ERICH BATTISTIN

Methods for Policy Evaluation

Ph.D. in Social and Political Science (Bocconi University)

Course Description

I offer a modern introduction to empirical strategies in applied micro research in fields such as public policy, development economics, labor economics, education, marketing, and corporate finance. Geared towards Ph.D. students familiar with introductory statistics or econometrics, my course focuses on causal reasoning and design-driven identification in the social sciences, offering practical insights and techniques for real-world applications. I emphasize intuition over extensive formal derivation of theoretical aspects of probability and statistics, focusing instead on the essential foundations for assessing causal relationships. I explore a range of methods to assess causal questions effectively, delving into differences between design-based and sampling-based uncertainty. The exploration begins with approximating the conditional expectation function using a linear predictor, employing ordinary least squares. I then discuss the implications of omitted variables and examine the value of quasi-experimental designs versus quasi-experimental methods to replicate the experimental ideal, or thought experiment. Time permitting, I extend my discussion to high-dimensional, big-data contexts. All concepts are brought to life with practical applications on real data.

Requirements

<u>Before the semester starts</u>. You are expected to be comfortable with college-level algebra and calculus. A lack of any introductory statistics and probability background may make this course more difficult than necessary. You are therefore invited to acquire a good working knowledge of basic mathematical tools, fundamentals of probability, fundamentals of mathematical statistics and matrix algebra before the beginning of classes. <u>After the semester starts</u>. I encourage you to spend time reading course materials class. You will learn the concepts much more clearly if

you spend time struggling with the material before class starts. You are also warmly encouraged to familiarize yourself with the use of statistical software throughout the course. However, my classes are not aimed at developing coding skills.

Course Readings

Lecture slides and reading materials will be made available below approximately one week before being used in lectures. I will mix traditional approaches to micro-econometrics with more modern tools used in several empirical literatures. For this reason, it is impossible to identify one textbook. Lecture slides are self-contained and may be enough to understand the topics discussed. However, you are strongly invited not to limit your study to the slides, and it is in your interest to familiarize yourself with the additional readings suggested below and during lectures.

Exams

Your final grade will be computed as a weighted average of two components: a final during exam week (70% of the final grade) and 2 problem sets (30% of the final grade). The exams may include questions with an analytical component, or problems based on the output of statistical software to test your ability to understand and interpret numbers. There isn't a fixed format for my problem sets or exams: these materials vary depending on how our discussion unfolds and your own taste about what I teach. Your answers to problem sets must be prepared in Latex, printed, and handed over to me at the beginning of the class when solutions are due. You are strongly encouraged to work together on the problem sets, but each student should turn in their own answers to these problems. All solutions to problem sets must be submitted on time to receive credit. If a problem set is not turned in on time, it will be graded as zero. I will publish solutions to all problem sets soon after each deadline. All deadlines will be communicated in class.

Grading

I grade exams by assessing each question individually rather than grading each exam as a whole. To ensure transparency in grading, I use a detailed checklist which I outline in my solution guide. You can use this guide to self-grade your exam by comparing your answers with the checklist. My grading process involves two readings of the answers for each question. Initially, I read all responses to assess the overall quality and understand common issues. This step helps me determine if the problems stem from the way questions were phrased in the exam or from the clarity of my lectures. In the second reading, I grade each answer using the checklist. I begin with what I considered the best response in the first review, and proceed through all the exams. This method ensures that I have differentiated the quality of responses. After grading, I review each student's exam
standing and control of the subject matter for each
g letter grades based on percentage scores:

A+, A, A- denote excellent mastery of the subject and outstanding scholarship.

B+, B, B- denote good mastery of the subject and good scholarship.

C+, C, C- denote acceptable mastery of the subject.

D+, D, D- denote borderline understanding of the subject and does not represent satisfactory progress.

F denotes failure to understand the subject and unsatisfactory performance.

Course Contents (tentative and subject to change)

LECTURE 1. ECONOMIC REASONING, STATISTICAL LEARNING AND MODERN MICROECONOMETRICS +

LECTURE 2. DESIGN-BASED UNCERTAINTY VERSUS SAMPLING-BASED UNCERTAINTY +

LECTURES 3 & 4. EXOGENOUS (OR RANDOMIZED) "TREATMENT" +

LECTURES 5 & 6 & 7. ENDOGENOUS "TREATMENT" AND INSTRUMENTAL VARIATION +

LECTURES 8 & 9 & 10. "TREATMENT" EFFECTS USING LONGITUDINAL VARIATION +

LECTURES 11 & 12. "TREATMENT" EFFECTS WITH JUMPS AND KINKS +