

ECON 437
WINTER 2024
Empirical Methods for Causal Inference

Times:

Monday and Wednesday 10:05-11:25am, Burnside 1205

Course Description:

In this very applied course, we will learn how to use STATA to evaluate the impact of public policies with very simple techniques.

First, we will discover what a randomized experiment is. You will implement your own randomized experiment within the classroom, by collecting data, implementing your intervention on your peers and analyzing its effects.

Second, we will use publicly available datasets to evaluate the impact of various programs, reforms, or policies. We will learn how to clean and manipulate datasets. We will then apply the simple statistical tools taught in class to analyze the data.

The goal of this course is to provide you with an understanding of STATA and how to use simple tools to analyze the impact of reforms or policies.

The only prerequisite is to know what a regression is, i.e., the simple Ordinary Least Squares (OLS) model: $reg\ y\ x$. If you have seen this model in a previous course (such as in ECON337 or any other course that taught that), then you are eligible for this course.

This course is designed for students with a desire to apply their knowledge to real practical data.

Course Instructor: Professor Matthieu Chemin

My research is on development economics and will be presented throughout the course (<https://www.matthieuchemin.com/>). In my research, I use the techniques of randomized experiments and difference-in-differences to analyze the effect of various development programs on poverty and economic development. I operate a research office in Kenya called ELIMU (EvaLuation Impact Unit, which also means education in Swahili: <https://elimu.lab.mcgill.ca/>) to collect data from the field and implement randomized experiments.

Lectures:

Lecture 1: Impact Evaluation

In this lecture, we will introduce the concepts of impact evaluation and discuss the counterfactual problem.

Lecture 2: Randomized Experiments

In this lecture, we will explain randomized experiments and discuss their assumptions. I will also present the latest improvements from the current literature: pre-analysis plans, multiple hypothesis testing, randomization inference tests.

We will study examples from my own research (as well as from other papers in the literature):

Aberra, A., and M. Chemin. (2021). "[Does Legal Representation Increase Investment? Evidence from a Randomized Experiment in Kenya](#)", Journal of Development Economics, Volume 150, May 2021.

Chemin, M., Chen, D., Di Maro, V., Kimalu, P., Mokaya, M., Ramos-Maqueda, M. (2023) "[Data Science for Justice: Evidence from a Nationwide Randomized Experiment in Kenya](#)".

These foundations will be helpful to implement your own "Project Randomized Experiment":

Project Randomized experiment:

A randomized experiment is a very simple technique whereby a randomly selected treatment group receives a treatment, while the control group continues business as usual. In this course, you will implement your own randomized experiment within our classroom and write a paper explaining the results. Detailed step-by-step explanations will be provided and explained throughout the semester. You will implement the randomized experiment in teams, but you will write your paper individually.

Lecture 3: Difference-in-Differences

In this lecture, we will explain the concept of difference-in-differences, discuss its assumptions, and present the latest improvements from the current literature on the topic: staggered introduction design, parallel trends test, event studies, clustering of standard errors.

We will study examples from my research (as well as from other papers in the literature):

Chemin, M. (2018). "[Judicial Efficiency and Firm Productivity: Evidence from a World Database of Judicial Reforms](#)", Review of Economics and Statistics, Volume 102, Issue 1, March 2020, p.49-64.

Chemin, M. (2009). "[The Impact of the Judiciary on Entrepreneurship: Evaluation of Pakistan's Access to Justice Programme](#)", Journal of Public Economics, Vol. 93(1-2): 114-125.

We will also access publicly available microeconomic datasets to implement practically a difference-in-differences using STATA. Together, we will build the code to produce graphs and regressions. We will interpret the findings. You will then use this code to undertake your own Project "Difference-in-Differences":

Project Difference-in-Differences:

Building from the example provided in class, you will either 1) continue working on the same reform presented in class using other variables, 2) work on another reform, program, policy which may be closer to your own interests, or 3) use a different dataset. More details will be provided in class. You will work individually and present your results in class.

The priority in this course will be to fully understand the two techniques of difference-in-differences and randomized experiments, since they are the most popular techniques used by economists nowadays.

If time permits, we will also work on:

Lecture 4: Instrumental Variables

Lecture 5: Regression Discontinuity Design

Lecture 6: Propensity Score Matching

Evaluation Methods:

- Project Randomized Experiment:
 - Paper: 20%
 - Presentation: 10%

- Project Difference-in-Differences:
 - Paper: 20%
 - Presentation: 10%

- Mid-term 1: 20% (Feb 14)
- Mid-term 2: 20% (March 27)

The mid-terms will be on the material covered in the lectures. They can include questions on papers seen in class or not (extensive details will be provided on the papers if they are not covered in class). They can also include questions on STATA code and output.

The dates are provisional and can be changed depending on the pace of the lectures.

Students who miss the mid-terms for medical reasons will have to take a make-up final exam, which will cover all the material covered during class.