

# DSE - Data-Driven Economic Analysis

## Econometrics Module

### Lecture 0 - Course Outline

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# Course objectives

The course is designed to introduce you to independent research and analysis using **empirical methods** commonly employed by economists in the **applied econometric** literature and in government/industry.

- ▶ Students will be exposed to the most common econometric methods used in the literature to draw **causal inference**.
- ▶ Applications will be considered throughout and explored through the use of the statistical software STATA and R.

## Expected outcomes

At the end of this course you will be expected to:

- ▶ Demonstrate an understanding of the causal inference methods introduced, including their **strenghts and limitations**.
- ▶ Demonstrate ability to apply the correct econometrics method to investigate a specific research question based on the available data.

# Topics

1. Introduction to the problems of causal inference
2. Linear regression model: properties and assumptions of the Ordinary Least Squares (OLS) estimator.
3. Non-linear regression models, including Logit and Probit models; Linear Probability Model.
4. Endogeneity and Instrumental Variables estimation.
5. Regression Discontinuity Designs and Diff in Diff as identification strategies.
6. Introduction to panel data: fixed effects and random effects models.

# Who am I

**Teacher:** Michele De Nadai

- ▶ Associate professor at DEMM since May 2022 (previously UNSW - Sydney)
- ▶ e-mail: [michele.denadai@unimi.it](mailto:michele.denadai@unimi.it)
- ▶ Research interests: Applied microeconometrics, policy evaluation methods, measurement errors in statistics
- ▶ Office: DEMM room 31, third floor.
- ▶ Consultation hours: on Teams/Zoom by appointment
- ▶ Homepage: <https://sites.google.com/site/micheledenadaihomepage>

# Teaching Methods

## **Lectures:**

- ▶ Discussion of the course contents
- ▶ Wednesday 10:30-12:30 (Aula 3, via Passione)
- ▶ Friday 14:30-16:30 (Aula 4, via Conservatorio)

# Course material

## **Main material:**

- ▶ Lecture slides
- ▶ "Econometrics" B. Hansen
- ▶ "Mostly Harmless Econometrics" J. Angrist and J. Pischke
- ▶ "Introductory Econometrics" J. Woodridge

## **Evaluation:** Written Exam

- ▶ evaluating your abilities to identify the correct methods to answer empirical questions
- ▶ will include output from statistical software to test your skills in reading and correctly interpret statistical analysis in applications