Overview

Empirical research in economics is largely based on observational research designs that suffer from analytical flexibility. Variations in the research design allow authors to obtain basically any estimate desired leaving empirical economists with substantial uncertainty about the reliability of causal inferences. For example, minimum wages are considered to reduce employment and these theoretical presumptions are supported by empirical evidence. More recently, however, empirical evidence that uses quasi-experimental designs and meta-regressions suggest the absence of a negative effect of minimum wages on employment.

We discuss the difference between experimental and observational research designs and focus on approaches that enhance the credibility of observational research designs, such as quasi-experimental designs, panel data, vector autoregressions, sensitivity analysis, specification testing, and meta-regressions.

The lecture is complemented by an exercise that uses recent articles as illustrative examples of the presented methods. An introduction to the statistical software R is provided and students are guided to reproduce results of recent articles using R.

Credit Requirements: Final exam (90 minutes)

Aim of the Lecture

The lecture aims to provide an overview of important econometric methods and discusses these methods in the light of reliable causal inferences. The aim is to enable students to
choose optimal research designs and to evaluate the reliability of causal inferences given a research question and research design.

**Structure of the Lecture**

1. Motivation
2. Rubin Causal Model and Randomized Experiments
3. Observational Research
   3.1. Biases
   3.2. Quasi-Experimental Designs
      3.2.1. Difference-in-Difference
      3.2.2. Regression Discontinuity
      3.2.3. Instrumental Variables
   3.3. Panel Data
   3.4. Vector Autoregressions
   3.5. Global Sensitivity Analysis
   3.6. Specification Testing
   3.7. Meta-Regression Analysis

**Suggested Textbooks**

Angrist, J. D. and J.-S. Pischke (2009), Mostly Harmless Econometrics, Princeton University Press.