1 General Information

- Organized and sponsored by The Abdul Latif Jameel Poverty Action Lab (J-PAL), Latin America & Caribbean regional office.
- Location: Instituto Tecnológico Autónomo de México, Mexico City, Mexico.
- Duration: Monday December 5 through Friday December 9, 2016.
- Schedule: 9.00am–12.00pm & 1.30pm–5.00pm.

Note: For further details please contact Shantal Aragón (saragon@povertyactionlab.org), Senior Training Manager, The Abdul Latif Jameel Poverty Action Lab (J-PAL), Latin America & Caribbean regional office.

2 Instructors

- Matias D. Cattaneo, Associate Professor of Economics and Statistics, University of Michigan. cattaneo@umich.edu · www.umich.edu/~cattaneo
- Sebastian F. Galiani, Professor of Economics, University of Maryland, and Scientific Director, J-PAL Latin America & Caribbean. galiani@econ.umd.edu · econweb.umd.edu/~galiani
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3 Overview and Required Background

This short course provides an introduction to classical and recent methodological developments in the analysis and interpretation of experimental and quasi-experimental research designs in the Social Sciences. The course will focus on three main topics: (i) introduction to causal inference, (ii) analysis of randomized experiments, and (iii) regression discontinuity (RD) designs. A brief outline of the course, along with some background references, is given below.

Participants are expected to have elementary working knowledge of statistics, econometrics and program 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 Angrist and Pischke (2009). See also Wooldridge (2010) for a graduate level textbook review on econometrics and program evaluation. However, the course is designed to be self-contained and hence most underlying statistical and econometric concepts will be explained in class. For more comprehensive technical reviews on causal inference and policy evaluation see Heckman and Vytlacil (2007) and Imbens and Wooldridge (2009).
4 Schedule & Background References

The first three days will focus on causal inference and analysis of experiments. Main background references for the topics covered include Angrist and Pischke (2009), Gerber and Green (2012), Glennerster and Takavarashan (2013), Hayes and Moulton (2009), Morgan and Winship (2015), Imbens and Rubin (2015), and Pearl, Glymour, and Jewell (2016).

Day 1 (Mon 5-Aug 2016): Causal Inference and Assignment Mechanisms

  09.00am – 10.15am: Review of Statistical Inference.
  10.45am – 12.00pm: Causal Inference and Experimental Designs.
  01.30pm – 02.45pm: Simple versus Cluster Randomization.
  03.15pm – 04.30pm: Power Analysis.
  04.30pm – 05.00pm: Q&A and general discussion

Day 2 (Tue 6-Aug 2016): Departures from Canonical RCTs

  09.00am – 10.15am: Non-compliance.
  10.45am – 12.00pm: Attrition and Bound Analysis.
  01.30pm – 02.45pm: Multiple Testing.
  03.10pm – 04.30pm: Empirical Applications.
  04.30pm – 05.00pm: Q&A and general discussion

Day 3 (Wed 7-Aug 2016): Analysis of Experiments

  09.00am – 10.15am: Conventional finite- and large-sample methods.
  10.45am – 12.00pm: Randomization inference methods.
  01.30pm – 02.45pm: Regression adjustment and parametric methods.
  03.15pm – 04.30pm: Empirical Applications.
  04.30pm – 05.00pm: Q&A and general discussion

The fourth day will focus on resampling methods commonly used in empirical work. Several Stata commands already offer different resampling methods and implementation, and hence we will employ these options directly. In addition, we will use user-written do-files specifically developed for this portion of the course, including some basic MATA code for simulation and resampling. Main background references for the topics covered include Chernick (2007); Davison and Hinkley (1997); Efron and Tibshirani (1994); Ernst (2004); Hall (2013); Horowitz (2001); Imbens and Rubin (2015); Politis, Romano, and Wolf (1999); Shao and Tu (2012).

Day 4 (Thu 8-Aug 2016): Resampling Methods

  09.00am – 10.20am: Introduction Permutation, Jackknife and Bootstrap.
  10.45am – 12.00pm: Resampling methods for RCTs.
  01.30pm – 02.45pm: Uncertainty estimation and inference.
  03.15pm – 04.30pm: Empirical Applications.
  04.30pm – 05.00pm: Q&A and general discussion
The last day will focus on a quasi-experimental research design. This year the course will discuss Regression Discontinuity (RD) designs. For early reviews on RD designs see Imbens and Lemieux (2008) and Lee and Lemieux (2010). Since these reviews do not cover many of the most recent methodological results available in the literature, we are currently working on an up-to-date review on RD methodology (Cattaneo and Titiunik, 2016). See also Cattaneo and Escanciano (2016) for a contemporaneous edited volume with more recent overviews, discussions, and references.

Main background references for the topics covered include Calonico, Cattaneo, and Titiunik (2014b); Cattaneo, Frandsen, and Titiunik (2015); Calonico, Cattaneo, and Titiunik (2015a); Calonico, Cattaneo, Farrell, and Titiunik (2016a); Calonico, Cattaneo, and Farrell (2016a,b); Card, Lee, Pei, and Weber (2015); Cattaneo, Keele, Titiunik, and Vazquez-Bare (2016); Cattaneo, Jansson, and Ma (2016a); Cattaneo, Titiunik, and Vazquez-Bare (2016a); Hahn, Todd, and van der Klaauw (2001); Keele and Titiunik (2015); Lee (2008); and McCrary (2008).

Finally, the following Stata packages will be used. Please make sure you have these packages installed and fully functional in your personal computer.

- **rdpower**: Power calculations and sample size selection for RD designs. See Cattaneo, Titiunik, and Vazquez-Bare (2016) for an introduction.
- **rdrobust**: RD inference employing local polynomial and partitioning methods. See Calonico, Cattaneo, and Titiunik (2014a, 2015b) for introductions, and Calonico, Cattaneo, Farrell, and Titiunik (2016b) for the most recent upgrades.
- **rddensity**: RD density test for manipulation testing. See Cattaneo, Jansson, and Ma (2016b) for an introduction.
- **rdlocrand**: RD inference employing randomization inference methods. See Cattaneo, Titiunik, and Vazquez-Bare (2016b) for an introduction.

Further details (including related R packages) may be found at:

https://sites.google.com/site/rdpackages

**Day 5 (Fri 9-Aug 2016): RD Designs**

- **09.00am – 10.20am**: Introduction to RD designs.
- **10.45am – 12.00pm**: RD designs as “local randomized experiments”.
- **01.30pm – 02.45pm**: Local-polynomial methods.
- **03.15pm – 04.30pm**: Empirical Applications.
- **04.30pm – 05.00pm**: Q&A and general discussion
References


