encouraged and welcome to come and talk things over with me to make sure you understand what’s going on.

**Statistical analysis software**

I recommend that students use Stata because it is becoming the ‘industry standard’ in places you may seek employment (though SAS is still popular) and it is the only package for which I will provide support. You are free, however, to use any program you wish. Replicability is an important part of the scientific method, and so I will insist that you submit your program codes for all assignments (do NOT, however, submit log-files). You can use pull-down menus to play, but your work should be backed up with programs showing exactly what you did to generate your results. You should have one ‘master do-file’ that is capable of replicating every data and analysis step of your completed assignments. While I will not spend much formal class time on the topic, learning to program well is an important objective of this course.

Some decent resources for Stata programming can be found on-line at:


You can get an account at CISER that will allow you to use Stata by creating an Athena account at the web page below, using my name as your faculty advisor and PAM 6090 as the course (even for those enrolled in the economics course number).

[http://www.ciser.cornell.edu/athena_newacct.shtml](http://www.ciser.cornell.edu/athena_newacct.shtml)

You can order a copy of Stata for yourself at a mild discount by taking advantage of Cornell’s campus-wide grad-plan by accessing this site. If you do so, note that you need at least Stata-SE to use some of the data assigned in the problem sets.


**Textbooks and Other References**

I do not require any textbook, but strongly suggest you obtain a copy of Angrist and Pischke’s excellent book, *Mostly Harmless Econometrics*, and one of the two standard graduate econometrics texts, either Cameron and Trivedi or Wooldridge (see below). Overall there is no other textbook I am comfortable recommending. There are many, and I’ve generally found most of them to be difficult to parse with the exception of a few helpful chapters. Accordingly I’ll try to provide a guide to the sections in each that I’ve found helpful in the syllabus below. What follows is a list of helpful references, roughly in my order of preference (your tastes may be different).


The following articles, books, and notes are also very useful references for a wide range of material.


**Course Readings by Topic**

I have attempted to provide a number of readings under each topic that might aide your understanding. I neither require or expect you to get through all of this. Where I list many readings, I note the more important readings (you should read these) with a ‘⋆’.

I. Overview of Causal Reasoning and Research Design

• ⋆ CT 2.


• DiNardo, John E., “Natural Experiments or Quasi-Natural Experiments,” in New Palgrave Dictionary of Economics.

II. Preliminaries (Review)
A. Consistency of OLS, Frisch-Waugh-Lovell Theorem, and Causal Interpretations
   • DM 2 (especially 2.4).
   • JD 13; CT 5, 14, 15, and 16.
C. Introduction to Monte-Carlo Simulation Methods.
   • JD 11.1 and 11.2;

III. Selection on Observables Designs
A. Regression Adjustment: Uses and Abuses
B. The Propensity Score and Matching

C. Decomposition and ‘Counterfactual-Distribution’ Estimation Techniques


D. Quantile Regression


E. Evaluating the Estimators


IV. Selection on Unobservables Designs

A. Difference-in-difference models and Event Studies.


B. Instrumental Variables


C. Regression Discontinuity Research Design (Damon Clark)


V. Other Topics

A. Your suggestions?

This version: August 23, 2012.
References


___ and ___, “Reducing Bias in Observational Studies Using Subclassification on the Propensity Score,” 


