Short Course in Regression Discontinuity Designs
ICPSR Summer Program in Quantitative Methods of Social Research
June 29 - July 1, 2020
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1 Basic Information

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Schedule: Monday June 29 through Wednesday July 1, 2020 (3 days)
9.00pm–12.00pm & 1.00pm–5.00pm

Website: https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0187

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2 Overview

The goal of this workshop is to give an introduction to standard and recent methodological developments in the analysis and interpretation of regression discontinuity (RD) designs. The course focuses on methodology and empirical practice, and will not discuss much of the statistical and econometric theory underlying the results. A brief description of the course, along with references to further readings, is given below.

It is assumed that participants have elementary working knowledge of statistics, econometrics and policy evaluation. It would be useful, but not required, if participants were familiar with basic results from the literature on program evaluation and treatment effects at the level of Wooldridge (2010). This course is nonetheless meant to be self-contained and hence most underlying statistics/econometrics concepts and results are introduced and explained in class.

3 Reading Materials

The main textbooks for the class are Cattaneo, Idrobo and Titiunik (2019b) and Cattaneo, Idrobo and Titiunik (2019a):


In addition to this practical guide, there are several prior review articles on RD methodology and empirical practices. In particular, Imbens and Lemieux (2008) and Lee and Lemieux (2010) are very helpful references, although they do not cover many of the most recent methodological results available in the literature. For more recent reviews, see Cattaneo and Titiunik (2019) and Cattaneo, Titiunik and Vazquez-Bare (Forthcoming).

We also provide specific background references under each specific topic below.

4 Software

The workshop will employ several empirical illustrations, which will be analyzed using Stata. In addition, all functions and packages are also available in R, a free and open-source statistical software environment. The following Stata/R modules/commands will be used:

- **rdrobust**: RD inference employing local polynomial and partitioning methods. See Calonico, Cattaneo and Titiunik (2014a, 2015b) for introductions.
- **rddensity**: Manipulation testing for RD designs. See Cattaneo, Jansson and Ma (2018) for an introduction.
- **rdlocrand**: RD inference employing randomization inference methods. See Cattaneo, Titiunik and Vazquez-Bare (2016) for an introduction.
- **rdmulti**: Analysis of RD designs with multiple cutoffs or scores. See Cattaneo, Titiunik and Vazquez-Bare (2018) for an introduction.
- **rdpower**: Power and sample size calculations for RD designs. See Cattaneo, Titiunik and Vazquez-Bare (2019) for an introduction.

Further details, including how to install the packages in both R and Stata may be found at:

[https://sites.google.com/site/rdpackages](https://sites.google.com/site/rdpackages)

Please make sure you have Stata (or R) and the above modules/commands installed and fully functional in your personal computer before the course begins. Datasets, do-files and R files will be provided in advance.

5 Outline, Schedule & Background References

This section gives an overview of the topics covered and optional readings.

Day 1: Causal Inference, Policy Evaluation and RD Designs

09.00pm – 12.00pm: Causal Inference and Policy Evaluation.
01.00pm – 04.00pm: Introduction to RD designs; graphical illustration via RD plots.
04.00pm – 05.00pm: Questions and answers, and general discussion.

Assigned Reading: Cattaneo, Idrobo and Titiunik (2019b), Sections 1, 2, and 3.


Day 2: RD Local Polynomial Analysis - Fuzzy RD - Power calculations in RD designs


09.00pm – 12.00pm: Standard local polynomial methods and bandwidth selection.
01.00pm – 04.00pm: Robust local polynomial methods; fuzzy RD design; power calculations.
04.00pm – 05.00pm: Questions and answers, and general discussion.


Day 3: RD local randomization analysis, RD falsification methods, and extensions to canonical RD design

Recent developments for RD designs: local randomized methods. Falsification methods: density and other manipulation tests. If time permits, the discussion will include RD designs with discrete running variables, geographic RD designs, and RD analysis using covariates. Examples and applications.

09.00am – 12.00pm: Local randomization methods.
01.00pm – 04.00pm: Falsification.
04.00pm – 05.00pm: Questions and answers, and general discussion.

Assigned Readings: Cattaneo, Idrobo and Titiunik (2019a), Section 2 (and 3 if time permits), Cattaneo, Idrobo and Titiunik (2019b), Section 5.

References


Cattaneo, Matias D., Rocio Titiunik and Gonzalo Vazquez-Bare. 2018. “Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Scores.” working paper.


