



Euro Area Business Cycle Network Training School

Difference-in-Differences and Event Study Estimators with Panel Data

by

Jeffrey Wooldridge (Michigan State University)

Online via Zoom

27-29 May 2024

Deadline: 6pm GMT (UK time), Friday 22 March 2024

General Description

We are pleased to announce the latest EABCN Training School; a three-day course entitled “Difference-in-Differences and Event Study Estimators with Panel Data” taught by Professor Jeffrey Wooldridge (Michigan State University). It is primarily aimed at participants in the Euro Area Business Cycle Network, but applications will also be considered from doctoral students, post-doctoral researchers and economists working in central banks and government institutions outside of the network, as well as commercial organisations (fees are applicable for non-network non-academic organisations).

The course will cover some recent methods for studying interventions, with a focus on simple, flexible methods that can be carried out with regression analysis. Extensions of these methods to relax functional form assumptions also will be covered. Event-study versions of flexible fixed effects will be contrasted with methods that use the full implications of the parallel trend’s assumption. We will talk about how to test for parallel trends and how to allow for heterogeneous trends. Imputation methods, and their relationship to pooled estimation methods, will be covered. Special topics include unbalanced panels, time-varying controls, non-binary treatments, and inference with few treated units. The last topic is nonlinear difference-in-difference estimators for binary, fractional, and nonnegative response variables.

The practice sessions will run two hours 30 minutes after the lecture sessions and will involve applying the methods covered in lecture to real data sets. Among other possibilities, these include data sets to study the effects of increased law enforcement on crime, the effect of locating “big box” stores on county-level employment, the effects of smoking restrictions on cigarette consumption, the effect of “hold-your-ground laws” on murder rates, and the effects of opportunity zones on economic activity. I will illustrate the methods using Stata 18, relying on built-in commands and some user-written commands.

Tentative Course Outline

There will be about a 15-minute break between the lecture sessions on each day.

DAY 1

Lecture Session: 14:00 to 17:00 CET
Practical Session: 17:30 to 19:30 CET

Session 1

Introduction and Overview; Common Intervention Timing; Parallel Trends; Controlling for Covariates via Regression Adjustment and Propensity Score Methods.

Session 2

Staggered Interventions, I. Heterogeneous Effects. Pooled OLS and Extended TWFE. All Units Eventually Treated.

Practice Session

Applications with common timing: law enforcement on crime; regulations on patents. Regression-based approaches to staggered interventions: effects of big box stores on employment.

DAY 2

Lecture Session: 14:00 to 17:00 CET
Practical Session: 17:30 to 19:30 CET

Session 3

Staggered Interventions, II. Event Study Methods. Strategies with Exit. Testing and Correcting for Violation of Parallel Trends.

Session 4

Staggered Interventions, III. Imputation Estimators. Rolling Methods and Long Differencing. Propensity Score Methods.

Practice Session

Comparison of estimators for staggered interventions using location of big box stores. Applications of event-study methods to location of big box stores on employment. Testing and adjusting for heterogeneous trends.

DAY 3

Lecture Session: 14:00 to 17:00 CET
Practical Session: 17:30 to 19:30 CET

Session 5

Time-Varying Covariates. Unbalanced Panels. Standard Errors and Inference in Nonstandard Settings.

Session 6

Nonlinear DiD. Binary, Fractional, and Nonnegative Responses. Pooled Quasi-MLE Estimation.

Practice Session

Effects of smoking restrictions on cigarette consumption. Fractional regression for opportunity zones on poverty rates. Poisson regression for patents.

Administrative Information

We ask that you send a current version of your CV. PhD students must also specify in which way the school will be useful for their current research (max 300 words).

The course will take place online via Zoom. More details will be circulated closer to the date to successful applicants.

Participants from non-academic institutions where the employer is not a member of the EABCN network are charged a course fee of EUR1000.

How to Apply:

Candidates who are CEPR affiliated or already have a CEPR profile should apply by submitting their CV online:

1. Log in on the CEPR hub online at <https://hub.cepr.org/>
2. Go to <https://hub.cepr.org/event/4236>
3. Click on "Step 1: Apply"
Members of the MEF programme area, click on "Change registration details"
4. Complete the requested information and upload the required documentation:
Applications without the required documents will not be considered.
 - a. All applicants must submit a CV. *PDF or word document is preferred but the option to provide a link to CV is available.*
 - b. PhD Students must include a supporting statement (max 300 words) specifying how the school will be useful for their current research.
 - i. To do so click 'Would you like to submit additional files?'
 - ii. Upload PDF or Word Document.
 - iii. The Supporting Statement must be in a document separate from the CV file.
5. Click "Submit Information".

Candidates who are not CEPR affiliated or do not have a CEPR profile should apply by submitting their CV online:

1. Create an online profile at <https://hub.cepr.org/user/register>
2. Log in on the CEPR hub online at <https://hub.cepr.org/>
3. Go to <https://hub.cepr.org/event/4236>
4. Click on "Step 1: Apply"
Members of the MEF programme area, click on "Change registration details"
5. Complete the requested information and upload the required documentation:
Applications without the required documents will not be considered.
 - a. All applicants must submit a CV. *PDF or word document is preferred but the option to provide a link to CV is available.*
 - b. PhD Students must include a supporting statement (max 300 words) specifying how the school will be useful for their current research.
 - i. To do so click 'Would you like to submit additional files?'
 - ii. Upload PDF or Word Document.
 - iii. The Supporting Statement must be in a document separate from the CV file.
6. Click "Submit Information".

If you have any difficulty in applying, please contact, Jemila Benchikh, CEPR Events Officer at jbenchikh@cepr.org for assistance, with the subject line '4236- EABCN Online Training School -Wooldridge'

About the Instructor:

Jeffrey M. Wooldridge is University Distinguished Professor of Economics and Walter Adams Distinguished Faculty Fellow in Economics at Michigan State University, where he has taught since 1991. He previously taught at MIT. He received his Bachelor of Arts, with majors in computer science and economics, from the University of California, Berkeley, and his doctorate in economics from the University of California, San Diego. Dr. Wooldridge is a fellow of the Econometric Society and of the *Journal of Econometrics* and is a founding fellow of the International Association for Applied Econometrics. His other awards include the Distinguished Author award from the *Journal of Applied Econometrics*, the Plura Scripset award from *Econometric Theory*, and the Sir Richard Stone prize from the *Journal of Applied Econometrics*. He has also served on several editorial boards, including as editor of the *Journal of Business and Economic Statistics*. Dr. Wooldridge has written chapters for the *Handbook of Econometrics* and the *Handbook of Applied Econometrics*. He is the author of the textbooks *Introductory Econometrics: A Modern Approach* (South-Western, 7e, 2019) and *Econometric Analysis of Cross Section and Panel Data* (MIT Press, 2e, 2010).