40995 Methods for Policy Evaluation

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PhD in Social and Political Sciences

Bocconi University

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Course Description

This course provides an introduction to modern methods for causal inference in policy evaluation. The main objective is to equip students with the tools to **critically assess empirical research** addressing causal questions and to **conduct their own empirical analyses** using state-of-the-art methods.

The course covers the main **experimental and quasi-experimental approaches** used in applied social sciences. While a theoretical foundation will be provided for each method, the primary focus is on **empirical applications**, implementation, and interpretation.

Students will learn how to:

- understand and evaluate identification strategies,
- implement empirical analyses using real data,
- conduct standard and advanced validity checks,
- critically assess the credibility of empirical findings.

Learning Objectives

By the end of the course, students should be able to:

- Understand the **fundamental problem of causal inference** and the role of research design
- Identify and evaluate different empirical strategies for causal identification
- Implement and interpret the main causal inference methods
- Conduct **robustness checks and validation tests** appropriate to each method
- Critically discuss empirical papers in applied economics
- Replicate and extend existing empirical analyses

Course Content

The course focuses on four main methods:

1. Randomized Controlled Trials and Natural Experiments

- Experimental design and implementation

- Internal and external validity
- Compliance and treatment assignment
- Balance tests and standard checks

2. Instrumental Variables (IV)

- Endogeneity and identification
- Two-stage least squares
- Instrument validity (relevance and exogeneity)
- Local Average Treatment Effects and compliance

3. Regression Discontinuity Design (RDD)

- Sharp and fuzzy designs
- Identification at the cutoff
- Bandwidth selection and functional form
- Manipulation tests and continuity checks

4. Difference-in-Differences (DiD)

- Basic DiD framework
- Parallel trends assumption
- Event study designs
- Extensions and recent developments

5. Machine learning methods for causal inference (if time allows to)

- Prediction with random forest methods
- Causal Forests

Teaching Format

The course combines:

- **Lectures** covering theoretical foundations and empirical implementation
- **Student-led presentations and discussions**
- **Hands-on replication work**

Active participation is essential. Students are expected to engage critically with the material and contribute to discussions.

Assignments

There are two main types of assignments:

1. Paper Discussion Assignment (25%)

For each method, students will:

- read an assigned empirical paper,
- prepare a **15-minute presentation**,
- critically assess the empirical strategy and findings.
- See instructions on blackboard

2. Replication Assignment (25%)

For each method, students will:

- replicate the empirical design of an assigned paper,
- implement the analysis independently,
- present results in a **20-minute presentation**,
- extend and critically reassess the empirical approach.
- See instructions on blackboard

Presentation Policy

- All students must prepare **both assignments for each method**
- In each class, **one student will be randomly selected** to present each assignment
- The selected student will lead the discussion
- All other students are expected to:
    - participate actively,
    - compare their results,
    - highlight differences and additional insights

Submission Requirements

- All assignments must be submitted **before the beginning of the class** in which they will be discussed (specific dates to be defined in class)
- Submissions should be sent by email to: **diogo.brito@unibocconi.it**

Grading

Final grade composition:

- Paper Discussion Assignments: **25%**

- Replication Assignments: **25%**
- Final Written Exam: **50%**

The **final exam is closed-book**.

Course Philosophy

The course emphasizes that credible causal inference requires careful attention to **research design and assumptions**, not just statistical estimation. As highlighted in the econometrics literature, causal interpretation depends on the validity of identifying assumptions rather than purely on regression techniques .

Students are expected to approach empirical work with a **critical mindset**, recognizing both the strengths and limitations of each method