ÊSTIMATE: The Reduced Form

Difference-in-Differences with Panel Data and Repeated Cross Sections

Instructor: Jeffrey M. Wooldridge (Michigan State University)

Dates: June 8-9, 2023
Times: 10:00 am to 4:00 pm, EST

Description: This course covers difference-in-differences (DiD) estimators for policy analysis, primarily focusing on panel data but also summarizing methods for repeated cross sections. The focus is on using and combining built-in Stata commands, along with recent user-written commands, to allow simple estimation methods, robust inference, and flexibility in the pattern of treatment effects. We will see how to extend the usual two-way fixed effects approach in the staggered intervention case to allow for heterogeneous treatment effects across cohort and time. In addition, we will see how to incorporate covariates into the analysis in all settings. We will discuss simple solutions to violations of the parallel trends. Problems and approaches with unbalanced panels and issues of statistical inference with few treated or control groups will also be covered. I will cover my recent work on staggered designs and nonlinear models, with focus on binary, fractional, and nonnegative responses. The last session will discuss how regression methods can accommodate time-varying covariates, and show how they can be applied to repeated cross sections.

Participants should have good working knowledge of ordinary least squares estimation, fixed effects estimation, and basic nonlinear models such as logit, probit, and exponential conditional means. Sufficient background is provided by my introductory econometrics book, Introductory Econometrics: A Modern Approach, 7e, Cengage, 2020. My book Econometric Analysis of Cross Section and Panel Data, 2e, MIT Press, 2010, covers the background material at a higher level. An optional video of approximately 90 minutes will provide background on potential outcomes and treatment effects estimators. This material will be applied in DiD contexts.

For much of the material I will rely on my working paper “Two-Way Fixed Effects, the Two-Way Mundlak Regression, and Difference-in-Differences Estimators.” I will also draw on my forthcoming paper “Simple Approaches to Nonlinear Difference-in-Differences with Panel Data.” All material is available here:

https://www.dropbox.com/sh/zj91darudf2fica/AADj_jaf5ZuS1muobgsnxS6Za?dl=0

I will record the lectures and the Q&A sessions, and the recordings will be available to participants.
Course Timetable (Times are EST)

DAY 1

Session 1: 10:00-11:30

Introduction; Common Timing with Panel Data; No Anticipation and Parallel Trends; Controlling for Covariates via Regression Adjustment and Propensity Score Methods

Q&A/Break: 11:30-12:00

Session 2: 12:00-13:30

Staggered Interventions, I; Heterogeneous Effects; Pooled OLS and Extended TWFE; Staggered Exit

Q&A/Break: 13:30-14:00

Session 3: 14:00-15:30

Staggered Interventions, II; Propensity Score and Imputation Methods; Testing No Anticipation; Event Study Estimators and Correcting for Violation of Parallel Trends

Q&A/Summary: 15:30-16:00

DAY 2

Session 4: 10:00-11:30

Unbalanced Panels; Standard Errors and Inference in Nonstandard Settings; Basic Synthetic Control Methods

Q&A/Break: 11:30-12:00

Session 5: 12:00-13:30

Nonlinear DiD; Binary, Fractional, and Nonnegative Responses; Pooled Quasi-Maximum Likelihood Estimation; Poisson Fixed Effects

Q&A/Break: 13:30-14:00

Session 6: 14:00-15:30

Time-varying Controls; Linear and Nonlinear DiD with Repeated Cross Sections

Q&A/Summary: 15:30-16:00