

Title: Research Methodology in Economics

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Credits: 4

Level: PhD

Course Objective

This advanced quantitative course is designed to provide a formal exposure to research students/scholars to recent statistical and econometric approaches to applied microeconomics. The goal of the course is to make students understand and apply different statistical methods and research designs that are essential for applied microeconomics and policy research in economics.

Course Outline

The course will focus on drawing causal inference, i.e. what methods can be designed to address research questions that concern the causal impact of some explanatory variable (such as a change in law, an intervention, a policy tool) on an outcome (e.g., wages, education, crime). It will cover a range of empirical approaches, including experiments (both randomized and natural), panel methods, difference-in-differences, synthetic DID, instrumental variable estimation, regression discontinuity designs, and recent DID literature. We will study the strengths and weaknesses of these methods. Applications will be drawn from labor economics, development economics, education and economics of institutions.

Prerequisites

In addition to introductory statistics and probability, the course assumes a good knowledge of introductory microeconomics and econometrics. Students are also expected to be reasonably proficient in the statistical software STATA.

Reading Material

The following is a list of recommended textbooks for this course. In addition, research papers will also be used heavily for the teaching of the course. Relevant research papers will be provided during the course.

- Angrist and Pischke (2009), *Mostly Harmless Econometrics*, Princeton University Press.
- J. Angrist and A. Krueger, "Empirical strategies in labor economics" In O. Ashenfelter and D. Card, editors, *Handbook of Labor Economics*, volume 3A, pages 1277–1366. Elsevier Science, 1999.
- JPAL online resource material on RCTs

Course Evaluation

- Midterm Exam 30%
- Final Empirical term paper 50%

- Class participation and presentations 20%

Topics to be Covered

1. Introduction

Overview of the course, course requirements and review of statistical concepts useful for causal inference

2. Potential Outcome Model

The idea of Counterfactuals, treatment effects, identification problem

3. Randomized controlled Trials

Implementing RCTs in practice, randomization bias, choosing the level of randomization, power calculation, measuring and controlling for externalities/spillovers

4. Causal effects under selection of observables

Propensity score matching, non-parametric regressions and minimum biased estimators

5. Panel Data Models and Differences-in-Differences

Fixed effect estimation, differences in differences and parallel trend assumptions

6. The new DID Literature

Multiple periods and variation in treatment timing, Goodman-Bacon Decomposition, potential violations of parallel trends, alternative frameworks for inference.

7. Instrumental Variables

Instrumental variables in practice, Local Average Treatment Effects, IV in randomized experiments

8. Regression Discontinuity Design

Sharp and Fuzzy Designs, Identification, Estimation, Falsification Checks